

**EXPLORING THE CORRELATION BETWEEN LANGUAGE MEDIUM AND ACADEMIC
ACHIEVEMENT: A COMPARATIVE STUDY OF THE LANGUAGE OF LEARNING AND TEACHING
(LoLT) AND MATHEMATICS RESULTS IN THE 2010 GRADE 12 NATIONAL SENIOR
CERTIFICATE EXAMINATIONS IN THE EASTERN CAPE**

THESIS

Submitted in fulfillment of the requirements for the degree of

MASTER OF ARTS

RHODES UNIVERSITY

FACULTY OF HUMANITIES

BY

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January 2013

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DECLARATION

I the undersigned, hereby declare that this thesis is my original work and has not, in its entirety or part, been submitted at any university for a degree.

Signed:

Date: 8 January 2013

ACKNOWLEDGEMENTS

Deep-felt gratitude goes to my life partner for having travelled with me this far; never to complain. His name Thebe means a shield in Sesotho; for shielding me and our precious 'soccer club' when needed the most. B-man, my eldest son; you helped centre my thoughts. I appreciate you; Zidodo my big girl, Amo, Kalo and the three musketeers – I live for you guys. A big thank you goes to the famous Mbude seven (Posh, Lungi, Wendice, Sindi our only brother Chris) and even more to the baby of the family - Mandila; for always believing in me and supporting me through thick and thin. To all those who are my family in many ways, physically and spiritually, I thank you. I appreciate greatly, the spirit of my mother Rose Gxabela-Mbude that has pushed me step by step from beyond. All my colleagues in the 'exclusive club' of language-in-education; especially Professor Neville Alexander my personal mentor; who offered me an opportunity to be a member of the 'exclusive club' in 1997 – *ndiyabulela ndlovu* Rest In Peace. Thanks to the DSRAC for financial support, and the Eastern Cape Department of Education; especially the Exams Directorate for giving me access to information that I needed for this study.

I have only respect for the dedication and commitment of my supervisor Professor Russell Kaschula. He and I know what it took to make this thesis a reality. I acknowledge the advice of Subject Head Ms Bulelwa Nosilela and the staff in the School of Languages at Rhodes University. Many people know how little personal time I have because of the demands of my job; I started this journey in 2000 at the University of Cape Town. I circumvented it ten years later at Rhodes – *halala Rhini*.

ABSTRACT

In 2009, of the 68,129 learners who wrote Matric, only 34,731 learners passed. In 2010, there was an increase in the provincial pass rate causing much excitement across the board. The reality was that of the 64,090 learners who wrote, only 37,345 learners passed. In 2010, a result below 50% was recorded for Mathematics and Physical Science nationally (DBE; 2011). Despite efforts by the Education Department to support MSTE; establishing Mathematics and Science schools, NGOs and HEIs giving extra Mathematics and Science support to students and teachers, the offering of Saturday classes and incubation camps, we still get minimal return on investment. This thesis analyses these results against the backdrop of language planning theory, particularly language-in-education policies, pre and post-apartheid. The correlation between language medium and academic performance in language (LoLT) and Mathematics of Grade 12 learners is explored. Worldwide the issue of low achievement in Mathematics by ESL students is of great concern (Cuevas, 1984). The 2004 Systemic Evaluation sample of learners was in Grade 6 then; in 2010 they wrote Grade 12. The purpose of the systemic evaluation was to provide an insight into the levels of learner performance in Maths, Natural Science and LoLT in Grade 6 (IPSER, 2006).

A major finding of the IPSER was that language was an important factor related to learner achievement. A major disparity was observed in this research, that although the Eastern Cape performed below the national average in the three subjects evaluated, the learners for whom LoLT was the same as their home language obtained scores that were significantly higher than those whose home language was different from the LoLT. The provincial average for Mathematics was 23.40% compared to the national average of 27.80%. For LoLT the province scored 30.16 against the national score of 38.03%. Of interest in this study is a juxtaposition of the Matric results of this same group of learners in 2010 and see whether issues that came up then are still significant in mitigating achievement in Mathematics and Language (LoLT). Some research studies have been conducted in South Africa (Adler, 1998; Setati, 1996-2002; Moloi, 2006) identifying the vital role language plays in learning Mathematics, especially for English L2 learners. Building on research and findings of academics such as the late Alexander, Ramani, Joseph, Hendricks, Heugh, Dalvit, Webb and Murray, this thesis suggests that a mother-tongue-based-bilingual approach to education should be adopted as a matter of urgency.

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CHAPTER 1

PATTERNS OF LANGUAGE POLICY AND PRACTISE IN SOUTH AFRICA

1.1 Introduction

This chapter seeks to set out the policies that exist pertaining to the language of learning and teaching in South Africa. This is done against a historical backdrop while at the same time referring to contemporary policies and best practices, for example policies developed in the Western Cape Province. Chapter 1 seeks to contextualize language policy and practice in South Africa.

1.2 The colonial experience

In trying to address the insalubrious state of education for the majority of citizens in post-colonial Africa, various educationists, academics and researchers agree that partially as a result of colonialism in Africa, South America and the Indian sub-continent, language policy and practice has been largely influenced by the colonial experience. As a result, education across these three continents has been marked by poor success for the majority populations (Education Rights Project, 2000).

Ngugi (1994) laments the state of the colonized mind by stating that the elevation of the language of the colonizer was conscious and deliberate. The domination of a people's language by the languages of the colonizing nations was crucial to the mental universe of the colonized (Ngugi in Alexander, 1997). Alexander takes the discussion further by stating that no government in Africa today can claim that the generality of the population has a sufficient command of the former colonial languages such that they can conduct their essential daily transactions in those languages without assistance (Alexander, 2001). It becomes important to validate this claim that relates poor language policy decisions to the colonial era by interrogating aspects of this history that might have contributed to the present quagmire in education.

There is an interesting colonial history to the use of colonial languages to educate African children in schools that can be backdated to the time of [Jan] Van Riebeeck. The Dutch East

India Company (DEIC) set up the first school in South Africa at the Cape in 1656, for slave children from the West Coast, for practical communication purposes (Loram, 1927). Slaves that could not understand the language of the masters were useless and language barriers presented tensions between master and slave. The Dutch colonists had to do something with the youth to ease the communication burden, thereby also breeding an effective workforce. The DEIC governed the Cape Colony between 1652 and 1795. Dutch was the sole medium of instruction in education and was the language of administration and of the Dutch Reformed Church (Gilliomee, 2003). In 1685, segregation in schools started, with missionaries taking control of Black education for some time.

The British conquering of the Cape Colony in 1795 and again in 1806 meant that the Cape Colony became the new British colony. More than 95 percent of the Cape population spoke no English, i.e. the Dutchmen, the imported slaves, and the indigenous Khoi-Khoi people. In 1822, the British Governor Lord Charles Somerset issued a proclamation that English would be the official language. By 1828, the British had entrenched English as the language of administration and of the justice system (Thompson, 1960). As early as 1841 the British colonialists sought to provide state aided education on condition that the medium of instruction was English (Heugh, 2001). One can already see the development of the pattern of education based on a minority language and how years later we still wrestle with the results thereof.

What was happening in South Africa was not an isolated act. It was part of the bigger plan linked to British imperialism. English as the defining reality or acting as the defining lingua franca is not an accident of modern technological advances. On the contrary, it is the culmination of a deliberate policy by the English intelligentsia (Kaschula et. al., 2007). If one traces the path of English around the British Empire, the language acted as a symbol of political power and domination. Languages in themselves can never dominate people. However, they can be used in hegemonic ways by the perpetrators of domination to achieve their agenda. The triumphalism attitude of the British Empire demonstrated this point very well. William Russel in 1801 stated that if many schools were established in different parts of Asia and Africa to instruct the natives, free of all expense, with various premiums of British manufacture to the most meritorious pupils, this would be the best preparatory step

that the Englishmen could adopt for the general administration of their commerce, their opinions, their religion (Russel, 1801 in Crystal, 1997). Isaac Pitman in 1873, an editor of a Journal when writing about the future of English also supported the thesis that the situation we are battling with today was not by default but by design; when he purported that it was considered self-evident that the civilizing influence of Britain was a desirable goal, anywhere in the world, and that the English language was an essential means of achieving this end.

In 1862, the colonial setting in South Africa forced the colonized to accept the 'Master language' English. In 1892, Sir Muir, the Superintendent General of Education in the Cape, raised both the standard of English and teaching in Cape schools (Koloti, 1999). Soon English was the language of aspiration for the children of the select few kings, chiefs and leaders. The few select would become the educated elite and were to serve as mediators between the locals and the colonial imperialists. The formation of this layer of English-speaking African elite was the beginnings of the hegemony of English in Southern Africa (Heugh, 2001) for years to come.

1.3 The role of missionaries

The first schools in South Africa were usually attached to Christian mission stations. For years this has been a problematic issue as this so-called 'importation of European ideas' has been regarded as *colonisation* of people in terms of religion, language, culture and thought. Yet the missionaries played a significant role in recording the languages of South Africa (Opland, 1983). Orthographies were established and grammars written down - sometimes with no regard for culturally similar ethnic groups. In this sense 'languages' were created by recording regional dialects differently. This happened mainly due to the fact that missionaries came from various countries and missions in Europe and did not necessarily have the opportunity to communicate with each other. This explains the difficulty that often comes up when trying to hopelessly define the boundary between isiXhosa and isiZulu or North Sotho and South Sotho.

The history of education in South Africa, like in other parts of Africa, has been shaped by a combination of colonial education policy and practice and missionary education during the 19th century. The Education of black children in South Africa was mainly conducted by

missionaries who mostly taught through English, whereas the German and Swiss missionaries taught through the languages of the African communities. As mentioned earlier, education would be state aided if it was conducted through the medium of English (Heugh, 2001).

The offspring of the handful of black elite continued to attend missionary schools. This is so even post the formation of the Union of South Africa in 1910. English was highly prized in these schools, reinforcing the notion that proficiency in English and education were inextricably linked. The value of the mother tongue began to dawn on missionaries after The United Missionary Conference in Kenya in 1909; which along with various reports on the education of African children began to stress the importance of the use of the mother tongue for the early years of education (Heugh, 1999). It was the Welsh Commission's recommendation of 1935 that all provinces extend the use of the mother tongue for African pupils to at least six years of school; that brought about regulatory language use. The switch to English for higher learning, which characterized black education in the colonial era and in the apartheid era as well as in post-1994, is a means to maintain power relations. As a consequence of that transition, any effort to deviate from this status quo is bound to be problematic.

The duty bound need by missionaries to Christianise Africans also led to massive translations of the Bible; thereby serving as a driving force in the written development of African languages (Opland, 1983; Oosthuysen, 2013). The following dates are interesting to note: as early as 1857, the first translation of the Bible was in Setswana, followed by isiXhosa in 1859. Even so the scientific development of these languages remains in its infancy. The Afrikaans translation was completed in 1933 after the Sesotho, isiZulu and Xitsonga versions.

- Afrikaans [1933, 1983]
- IsiNdebele [1986 - the Old Testament still needs to be translated]
- IsiXhosa [1859, 1996]
- IsiZulu [1883, 1959]
- Northern Sotho [1904, 1951, 1998]
- Sesotho [1878, 1989]

- Setswana [1857, 1970]
- SiSwati [1997]
- Tshivenda [1936, 1998]
- Xitsonga [1907, 1929, 1986] (Wikipedia, 2011).

Afrikaans was generally regarded a 'mere vernacular' (in the negative sense of the word), used only in the lowest social functions, and was without a writing system and had no literature. The development of Afrikaans within a period of 60 years was strongly supported by Afrikaner nationalism. Today in the case of Bantu languages, a similar move could conceivably lead to conflict if an excessive degree of ethno linguistic nationalism developed in the course of their intellectualization (Webb et al, 2008). This effectively means that the intellectualization process will take longer for African languages, for the sake of harmony in South Africa. The colonial status quo remains.

1.4 The development of Afrikaans as a public language

Afrikaans as a language originated in the Cape, as a result of the settling of the Dutch in the Cape during the seventeenth century. It took root as a result of interaction of the slaves and the indigenous peoples who resided in the Cape between the seventeenth, eighteenth and nineteenth century. There are many theories contesting Afrikaans origins and how much Dutch or Malay or Khoi-Khoi or Creole is contained in Afrikaans (Ponelis, 1993 in Gilliomee, 2003). The significant lesson from the development of Afrikaans as a language that African language speakers can learn from is that in the course of the twentieth century Afrikaans, Hindi, Indonesian, and Hebrew, are possibly the only languages that were standardized and came to be used in all branches of life and learning, including in both undergraduate and postgraduate teaching, and in science and technology (Gilliomee, 2003). It is an achievement that all living languages, including African languages can achieve if all the ingredients of making this possible are combined.

In the quest to resist the Anglicization attempts by the British after the Anglo-Boer War of 1899-1902, there was a renewed growth of Afrikaans. The British government severely curtailed Dutch through Anglicizing education and the administration system. This did not only spell doom for the Dutch settlers who had established two republics; the Transvaal and

the Orange Free State, as mentioned earlier on, the education of Africans was left to missionaries. The few state schools did not provide for the education of Africans. The few which did practiced mother tongue education for the first four to six years followed by a switch to English (Hartshorne, 1992).

On the Afrikaans front there was a demand for a simpler medium of instruction than Dutch to be used in the system of mass education for whites. Most of the Afrikaners in the ex-republics were the impoverished poor and the war had shown them the aggressive face of British imperialism. The English press dismissed Afrikaans as a mongrel, kitchen or decaying language fit for peasants and up-country kraals (Gilliomee, 2003). It was the determination of Afrikaner nationalists like J.B.M. Hertzog who proposed equal freedom, rights and privileges for Dutch and English. Marthinus Steyn asked delegates to place both languages on an equal footing at the National Convention of 1908-1909 when in 1910 the Union of South Africa was formed, accompanied by a new language policy which gave equal status to both English and Dutch. This was significant for the Afrikaner (Malherbe, 1977).

Afrikaners were far behind English speakers in terms of education. In 1915 only 15% of Afrikaner children had advanced beyond Grade seven. Only 4% had progressed far enough to become proficient in English (Gilliomee, 2003). Dutch was a problem as the melting pot effect had diminished its role as a first language for the younger generation. Between 1910 and 1924 men such as Cornelis Langenhoven advocated that Afrikaans was the language that the Afrikaner could relate to. It was a simple degraded language that still had retained the expressiveness of High Dutch and a luxuriant wealth of additional phrases and idioms of local growth. In July 1914 in a powerful speech to academics, he demolished the gradualist argument that the introduction of Afrikaans in schools and universities had to be postponed until it was a cultivated language (Ponelis, 1993). A number of teachers, church ministers and leaders did corpus, status and prestige planning. In 1925 Afrikaans replaced Dutch as official language alongside English. This was called Official Bilingualism.

Whilst the Anglophone policy of the last years of the British rule had, in reality, been mainly directed at the Dutch-speaking community and was a mechanism for entrenching colonial power over this group the spin off for African language speakers was that the learning of

and proficiency in English came to be seen as evidence of a highly prized educational qualification (Heugh, 2003). Thus, even though political changes came into being in 1994, the residue of the Anglicisation policy at the turn of the 20th century continued to impact and influence, the psyche of the African (especially the elite). It came to be believed that English was the only language in use in South Africa which could provide access to an education which could equip one for the modern world (Alexander, 1986).

Since the formation of the Union of South Africa in 1910, Afrikaners realized that there would be no development for them without Afrikaans; and they gravely despised the Anglicization policy of the British. They united to fight against it by elevating the status of an undermined 'hotnot' language, as it was negatively portrayed) by the English Press. Strangely, when it was their turn to govern South Africa, they exercised the same linguistic domination that the British performed against them to Africans; with dire consequences for generations to come.

The relevance of the history of the development of Afrikaans for African language speakers are the lessons that can be learnt; that language promotion is directly linked to language pride and loyalty, and secondly that it is largely a bottom/up process – language promotion requires the support of its speakers. A public movement, driven by a dedicated community leadership is required (Webb, 2008).

1.5 The Apartheid Era: The 1976 language uprising

The root cause of the 1976 uprising is a direct consequence of Afrikaner survival fears of Afrikaans as a public language. Hermann Gilliomee (2003) cites that by the early 1970s a census revealed that the proportion of people who spoke Afrikaans as their mother tongue would steadily decline. The census revealed that the 18 percent of the population who spoke it as first language in 1970 was projected to decline to 15 percent by 2000. The worst news for the Afrikaner came from the 1972 survey of young Sowetans that reported that 98 percent of them did not wish to be taught in Afrikaans. Gilliomee (2003) goes on to say that half of those polled considered Afrikaners the most cruel and least sympathetic people in South Africa. Those of us who know the history of this era, and the cruel role the Afrikaans

speaking police played in the lives of black people, understand the blatant rejection of Afrikaans.

The Bantustans or homelands created by the apartheid Afrikaner government were choosing English and an African language, not Afrikaans. The Bantustan set up was created according to language groups: The Nguni group - isiXhosa was shared amongst the Transkei and Ciskei, Kangwane had isiSwati, Zululand had isiZulu and Kwa-Ndebele had isiNdebele as an official language. The Sesotho group - Lebowa had Northern Sesotho, Bophuthatswana had Setswana and Qwa-qwa had Sesotho as official languages. Gazankulu had Xitsonga and Venda was for TshiVenda speakers. These puppet states were not spared the might of the apartheid forces and this led to the association of Afrikaans as the language to the oppressor.

The novelist Alan Paton (in Alexander, 2000) once made the following statement about Afrikaans: that only a fool or philologist would discuss Afrikaans without thinking immediately of Afrikaner nationalism and its close association with apartheid. He went further to add that Afrikaans had become the defining characteristic [of the state] which the greatest part of the population knows, particularly by its image of arrogance and cruelty (Gerwel, 1976). It is this arrogance that led the leader of the National Party's right-wing and deputy minister of Bantu Administration and Development, to hold the view that government had the right to decide medium of instruction in black schools because white taxpayers subsidized these schools. This provided the context to apply the Language Accord of 1909 in black schools where both English and Afrikaans would hold a 50-50 hold as media of instruction (Gilliomee, 2003). Blacks could not know at the time that Afrikaans, a language spoken by various sections of the population and not ONLY by whites, would become embroiled in a power struggle among whites. It was black education which became a casualty with the 50-50 rule as a result of the linguistic conflict that ensued. This helped to catapult black anger against Bantu Education and led to the demise for Afrikaans and Afrikaner politics. The 1976 uprising was arguably the most costly event for Afrikaans as a public language.

1.6 A historical accident that yielded positive results

Bantu Education (1953-76) offered African language learners mother tongue instruction for eight years. What the architects of Bantu Education could not then know was that the findings of international research of bilingual education between 1980 and 2000 would show that in normal conditions, it takes twelve years to develop a strong proficiency in the home language (Heugh, 2000). Researchers world-wide agree that children need six to eight years of learning a second language before they can use it effectively as a medium of instruction. It is not surprising that despite the impoverished curriculum of Bantu Education, eight years of mother tongue instruction gave learners the time to learn their own language, and learn a second language sufficiently well to make the switch to English medium in the ninth year.

There are differing schools of thought about why the National Party decided on eight years of mother tongue education for black children. The Eiselen Commission was established to do an inquiry into the education of Africans. With its report presented in 1951, it culminated into what became known as the Bantu Education Act of 1953 (Hartshorne, 1992). Did the Commission recommend this language policy? Or did the later Report on the use of Vernacular Languages in Education by UNESCO in 1953 play an influencing role? Some of us would like to hypothesize that given the overconcentration on elevating the status of Afrikaans on the part of the leaders of the time; purely, by accident, created an educationally enabling language in education policy which was applied. It might also have been linked to the delay in giving prominence to English as a language of teaching and learning. The basis of Bantu Education was never to educationally enable black people – it therefore does not follow logic that they thought along the lines of a cognitively beneficial language policy. It was purely an accident that worked in the end – but not in accordance with the actual objectives of the Bantu Education plan.

The following table demonstrates that matriculation results improved with the extension of mother tongue instruction from six to eight years during Bantu Education, despite the impoverished curriculum. This concurs with the theory that delayed use of the mother

tongue lays a solid foundation; facilitating an easier switch to English in the later grades. These learners wrote Matric in English in 1976, and they produced an impressive 83.7%.

Year	African language speaking students	% Pass rate
1955	595	43,5
1976	9 595	83,7
1979	14 574	73,5
1980	29 973	53,2
1982	70 241	48,4
1992	342 038	44,0
1994	392 434	49,0

Figure 1.1 (Table adapted from SAIRR - Topical briefing 1984, South Africa Survey 1995/6.

The years 1997 to 1998 are left out as candidates were no longer categorized according to race and language after the democratic elections in 1994).

In 1976 African language students obtained an 83, 7% pass rate. The corollary was that primary school had clearly worked (Heugh, 2000). Immediately after eight years of mother tongue instruction came to an end we see a coincidental decline in pass rates at matriculation level. After the Soweto Uprisings, mother tongue instruction was reduced first to six and later to four years. Carol McDonald in 1990 argued that four years of mother tongue instruction was too early for a shift. She made a depressing finding about the vocabulary of African learners when they completed Grade 4 (800) against the 5000 words that were required in Grade 5. Unfortunately this was at a time when it was not fashionable to promote African languages as English now rose to prominence as the language of freedom. Other researchers like Walters (1996) agreed. Currently black children have just three years of mother tongue education in the Foundation Phase (Grade 1-3) and then transition to an early exit model using English as language of learning and teaching (LoLT). If there were already indications in the 1990s about four years being too early, what then now? It does not come as a surprise that the dismal Annual National Assessment (ANA) results for Grades 3 and 6, announced by the Minister of Basic Education Angie Motshekga on the 1 July 2011 spell doom for the poor black majority.

1.7 The birth of a new era

By the end of 1993 South Africa had an interim constitution in place. Of the 25 languages spoken in South Africa, official status was given to eleven languages including nine African languages: isiNdebele, Sepedi, Sesotho, Setswana, siSwati, Tshivenda, isiXhosa, Xitsonga and isiZulu; plus the two Indo-European languages of Afrikaans and English. The logic was that their usage included 98% of the total population. On the 27th April 1994 the first democratic elections were held in South Africa, signaling a new era. The post-apartheid Republic of South Africa adopted a new Constitution on the 8th May 1996. This language accord of the Union of South Africa of 1909 and the principle of official bilingualism of 1925 were effectively put to an end in 1996. The question then arises as to why the education of black children is still characterized by linguistic discrimination similar to that of pre-1994? Alexander (2000) argues that the maintenance of the linguistic status quo is a result of static maintenance syndrome; where people know what to do but are gripped by middle class inertia that Africa is experiencing, to the detriment of the poor masses. The following are pieces of legislation/policies of the new era which are designed to turn around the education system.

1.7.1 The Constitution and key clauses pertaining to language rights

3(2) All citizens are –

- (a) equally entitled to the rights, privileges and benefits of citizenship; and
- (b) equally subject to the duties and responsibilities of citizenship.

9(3) The state may not unfairly discriminate directly or indirectly against anyone on one or more grounds, including ... language...

29(2) Everyone has the right to receive education in the official language or languages of their choice in public educational institutions where that education is reasonably practicable. In order to ensure the effective access to, and implementation of, this right, the state must consider all reasonable educational alternatives, including single medium institutions, taking into account –

- (a) equity;
- (b) practicability; and

(c) the need to redress the results of past racially discriminatory laws and practices.

(Education Rights Project, 2005)

1.7.2 Pan South African Language Board Act (Act 59 of 1995)

President Mandela acquiesced to the above Act in 1995 as a means to provide for the recognition, implementation and furtherance of multilingualism in the Republic of South Africa. This was also to develop the previously marginalised languages and to establish a Pan South African Language Board and to provide for matters connected therewith (PanSALB Act, 1995).

The Pan South African Language Board being a quasi-government structure was established to promote and create conditions for the development and use of all official languages, including the Khoi and San languages and Sign languages (Marivate, 1998).

The ability of the Pan South African Language Board to perform its watchdog function has been severely curtailed by the inadequate funding it receives from parliament. The board members of PanSALB have a range of expertise in the language arena as required by the PanSALB Act, ranging from lexicography, translation, interpreting, language learning and teaching, language planning and language legislation. It then does not make sense that so many language violations continue unabated. Arguably the financing of the activities of this body needs to be reviewed.

1.7.3 South African Schools Act (Act 84 of 1996)

The objective of the *South African Schools Act* is to provide a strong foundation for the protection and advancement of the country's diverse cultures and languages. Section 6 of this act empowers school governing bodies to determine the language policy of schools within guidelines set nationally and on a provincial level.

According to the Department of Education's language policy school pupils have a right to be taught in a language of their choice and they should inform the school which language they wish to be taught in when applying for admission. Schools should take these preferences into account and work towards multilingualism.

Only official languages may be used for instruction. From Grade 3 onwards, all pupils will have to study the language they are taught in, and at least one other approved language. Furthermore language may not be used as a barrier to admission. Governing bodies must stipulate how their schools will promote multilingualism. Failing a language will result in failing a grade.

1.7.4 The National Education Policy Act (Act 27 of 1996)

On the 24th April 1996, President Mandela signed the above Act to provide for the determination of national policy for education; thus amending the existing National Policy for General Education Affairs Act of 1984. This Act empowers the Minister amongst other things to determine a national policy for language in education. Subsequently the *Language-in-Education Policy* was adopted in 1997.

1.7.5 The Language in Education Policy (1997)

In July 1997, the National Department of Education (DoE) released its Language in Education Policy (DoE, 1997) for public schools. The LiEP favoured an additive approach in which “the underlying principle is to maintain home language(s) while providing access to and the effective acquisition of additional language(s)” (DoE, 1997). The LiEP gave schools the right to decide on their own language policies, subject to the obligation to promote multilingualism. By raising the status of African languages this policy operates within the following paradigm (paragraph 1):

1. In terms of the new Constitution of the Republic of South Africa, the government, and thus the Department of Education, recognises that our cultural diversity is a valuable national asset and hence is tasked, amongst other things, to promote multilingualism, the development of the official languages, and respect for all languages used in the country, including South African Sign Language and the languages referred to in the South African Constitution.
2. The inherited language-in-education policy in South Africa has been fraught with tensions, contradictions and sensitivities, and underpinned by racial and linguistic discrimination. A number of these discriminatory policies have affected either the access of the learners to the education system or their success within it.

3. The new language-in-education policy is conceived of as an integral and necessary aspect of the new government's strategy of building a non-racial nation in South Africa. It is meant to facilitate communication across the barriers of colour, language and region, while at the same time creating an environment in which respect for languages other than one's own would be encouraged.

4. This approach is in line with the fact that both societal and individual multilingualism are the global norm today, especially on the African continent. As such, it assumes that the learning of more than one language should be general practice and principle in our society. That is to say, being multilingual should be a defining characteristic of being South African. It is constructed also to counter any particularistic ethnic chauvinism or separatism through mutual understanding.

5. A wide spectrum of opinions exists as to the locally viable approaches towards multilingual education, ranging from arguments in favour of the cognitive benefits and cost-effectiveness of teaching through one medium (home language) and learning additional language(s) as subjects, to those drawing on comparative international experience demonstrating that, under appropriate conditions, most learners benefit cognitively and emotionally from the type of structured bilingual education found in dual-medium (also known as two way immersion) programmes. Whichever route is followed, the underlying principle is to maintain home language(s) while providing access to and the effective acquisition of additional language(s). Hence, the Department's position that an additive approach to bilingualism is to be seen as the normal orientation of our language-in-education policy. With regard to the delivery system, policy will progressively be guided by the results of comparative research, both locally and internationally.

6. The right to choose the language of learning and teaching is vested in the individual. This right has, however, to be exercised within the overall framework of the obligation on the education system to promote multilingualism.

According to the *Language-in-Education Policy* (1997) the main aims of the Ministry of Education's policy for language in education are (paragraph 5):

1. to promote full participation in society and the economy through equitable and meaningful access to education;

2. to pursue the language policy most supportive of general conceptual growth amongst learners, and hence to establish additive multilingualism as an approach to language in education;
3. to promote and develop all the official languages;
4. to support the teaching and learning of all other languages required by learners or used by communities in South Africa, including languages used for religious purposes, languages which are important for international trade and communication, and South African Sign Language, as well as Alternative and Augmentative Communication;
5. to counter disadvantages resulting from different kinds of mismatches between home languages and languages of learning and teaching;
6. to develop programmes for the redress of previously disadvantaged languages.

The *Language-in-Education Policy* (1997) also articulates the following statements:

- The parent exercises the language choice (the document uses the wording 'language rights') on behalf of the minor learner.
- Learners (i.e. their parents) must choose their language of teaching upon admission to a school.
- Where a certain language is not available, learners may request the provincial education department to make provision for instruction in the chosen language.
- Governing bodies of schools must stipulate how the school will promote multilingualism through using more than one language of learning and teaching, and/or by offering additional languages as fully-fledged subjects, and/or applying special immersion or language maintenance programmes, or through other means approved by the head of the provincial education department.
- Where there are less than 40 requests in Grades 1 to 6, or less than 35 requests in Grades 7 to 12 for instruction in a language in a given grade not already offered by a school in a particular school district, the head of the provincial department of education will determine how the needs of those learners will be met, taking into account:

- 1.the duty of the state and the right of the learners in terms of the Constitution, including
- 2.the need to achieve equity,
- 3.the need to redress the results of past racially discriminatory laws and practices,
- 4.practicability, and
- 5.the advice of the governing bodies and principals of the public schools concerned.

1.7.6 The National Language Policy Framework (2003)

In the eighth year of democracy, in the year 2000 the government of national unity realized that South Africans had to respond to the linguistic and cultural diversity and the challenges of constitutional multilingualism; hence the introduction of the NLPF (2003). The National Language Policy Framework (NLPF) strongly encourages utilization of the indigenous languages as official languages in order to foster national unity. It takes into the account the broad acceptance of linguistic diversity, social justice, the principle of equal access to public services and programmes and respect for language rights. The document sets out an enabling framework for a coherent multilingual dispensation within the parameters of the Constitution (NLPF, 2003).

An Implementation Plan for the National Language Policy was developed and costed. It calls for the establishment of a language infrastructure and appropriate mechanisms for the full implementation of multilingualism in the public service. The national, provincial, and local government departments are mandated to play a critical role in ensuring the successful implementation of the Language Policy by establishing language units staffed with people to manage language related issues for that particular department. This would include language development in all its forms including translation, terminology development, human language technology etc. In this implementation plan, the costs of establishing a language unit are spelt out in detail and how minimal the costs would actually be for such a crucial department. The Department of Education has eventually heeded the call; a language unit is

in the process of being set up in Pretoria; some provincial education departments have moved in an attempt to comply with this mandate. The Western Cape Education Department set up a translation unit, it is understaffed and deals mainly with the translation of documents. The Eastern Cape Department of Education in 2010; despite its plethora of problems and challenges has led the way for South Africa by setting up a fully functional language unit, as proposed by the National Language Policy Framework (2003).

The then Minister of Arts, Culture, Science and Technology, Dr Ben Ngubane announced the National Language Policy Framework in 2002 after lengthy consultations through the Language Plan Task Group (LANGTAG of 1995) and his advisory panel on Language Policy, and he further stated that this framework was fundamental to the management of South Africa's diverse language resources.

The National Language Policy Framework is very clear about the challenges of the post-apartheid South Africa. It states that to date management of linguistic diversity in post-apartheid South Africa has been made problematic by the lack of a clearly defined language policy, leading to the use of English and Afrikaans as the most dominant languages. The document further claims that the situation is compounded by the fact that owing to shortsighted and bureaucratic attitudes against implementing multilingualism, public institutions have a tendency of taking ad hoc decisions that negate the constitutional provisions and requirements relating to languages. The Framework goes a step further by instructing provincial departments to formulate their policies in line with guidelines contained in the Policy Framework, in promoting multilingualism (NLPF, 2003). It is disheartening to accept the truism in the statement that Government agencies in Africa and other stakeholders do not regard language planning as a priority (Kaschula et al 2007). The wait continues in relation to the implementation of this framework and other policies.

1.7.7 The Western Cape Language Act (2005)

The Western Cape's Provincial Language Committee (a PanSALB structure) led the way for the other provinces by drawing up a Language Act for the province. At the time all indications from some quarters were that the other provinces were not yet ready and that it was premature to produce such a document. The Provincial Language Committee pushed

hard and the document went through all the processes required. Within two years the Western Cape became the first province to have a Language Act. This was widely applauded as a first but there were questions about the feasibility of implementation. A detailed presentation of the Act follows as a policy example for other provinces to follow in order to further influence the debate concerning language of instruction in the educational domain:

1. PURPOSE: To give effect to

- sections 6 and 9 of the Constitution of the Republic of South Africa (Act 108 of 1996);
- section 5 of the Constitution of the Western Cape (Act 1 of 1998);
- the Western Cape Languages Act (Act 13 of 1998);
- the Pan South African Language Board Act (Act 59 of 1995);
- the National Language Policy Framework (2003);
- the Batho Pele principle;
- *IKapa elihlumayo* (growing and sharing the Cape),
- the development strategy of the Western Cape;
- the South African Government's call for social cohesion;
- the development of the provincial and national economy.

2. GOALS

2.1 To promote the use of the three official languages of the Western Cape, namely Afrikaans, isiXhosa and English, by the provincial and local governments of the Western Cape;

- 2.2 To elevate the status and advance the use of those indigenous languages of historically diminished status used by the people of the Western Cape, such as the Khoi and San languages;
- 2.3 To ensure that the Western Cape is a caring home for all by promoting multilingualism;
- 2.4 To support the Batho Pele initiative of impartial service delivery by promoting equal access to public services and programmes by removing communication or language barriers;
- 2.5 To give increasing effect to the equal constitutional status of the three official languages of the Western Cape;
- 2.6 To empower and affirm speakers of previously marginalised languages;
- 2.7 To eradicate the serious marginalisation of isiXhosa in the public service by resourcing and promoting the development and awareness of its official status;
- 2.8 To foster respect and protect language rights, thereby avoiding the use of language for exploitation and domination based on gender, race, class, age, religion, culture or sexual orientation, or language that condones violence;
- 2.9 To ensure social cohesion and improve relationships by promoting language diversity;
- 2.10 To contribute to *iKapa elihlumayo* (growing and sharing the Cape) through training and service in languages understood by different language groups;
- 2.11 To promote and ensure respect of other official languages (eg Sesotho) and heritage languages in the Western Cape;
- 2.12 To create awareness about the needs of the hearing impaired;
- 2.13 To develop language resources by enabling and supporting the training of language professionals;
- 2.14 To encourage language use that is accessible to all.

3. POLICY PROVISIONS FOR THE USE OF THE OFFICIAL LANGUAGES OF THE WESTERN CAPE BY THE PROVINCIAL GOVERNMENT

3.1 The official languages of the Province are Afrikaans, isiXhosa and English. These languages may be used in any debates and other proceedings of the Western Cape Provincial Parliament and its committees. The Western Cape Parliament must make provision for interpreting services for members from and into the three official languages during sittings of the Provincial Parliament and any of its committees. Sign language interpreting must be provided where necessary.

3.2 The official record of debates of the Provincial Parliament must be kept in the official languages in which the debates took place. Translations of any sections of the record into any of the relevant official languages must be made available by the Secretary to the Provincial Parliament within a reasonable period after the debate.

3.3 All legislation, official reports and resolutions of the Provincial Parliament and its committees must be made available in all three official languages. The Provincial Parliament may make practical arrangements to cause legislation, official reports and resolutions drawn up in one official language to be available, within a reasonable period, in the other two official languages.

3.4 A bill introduced in the Provincial Parliament must upon introduction be available in at least two official languages. A system must be implemented which rotates the choice of two languages equitably amongst the three official languages of the Province. The Secretary to Parliament must keep a centralised register in order to regulate the rotation of the languages in bills to be introduced to the Provincial Parliament.

3.5 A notice of motion or a formal motion in the Provincial Parliament must be available in all three official languages. The Provincial Parliament may make practical arrangements to cause motions drawn up in one official language to be available, within a reasonable period, in the other two official languages.

4. OFFICIAL NOTICES AND ADVERTISEMENTS

4.1 All official notices issued by the provincial government for general public information, must be issued in Afrikaans, isiXhosa and English. Local government must give due consideration to the language preferences of their residents in this regard.

4.2 All official notices and advertisements published by provincial and local governments must, in case of publication in the Provincial Gazette, be published in Afrikaans, isiXhosa and English. When published in other newspapers, it is sufficient to publish such documents, notices or advertisements only in the language in which the newspaper concerned appears. If there is no newspaper published in a particular language, such notices or advertisements must be published in that official language in another newspaper.

5. COMMUNICATION WITH AND SERVICES TO THE PUBLIC

5.1 Every organ or institution of the provincial or local government must, in its oral, written and electronic communication with and rendering of services to the public, ensure that these are carried out in the most appropriate manner, with the assistance of interpreters and translators and other technical means such as simulcast and subtitling, in any of the three official languages of the Western Cape, depending on the language usage and needs of the residents.

5.2 Any member of the public in the Western Cape may

(a) use any one of the three official languages of the Western Cape in his or her communication with any institution of the provincial or local government, and

(b) be served in any of the three official languages at or by any institution of the provincial or local government where there is a substantial need for communication and services in that language based on the language needs and preferences of the community, and it can reasonably be expected of the institution concerned to communicate and render services in that language, with due consideration to the National Education Language Policy,

5.3 In the case of written and electronic communication between the provincial and local governments and residents, the provincial official language of the residents' choice must be used. If the provincial or local government initiates the communication, the language profile of the *target audience* will determine the languages to be used. Subject to periodic language audits, provincial and local government publications shall be issued in the language/s of the target audience.

5.4 International communication on the part of provincial and local governments will usually be in English or in the preferred language of the country concerned.

6. INTERNAL COMMUNICATION

6.1 Provincial and local governments must in their various structures each reach sufficient consensus on their working languages for internal **oral** communication, intra- and inter-departmentally, subject to the proviso that no person shall be prevented from using the language of his or her preference, at any given time.

6.2 Provincial and local government structures must in their various structures each reach sufficient consensus on their working languages for internal **written** and **electronic** communication, intra- and inter-departmentally, provided that every effort be made to comply with the language code of conduct.

7. LOCAL GOVERNMENT

Local governments must determine the language usage and preferences of their communities within the enabling provincial language policy framework.

Upon the determination of the language usage and preferences of the residents, local governments must, in consultation with their communities, develop, publicise and implement language policies.

8. PRIVATE SECTOR

8.1 Provincial and local governments shall encourage and advise private enterprises to develop and implement their own language policies in accordance with the framework of the Provincial Language Policy.

8.2 Provincial and local governments shall endeavor to promote the most important languages of trade and tourism such as German, French and Japanese. Provincial and local governments shall advise non-governmental organisations and the private sector in this regard, e.g. in regard to planning and the formulation of policy.

9. IDENTIFICATION SIGNS

Where an organ or institution of the provincial or local government uses signage and directions to identify any of its offices or facilities, such signage and directions must be in the three official languages of the province. The three official languages of the Western Cape must be used equitably on road signs and direction signs on roads that do not form part of the RTRN. As far as local road signs, direction signs and street names are concerned, due consideration must be given to local communities' language use and preferences.

1.8 Practice versus Policy yet again

A cursory look at the Western Cape Language Act (2005) easily conjures in one's mind images of a province that is well deserving of the continuous high academic achievement it has come to be known for because it purports to value the home languages of learners in the province. Section 2.3 of the Act makes one to feel as if all provinces need to follow the example of the Western Cape as it states that it will ensure that the Western Cape is a caring home for all by promoting multilingualism.

Those of us acquainted with the educational landscape of the Western Cape know too well that Afrikaans and English learners are the only ones privileged to benefit from this Act. Only the majority Afrikaans speakers and English home language learners have access to home language education from the cradle to the university (Alexander, 2005) in the Western Cape. The other official language group i.e. isiXhosa learners fail repeatedly, year

after year as their mother tongue journey is circumvented after Grade 3. In the Goals, Section 2.11 claims that the Act will promote and ensure respect for other official languages like Sesotho and other heritage languages. However, Sesotho learners are in the same category as amaXhosa in the Western Cape. The previously disadvantaged of the past continue to be disadvantaged presently even against the backdrop of sound Acts and Policies post-1994. The language of learning and teaching, like in the rest of the country continues to favour two language groups; similar to the language accord of 1909 and the Official Bilingualism sanctioned in 1925, even seventeen years after democracy.

1.9 The Language Transformation Plan (LTP)

In the year 2008 I was Project Manager for the sixteen pilot schools experimenting with the Language Transformation Plan (LTP) in the Western Cape Education Department. The ex-MEC for Education Cameron Dugmore together with the Project for Alternative Education in South Africa (PRAESA) drew up an implementation plan for sixteen pilot schools to experiment with Mother-Tongue-Based-Bilingual Education (MTBBE) for six years (Grade 1-6). Thanks to a previous Afrikaner MEC Andre Gaum; the Western Cape showed signs of respecting the official trilingualism in the province with the production of a Language Act. Dugmore's task was made easy by his predecessor who believed that the Western Cape was not a bilingual province. Language was acknowledged as a contributing factor impacting on the low academic achievement of black learners. Gaum commissioned a Task Team led by Neville Alexander in 2003 to come up with the means of reversing the situation. The LTP was born in 2005 with the blessing of then Minister of Education Naledi Pandor. One teacher per pilot site was chosen to attend an INSET Advanced Certificate in Education (ACE) course at a designated university in the province to capacitate them to teach in the mother tongue for six years. After every two years there would be a new set of teachers attending the course from the pilot schools. I will not delve into details of the LTP pilot as an evaluation of it has been done elsewhere. The LTP is drawn in merely to give a contextual background to the following analysis that is referred to in this study.

Before the introduction of ANAs; Systemic Evaluation studies were done by the DoE to offer a powerful lens through which to view the achievement and health of the education system. The Grade 6 systemic evaluation in particular was intended to serve three purposes; to

determine the level of achievement of learners within the system, to highlight specific areas within the system that require further attention/investigation, and to serve as a baseline for comparison against future systemic evaluation studies (IPSER, 2004). In 2009 I analyzed the performance of LTP schools since its inception in 2005.

Key: Numeracy = Num.

Literacy = Lit.

Difference = Diff.

School	Num 2005	Num 2006	Num 2007	Num 2008	Diff 2006 & 2008	Lit 2005	Lit 2006	Lit 2007	Lit 2008	Diff 2006 & 2008
Mosh	0.0	5.3	0.0	41.9	36.6	2.6	5.3	11.7	74.2	68.9
Ntw	0.0	18.5	0.0	25.0	6.5	2.5	61.7	24.1	34.5	-27.2
Ornj	2.5	10.0	0.0	8.3	-1.7	17.5	34.6	26.5	23.7	-10.9
Skml	0.0	2.4	1.1	27.7	25.3	7.5	26.2	20.7	54.2	28.0
Lwz	0.0	11.7	0.0	8.8	-2.9	2.5	27.6	17.4	41.2	13.6
Syfn	0.0	12.3	0.0	7.2	-5.1	5.0	28.4	11.9	36.8	8.4
Mzx	0.0	7.9	0.0	5.4	-2.5	5.0	15.8	18.4	53.2	37.4
Grnh	-	32.3	0.8	3.8	-28.5	-	51.2	14.2	18.2	-33.0
Tyhl	0.0	10.0	0.0	17.5	7.5	2.5	36.9	8.5	45.0	8.1
Kros	0.0	9.2	0.0	12.8	3.6	0.0	19.5	20.1	56.4	36.9
Laps	-	10.7	0.0	14.9	4.2	-	33.9	8.2	36.2	2.3
JhPm	0.0	10.2	0.0	15.6	5.4	10.0	32.3	12.3	48.4	16.1
Impnd	0.0	14.4	0.0	4.0	-10.4	7.5	37.0	23.0	16.6	20.4
Wndm	0.0	6.0	0.0	26.2	20.2	52.5	16.0	38.1	50.0	34.0
Zms	0.0	18.9	0.6	42.6	23.7	7.5	46.3	39.8	62.8	16.5

Figure 1.2 (ANALYSIS OF SYSTEMIC EVALUATION PERFORMANCE LTP SCHOOLS 2006-08)

Sixteen schools were randomly selected from a pool of schools that were constantly underperforming in the systemic evaluation studies. All the highlighted schools in column II had serious management problems. The results of 1 school that was extremely challenged were not reflected in the system, so it is not included in the analysis. Despite challenges of resources, management, lack of support from officials and apathy from some sections of

school communities, all the LTP pilot schools experienced gains since 2005. Some schools experienced a doubling of the pass rate and others even tripled their pass rates as seen in the above table. The growth potential of this program is great if it could be supported by government, teachers and parents. One can never claim that language is the ONLY contributing factor to underperformance in schools. There are other issues that need attention such as weak management, teacher absenteeism, learner absenteeism, societal and poverty issues that are more prevalent in township and rural schools. Mechanisms have been put in place by the Education Department to address these issues with District Managers that are given the responsibility to ensure optimal school functionality. On the other hand there is arguably no infrastructure in South Africa to manage language diversity in education. It is my learned opinion that we can no longer afford to pretend that language issues will simply go away by ignoring it, while we fix other 'pressing issues'.

1.10 Quantity versus Quality

Pai Obanya (2004) laments the fact that quality is a major problem area of education the world over. Post apartheid there has been a tremendous increase in numbers of learners, and of institutions as well as in the amount of money spent on education. He adds that the impact of the expansion syndrome has been more, but not better education. African leaders are unique in advocating, for the sake of 'national unity' the adoption of a foreign language considered 'universal' because of its foreign origin; even though they are minority languages (Mateene, 1999 in Obanya, 2004). He further goes on to make an example of a country like Senegal, where French has been the official language for more than a century. It is still used by no more than 15% of the population. It is this use of exoglossic languages that arguably impacts on the quality of education in Africa. The notion that quality of education is enhanced through mother tongue instruction and that "high-order thinking" and excellence can happen through an African language is supported by the work of Joseph and Ramani (2008; 2010). This body of research largely pertains to the use of Sesotho sa Leboa as medium of instruction, alongside English, at the University of Limpopo. It is argued that quality of education is enhanced through such an approach. This is further supported by Dalvit, Murray & Terzoli (2009) where they show how cognition is enhanced when isiXhosa-speaking learners use mother tongue terminology in acquiring and understanding ICT terms, thereby making the transfer back to English much easier.

In South Africa, even though English has been a school subject and medium of instruction for more than a century, a large percentage of South Africans have not acquired the necessary English language proficiency in order to attain meaningful access to educational, economic, political and social participation (Webb, 2008). The national socio-linguistic MarkData-PanSALB survey in 2000 revealed that more than 70% of South Africans do not understand English and therefore cannot understand messages from government. Therefore they are bound to have limited access to the services that are intended for them.

1.11 Reasons deterring implementation of policy

1.11.1 The issue of Parental choice

An often overstated exhortation has and still is that black parents want their children to be educated in English and not in the mother tongue. For a while South Africa used to believe that, without searching for the obvious deeper reasons as to why this is so, if at all. These voices in the 1990s like Ridge (1996) created an impression that black parents in particular wanted English from the word go. This was in direct contradiction with the DoE survey (1992) that more than 54% of parents wanted a gradual transfer to English (Heugh, 1993).

DET STATISTICS ON PARENTAL CHOICE OF LANGUAGE MEDIUM FOR LEARNERS

Straight for English	22%
Gradual Transfer to English	54%
Sudden transfer to English	13,4%
Retain Status quo	7,5%

Figure 1.3 (Department of Education and Training Survey 2000)

Heugh (2000) makes the observation that unlike other proponents of this theory, Ridge acknowledges the DET statistics but does not appear to realise that they contradict his earlier claims drawn from the NEPI report based on perception of preliminary findings (Heugh, 2000). Nick Taylor & Penny Vinjevold in the JET report of the President's Education Initiative Research Project claimed that many parents want English instruction from as early as possible (1999). This claim was also later made by Deumert in 2000 (in Heugh, 2000)

creating a sense of anti-mother-tongue sentiment by parents, until PanSALB in 1999 commissioned a Mark Data survey on medium of instruction choices. This would back whatever claims were made with empirical evidence and limit anecdotal evidence.

MEDIUM OF INSTRUCTION CHOICES

	FIRST ANSWER	MULTIPLE ANSWERS INCLUDED
Mother tongue instruction and good teaching of another official language should be available	38%	37%
Learners should have the opportunity to learn both their mother tongue and English equally well	32,6%	42%
Learners should have the opportunity to learn <u>through</u> both English and their mother tongue	21%	39%
It is more important that learners learn in English than in other languages	7,6%	12%
	99,2%	130%

Figure 1.4 (MarkData–PANSALB LANGUAGE CHOICE SURVEY 2000)

While a war of words went on in publications and higher education institutions about parental anti-mother-tongue sentiments amongst blacks, parents were not necessarily in agreement with the claims. Allow me to elaborate with a practical scenario: I remember in 2000 listening to an African language national radio station interviewing a learned guest on this issue. Later parents were asked to phone in and it became very tense. All the parents who phoned in expressed what the DET survey expressed in 2000; and echoed the findings of the MarkData survey. The majority of black parents wanted their children to learn and know their mother tongue plus English and even Afrikaans in some instances. The MarkData-PanSALB findings were that the majority of people; at least 88% favour

maintenance of the home language throughout education or the maintenance of the home language alongside a second language such as English (Heugh, 2000).

However, one can also not ignore the new trend of black parents sending their children to English medium schools. Rubagumya (2007) argues that this choice is a reaction by parents to the deteriorating quality of public education. This quality is measured in better resources including availability of books and better qualified teachers. As long as the government does little to improve resources and good teaching in black schools and also elevate the status of the indigenous languages to counter the hegemony of English; it is natural that parents will seek better pastures for their children. It is a historical construct that better education is equalled with English; in Francophone countries I would be French. It was designed like that.

1.11.2 Strategic weakness in the Constitution (1996) the SASA (1996) and LIEP (1997)

The basis of the following argument is in the flaw of the language planning based on the linguistic human rights paradigm. Heugh (2007) states that the fragility of planning is based on rights, and the tendency to default to earlier practises is evidenced in the contemporary South African situation. She goes on to further state that although the equal status of the eleven official languages was prefaced in the interim Constitution; this was diluted in the final constitution of 1996. She laments the unintended consequence where there are now eleven official languages with little compulsion towards equality. This original weakening of the original principles; she claims led to a situation whereby instead of two official languages operating vertically across the country as was the case under the apartheid government, and instead of a shift towards better resourcing and tapping into the horizontal use of eleven official languages, there has been a default to one language of power, namely English (Heugh, 2007).

In the new Constitution, Section 6(2) of the founding provisions attempts to elevate the status and advance the use of the indigenous languages as a form of redress. Section 6(4) restrains this provision by stating that “without detracting from the provision of section 2”, all official languages must enjoy parity of esteem and must be treated equitably. The latter clause has important implications for the determination of language policy in schools. In effect, although the Constitution offers learners the right to learn in their language(s) of

choice; this right is tempered by the state's ability to practically provide for its implementation (DBE, 2010).

Section 6 of the South African Schools Act (SASA 1996) prescribes several preconditions for the determination of languages policies in schools. Of great significance is the power conferred by the SASA to school governing bodies (SGBs) to determine the language policy of the school; albeit subject to the Constitution, the SASA and other applicable provincial laws. The interpretation of this section of SASA by schools, SGBs and parents has been the object of legal contestation against government and schools over the years (DBE, 2010). Litigation is often exercised by those who know their rights and are adequately literate to read up policies and policy prescripts to know what is educationally sound for their children. That is a minority of the South African population; the black poor masses have not taken the government to court for the language violations they experience every day. These masses have a right that they do not even know exists. To confer such a powerful decision on a section of the population that has been failed by the education system, where many parents cannot read or write is tantamount to playing with the future of generations to come, more especially if there are no efforts of mass education to advocate for the benefits of mother tongue education. This needs serious revision.

The Language-in-Education Policy and the Norms and Standards regarding language policy were announced together by the Minister of Education on 14 July 1997 (Education Rights Project, 2005). Since then, the policy has not been accompanied or followed by any significant government initiated implementation plan for the country (Heugh, 2000). The Language Transformation Plan of the Western Cape; though small in scope was an effort at implementation. The Language Policy Implementation Office established in 2010 by ex-MEC Mahlubandile Qwase in the Eastern Cape are the only isolated provincial initiatives that I am aware of. Pockets of development across the country by individuals and NGOs are also acknowledged in the midst of the deafening silence by the national government. The ambiguity in the policy that says 'where practicable' provides an easy loophole for discriminatory schools and government to get away with non-implementation of the policy. Like the SASA (1996) it confers certain rights on SGBs in determining language policy for schools and places emphasis on choice rather than on strong state intervention for

determining the policy pertaining to Languages of Learning and Teaching in schools (DBE, 2010). In the past ten years there have been serious debates about the need to revise the LiEP (1997). In the meantime English continues to be the sole medium of instruction for black learners. A recent language policy survey conducted by the Eastern Cape Department of Education's Language Policy Management Unit (ECDoE, 2011) has established that

- 30% of schools in the province have no succinct language policies in line with the SASA (1996) and the LiEP (1997)
- 50% do not have language policies at all;
- 10% have no knowledge of language policy formulation processes and therefore do not place any value or premium on language issues. Language issues are treated in an adhoc manner as they arise with no policy prescripts being followed (ECDoE, 2011).

This scenario warrants urgent attention if all South African children are to enjoy meaningful education.

1.11.3 Lack of political will

No politician wants to be seen as lacking the will to do things for the people as he or she is there because of the will of the people. Alexander (2003) made the uncomfortable observation that in the handover process between the apartheid and the new government there was no zero hour; implying that the new government took over from the old masters without completely shutting off the old system. Globalisation and neo-liberalism are asserting themselves and weakening state structures as agendas on the table are determined by where donor funding comes from (Rubagumya 2007). He further lucidly articulates that elite vested interest creates the half-heartedness that brings on mixed messages from the government. On the one hand they come up with multilingual policies while on the other hand maintaining foreign languages for high status functions. It is commendable that in a poor province like the Eastern Cape, both political heads of Education (2010 and 2012) would ensure the availability of MTBBE for learners who so wish.

1.12 Conclusion

This chapter has set the scene for the research pertaining to this thesis, namely, the issue of mother tongue instruction regarding content subjects such as mathematics and science.

Furthermore, this has been done against the backdrop of the development of Afrikaans as a successful medium of instruction. Contemporary policy documents pertaining to education have also been outlined and referred to, particularly recent developments in the Eastern and Western Cape.

Chapter 2 is a discussion of the complex issue of the relationship between language and mathematics and how it impacts on non-native English mathematics learners. Chapter 3 outlines the methodology used in this thesis, while chapter 4 presents the data that has been collected. Chapter 5 seeks to analyse this data, while chapter 6 provides a conclusion to the study.

CHAPTER 2

THE TEACHING AND LEARNING OF MATHEMATICS IN MULTILINGUAL SETTINGS

2.1 Introduction: the debate in context

A plethora of research studies on the association between mother-tongue education and scholastic achievement point to a good correlation between the two (Myburgh, Poggenpoel & Van Rensburg, 2004; Burkett, Clegg, Landon, Reilly & Verster, 2001; Kaphesi, 2000; Howie, Venter & Van Staden, undated). A finding that is consistent is that bilingual children perform better in school when the school effectively teaches the children's home language and, where appropriate, develops literacy in that language (Cummins, 2001). By contrast, when children are encouraged to reject their home language, the development of that language stagnates and their personal and conceptual foundation for learning is undermined (DBE, 2011). The language (s) used to convey mathematical ideas to students have become a topic of increased concern to mathematics educators in recent years. Until recently multilingualism in the learning of mathematics has rarely been mentioned in much published research in mathematics education, mathematics education policy or mathematics curricula. Where multilingualism is mentioned, it is often as an after-thought, a challenge, or a problem to be overcome, but mostly there is just silence. Multilingualism may therefore be an unmentioned feature, an unmarked factor in much of the work of researching and organising mathematics education (ICMI Study 21, 2009). When the language of instruction is English, the learning of mathematics by students for whom English is a second language raises some important issues not only in South Africa, but all over the world where a number of children are expected to learn mathematics through a second or third language.

Amongst the many reasons why the language factor needs special attention, is the fact that many students are currently learning mathematics in their second or third language (Austing & Howson, 1979; Ellerton & Clarkson, 1996). In most parts of the world, mathematics is learned and taught in situations of language diversity. Whether through historical multilingualism, migration, colonization, globalisation or other factors, mathematics classrooms frequently involve multiple language use, learning through foreign, second or

additional languages (e.g. English and French in Africa), learning through minority or oppressed languages (e.g. Spanish in the United States), or through majority or dominant languages (English and French in Canada). Increasing recognition and awareness of this long-standing reality have led to a growing body of research that seeks to understand the relationship between different facets of language diversity and the teaching and learning of mathematics (ICMI Study 21, 2009). This has important implications for mathematics classroom practices and is an area worthy of research.

Until very recently there has been very little understanding in the schooling and public domain of the fact that the learning of mathematics requires a variety of linguistic skills that second-language learners may not have mastered, depending on the quality and quantity of exposure to the second language. We know that in South Africa, after one year of very basic exposure to English as an Additional language in Grade 3, African language learners are expected to learn through this medium all the subjects from Grade 4 to Grade 12. Special problems of reliability and validity then arise in assessing the mathematics achievement of students in a language they have not mastered. The question always arises: is the assessment a true reflection of the ability of second language learners? The recognition of the importance of language factors in mathematics learning and teaching are found in many other curriculum documents, especially in countries that are multicultural such as the USA, New Zealand, Australia and South Africa. However, it has been noted that the attention given to the centrality of the language factor by mathematics educators and researchers in both the research and practice domains is “little more than lip service” (Ellerton & Clarkson, 1996).

This thesis postulates that a mathematics curriculum is needed that would develop second-language skills, and more research is needed into the relation between second-language learning and mathematics learning (Cuevas, 1984). This scholar further makes the claim that an inadequate grasp of the language of instruction is a major source of underachievement in school. He uses as an example the United States landmark Supreme Court case of *Lau vs Nichols* (1974) which addressed this claim by ruling that students who do not understand English are effectively foreclosed from any meaningful education. If a court of law in a wealthy and resourced country like the United States of America arrived at this conclusion

about the education of non-native English speakers, then it would be interesting to compare similar implications for learners in Africa, particularly in South Africa where the shortage of resources is the norm. However, learners are expected to learn mathematics in a second or even third language. Nevertheless there have been a number of court cases in this regard which are analysed below and which have implications for language teaching in multilingual settings as well as for the teaching of mother tongue mathematics.

2.2 South African School Language Policy Court Cases

South African courts have seen a number of cases in respect of language policy in schools brought before the courts. Section 6 of the South African Schools Act (SASA) (RSA, 1996b) prescribes several preconditions in relation to the determination of language policy in public schools. Of great importance for this study is the power that the Act confers on school governing bodies (SGBs) to determine the language policy of a school, albeit subject to the Constitution, SASA and any applicable provincial law (SASA RSA, 1996b). Indeed, the interpretation of this section of SASA has been the object of significant legal contestation, as is evidenced by the number of court cases pertaining to this matter. These cases have important implications for the interpretation of laws and policies on language and, consequently, their implementation (DBE, 2011). The Department of Basic Education (2011) has provided a useful summary of the cases by highlighting the key points in relation to two landmark judgments.

2.2.1 Court Case 1: NR Nkosi vs Durban High School Governing Body

- A parent of a Durban High School learner claimed that her son (and other learners whose home language was isiZulu) were discriminated against by being taught in isiZulu as a third additional language (LLC 3), as opposed to isiZulu being taught at a higher level.
- The parent testified that the school's language policy was discriminatory, since isiZulu learners were negatively affected with regard to their proficiency in isiZulu.
- The court found that offering Afrikaans as a subject at a higher level (LLC 2) as compared to isiZulu, constituted unfair discrimination (on the part of the school) against all learners in those grades whose home language was isiZulu.

- More particularly, the court found that offering Afrikaans as a subject at a higher level (LLC 2) as compared to isiZulu, constituted unfair discrimination (on the part of the school).
- The Court did not expressly order the school what to do, but instead it expressed passing remarks that the following be undertaken:
- A serious commitment by the state to provide the capacity, in terms of resources, in order to enable every public school in KwaZulu-Natal to be in the position to provide isiZulu at LLC 1 level.
- Furthermore, the court was asked by the parent to find that the school should provide isiZulu at LLC 1 level. The court was not prepared to make such a finding because, to have done that, would in fact be treating the school (second respondent) as a *sui generis* (of its own kind) in that it would be expecting the second respondent to meet an ideal standard that no school in the province, or indeed in the country, meets. However, the court supported the notion that the Constitution is transformative.
- There was no specific implication for School Governing Bodies.

The implication of this case is that schools are expected to familiarise themselves with the difference between fair and unfair discrimination when dealing with language issues. For instance, both Afrikaans and isiZulu were additional languages, but they were not offered at the same level and there was no evidence before the court as to the comparative number of learners with regard to the two subjects mentioned.

Building on the results of this court case one can consider an interesting development that is taking place in the Eastern Cape Province. A prestigious former Model-C school in King William's Town, recently received a provincial Multilingualism award from the Eastern Cape Department of Basic Education (ECDoE) for being the first school in the province (possibly in the country) to offer both English and isiXhosa at home language level since 2007 from Grade 8. The advantage of this language model is that at Grade 12; according to the NSC pass requirements, learners have to pass one language subject at Home Language level at 40% to pass Matric. This effectively means that if it happens that learners fail English at home language level (despite the school being 90% isiXhosa home language speakers, the

school still insists on Home Language English); they will still pass Matric if they gain a 40% pass in home language isiXhosa. A recent survey by the Department of Education's Language Policy Management Office (LPMO) indicates that learners at this school get significantly high marks for mathematics and science as well. This experience suggests that schools, via SGBs must attribute equal value to the home languages of learners (equally with English and or Afrikaans), to the benefit of learners. The new language policy uplifts the centrality of the mother tongue in the education system. It is therefore no longer acceptable to relegate the African languages to third language status while the speakers of that language form the majority in the classroom. The educational advantage of the language policy at the school is enormous for those learners, as a pass in the home language determines a pass or a fail in the whole exam. The school has reported that the minority of students who choose Afrikaans as an additional language because their parents do not see value in isiXhosa do not do as well in Afrikaans as they would do in their home language.

If this model could be rolled out to all other former Model C schools and to schools more generally as well, then this could set us on a trajectory that is more positive for learners. Currently a pass of English at Additional Language level for Black learners poses a difficulty in terms of the point systems that universities use as entry criteria i.e. by attaching more value to English done at Home Language level. The point is that if race relations were such that English native speaking teachers would be prepared to teach in township schools offering English at Home Language level alongside isiXhosa also at Home Language level, we could begin to see improvements. Language taught by a native speaker who can model the language leads to quicker acquisition, assisting therefore better understanding of other learning areas taught in English. One of the negative results of the neglect of cultural politics on the part of the political leadership of the oppressed people of South Africa throughout the 20th century is that the present generation of politically literate adults among English and Afrikaans speakers have little or no proficiency in any African language, with the consequent communication gap that renders the "nation building" project of former President Mandela and the African National Congress extremely difficult and well-nigh impossible within the next generation (Alexander, 2008). If efforts to close this gap were attended to in the new democracy, South Africa would be a long way towards integration

with white teachers ready to be deployed to Black schools and vice versa with very little fear of linguistic misfit. It is not too late even at this stage.

A second benefit for learners at the High School mentioned above, is that when they pass both Home Languages well, their points increase, thereby providing an incentive. If they happen to fail one of the two Home Languages, they still pass the exam.

Another common scenario is that of learners who having failed at ex-Model C schools are placed by their despondent parents at township schools, thinking that they would handle the 'pressure-less' environment of township schools. The reasoning behind this practice is usually informed by the fact that learners speak isiXhosa at home and will adapt easier to isiXhosa than they were doing with English and Afrikaans. They are again thrown in at the deep-end, as they now have to learn isiXhosa at Home Language level and English at Additional language level. In certain instances they were never even taught isiXhosa, not even at additional language level. These students tend to understand English better than their peers because they come from an English mainly schooling environment in comparison to their peers at the township school. However, some fail anyway as having to pass isiXhosa at Home Language level might be too difficult. The trauma of failing in a system that is deemed 'functioning', and again failing at one fraught with 'weaknesses' must be enormous. Offering both English and isiXhosa at Home Language level even in certain township schools where a teacher is available; could result in a win-win situation for all. Creating opportunities for learners to access further education, should be about removing stumbling blocks, and create more education opportunities.

2.2.2 Court Case 2: Hoërskool Ermelo vs the Head of the Mpumalanga DoE

The Head of the Mpumalanga Department of Education (HoD) instructed the Principal of Ermelo High School, an Afrikaans medium school, to admit 113 learners who could not be accommodated elsewhere [to be taught in English] for the 2007 academic year, which was contrary to the language policy of the school. The HoD also decided to withdraw the SGB's function of determining the language policy of the school with immediate effect. The HoD appointed an interim committee to change the language policy of the school from an Afrikaans medium school to a parallel medium school.

- The court decision went in favor of the school, thus setting aside the HoD's decision to withdraw the school's function of determining its language policy.
- The HoD appealed to the Constitutional Court, stating that the school was the only high school not filled to capacity.
- The Constitutional Court found that a HoD may, on reasonable grounds, withdraw a school's language policy.
- The power to determine the language policy in a public school must be exercised by the SGB, subject to the limitations that the Constitution and the Schools Act laid down, taking into consideration what is fair, practicable and enhances historical redress.
- The court ordered the HoD to file a report to the Constitutional Court, setting out the likely demand for Grade 8 English places at the beginning of 2010, as well as setting out the steps that the Department had taken to satisfy this likely demand for an English or parallel medium high school in the circuit of Ermelo.
- It further ordered the SGB of Ermelo to review and determine a language policy in terms of section 6(2) of the Schools Act and the Constitution.
- In conclusion, the judge stated that the power to determine a school's language policy was vested in the SGB. The judge emphasised, however, that this did not mean that the function to decide on a medium (language) of instruction in a public school is absolute, or that it was the exclusive preserve of the governing body.
- Section 6(2) of SASA makes provision that the SGB may determine the language policy of a school. The word **"may"** is used in this particular section and not the word **"must,"** which means that the power is not absolute. Many SGBs ignore this important distinction and the Education Department has allowed them to do as they please; in the process many learners are discriminated against.
- The HoD may only withdraw a function of an SGB "on reasonable grounds". Again, the statute does not set any limitation beyond the requirement of reasonableness in withdrawing a function.

The above court judgments confirmed the importance of ensuring that learners be given the choice of their home language as the LoLT or as an additional language. In recognising the right of a learner to receive education in an official language or in a language of one's choice, the state is duty-bound to ensure effective access to the right to be taught in the

language of one's choice. This duty is coupled with the obligation on the state to ensure that there are sufficient school places for every child living in a province, as well as with the duty to ensure that a public school admits learners without unfair discrimination against them in any way (DBE, 2011).

The significance of these cases is that they outline the political nature of language use. Even in post-apartheid South Africa, it is a feature of classrooms. Indeed this is the case throughout the world as evidenced by the American court case. As early as 1987, Reagan and Ntshoe concurred with Hartshorne (1992) about the political nature of language use. This is also emphasized by Mclean (1992) who speaks of the "bourgeois revolution" if English were to finally end up being the only language used in education and politics. Later on, various authors made similar observations and claims that language is always political, for example, Alexander, Heugh, Mphahlele, Mda, Ramani, Janks, Kaschula, Hlongwa, Gee and others.

In discussing the choice of language in multilingual mathematics classrooms, Setati (2003) purports that decisions about which languages to use, how and for what purposes in the multilingual mathematics classroom are not always pedagogic but political as well (Setati, 2003). In many countries, a global language, such as English, is linked to dominant discourses through high-status jobs or access to the dominant class. As a result, education systems come under pressure to use the global language for learning and teaching to the exclusion of the languages of learners. Language in education policies formulated under these kinds of political and economic pressures can then lead to a class divide in schooling generally, as learners from the dominant language groups will always do well. In mathematics education in particular, learners from the marginalized language groups experience language barriers which often lead to under-achievement in mathematics as well as either scientific subjects such as ICT (Sam, 2010).

The ICMI Study 21 document (2009) outlines the different dimensions of language diversity in different contexts as that of *classroom practices*, that of *international policies*, and that of *national language policies*. The Study recognizes that there are inconsistencies and contradictions between these dimensions; as they emerge in relation to the somewhat

simplistic, often incompatible views of language evident across these dimensions. It proposes that a better theoretical understanding of language as it relates to mathematics education is needed, which would mean a perspective that is congruent with these and other dimensions (ICMI Study 21, 2009). Various authors agree with Alexander (2003) that languages are implicated in issues of power and access, whether to education, employment or positions of authority. Language use is often a marker of social class, with English often (though not always) having a particular cachet (ICMI Study 21, 2009). The politics of language, as supported by the above court cases, does influence multilingual mathematics classrooms in many ways, including, for example, the choice of 'official' language, the desire of students or their parents to be taught in a particular language, or the challenges of accommodating competing languages such as English and Afrikaans.

There will always be various issues at play in classrooms whether they are of a political, social or economic nature. The argument for the use of the home language of learners to teach and learn mathematics as a needed support and resource, while learners are acquiring the proficiency they need in English, is most salient and should be pursued to widen access to meaningful mathematics education (Clarkson, 2006; Dalvit, Murray & Terzoli, 2009).

2.3 The contextual reality of multilingual mathematics classrooms

Multilingual classrooms are the normal learning context for most children throughout the world. The prevalence of multilingualism in most parts of the world and in mathematics classrooms necessitates the importance of its consideration when conducting research related to mathematics education. Research conducted in multilingual mathematics teaching and learning settings illustrates that there are various challenges faced by students who do not learn mathematics in their home language (Pirie, 1998; Moskovich, 1999; Adler, 2001 and Setati, 2005). The mathematics register, vocabulary and various discourses to be learnt poses varying degrees of complexity in the teaching and learning of mathematics. Hoffmanova et al (2004) posit that everyone agrees that thought and language are related, but the nature of that relationship remains controversial. A further claim is that traditionally linguists have only studied natural languages used by members of human communities to

communicate with each other. This, according to the Haffmanova et al (2004) has left out wider senses of communication like mathematical and logical codes that can be used to transmit messages. Discussions about education in the 1930s engaged psychologists like Jean Piaget (known for cognitive constructivism) to argue for the importance of the co-operation and mutual respect in social interaction as a necessary condition for cognitive development (Piaget, 1932).

It is safe to then articulate that constructivism stressed the importance of linking any new knowledge to existing concepts and ideas. Les Semenovich Vygotsky, a Belarusian psychologist known for his view of the process of mediation, emphasized the importance of discourse with others, as well as language and culture in order to, through the process of mediation, get to a higher order of truth that has also been socially tested. He maintained that language plays a central role in cognitive development (Derry, 1999). On the one hand, educationists and linguists have taken on the work of both Piaget and Vygotsky to inform education psychology and second language acquisition theory, while research on natural languages continue.

On the other hand, a cursory look at what Mathematicians preoccupied themselves with over the years can be summed up as the mathematics wars, deliberating and arguing about the origin of mathematics. Arguments about whether the birth of mathematics was a random happening, or whether it was induced by necessity duly contingent on other subjects, say for example physics, is still a matter of prolific debates. Major contributions from scholars of mathematics has been ideas concerning the nature of mathematics, with some philosophers of mathematics aiming to give accounts of this form of inquiry and its products as they stand, while others emphasize a role for themselves that goes beyond simple interpretation to critical analysis – but virtually nothing is said about the centrality of the tool that mediates mathematics: language.

There are traditions of mathematical philosophy in both Western philosophy and Eastern philosophy. Western philosophies of mathematics go as far back as Plato, who studied the ontological status of mathematical objects, and Aristotle, who studied logic and issues related to infinity (actual versus potential). Greek philosophy on mathematics was strongly influenced by their study of geometry. For example, at one time, the Greeks held the

opinion that 1 (one) was not a number, but rather a unit of arbitrary length. A number was defined as a multitude. Therefore 3, for example, represented a certain multitude of units, and was thus not "truly" a number. At another point, a similar argument was made that 2 was not a number but a fundamental notion of a pair. These views come from the heavily geometric straight-edge-and-compass viewpoint of the Greeks: just as lines drawn in a geometric problem are measured in proportion to the first arbitrarily drawn line, so too are the numbers on a number line measured in proportion to the arbitrary first "number" or "one" (Wikipedia, 2011). These were the kinds of mathematical ideas that occupied the minds of European mathematicians and not the relationship between mathematics and language. In the meantime, language challenges in learning mathematics did not stop.

In the United States, near the end of the 20th century, diverse and changing ideas about the goals and methods of mathematical education led to wide adoption of reform-based standards based on research emphasizing the importance of conceptual learning, student centred learning methods and equity in mathematics. Again, all these debates and reforms in mathematics did not take into consideration the central role language plays in the teaching and learning of mathematics. Over recent years researchers started to recognise the vital role that language plays in mathematics performance (Aiken, 1971). Cuevas argues that even when these pockets of recognition started to happen, researchers did not always accept its equally important role in acquiring mathematical concepts and skills (Cuevas, 1984). Until the 1980s multilingualism received little attention from many researchers in mathematics education. However, students and teachers regularly make use of different languages available to them in their mathematical work. In recent years, researchers have examined several aspects of this situation, including the role of multilingualism in students' learning and understanding of mathematics, the relationship between multilingualism and mathematical attainment and the ways in which mathematics teachers' deal with multilingualism in their classrooms (ICMI Study 21, 2009). This thesis is an attempt to add value to this enveloping debate as a pass in mathematics remains a strong determinant of a quality pass in Grade 12.

2.4 Bi/multilingualism explained

If we are to accept Lewis's position (1977) that bilingualism and multilingualism are a very early characteristic of human societies, and that monolingualism is a limitation induced by some forms of social change, cultural and ethnocentric developments, it then becomes crucial that research in mathematics education takes the multilingual nature of classrooms into consideration. For the purposes of this thesis it is important to define bilingual and multilingual education. It is noteworthy to acknowledge that the definitions provided are based on a particular theoretical thrust developed by Cummins (Cummins and Swain, 1986). This theory had grown with three predominant situations of bilinguals in mind. One was the offspring of immigrants learning in a second language. Another was parents belonging to the dominant language group in a western society choosing to have their children learn in a minority language of the country e.g. the immersion programs in Canada. A third situation was that of an indigenous people living in a western country, but learning in their own minority language. In our context it is the indigenous people living in a developing country, learning in a minority language as a direct result of the history of language in education policy in South Africa, which has been interwoven with the politics of domination and separation, resistance and affirmation (ANC, 1994). In South Africa, bilingualism was tarnished by the policy of official bilingualism (1925) that put ONLY English and Afrikaans as equals above the indigenous languages.

In the late 1970s Lambert made a distinction between **additive** and **subtractive** bilingualism. Additive bilingualism is explained as a situation where the addition of a second language and culture are unlikely to replace or displace the first language and culture. Subtractive bilingualism is defined as a situation where the learning of a majority second language may undermine a person's first language.

The following are several different types of bilingual education models as defined by Cummins (Cummins and Swain, 1986)

- **Transitional Bilingual Education.** This involves education in a child's native language, typically for no more than three years, to ensure that students do not fall behind in content areas like mathematics, science and social studies while they are learning

English. The goal is to help students transition to mainstream, English-only classrooms as quickly as possible, and the linguistic goal of such programs is English acquisition. South Africa is currently using this model as learners have mother tongue for three years and change to English medium in the fourth year.

- **Two-Way or Dual Language Immersion Bilingual Education.** These programs are designed to help native and non-native English speakers become bilingual and bi-literate. Ideally in such programs in the United States context, half of the students will be native speakers of English and half of the students will be native speakers of a minority language such as Spanish. In South Africa, this model is called Dual Medium education where only Afrikaans and English speaking students benefit from this model. The permutations of this model in South Africa are two-fold; half of the students in the same class would be mother tongue speakers of English and the other half would be speakers of Afrikaans. Or the demand for the other language of the two (English or Afrikaans) even if the numbers are not split equally; requires of the teacher to deliver content bilingually – in English and Afrikaans. The current challenges experienced in this model are due to the hegemony of English. Afrikaans parents are complaining that the value attached to Afrikaans is becoming less and less in the wake of the new South Africa (post-1994) where English is “unassailable but unattainable” (Alexander, 2004). This means that it appears as if although English through colonial practices and globalization has been positioned as a ‘must have asset’ for educational and economic purposes, more than 50% of the South African population cannot understand it (PanSALB, 2006). Dual Language programs are for example less common in United States schools, although research indicates they are extremely effective in helping students learn English well and aiding the long-term performance of English learners in school. Native English speakers benefit by learning a second language. English language learners (ELLs) are not segregated from their peers in this kind of model.
- **Late-Exit or Developmental Bilingual Education.** Education is in the child's native language for an extended duration, accompanied by education in the target language; in our case, English. The goal is to develop literacy in the child's native language first, and transfer these skills to the second language. Researchers throughout the world have reached near consensus that a period of six years

teaching in the mother tongue while English is introduced incrementally is necessary as the desirable model of Late Exit Bilingual Education. The Language Transformation Plan Project in the Western Cape, outlined in chapter 1 of this thesis, attempted this model.

A supposition was made by Cummins (1976) that there may be a threshold level of language competence that bilinguals must achieve in order to avoid cognitive deficits and to allow the potential benefits of being bilingual to come to the fore. There is a need to investigate this hypothesis in relation to African languages in order to assess whether the level of language competence in both the home language and LoLT has detrimental/beneficial influences on mathematics learning. The quest to improve mathematics achievement for bilingual learners in South Africa must be accompanied by further investigation in relation to the particular aspects of the mathematics register in English which hinder their learning of mathematics and are sources of difficulty when learning through English. Similar studies were conducted for the Annual National Assessment for Grades 3-6 in the Eastern Cape in 2011. The size of the sample was very small, therefore limiting any wider generalizations. It is noteworthy to mention that like in other countries, fractions were a problem and so were word sums for the group of children that were sampled (ECDoE, 2011). A further study would need to be pursued to investigate exactly what particular aspects of the mathematics curriculum and register in English pose challenges for bilinguals in mathematics learning.

The various definitions of bilingualism or multilingualism as outlined above present various educational challenges. It may now be appropriate to assess these against various contexts of multilingualism. The ICMI Study 21 (2009) identifies the diversity of settings in which multilingualism is apparent as follows:

- Multilingual societies where people are used to using several languages (e.g. East and Southern Africa);
- Multilingual societies with more than one official language, one of them with a higher status than others (e.g. Catalonia; Wales);

- Bilingual societies in which two languages are sometimes used in support of minority language(s) (e.g. Peru) or in which the use of minority languages in the classroom are restricted by law (e.g. some states in the USA);
- Societies previously seen as monolingual where immigration has made language diversity more salient (e.g. Europe, Australia);
- Societies in which a foreign language is taught through subjects like mathematics (e.g. Czech Republic);
- Societies in which mathematics education for indigenous language speakers is conducted in a majority colonising language (e.g. Africa, South America);
- Societies where languages of instruction change across primary, secondary, and tertiary levels and/or have changed during specific historical moments (e.g. Pakistan, Algeria).

2.5 Mathematics and multilingualism

Until the 1980s multilingualism received little attention from many researchers in mathematics education. However, students and teachers regularly make use of different languages available to them in their mathematical work. In recent years, researchers have examined several aspects of this situation, including the role of multilingualism in students' learning and understanding of mathematics, the relationship between multilingualism and mathematical attainment and the ways in which mathematics teachers' deal with multilingualism in their classrooms.

The teaching and learning of mathematics in multilingual contexts is thus a substantive issue in mathematics education, and one around which there has been recent but considerable growth in research and practical knowledge. Participants in this field span a wide range of countries and contexts on every continent, as indicated above.

Research to date on multilingualism and the teaching and learning of mathematics has served to highlight some of the challenges faced by teachers and learners, as well as to identify some successful teaching strategies and approaches to learning. Researchers have consistently argued that multilingualism is potentially an advantage for learning mathematics and have sought to refute the long-standing assumption that multilingualism is a problem in mathematics classrooms. Most studies have been located in single classrooms

or in a small number of classrooms and have generally focused on single age groups, although there are some exceptions. Not enough is known about the specific benefits, challenges and interventions appropriate for different levels of education (pre-primary, primary, secondary and tertiary). And little is known about whether and how the demands of multilingualism and mathematics change with different domains of mathematics (e.g. number, algebra, probability). Tackling these and other issues would lead to valuable additional knowledge with implications for practitioners and policy makers. Thinking about language diversity in the learning and teaching of mathematics involves a good deal of complexity. In this section, I highlight some of the different perspectives from which this learning and teaching can be examined. Each perspective reveals slightly different issues, features and questions, and each highlights a different part of the complexity. These different perspectives are viewed by the study participants as relevant and important and expect to see them informing further research in the area of mathematics education (ICMI Study 21, 2009). The mathematical aspects of learning and teaching mathematics in multilingual classrooms are outlined in the ICMI Study as follows: focuses on multilingualism and the learning and teaching of mathematics in general.

There has however been little systematic focus on whether and how the demands of multilingualism and mathematics change with different domains of mathematics. In the mathematics classroom, we are not teaching and learning undefined and vague objects and processes, but objects and processes, with their own differing and specific natures and structures. Is research in this area sufficiently focused on the specificity of the mathematics in our on-going research discourse? Is it the same to have multilingualism in a class where the teacher is introducing objects such as the idea of a “vertical asymptote,” in comparison to a class where the teacher is introducing non-mathematical objects, mathematical objects from other domains, or mathematical objects being presented with non-symbolic language? How do we include consideration of the intersection of the language of mathematics with the mathematics itself in the multilingual classroom? And finally, of course, we must be clear about the mathematical practices that are intervening in our empirical studies. Various analytic tools may contribute to this aspect, including for example, work on semiotics or functional linguistics.

The psychological aspects of learning and teaching mathematics in multilingual classrooms require research. Any research concerning issues like learning, understanding, thinking, feeling or knowing necessarily involves some kind of psychological perspective. Many mathematics educators have been informed to a greater or lesser extent by socio-cultural psychology, derived from the work of Vygotsky, although this is by no means the only perspective. Equally, research on the psychology of language learning, processing and use may offer useful insights, such as research in the psycholinguistics of bilingualism or multilingualism is important.

The sociolinguistic aspects of learning and teaching mathematics in multilingual classrooms are that multilingual mathematics classrooms do not exist in a vacuum; they are influenced by the society in which they are situated. Sociolinguistics offers ideas on and insights into the nature of language use in multilingual settings. Such work includes, for example, research on code-switching, as well as research into the distribution of different languages and language varieties across different groups, professions, locations, etc. Such work is relevant to multilingual mathematics classrooms, where the use of multiple/mixed languages is potentially a relevant feature of interaction, and which, therefore, needs to be carefully conceptualized (ICMI Study 21, 2009).

In South Africa a major finding of the 2004 Grade 6 systemic evaluation suggested that language medium was a deciding factor in whether the learners evaluated did well or poorly academically in mathematics and natural science. This same group of learners wrote Matric in 2010. It is worth investigating the concept of bilingual education and second language learning theory and to juxtapose it with the current model still used in South Africa. This will establish and explain whether language impacts on the dismal mathematics results obtained in our exit year, Grade 12. The focus of this study is not to understate the influence of other factors on academic performance; it becomes important to investigate the link made by various bilingual education theorists over the recent years on language proficiency, development and cognition, with particular reference to mathematics education.

The role of language in learning mathematics has been the centre of much debate in mathematics education research over the past three decades. Halliday (1978) offered useful

insights to the topic amidst a lot of negative responses from various mathematics specialists who felt that mathematics was language free. There is a general understanding now that conducting research in multilingual contexts leads to a number of theoretical and methodological challenges (Borwell and Clarkson, 2002). Amongst the challenges, they cite that issues may arise concerning validity, interpretation and the relationship between language mathematics and mental processes. They drew experience from a range of different theories including anthropology, sociology, linguistics, psychology and education (Borwell and Clarkson, 2002).

2.5.1 The learning of mathematics by English L2 learners

The Department of Education in 2004 made a statement that in South Africa broad participation and quality achievement in mathematics was prioritized for equity and general redress of historical inequities. Coupled with this statement, financial commitments were made by government as spending on education increased to more than 22% of the total budget. The return on investment (ROI) though, has disappointingly sat at a low 27% (percentages of pupils who leave the schooling system with a matriculation certificate) in South Africa (Heugh, 2000). Ten years down the line, there have been insignificant changes in terms of numbers. Young (1995) in trying to explain the low levels of English even with the group of learners who matriculated and obtained university entrances asked the question; why after twelve to eight years of English second language learning, do we still have demonstrably low levels of proficiency displayed by most ESL learners after such lengthy school exposure to English (Young, 1995). He posed a series of popular suggestions offered by various people at the time ranging from poor or under-qualified teaching; ineffective language teacher training; low-learner motivation; poor resources, to perhaps the dilemma of overcrowded classrooms. While very careful to admit the copious nature of the research by Skutnabb-Kangas and Cummins in the USA and Canada, Young admits that the empirical evidence they produced bears testimony to the fact that there is a direct relationship between first language acquisition and learning beyond and inside the classroom and parallel, second language learning in the classroom (Young, 1995). Notwithstanding any of the suggested explanations above with relation to the low levels of achievement in English; my focus is to interrogate what role language plays in the learning of mathematics by ESL learners in a specific context and year of study.

There has been a range of research findings to explain ESL learner under-performance generally, locally and internationally, but there has been very limited research in South Africa to explain under-performance in mathematics post primary school, especially by ESL learners. The systemic evaluations of Grade 3 in 2001 and later on of Grade 6 in 2003, revealed worrying deficiencies in the levels of reading, writing and numeracy (DoE, 2003). ESL learners across the country fared badly in mathematics and English LoLT, especially in the Eastern Cape in the Grade 6 systemic evaluation of 2003 (DoE, 2004). In 2000, South Africa participated in the second SACMEQ study (Southern Africa Consortium for Monitoring Educational Quality II) in which 15 countries from southern and eastern Africa participated. Grade 6 learners were randomly selected in all 15 countries and were tested in literacy (reading) and numeracy (mathematics). The South African learners performed particularly poorly in mathematics (Moloi, 2005).

There is virtually not a single definitive research study to explain the Grade 12 low performance of ESL learners in mathematics; yet South Africa places huge emphasis on the importance of attaining Grade 12. A large percentage of the budget in Education is spent on incubation winter, spring, summer schools and Dinaledi schools across the country while we have not taken seriously the analysis of the root cause of the problem. An analysis of the 2010 Grade 12 results was conducted by the National Further Education and Training (FET) directorate of Curriculum in February 2011 (NSLA) and is analysed as part of this thesis. Language was once again identified as problem number one contributing to the underachievement of learners in Grade 12 across all subjects (DBE, 2011).

Common challenges identified in the analysis of Grade 12 2010 scripts

- Language is a barrier for most learners, they struggle to understand questions and cannot express themselves in the LoLT;
- Learners interpret questions literally from vernacular to English;
- Overall performance of some questions in different subjects is very poor, an indication that teachers' content knowledge is lacking;
- Most learners are unable to answer questions requiring basic knowledge in the different subjects;

- Learners are unable to calculate using basic functions;
- Most learners are only able to answer low level questions;
- Learners are unable to distinguish between active verbs e.g. explain, describe, list;
- Learners are unable to calculate using basic functions.

2010 MATHEMATICS RESULTS PER PROVINCE

Provinces	0-39% Red	40-49% Amber	50-100% Green
Eastern Cape	554	86	242
Free State	118	35	150
Gauteng Province	200	67	456
KwaZulu Natal	738	341	583
Limpopo	739	174	456
Mpumalanga	251	58	205
North West	122	44	202
Northern Cape	47	10	70
Western Cape	94	27	271
National	2 831	842	2 635

Figure 2.1

Figure 2.1 illustrates the disappointing story that the overall performance in mathematics was below 50% nationally, like in the past. What this analysis brings to the fore is that achievement in mathematics is a serious challenge and more pointedly the most serious problem for ESL learners. This has been articulated by various organizations, HEIs and researchers throughout the world. The question that arises is – why is this so, why do ESL learners experience low performance in mathematics? Is there something inherent in mathematics or in the curriculum or in the socio-economic characteristic of ESL learners? If so what is it? In an effort to explain why half of the ESL learners who sit for the National Senior Certificate examinations fail the exam; UMALUSI, the Council responsible for Quality Assuring Grade 12 examinations made an observation that there is an increasing weight of evidence that after poverty, language, and, in particular, proficiency in the medium of instruction, is the largest single factor affecting learner performance at school (Lolwana, 2004). It is the concern of this study to further articulate and connect language to performance in mathematics.

2.6 Factors that influence academic achievement for ESL learners

2.6.1 The language of learning and teaching mathematics post-Grade 4

Several studies have indicated that the language issue is one of the major factors contributing toward the poor performance of many students in mathematics, especially those who are bilingual and multilingual (Barton, 2003; Setati, 2003). Students usually experience severe problems when the medium of instruction changes from their native language to another. This phenomenon in the case of mathematics education brings dire consequences if unchecked by mathematics educators (Yushau & Bokhari, 2002). But despite this African opinion never became reconciled to the extension of first language learning beyond grade 4, nor to the dual medium policy (as practiced for English and Afrikaans students) in the secondary school (Hartshorne, 1987). This articulation by Hartshorne was made in 1987 when mother tongue education for blacks was four years (Sub-standard A to standard 2); currently it is three years (Grade 1-3). Post-apartheid, the South African education system is characterized by a dichotomy of mother tongue education for Whites (English and Afrikaans) and so-called Coloureds and an English-mainly system for Blacks.

Cuevas (2004) posits that the relationship between language factors and mathematics achievement is not clearly understood, although it is obviously reasonable to assume that a mastery of mathematical concepts presupposes some facility with the language used to express, characterize, and apply those concepts. As early as 1912, Thorndike noted that our measurement of ability in arithmetic actually is a measurement of two different things: sheer mathematical insight and knowledge, on the one hand; and acquaintance with language, on the other (Thorndike, 1912). One would think that policy makers and education planners by now would have charted a very clear plan to mitigate the finding of various research studies that have ascertained that for students who are acquiring a language of instruction as well as learning mathematics in the new language, the language of mathematics is another source of difficulty and confusion (Yushau & Bokhari, 2002). Studies have shown that bilingual students, even at university level, are confusing the meanings of some of these mathematical terms (Setati, 2003). The problem is greater for bilingual students who are acquiring a language of instruction. It is one thing to learn a second language as an additional language to add to the linguistic repertoire of a student. It is another to have to learn a second or third language so that you can acquire it as a language of teaching and learning (LoLT).

Cummins (1980) hypothesized that it may take five to eight years to acquire mastery of the linguistic skills needed for academic pursuits in a second language. This hypothesis and others have done little to convince authorities in post-colonial countries to shift from the subtractive and early transitional bilingual models practiced by colonial masters. Despite many studies from various parts of the world producing empirical evidence on the disadvantages experienced by second language learners when learning mathematics, millions of children are still forced to change medium to dominant languages to learn mathematics. In the early 90s, the Threshold Project Report (1990) stated unequivocally that as a result of the sudden change over from a first to a second-language medium of instruction in Standard 3 (Grade 5) many black pupils suffered the ill-effects of subtractive bilingualism. The project found that learners could not explain in English what they already knew in their home languages, nor could they transfer into their first languages the new knowledge that they had learnt through English. Phillip Coombs (1985 in Alexander 2000)

made the following statement in describing the world crisis in education; that the issue of what language to adopt as the medium of instruction at the successive levels of education is one of the most pedagogically difficult and potentially explosive political issues faced by schools in many African countries post-independence. The truth in this statement for African countries can largely be ascribed to pressure from international funding agencies who determine which languages they will support for education; and also to some extent the inertia that paralyses decision makers in African governments. This is caused by the uninformed position that English is the only language to learn mathematics and science.

The recognition of the centrality of language factors in the teaching and learning of mathematics are found in many other curricula documents, especially in countries that are multicultural like the USA, New Zealand, Australia and South Africa (Yushau & Bokhari, 2002). In the same vein, various mathematicians and practitioners have noted that the attention given to the centrality of the language factor by mathematics educators and researchers in both the research and practice domains is little more than lip service (Ellerton & Clarkson, 1996). This is primarily because thus far the problem has been defined, but not enough has been done to come up with language-sensitive strategies to mitigate the challenges facing the learning and teaching of mathematics by ESL learners.

The phenomena of students who are learning mathematics in their second or third language is fast becoming the norm rather than the exception throughout the world (Secada, 1991). As early as 1979, Austing & Howson noted that there was an urgent need to take a serious look into language factors in mathematics learning as the number of students learning it in a non-native language was on the increase. A factor that is linked to globalization is the use of English and a few dominant languages like French on the internet. The language of science, technology and the internet is slowly but surely narrowing down to a few languages. Therefore, textbooks and other learning and teaching materials are increasingly likely to adopt these few languages (Yushau & Bokhari, 2002). Although studies on the consequences of this bilingualism and multilingualism on student mathematics learning are inconclusive (Davidenko, 2000), some studies (Secada, 1988; Ellerton & Clarkson, 1996; Brodie, 1989) have shown that there is a relationship between the degree of bilingualism and logical reasoning. Setati's (2003) study in South Africa claims that students that are found to be

very weak in the language of instruction have the tendency toward ill-comprehension as well as poor participation in classroom discourse (Setati, 2003, 2006). Consequently, they cannot meet the desired objectives of their studies due to a lack of communication skills. This presents enormous challenges for teachers of how to correctly assess the sources of student difficulty: is it mathematics or language? (Secada & Cruz, 2000).

Researchers such as Tove Skutnabb-Kangas (2000) provide copious evidence of the failure of most children who are plunged too quickly into English without strong support in the school for their home language. She asks a question as to why responsible teachers choose to repeat this cycle every year, knowing that the results are unlikely to improve (Skutnabb-Kangas, 2000). It is also true that there are a number of badly managed schools where teachers are not in class teaching and nobody makes them account for their actions. This is one of the factors affecting learner performance and is an area of concern for most education authorities, civil society, parents and learners. That is a research area on its own and warrants its own merits and demerits. Various studies that have engaged with learner underperformance, rarely mention the issue of language and the contributory role of teachers, parents and learners in the dire state of affairs is often overstated, with language as a side or non-issue. I will therefore not attempt to bring the element of teacher underperformance into this thesis; in the same vein, acknowledging the importance of a dedicated teacher, responsible parenthood and utter commitment to studies of students as key to effective learning. Nothing takes the place of that triumvirate.

Clarkson (2007) discusses Kern's (2000) empirical study to ascertain how learners comprehend foreign language texts using their first learnt language L1. He argues that L1 facilitates semantic processing, while if a learner were to process the input exclusively in L2 (second language/formal language of instruction), then they might have difficulty in handling syntactically complex or harder sentences. He adds that translation is not always beneficial or reliable as it might not reflect the exact meaning. However, the exact meaning can be retained by replacing a few words in L2 with words from L1. Hence the use of code mixing and switching helps in such situations for better understanding and comprehension (Clarkson, 2007).

However, there is little research that might help us understand the role of language and specific curriculum content in the light of learners' interactions (Barwell, 2005). Therefore, by looking at code-mixing, code-switching and hybrid languages, one may expect to make better sense of the ways learners socialise into discursive practices and their ways of using and interpreting given arithmetical tasks (Yushau & Bokhari, 2002). Mji & Makgato (2006) in discussing the direct and indirect variables that plague the teaching and learning of mathematics and science, argue that language transcends both direct and indirect influences. This is attributed to the fact that second language speakers of the language of instruction generally need tuition in that language, which is English in this case. Because the language used in mathematics and science sometimes overlaps with everyday English whilst not necessarily meaning the same, it sometimes results in misconceptions or at least confusion among second-language speakers (Mji & Makgato 2006).

Forming part of these discourses are the languages learners speak at home and depending on the social status of the language; usually in South Africa they are underdeveloped and not the language of learning and teaching (LoLT). Despite their status they are very active in the mathematics classroom and they form the backbone of most of what is taught in the classroom (Setati, 2005). I have claimed (Mbude-Shale, 2003) that in the majority of schools in South Africa, both teachers and learners use the mother tongue in the mathematics and science classroom for teaching and learning. English is used for introducing the lesson formally and for summing up right at the end followed by assessment which is always given in English. This model is what most black children in this country have gone through. It is a model very far-fetched from the English mainly system that we would like to believe is currently being utilized at school level. My teaching experience and extensive observation of numerous mathematics and science lessons qualifies the position that the current passes we have in mathematics are ascribed to a bilingual model; where the mother tongue serves a teaching and learning role while English serves a definitive role of being the language of assessment. The majority of failures in mathematics are as a result of not extending the use of this obvious bilingualism to assessment. The ICMI Study 21 (2009) posits that whether learners and teachers feel at home in a linguistically diverse environment or not, they routinely find ways to discuss and learn mathematics, this means that in multilingual mathematics classrooms no one can claim that one language is responsible for the

knowledge that students gained. Across the world, the teaching and learning of mathematics occurs in contexts of linguistic and cultural diversity. How do we work with, and work within, this diversity to enhance the learning and teaching of mathematics? In particular, how can the range and complexity of learners' language backgrounds be most effectively used to promote their mathematical learning? (ICMI Study 21, 2009). This becomes an important question for South Africa when all else has failed.

When learning mathematics in multilingual classrooms, teacher–learner talk or learner–learner talk; or learner–teacher talk utilizes a range of the unofficial discourses. In mathematics education this discourse is termed as unofficial or casual talk. When the role of language in mathematics learning is not sufficiently highlighted to teachers and appropriate strategies of managing teaching mathematics in multilingual contexts, an unfortunate situation arises where an unsystematic use of language leads to most lessons ending in the code switched state. Concepts are not transferred to the subject specific ways of talking mathematics. Setati (2007) refers to this phenomenon as the incomplete journey. Adler (2001) states that mathematics education highly prizes formal talk. The majority of African homes are print scarce; with the reasons for this varying from cultural to socio-economic. Traditional African societies value oracy and this has been passed on from generation to generation. It is a fairly new middle class advancement in African homes that literate parents value literacy and can afford to buy books and other technologically advanced educational supplements for their offspring. These children are at an advantage at school if compared to those who depend on school and teachers for acquaintance with formal mathematical talk, literacy and numeracy. The socio-economic realities of poor parents are such that they are forced to make choices between essentials (food, fuel and clothes) and non-essentials (books and educational toys and supplements). Education cannot compete in this environment.

The inadequacies in the knowledge of mathematics from primary school onwards generally do not pose an immense problem to children of the middle class as various types of remedial help are sought and provided by parents. There has been a rise in the number of businesses that have identified a need to fill in the gap created by an education system that favors English in particular. They have carved a niche area from the weak mathematics

levels from Grade R to Grade 12. In urban areas English and mathematics extra classes are very fashionable amongst middle class parents who can afford these services. The availability of technological media devices e.g. Computer assisted learning CDs to provide similar help is also in abundance in major towns but it does not come cheap, therefore limiting resources to the middle class.

In poorer township and rural areas schools resort to what I call the excessive extra class syndrome (EECS) that 'Only African' language learners seem to heavily depend on to pass Grade 12. Caring teachers put aside their time after school and during weekends and even during school holidays to make up for the time lost in *translation*. It is a common sight in districts to find learners camping in classrooms and being provided with food just before the final exams. This seems to be a working passport to success as their results then improve dramatically. This does not apply to English and Afrikaans speaking learners as whatever time is used in class is sufficient to grasp concepts and then learners acquire content on their own. It is those learners who happen to be Black that have to make sacrifices to write the same exam. The department of education in the province also sets aside an annual budget to assist schools with incubation classes as they seem to work. Such measures are usually successful in remedying the inadequacies in mathematics. It is the children belonging to the lower socio-economic groups who suffer from the inadequacies of the education system. The parents of these children can neither help these children personally as they are generally not educated themselves nor afford to send their children for coaching classes, which is rather a costly affair (Henriques, 1983). If we are to continue with mass education in a second language then the system has to take into account the extra time and resources needed by L2 learners. If the Education department has realized the need to invest in incubation classes for African language learners before the final exams; then it is time to reconsider notional curriculum hours for multilingual learners. The education system needs to be upfront about the reality of the second language system and add an extra year for each grade for Black children if we are to continue with an English mainly system (Heugh, 2003). This would mean that at least we are honest about our intentions and less money and energy would be spent time trying to figure out why Black children underachieve compared to their peers. It would also remove the cloud that hangs over Black teachers about their ability and commitment to teach. This though, wouldn't be politically correct?

2.6.2 The role and practice of the teacher in multilingual mathematics classrooms

Language is the channel of communication within a mathematics classroom as language provides the tool for teacher-student interaction (Smith & Ennis, 1961).

Competence in the language of communication/interaction is a prerequisite for engagement in the learning process. For the majority of South African students this is two-fold in that they are required to have competence in the language of instruction and in the language of mathematics (the mathematics register), thereby often delaying the engagement with concepts that they need. The acquisition of mathematical ability is a subtle process, but dialogue between the learner and teacher is imperative, and this depends on effective communication (Jacobsen, 1975).

Like many countries of the world, particularly developing countries, South Africa is faced with a challenge to overcome a critical shortage of mathematics teachers as well as to develop a mathematically-skilled workforce in various fields. On the supply side, statistics released by the Department of Education showed that only three percent of all the students enrolled in institutions of higher learning in the year 2000 were in mathematical sciences as an area of specialization (Department of Education, 2005). In prefacing a National Strategy for Mathematics, Science and Technology for 2005-2009, the Department took cognizance of this limitation and further expressed concern that the teaching of mathematics in schools was often never a first choice to talented mathematics graduates. Consequently, mathematics was often taught by inadequately qualified teachers and this led to a vicious cycle of poor teaching, poor learner achievement and a constant under-supply of competent teachers (DoE, 2004).

Teachers in multilingual mathematics classrooms, have to develop effective ways of teaching both the language of mathematics and the language of learning. It is therefore important to understand the different language practices that teachers in multilingual mathematics classrooms use to facilitate access to communicating mathematics (Setati, 2003). One of the strategies teachers employ to mitigate this difficulty is code-switching. It is a practice of switching between two or more languages in a conversation or an utterance,

while code-mixing happens when the switch between the languages is only for one or a few words (Farrugia, 2009).

One of the tasks of a mathematics teacher is to help learners develop ways of talking about mathematics which will enable them to understand and be understood by other members of wider communities of educational discourses (Mercer, 1995). This is not an easy task for teachers of second-language learners since the mathematical talk is not in their first language. Learners therefore need to be initiated into the discourse. This initiation includes: recognition of mathematical terms, knowing how to say them (being able to pronounce them), knowing what they mean and being able to use them in mathematical conversations. The challenge here, for many teachers, is assisting learners to move from a position where they cannot understand the language of learning (English) to a point where they use English to talk about mathematics. Code-switching and mixing is used by teachers as a strategy to facilitate learning. Observation found that both teachers and learners use this strategy:

The different uses of code-switching and code-mixing in mathematics classrooms		
Teacher talk:	Learner talk:	Learner-learner talk:
Introducing new concepts	Confirming understanding	Further explanation amongst peers
Repeating and explaining	Checking to gauge understanding	Checking with others
Clarification of difficult concepts	Attempting to answer questions	To give each other clues
Teacher – Learner Talk	Learner – Teacher Talk	Free talk L-T-L
Asking questions	Giving answers	Arguing points
Affirmation of attempts to answer questions	Asking questions of clarity	Seeking a repeat of instructions
Summarising lesson	Seeking affirmation	Translating/clarifying

Figure 2.2 (Use of Code-switching and mixing in sample schools)

Generally, learners who experience a transition from a mother tongue based system to one different to their home language, face numerous challenges which include mathematical challenges, linguistic challenges, cultural challenges, pedagogical challenges, bilingual and personal challenges. Once these needs are identified, only then can they be addressed and appropriate pedagogical and support measures introduced. Thus this is where the challenge lies for us as education planners, researchers and teachers (O' Riordan, 2007).

As a result of the symbolic market that has been created in South Africa where English constitutes the dominant, if not exclusive, symbolic resource and the prerequisite for individuals aspiring to gain a share of the socio-economic, it is seen as providing access to material resources enjoyed by a small elite group. The language choices of mathematics teachers will not only depend on what policy stipulates, but also on what teachers perceive to be in the interests of their learners (Setati, 2006). In multilingual mathematics classrooms teachers move (whether code-mixing or code-switching) between the language of instruction and the home language for various reasons:

- a. To introduce the lesson,
- b. To repeat and back up instructions,
- c. To assert authority whether to reprimand or call learners into order,
- d. To ask questions,
- e. To encourage and affirm attempts at giving answers,
- f. To translate answers for the rest of the class if answers are given in English,
- g. To give a summary of the crux of lessons.

It has been reported that outdated teaching practices and lack of basic content knowledge have resulted in poor teaching standards. The poor standards have also been exacerbated by a large number of under-qualified or unqualified teachers who teach in overcrowded and non-equipped classrooms. The combination of all these factors has in turn produced a new generation of teachers who are further perpetuating the cycle of mediocrity (DoE, 2001a). The National Teacher Education Audit of 1996 followed by the mathematics and science Audit of 1997 produced factual and statistical revelations about teachers and teaching in these subject areas. Whilst policies and programs have been produced on a general scale,

very little has happened at a systemic level to address the challenges of providing quality mathematics and science teachers. In fact, the mathematics and science audit revealed that more than 50% mathematics and 68% science teachers have had no formal subject training (DoE, 2001a). The problem of inadequate training was particularly identified in the general education phase of the schooling system. The Education For All (EFA) 2000 assessment also reported that, in spite of approximately 85% of mathematics educators being professionally qualified only 50% have specialized in mathematics in their training. Similarly, with 84% of science educators professionally qualified, only 42% are qualified in science. An estimated 8 000 mathematics and 8 200 science educators therefore needed in-service training to address their shortcomings in these subjects (DoE, 2001a). Another problem is that very few students graduating with mathematics and science choose teaching as a career. A consequence of this is a vicious cycle of not many students taking mathematics and science related subjects at universities resulting in an under-supply of educators. In some instances, this has resulted in schools not offering mathematics and physical science at all; those that offer these subjects do not have facilities and equipment to promote their effective teaching and learning; resulting in the teaching of physical science, remaining at a theoretical level with no experiments to enhance understanding and knowledge application.

The analysis made by Carnoy (2008) of the DoE, South African Council for Educators (SACE) and Statistics SA (StatsSA) figures at an aggregated level seems to suggest that there is no shortage of teachers (Arends, 2008; Erasmus & Mda, 2008). DoE figures at the time, indicated that there were more than 380 000 practising teachers and a possible 12 000 surplus teachers in the ordinary school system in 2006. According to Stats SA (2006) figures, there were an estimated 524 159 employed graduates in the field of Education, and a further 23 021 unemployed graduates in the field of Education in 2005 in the country. By the end of March 2006, a total of 482 665 teachers were registered on the Teachers' (SACE) database (SACE, 2007). The database of teachers includes those who were not currently teaching. But if it is considered that there were 386 595 teachers in the ordinary school system in 2006, then (in terms of supply) there were an additional 96 070 eligible teachers to practise their skills available to the country. Based on the figures supplied by these databases it could be concluded, as the DoE had done, that there is not a shortage in the absolute number of teachers (Carnoy, 2008).

Although aggregated data points to the fact that there is no shortage of teachers, this belies the shortages of specific categories of teachers (Arends, 2008). At local school level there are few qualified teachers of Mathematics and Science. Provincial departments in the various provinces consequently frequently employ unqualified teachers to teach these subjects (Carnoy, 2008). This situation has necessitated schools to seek the services of temporary educators who offer mathematics on top of those educators whose students fail the subject in Grade 12 due to their insufficient skills and knowledge. The issue of temporary educators has created an impasse between the Eastern Cape Education Department (ECDoE) and the major teacher union; the South African Democratic Teacher's Union (SADTU). Mathematics is categorized as a 'killer subject' in the Learner Attainment and Improvement Strategy (LAIS) of the ECDoE because of the continuing underperformance by the majority of learners in the subject (ECDoE, 2009). SADTU wants the department to retain the temporary educators it says it cannot afford, especially those that offer mathematics and science. In addressing the challenge of under-qualified teachers and too few students taking mathematics and science related subjects, a number of initiatives and programs were and are still developed at national and provincial levels as well as by higher education institutions, to mitigate the effects. An example from the Government side, was the setting up of Dinaledi Focus Schools Project as part of the National Strategy for Science, Mathematics and Technology, to increase the number of learners studying mathematics and physical science in Grades 10–12; to increase the number of higher grade learners in these subjects — especially girls and formerly disadvantaged learners; to increase the pass rate and achievement in mathematics and science in these grades; and also develop the capacity of the mathematics and physical science teachers (WCED, 2005).

Universities have also introduced bridging courses aimed at improving the content knowledge of mathematics and science students entering university. What has been shown is the fact that a number of issues impact on the teaching and learning of mathematics and science throughout the school system in South Africa, with multilingualism taking centre stage. It therefore does not follow that pre-service and in-service mathematics teacher training at Higher Education Institutions (HEIs) does not feature any courses to help

facilitate the language medium transition. This creates a burden for both teachers and learners in multilingual classrooms, as they struggle on their own to navigate coping strategies. The transition from a mother tongue-based mathematics teaching approach in the foundation phase to English only instruction; demands of teachers to facilitate better comprehension skills, while also stimulating the learners' mathematics experience. If South Africa does not offer formal training to capacitate teachers with this skill it can be expected that our education system will continue to produce very low passes in mathematics.

2.6.3 Learning and Teaching Support Materials (LTSM)

Moloi (2009) makes a comparison of the official curriculum with pupil performance in the Southern and Eastern Africa Consortium for Monitoring Educational Quality study (SACMEQ II); where around 80% of South African grade 6 learners in the study reached the lower half of eight levels of competence in mathematics on the SACMEQ continuum (Moloi, 2009). The report shows that the lowest levels of competency were observed among learners in rural schools. In the main these were also schools where the lowest levels of resources were reported and infrastructure was inadequate. The analysis of local textbooks of mathematics that was done showed significant gaps between what texts presented and what the official curriculum requires. The reality of rural environs and schools is that textbooks are often the only resource available. These gaps had serious implications for the teaching and learning of mathematics. Although textbooks may not be the sole cause of poor learner performance, the relevance of learner support materials is a matter that needs to be prioritized for effective teaching and learning of mathematics.

As already stated earlier, English is taught as an additional language to the majority of learners in South Africa; but textbooks are written at English L1 level, and are not written by second language experts. It is simple-minded to introduce to a seven year old a second language orally for one year; then attempt to make them write small sentences in the second year and suddenly switch their whole education to learning in that new language whilst providing materials at first language level in the fourth year – all this time they are still trying to learn that language. The same textbooks used by English L1 learners are used by African language learners for mathematics and all other learning areas. Very few publishers take language considerations seriously by providing vocabulary boxes and

pictures to explain difficult terminology and concepts. Exactly how much learning actually takes place is then of great concern.

Moloi (2009) postulates that besides the universally known cognitive challenges that learners have to contend with in learning mathematics, in South Africa the then apartheid regime made access to this learning area particularly difficult on three fronts. Firstly, discriminatory provision for education on the basis of race limited severely the availability of adequate and appropriate resources for Black learners who constitute the absolute majority of the learner population in the country. Secondly, whatever learning support materials (LSM), particularly textbooks, were available were based on western philosophies and were found not adaptable to local indigenous knowledge systems (IKS). The locus of the underlying pedagogy was on teaching rather than learning. Consequently, the curriculum was packaged into time-bound subject syllabi which required highly contrived and theoretical contexts in order to be accessed cognitively. Thirdly, the use of imposed foreign languages as LoLT affected the acceptability of the curriculum, made learning in general very difficult and learning of mathematics in particular virtually impossible (Moloi, 2009).

Most people are not aware of the development of English as a language of mathematics, and usually hold on to the myth that English is the only language to teach mathematics. They think that learning support material have always been available in English. The first mathematics textbooks to be written in English and French were published by Robert Recorde, beginning with *The Grounde of Artes* in 1540; responding to the need to supply language appropriate material to students of mathematics. Elementary mathematics was part of the education system in most ancient civilisations, including Ancient Greece; the Roman Empire; Vedic society and ancient Egypt. In most cases, a formal education was only available to male children with a sufficiently high status, wealth or caste. Mathematics had to be made accessible to a wider audience. However, it was uncommon for mathematics to be taught outside of the universities. Isaac Newton for example, received no formal mathematics teaching until he joined Trinity College, Cambridge in 1661; discovering how mathematics and science worked was a natural process not one hindered by language barriers. In the 18th and 19th centuries the industrial revolution led to an enormous increase in urban populations. Basic numeracy skills, such as the ability to tell the time,

count money and carry out simple arithmetic, became essential in this new urban lifestyle. Within the new public education systems, mathematics became a central part of the curriculum from an early age; there was greater demand to make mathematics accessible hence the need for appropriate materials.

By the twentieth century mathematics was part of the core curriculum in all developed countries with learner support materials being a major part of mathematics education. Availability of instructional materials at the appropriate language levels has a profound bearing on how teachers teach mathematics and on student performance. This is the reason developed countries spend the bulk of their education budgets on education materials. The lack of language appropriate and adequate teaching and learning resources for second language learners contributes to the constant under-performance in mathematics education in South Africa (Mbude-Shale, 2003).

2.6.4 The Language of Mathematics

The language of mathematics has been reported as creating an impression to students that visualizes it as a herculean task. They then see mathematics as something unmanageable and not within their grasp. The language of mathematics, like other languages, has its own grammar, syntax, vocabulary, word order, synonyms, negations, conventions, abbreviations, sentence structure, and paragraph structure. It has certain language features unparalleled in other languages (for example, theorems expressed using the letter "x" also apply to "b" and " $2x-5$ "). It is important to teach essential language concepts which are usually under-emphasized in many mathematics curricula in order to emphasize the basic patterns of mathematical expression and thought (Clarkson, 2007). There are a limited number of frequently repeated patterns of expression and thought in mathematics. Algebra for example is written in a symbolic language that is designed to express mathematical thoughts, including how to approach problems. It is important to understand that mathematical methods are expressed in symbolism.

Teachers who do not know how to navigate around mathematical methods prefer traditional mathematics classes and over-concentrate on computational skills for particular types of problems. New mathematics education demands that the concentration should be

on *how* mathematical methods and facts are expressed, with many examples, so that if a learner ever needs to know how to do a problem they will be able to execute it with ease (Esty, 2011). The emphasis of mathematics education should be on all the ways that mathematics is used to express thoughts. Teachers usually blame the low levels of proficiency of learners in English, forcing them to over concentrate less on the language and more on the computational activities, hereby hoping to create less confusion for learners. Teachers need training on teaching multilingual learners to limit language barriers.

Linguists use the term language register to refer to the meanings that serve a particular function in the language, as well as the words and structures that convey those meanings. A mathematics register, therefore, can be defined as the meanings belonging to the natural language used in mathematics (Cuevas, 1984). A mathematics register is more precise than the natural language itself because the meanings of the terms are much narrower in scope. Mathematical terms give rise to an almost totally non-redundant and relatively unambiguous language (Brunner, 1976). Halliday (1975) suggested that a mathematics register has the following components:

1. Natural language words reinterpreted in the context of mathematics, such as set, point, field, column, sum, even (number), random;
2. Locutions, such as square on the hypotenuse and least common multiple;
3. Terms created from combinations of natural words, such as feedback and output;
4. Terms formed from combining elements of Greek and Latin words, such as parabola, denominator, coefficient, and asymptotic.

In addition to vocabulary, a mathematics register also includes styles of meaning and ways of presenting arguments within the context of mathematics. These processes require new structures, which are most often borrowed from specialized forms in the natural language (Cuevas, 1984). In 1975, Clark proposed a model for representing the different roles that language might play in the teaching and learning of mathematics and they are listed below:

- | | |
|--|-----------------------------|
| (1) representation, definition, creation | (2) discussion, instruction |
| (3) translation | (4) description; discussion |
| (5) verbalization | (6) representation |
| (7) validation | |

In Clark's model, concepts are viewed as the result of the learner's experience, with language facilitating the learner's conceptual development through discussion and instruction. These activities might take place in the learner's mother tongue or in a second language. Language is also applied to the content of mathematics in the representation of experience through diagrams and mathematical notation. The diagrams might be given a description or discussion, and the notation might yield a verbalization. Clark includes creative processes (inspiration) that may or may not make use of verbal, spatial or notational imagery. In summary the model suggests the variety in the roles language plays in mathematics instruction. Different linguistic activities serve different purposes when mathematical concepts and skills are being acquired. Clark then intimates that students require considerable proficiency in both their first and second languages if they are to cope with the range of linguistic activities required for learning mathematics (Clark, 1975).

Unlike other subjects the fact that mathematics has its own register or specific discourse brings about a measure of complication in multilingual classrooms. The reason being that mathematical terminology is often complex and the words used therein are endowed with meanings, which in most cases are completely different from their normal usage (Yushau et.al, 2002). For instance, the words: *root*, *similar*, *power*, *or* and *odd* have a different sense from the usual meanings when used in mathematics. Sometimes it may be difficult, even for students who are not bilingual, to determine which meaning of 'odd' is intended in a problem (odd as in something peculiar or odd as in numbers that are not divisible by two (Raborn, 1995). Learners have to cope with the new language of mathematics as well as the new language in which mathematics is taught in our case, English (Setati, 2008). The kind of thinking one learns in mathematics is an ability to handle abstractions, and is therefore on its own an approach to problem solving that the learning of mathematics requires. Language patterns and discursive practices in classrooms help students in abstracting mathematical concepts and relationships (Sfard et al., 1998). Mathematical language skills include the abilities to read with comprehension, to express mathematical thoughts clearly, to reason logically, and to recognize and employ common patterns of mathematical thought. Mathematical methods and results are expressed in a foreign language. There are a limited number of key vocabulary words from logic ("and", "or", "not", "if... then", "if and only if",

"for all", and "there exists") which are frequently used in mathematics that might confuse second language learners; especially knowing that our second language curricula from Grade 3 upwards does little to prepare them for the mathematics register. The important question is how and where do learners learn this vocabulary and register so that they can get on with learning mathematics in class instead of getting lost in the complexities of mathematical English? Not only are second language speakers of English disadvantaged by having to make use of a second language when learning mathematics, but they are further disadvantaged by the lack of access to the mathematical register.

Mathematics education researchers worldwide have taken great pains to counter the anti-language in mathematics sentiment that has maintained that mathematics is language free and that it would be futile to link language to mathematics learning. However, it has been stated un-categorically that the teaching and learning of mathematics like any other school subject must be communicated through a language medium (Adetula, 1990). It is also the use of language that leads to a conflict between students' negotiations with the mathematical meanings of the word problems, and the required mathematical operations therein. This happens due to inconsistency in their expectations arising from the everyday experience and the structure of the instruction language. Halai (2009) then articulates correctly that language proficiency becomes essential in comprehending the mathematical tasks, more so because mathematical abstractions become contingent upon the understanding of the language in which it is put forth (Halai, 2009). One can deduce then that is a double burden for students to learn mathematics in a language they are still learning. It can result in learning of a poor quality as evidenced by our ANA results.

The organization of mathematics content and curriculum also places a burden on bilinguals as it demands that students be acquainted with the officialised or formalized talk to progress positively in mathematics. Teachers therefore have a double task to assuage the burden of learning the language of mathematics and the language of learning and teaching to multilingual students at the same time. Those of us who work in this field, know too well what a struggle it has been for teachers to successfully edify students with mathematical talk or language (Moskovich, 1999). The dilemma of the double burden for second language learners has been widely articulated by various educationists e.g. Alexander (1989, 2001);

Heugh (1993, 1999, 2000); Skutnabb-Kangas & Cummins (1988); MacDonald (1990); Thomas and Collier (1997); Skutnabb-Kangas (2000); Wolff (2000); Ramani, Kekana, Modiba & Joseph (2007); Komarek (1997, 2001); Kaschula (2009) and others).

However, teacher training, both pre- and in-service rarely takes the role of language in learning mathematics into consideration, even at the basic level of managing multilingual classrooms. Can this be ascribed to the claim made by the ICMI Study 21 (2009) that given the widespread occurrence of multilingualism, it is surprising that it is rarely mentioned in much published research in mathematics education, mathematics education policy or mathematics curricula. Where multilingualism is mentioned, it is often as an after-thought, a challenge, or a problem to be overcome, but mostly there is just silence. Multilingualism may therefore be an unmentioned feature, an unmarked factor in much of the work of researching and organising mathematics education (ICMI Study 21, 2009). Having articulated that position though, it is important to acknowledge that after an extremely problematic start during the first seven years of the new Republic of South Africa, language education policy appears to be on the road towards finding a definite direction, no matter how slow the pace is. Although the gap between the constitutional and legislative position on the one hand, and the actual practices in the classrooms and lecture halls of the country on the other hand, remains very wide and often appears to be widening, the fact that these instruments exist is of the greatest significance. They represent democratic space for the legal and peaceful promotion of multilingualism and for mother tongue based bilingual education in South Africa (Alexander, 2008; Ramani & Joseph, 2010). Both the constitution of the country and the language policy in education take it as their point of departure that the 11 official languages shall have equality of status and should enjoy “parity of esteem”. All the languages used in the country are deemed to be assets rather than problems. However, there is no doubt that in practice the state bureaucracy as well as most of the political leadership is trapped in the **language-is-a-problem** paradigm. They model an English-only paradigm in the media and they address masses in English although all indications are that the majority of people do not understand English.

In my opinion, the public service is doing the cause of multilingualism a disservice by rapidly sliding in the direction of unilingualism in spite of the constitutional provision for the use of

a minimum of two languages at both national and provincial levels, with one being the language spoken by the majority of the people. Alexander (2000) intimated a position, that he calls the Static Maintenance Syndrome (SMS) that debilitates and paralyses most African language speakers. This refers to an attitude of mind, which is prevalent throughout the African continent, and which manifests itself as a sense of resignation about the perceived and imputed powerlessness of the local or indigenous languages of Africa. He says that most of the people are willing to maintain their primary languages in family, community and religious contexts but they do not believe that these languages have the capacity to develop into languages of power. Their consciousness reflects the reality of the linguistic market and they have become victims of a monolingual habitus (Alexander, 2000).

It is understandable then that schools feel pressurized to reproduce the status quo as exercised by the anglophile oriented black elite, ignoring the UNESCO declaration (1953) that it is axiomatic that the best medium for teaching a child is their mother tongue. Psychologically, it is the system of meaningful signs that in the child's mind works automatically for expression and understanding. Sociologically, it is a means of identification among the members of the community to which the child belongs. Educationally, they learn more quickly through it than through an unfamiliar linguistic medium (UNESCO, 1953).

Deep conceptual development in mathematics is then dependent on an appropriate understanding and use of the academic language of the subject and this academic language needs to be taught (Clarkson, 1994). While this assertion is central to successful acquisition of mathematics skills, very little attention has been given to the area of bilingualism and mathematics learning in South Africa except studies by Adler, Mji and Makgato, Setati and a few others. In countries such as Australia, America, the United Kingdom, Canada, Spain and New Zealand, however, much research has been done. Findings reveal conflicting views about the learning of mathematics in a second language at all levels of education. While some of these findings found positive correlations and cognitive benefits from learning through the medium of a second language (e.g. Barwell, 2003; Bournot-Trite & Tellowitz, 2002; Clarkson, 1992 & 2007; Cummins, 1979; Swain, 1996; Williams, 2002) other studies put forward that such students under-achieve in mathematics (Adetula, 1990; Barton et al, 2005; Galligan, 1995; Gorgorió & Planas, 2001; Secada, 1992; Setati & Adler, 2000).

2.7 Conclusion

Despite the findings of Adler (2000), October (2006) and Setati (2009) that have contributed to the local and international debate around the teaching and learning of mathematics by second language learners, the innovative strategies and programs aimed at improving performance in mathematics do not as yet take the language issue into consideration. It is tantamount to taking an unfortunate position that other countries need our experience, but we will not use our own empirical evidence to benefit our learners. This thesis is a step towards appreciating the work that has been started in this country in order to shed light on mathematics underperformance and also add to the volume of growing work in this area for the benefit of our learners.

This thesis is therefore concerned with the effect that the early change in the LoLT in Grade 4 has on mathematics achievement in the students' final school year, Grade 12. In chapters 3, 4 and 5 this is pursued further. Chapter 2 has attempted to make the link between language and the learning of mathematics, against the backdrop of language related court cases in South Africa where the language issue has been brought before the courts. The chapter further deliberates on the factors, both language and teacher related, including curriculum and access to learning materials that can influence the learning of mathematics. Chapter 3 will look closely at the 2010 Grade 12 mathematics and language results of the results of three high schools in the Eastern Cape Province. The study will investigate to what extent the analysis of the Grade 6 2004 Intermediate Phase Systemic Evaluation Report (IPSER, 2006) which shows that those students who used the Home Language as a LoLT outperformed their peers in both Language (LoLT) in Mathematics and in Natural Science still applies when the same students wrote their final examinations in Grade 12. Chapter 3 will also outline the methodology and research design that is used in this process of analyzing these results.

CHAPTER 3

RESEARCH DESIGN AND IMPLEMENTATION

3.1 Introduction

This chapter describes the design of the Grade 12 2010 results analysis for Language and Mathematics. Grade 12 results are appropriate in illustrating problems because these can be analysed in many ways, for example, using school-related variables, gender-related issues of learners and educators, and resources available to individual schools. Also, such analyses are relatively fair because national standards are maintained through the results being examined and moderated by external bodies, to minimize bias (Kahn, 1994). This means that all schools at least write the same examinations and therefore comparisons based on the results should generally be valid. Such comparisons are also useful in indicating the factors that lead to poor performance (Mji & Makgatho, 2006). The specific thrust of this study is on mathematics learning by second language learners of English, whether they take English at Home language (HL) level as this is the norm in former-Model C schools i.e. School MAH and School MCH; or they take it as a First Additional Language (FAL) as in School MBH and School MEH. They still do Mathematics at an academic English level and write the same paper as those learners who are taught and learn English at Home Language level (L1).

This chapter sets out the methodology implemented in this study. The entire assessment and examination process for the National Senior Certificate is underpinned by Kanjee's (2002) assertion that for assessment to have an impact on improving the quality of education, first, efficient systems and processes must be in place to provide relevant and timely information to key role players in the education system. Over the past five years the ECDoE has run a credible examination system with very few irregularities. Despite all other challenges the province might be experiencing it prides itself in doing something right and putting efficient processes in place. A simple analysis of credible results is not adequate for this study though. It is the interpretation of the educational situation that African language learners find themselves in when learning mathematics and what it is that policy makers, officials, teachers, parents and HEIs can do about the findings that is equally important.

3.2 Research orientation

What follows is a personalized interpretation of research approaches and why I have chosen specific methods. Like Gramsci (1971) I also share in the belief that research needs to have a practical impact on society by criticizing the status quo and challenging the hegemony of English in mathematics classrooms; especially if it makes the playing field of African language students unlevel. To gain a better understanding of hegemonic relationships in the Grade 12 NSC examinations I analyse the academic performance of four different language groups viz. IsiXhosa; Sesotho; Afrikaans and English learners. The practical impact for me would be the change the findings could bring about for the next generation of learners. I am a government official responsible in the education sector and I am in a position to influence certain decisions about what can be done to mitigate the effects of educational inequality. This can be the case should this research prove that there is something disadvantaging to the child and to mathematical development of learners if they constantly have to engage with language barriers rather than learning mathematics.

3.3 Research Goal

The main purpose of this study is to explore the correlation between language medium and academic achievement. It is a comparative study of the language of learning and teaching and mathematics results in the 2010 National Senior Certificate (NSC) examinations between home language African language students (isiXhosa and Sesotho); who write mathematics in English and those who are home language (English and Afrikaans) who write mathematics through their home languages. Matric results are often considered in statistical research as predictors of academic success (Dambisya et.al. 2004). The 2010 National Senior Certificate cohort entered Grade 1 in 1999 when the Provincial Pass rate was at 40.3%, the lowest since 1996 and such a low percentage was never to be repeated to date (NSCR, 2011). From the time these learners were in Grade 1 huge amounts of money and resources were spent by government. 27% of the national budget is spent on education (Heugh, 2002); non-governmental organizations; parents and communities on interventions in preparation for the class of 2010 to succeed. The Eastern Cape Education Department set a target of 60% for this class in 2009; instead 58.3% was achieved. Although the department fell short of our target it is still better than the 50.6% of 2008 and much better than the 51.0% of 2009. In all this excitement about the gains made, can one say the same about the

mathematics achievement? The mathematics achievement of students' is often associated with the future of a country (Wobmann, 2003; Baker & LeTendre, 2005). Thus, the desire to understand and identify factors that may have meaningful and consistent relationships with achievement in mathematics has been commonly shared among national leaders, policy makers, and educators around the world.

This interest in the mathematics achievement of learners is the reason why in 2007, more than 60 countries participated in the Trends in International Mathematics and Science Study (TIMSS) (TIMSS, 2007). By collaboratively supporting and participating in a large-scale international achievement study such as the TIMSS, it was hoped that the rich data (achievement and other contextual data) collected from such an international achievement study could illuminate important correlates of mathematics achievement both within and between countries that would otherwise escape detection (Wagemaker, 2003). Unfortunately, despite the fact that data from these international achievement studies have been made available for all participating countries (NCES, 2007) only a small number of these countries were included in subsequent research studies. A review of existing literature suggests that low-income countries as well as those that performed poorly in international achievement studies such as South Africa, Chile, and Egypt, were rarely included in international research studies. In contrast, researchers tended to focus on a small group of developed and high-performing countries such as Japan, Canada, and the United States. Such bias in international achievement research has resulted in research findings related to students' mathematics achievement that are based mostly on students in developed countries. Consequently, the lack of research findings related to students' mathematics achievement in developing countries has led many of these countries to base their policy decisions and even educational reform projects on research findings and educational models of other developed countries (Riddell, 1997). Such bases are problematic because countries differ in characteristics and a model that works in a developed country may not work in a developing country (Delaney, 2000).

Within the body of research on mathematics learning by ESL students, there had not been a direct exploration of the effect that the students' bilingualism has on their achievement in mathematics. This study does not claim to focus exclusively on that and it will attempt to

incorporate aspects of bilingualism and its effect on mathematics achievement. The goal is to provide appropriate feedback to all role-players, especially teachers, learners, parents and the department of education in order to enhance teaching and learning. Kanjee (2002) asserts that information must be effectively used to address the challenges that impact on learning. The real issue is to develop an integrated and effective assessment system to address the challenge of improving learning in the classroom. In the case of this study the goal is to provide empirical evidence as to whether language factors do affect achievement in mathematics in Grade 12. This study will also attempt to investigate the extent of the relationship between a learners' proficiency in their home language; the school's LoLT, and their level of academic performance in mathematics.

3.4 Research design and implementation

The methodology of the research is multi-faceted while employing a mainly quantitative research style. The key elements of the design include statistical analysis and interpretation of the Grade 12 2010 NSC results. The thesis is further supplemented with other data sources to provide a more comprehensive overview by using the Grade 6 Intermediate Phase Systemic Evaluation Report (IPSER, 2005) when the same group of students were in Grade 6 in 2004. This study also attempts to investigate the extent of the relationship between a learners' proficiency in the school's LoLT, and their level of academic performance in mathematics by comparing the 2010 Grade 12 learners from the four provincial language groups namely: isiXhosa (largest group), Sesotho (minority group), English (minority but extensively used as LoLT) and Afrikaans (minority).

The qualitative aspects include participatory research methodology where participants (including learners; teachers, parents and departmental officials) are interviewed and their responses recorded for use in order to compliment the quantitative data analysis. The semi-structured interview questions were designed to elicit responses on contextual factors that might impact on teaching and learning and were administered to the above role-players in separate interviews. Different indicators are used to compare the different language groups within the same sample pertaining to the teaching and learning context of mathematics and language for Grade 12 learners (within their language groups). They are described below:

1. The Home Language of learners is the most obvious choice as LoLT; though there are claims that it is not a very reliable indicator (de Klerk, 1996) as the majority of learners learn through English. In some former Model-C schools they can only do English as a true reflection of the linguistic landscape of learners in these schools as neither English nor Afrikaans is their Home or Additional Language. They are then forced to categorise themselves as English Home Language and Afrikaans Home Language to a lesser extent; depending on the desperation of the learner to get a place in a particular school. For the purposes of this study it is important to establish how this dynamic plays itself out in their final results for Language and how this affects their learning of mathematics. The study will also take a closer look between the results of Black learners who in 2010, wrote English as Home Language and those who wrote it as First Additional. A vice versa approach is also used where a comparison is made between learners who wrote an isiXhosa or Sesotho at Home Language level and those who wrote it at First Additional level. It is interesting to compare their mathematics results.
2. A second indicator that is important for this study is the population group or race. Given the history of our country; the race indicator would be more reliable as it spells out which racial group experiences the educational inequality and how that affects that group's academic performance. The researcher is aware of Negash's research (2001) where precisely because of the reasons I stated earlier on; race alone is not a sufficiently reliable indicator of a learners' background. Educational background is therefore added as another indicator.
3. The kind of school a learner attends is a good indicator of the kind of education they were exposed to. Educational background is therefore the third indicator, especially for Black students. Their educational background can either be educationally disadvantaged; whereby limited resources for good teaching of mathematics and low levels of proficiency of teachers in the language of teaching and learning (LoLT) can negatively contribute to their results. An educationally advantaged education background can mean sufficient exposure to good teaching of both mathematics and

language. Therefore if academic performance is related to which educational background students have been exposed to, then it is an important indicator together with language. School MBH and MEH are interesting for this study as the results of these Black students (peri-urban and rural) continue to compete with the former Model-C schools at levels beyond expectations.

4. The fourth indicator has to do with factors related to learner achievement, both school-based as well as factors related to the broader contextual conditions of learning and teaching. The socio-economic background of learners, as can be expected given our country's history of inequality, continues to be a primary influence of learner achievement (IPSER, 2005). Data is obtained from the interviews with learners, teachers, parents and departmental officials.

The gender of learners is also considered, but to a lesser extent. Various studies have emphasized how female learners are doing academically as compared to male learners. The column depicting gender in the performance tables is outlined for those who might have an interest in such comparison but it is not central to my analysis.

3.4.1 Quantitative methodology

For the purposes of this research, I rely primarily on the Grade 12 National Senior Certificate (NSC) results for Mathematics and Language (Home Language and LoLT) which are numerical data obtained from the Assessment and Examinations Directorate of the Eastern Cape Department of Education. The data is presented in tables, with information per school about the population group (Black/White/Coloured/Asian/Indian). For the purposes of this research I will use the Black or White classification.

3.4.2 Qualitative methodology

The qualitative part of this research is concerned with finding answers from role-players in the research sites as to what they think contributes to good or poor performance in mathematics and language. The uniqueness of that feature is the part that puts verbal explanations to the numerical data. It is what I do not know as an outsider as explained by

insiders about their performance. To analyse qualitatively, the skill involves collecting; classifying, ordering, synthesizing, evaluating, and interpreting data. At the basis of all these acts lies sound personal judgment (Cohen et.al, 2001). The use of interviews for learners, teachers, parents and focus groups with departmental officials plus classroom observation forms part of what Mack et.al (2005) describe as the three most common qualitative methods. When one considers the fact that the qualitative aspect of the research interprets the quantitative data for the Grade 12 NSC examinations; I then have to concur with Hodgeskiss (2007) that the terms qualitative and interpretive research are often used interchangeably based on the perception that reality is ever changing precisely because when individuals interact with their worlds, experiences are bound to change differently for different people. The verbal interpretations are therefore crucial to explain quantitative data. How students explain their performance is crucial; how teachers explain what is usually ascribed as success or failure on their part is central to this discussion. The parent voice about how they view what impacts on the education of their children also takes centre stage in the qualitative research. Although qualitative data was collected from interviews; an agreement was reached with the participants that their responses old be summarized as there was a level of fear of victimization by sample schools. The issue of race and language is still one that people feel they are not comfortable to freely talk about when their children are in multiracial schools. Commenting on the performance of teachers was also an area of discomfort for Black parents and learners if it was negative.

3.4.3 Triangulation

Although mainly quantitative, this research attempts to incorporate aspects of a multi-method approach to the problem investigated by employing some aspects of triangular techniques so as not to be limited by a singular method. Triangulation may be defined as the use of two or more methods of data collection in the study of some aspect of human behavior. In an original and literal sense, triangulation is a technique used by maritime navigators and surveyors for example, using several markers in their endeavours to pinpoint a single spot or objective. By analogy, triangular techniques in the social sciences attempt to map out, or explain more fully, the richness and complexity of human behavior by studying it from more than one standpoint and, in so doing, by making use of both quantitative and qualitative data (Cohen et.al, 2001). The quantitative data used in this study will be the

interpretation of the 2010 Grade 12 results for Language (s) and Mathematics. The interviews and observation sessions held on the different sites with teachers; parents, students and departmental officials constitutes the quantitative method and is a group analysis that indicates the interaction patterns of individuals and groups (Smith 1975). Denzin (1970) identifies two categories in his typology: 'within methods' triangulation and 'between methods' triangulation. As a check on validity; the between methods approach embraces the notion of convergence between independent measures of the same objective (Cambell and Fiske, 1959). For this study the use of the 2004 Grade 6 learners that wrote the systemic evaluation for Mathematics; Language and Natural Science is a perfect example of convergence between independent measures. In 2004, the Grade 6 systemic evaluation study was intended to serve three purposes: first to determine the level of achievement of learners within the system, second, to highlight specific areas/issues within the system that require further attention/investigation; and third, to serve as a baseline against future system evaluation studies. Indeed in 2010 the same group of students wrote the Grade 12 National Senior Certificate examinations. The purposes of this study are outlined in the Research Goal in 3.3. They are not as extensive as the IPSE 2004 study and the systemic evaluation studies use a large sample so as to offer a powerful lens through which to view the achievement of the education system. This study shares similarities with the IPSE in that:

1. The same group of students are investigated to ascertain factors associated with learner achievement over time and this then offers a type of methodological triangulation viz. time triangulation as described by Denzin (1970). Kirk and Miller (1986) expand on time triangulation by making a difference between diachronic reliability viz. stability over time and synchronic reliability – similarity of data gathered at the same time. This study uses both types of time triangulation with the latter exemplified by the different samples of schools with data gathered.
2. The difference between when they were in Grade 6 and six years later writing their final exam in Grade 12 examining their performance for the same subjects Mathematics and Language (Home and LoLT) is a point of convergence. A closer look at their Grade 12 performance will contextualise the problem far more, as a major disparity was observed in this study which has not changed since 2004. The disparity was that learners for whom the LoLT was the same as their mother tongue, or home

language, obtained scores that were significantly higher for all three learning areas investigated (Mathematics, Language and Natural Science) than learners whose home language was different from the LoLT. The same study reports that home language as the medium of instruction emerged across provinces as a significant factor affecting learner performance (IPSER, 2005). This study will further explore to what extent those findings will still be reflected when they write Grade 12 in 2010.

Besides the 2004 findings that are used to triangulate the present findings in this investigation about the low level of academic performance of African Language learners in mathematics and language; the various data collection techniques are meant to offer some validity to the findings. I concur with Altritcher et.al. (1993) when they postulate that triangulation is an important method for contrasting and comparing different accounts of the same situation. The notion of triangulation bridges issues of reliability and validity (Cohen et.al., 2001).

3.4.4 Sampling

The aim of this sample was to draw a representative sample comprising of a total of 1009 learners from 10 schools in 10 different education districts. 50 of the learners are the top achievers of the Province and represent all districts. The Eastern Cape has 23 education districts that are based primarily on municipal government boundaries established by the Demarcation Board (ECDoE, 2007). This study employs non-probability sampling or purposeful sampling (Maxwell, 2005); where particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be obtained from other choices. Patton (2007) articulates that the power of purposeful sampling lies in selecting information-rich cases for in-depth study. A small sample that has been systematically selected for typically and relative homogeneity provides far more confidence that the conclusions adequately represent. He also shared the belief that a sample can be purposefully selected to allow for the examination of cases that are critical for the theories that the study began with (Patton, 2007). Purposeful sampling can be used to establish particular comparisons to illuminate the reasons for differences between settings or individuals, a common strategy in multi-case qualitative studies (Maxwell, 2008). For the purposes of this study the academic performance of two population groups; Black

and White will be analysed amongst four different language groups viz. IsiXhosa; Sesotho; Afrikaans and English learners; and a reflection on the comparison between the findings of the two analyses using Home Language as an indicator. The other population groups viz. Coloured, Asian and Indian fall under English or Afrikaans Home Language. My reason for choosing race as a strong variable is that my argument is that shared by Alexander (1995) that in South Africa, the simplistic adoption or implementation of western theories, under present conditions, tends to revive and reinforce apartheid structures and patterns (Alexander, 1995). I have purposefully selected these schools for the following reasons:

1. Seven (7) of the 10 schools are categorized as performing schools by the department of education. If one considers their pass rate over a period of three years viz. 2008 - 2010; six have maintained a pass rate of between 80% - 100%; and one has vacillated between 70% - 100%. One of the remaining three schools was in the underperforming category with 40% and below in 2008 -2009; it managed to push its results to the performing category of more than 70% in 2010. The other was between +50% and had pushed its results to 70% in 2010. The last school MJH is used for illustrative purposes of what can happen to a school if all factors contributing to proper teaching and learning are not in place. Over three years they had moved from a 60+ bracket to 20% in 2010. I have included it in the sample as a school that was doing quite well in the past in mathematics. When their results declined; mathematics was thought to be responsible and they did away with it, but their results went down even further. What parents and learners think about what went wrong is noteworthy; as opposed to what teachers ascribe to the downslide.
2. I have purposefully selected both traditionally African language schools and English and Afrikaans schools that are regarded as high performing to analyse their mathematics and language performance. I have deliberately not included underperforming schools (except one that continues to weaken) for the reason that I claim that the quality of the 80% - 100% we are getting even in high performing schools does not translate to high quality performance in mathematics even in former Model-C schools; where the perception is of functioning models of education. So if good management and teaching in a school does not translate into good scores in mathematics; what else contributes to the low scores we are getting,

especially from Black students? A closer look at the mathematics results across the sample schools that are all performing in the same acceptable band will hopefully provide some empirical evidence as to possible reasons.

A sample of 1009 students might be viewed differently by different people; for the purposes of this research it provides an adequate picture of what the study sets out to do.

3.5 Data collection instruments

As described in the above sections the study employs various data collection tools and techniques to validate its findings. They are the following:

- Department of Education Documentation analysis (Grade 12 NSC examinations (2010) and reference to the 2004 Intermediate Phase Systemic Evaluation (2005).
- On-site Interviews (teachers, learners, parents and departmental officials)
- Participant Observation (mathematics and language classes)

3.6 Interviews

The primary focus of interviews was for the respondents to identify factors affecting the teaching and learning of both mathematics and language. The purpose is to identify the strong predictors of learner achievement, both to understand the main drivers of achievement and to identify which variables were likely targets for intervention. Participants were selected from each of the 10 schools with one-on-one interviews with three officials from each of the 10 districts involved in the study. Five teachers from each school were interviewed and parents were in groups of five wherever possible. Focus group interviews were conducted with individual past 2010 Grade 12 learners and a group of ten learners per school as a means to collect data. Semi-structured interviews as used in qualitative studies were conducted due to their flexibility as they are more open-ended in nature, thereby allowing the researcher to probe as much as desired to get quality data. The parent interviews were the most difficult as the level of interaction had always to be adjusted when they appeared confused. Their view on their children's education was important for this study as they are always blamed for non-participation in it. A large portion of the interviews were guided by set questions that had to be investigated; not necessarily in a particular

order or exact wording although they would achieve what was to be explored. The language of the interviews was deliberately isiXhosa and English to a lesser extent for those who did not understand isiXhosa. The results indicated that two factors were identifiable across the four respondent groups; viz. positive characteristics and negative characteristics that were influencing achievement in Grade 12 particularly in mathematics and language.

3.7 Observation

The location for observation was in mathematics periods in 5 of the 10 schools and five language classes in the other 5 schools. Approaching the participants in their own environment proved to sometimes clash with what they reported in the interviews; especially in the mathematics classrooms. The teachers were more than willing to allow the researcher to become an active participant and to ask questions to learners or engage with them on a particular topic. An in-depth discussion of what transpired in classrooms is discussed in Chapter 5 when dealing with the research findings.

3.8 Data analysis

In Section A of chapter 4, an active presentation of the Grade 12 NSC examinations data for Mathematics and Language is outlined; organized and broken down, and synthesized (Bogdan et. al, 1982). In Section B of chapter 4 patterns are identified for lessons we can learn from the emerging patterns and a sifting for indicators that are the focus of my study. They are identified and discussed as they come up per school. It is a very labour intensive process but one that is very exciting as indicators emerge diverging or converging on certain points. While Section A is mainly quantitative with numerical data; Section B is mainly qualitative, adding a voice to complement Section A.

The qualitative data collected from the observation schedule and interview notes is used to complement Section B. This data shaped the themes or rubrics under which Section B operates. It is the interpretation of the presented data. The data is the presented in Section A while Section B is dedicated to interpreting that data.

3.9 Ethics

Cavan (1977) describes ethics in social science research as a matter of principled sensitivity to the rights of others. He states that being ethical limits the choices we can make in the pursuit of truth. Ethics say that while truth is good, respect for human dignity is better, even if, in the extreme case, the respect of human nature leaves one ignorant of human nature (Cavan, 1977). For the purposes of this research; nine of the 10 sampled schools are doing well. Therefore it would not be degrading to them to see their results discussed publicly. But I had to consider the fact that the performance of each candidate is a private and confidential matter and therefore all the subjects in the sample are treated in an anonymous manner. I have used three short alphabet codes (MIH) to classify the schools: 'M' for Matric and random alphabets A-J for each school in no particular order except for the last school, with the letter 'H' at the end for High School. Matric results are public documents in South Africa; but despite that, permission was sought from the department of education to use these results for this study. Coupled with the right to access information is then the consideration of ethics.

3.10 Anonymity and confidentiality

Various researchers have highlighted the fact that the question of ethics in research is a highly complex subject. This complexity stems from numerous sources of tension (Cohen et.al, 2001). Let us consider two of the most important. The first is expressed by Aronson and Carlsmith (1969 in Cohen et.al. 2001). They highlight the tension that exists between two sets of related values held by society viz. a belief in the value of the free scientific inquiry in pursuit of truth and knowledge; and a belief in the dignity of individuals and their right to those considerations that follow from it. Although some schools did not mind being mentioned if it was in good faith; I decided to limit recognisability of the research subjects by using the coding described in 3.9. This was done in pursuance of the position of 'non-maleficence' of the Social Sciences and Humanities Research Council of Canada (1981) where it maintains that no harm should befall the subjects. The agreement reached with all participants was that the interview schedules would not be transcribed as people feared victimization from teachers and their unions and principals. The coding is as follows:

1. School MAH = (Dual Med. AFR HL-ENG HL) no African language offered.
2. School MBH = (XH HL, ENG FAL) English med/LoLT no Afrikaans offered.
3. School MCH = (AFR HL, ENG HL) no African language offered.
4. School MDH = ENG HL, XH HL, AFR FAL.
5. School MEH = ENG HL, XH FAL, AFR FAL.
6. School MFH = SOTHO HL, XH HL no AFR offered.
7. School MGH = SOTHO HL, XH HL no AFR offered.
8. School MHH = SOTHO HL, XH HL no AFR offered.
9. School MIH = SOTHO HL, XH HL, AFR FAL.
10. School MJH = AFR HL, XH HL, ENG FAL.

3.11 Negotiating Access

I am an inside researcher in terms of my position as an official within the department of education. Negotiating access was therefore a very important stage in my investigation especially for the interviews and observation. Whatever mistakes I could possibly make I would have to live with them for the rest of my employment in the department. It could also undermine the quality of the research if people felt they were just research subjects when interacting with me. I negotiated access to the different sites with no assumption that because I work for the department everything was fine. I was upfront about the purpose of the data collection with all the role-players. Recording, Transcribing, Analysis and Dissemination of findings was negotiated openly and a special request of sensitivity to the fact that the findings might not bode well with the principals of some of the school that showed a high level of arrogance and did not see the need to improve as they were 'doing their best'. They ascribed any negative scores or result to learners and parents whom the principal termed as irresponsible and absent. It is the intention of the researcher to maintain scientific impartiality in the analysis of the Grade 12 results in all sampled schools, despite any personal feelings or influences that might have occurred as a result of such unfortunate interactions.

3.12 Limitations of the study

The limited understanding of Section 6 of the South African Schools Act (1996) is a direct result of the limited broadcast to school communities by the national department of

education. This section capacitates School Governing Body (SGB) members to be able to make language policy decisions for schools in line with national and provincial legislation. These parents as representative of the broader school community and are expected to make succinct School Language Policy (SLP) choices that are well informed so as to serve the best educational interests of their children. Even if the SASA (1996) and the LiEP (1997) were designed to address the inequities of the past; the reality is that with masses of poor, illiterate parents who have no knowledge of language policy issues and processes; these parents are unable to use this legislation to their advantage. This also posed a limitation to the study.

The parent interviews were the most difficult and they lent themselves to being opportunities for me to explain to parents the pieces of legislation as they did not know of such existence. With the learners as well I almost had to lead them into understanding the value of home languages in education. I found myself having to explain that the Constitution (1994), the SASA (1996) and the LiEP (1997); the ECLPF (2011) all encouraged incremental bilingualism; without having to sacrifice either English or the home language. It was strange that Black learners, students and parents knew that learning and teaching was difficult in a language they spoke only at school; but they thought that things had to be that way. They were resigned to this status quo and did not know that things do not have to stay that way. I found myself in several instances having to intervene by correcting misconceptions about the language policy and offered one or two leading questions to steer the interaction to produce the answers I wanted from them.

A lot of my subjectivity about the language and mathematics issue came through in some instances where I heard my people thinking that mathematics was meant for particular racial groups and were actually apologetic about saying things as they are; when actually the system had failed them. This presented challenges of having to maintain being an objective investigator. This impacted a lot on the time set for each interview as we always went over the stipulated time, forcing me to give lifts to people and dropping them nearer to home. In the rural areas time was a limiting factor as parents had to travel long distances to get to the school and teachers wanted to leave early as they lived far away from the school. I decided to move parent interviews where I anticipated that people would be affected to a central

venue in order to overcome the issue of long distance travelling. The departmental officials were difficult to get hold of but it helped being an official because I have direct access to their offices and managers.

The third limitation was the fact that I work for the Department of Education. There was a certain level of inhibition from some teachers and district officials who were anxious that the interviews were perhaps an assessment as to their work performance. I had to spend a lot of time explaining that I was not trying to catch people out. It paid off at the end as it was these two layers of subjects which gave me insightful information as to where the system has allowed gains for learners and how schools use that to their advantage and where the department simply fails schools and learners.

3.13 Conclusion

The stark reality that Black parents have a right that they do not know of, and therefore cannot exercise it to the advantage of their children's academic development is a cruel reminder of what can happen when people do not have access to information in a language they understand. It hit me very hard and left me drained and emotional that as an African language speaker and government official we are simply not doing enough. The reality that we live in a society that has institutionalized racism in the way we have acted or not acted to ensure implementation of the Language-in-Education Policy (1997) is tragic.

This chapter has set out and described the methodology used in conducting this research. In the next chapter the Grade 12 NSC final examinations data for mathematics and language will be outlined in Section A. In Section B I will work within an interpretative paradigm in trying to explain and interpret the patterns emerging from the data.

CHAPTER 4

2010 GRADE 12 RESULTS FOR MATHEMATICS AND LANGUAGE

4.1 SECTION A: Background Introduction

This chapter deals with the data of this thesis both qualitatively in Section A and quantitatively in Section B. Section A of this chapter sets out the scenario of the Grade 12 final examinations process while Section B highlights the Grade 12 2010 NSC results for 10 schools in 10 different districts in the Eastern Cape Province with a total of 959 learners as a sample. A pattern has been observed with those students who learn in their mother tongue and this is discussed further in chapter 5. Generalisations can be made from the sample of 959 students, while the results cannot be said to represent all students in the province, they do represent trends that can be established from the research. This chapter largely presents the raw data that has been gathered in the form of various graphs and tables. Rather than place this material in an appendix it was felt more appropriate to include it as a separate chapter prior to the analysis and findings presented in chapter 5, thereby facilitating continuity of the thesis. Before presenting the raw data, some information concerning examination processes in the Eastern Cape and nationally will be discussed. This information has been previously presented publically in various planning and policy documents.

The year 2010 was difficult for the education sector as a direct result of the protracted industrial action; when teachers went on strike, showing their displeasure about the salary offers made by the Department of Basic Education. Unions affiliated to COSATU went on this protracted strike, including thousands of teachers leaving classrooms without teachers. The obvious public reaction was that the Class of 2010 was doomed for failure and there was a pointing of fingers at teachers for having failed learners by embarking on the endless strike. After the strike this sentiment created a desperate frenzy to maximize the little time left by employing catch up creative strategies from teachers, schools, NGOs, districts and circuits. This seemed to work as the pass rate went up instead of the downslide that everyone anticipated. The overall national achievement rate for 2010 was 67.8%, an increase of 7.2% compared to 2009. Subjects that continue to create challenges for the Department and performed below 50% were Mathematics and Physical Science. Subjects

that performed below 67.8% were Accounting and Agricultural Science. On the whole the Department of Education was very excited about the increase in the pass rate despite the teacher strike. The 2010 Soccer World Cup also saw a very long mid-year vacation for learners that the public criticized as taking time away from teaching.

Amidst the excitement was a public outcry by education critics through the media who questioned the authenticity of the results. How could there be such a jump in results when all odds were against the Class of 2010? UMALUSI the organisation responsible for an oversight function on the National Senior Certificate examinations came to the Department of Basic Education's defence and stated that the results were indeed authentic. Despite all of these issues, for a rural province like the Eastern Cape, the 7.3 % increase from 51.0 % in 2009 to 58.3 was a success story. The reason being in addition to the nationally felt challenges of the World Cup and the national strike; there were internal problems in the Eastern Cape Department of Education where unions clashed with the management of the Department over numerous issues that they could not agree on. So, when other provinces were trying to recover from the national strike the Eastern Cape learners felt the pinch further as the Provincial Office was unable to support schools. Districts were left to their own devices to support themselves for a period of two months as the impasse between the unions and the ECDoE intensified.

On the up side the ex-MEC of Education, Mr Qwase in 2010 supported the Learner Attainment and Improvement Strategy (LAIS) and intensified efforts to maximise on time wasted and this strategy worked. This effort by the then MEC and departmental officials was acknowledged by the incumbent MEC for Education Mr M Makhuphula in the foreword of the National Senior Certificate Results by stating that on behalf of the Department, he salutes the Grade 12 Class of 2010, the teachers, markers, parents, the departmental officials, and his predecessor, Mr DM Qwase, for the outstanding work they have done to bring the department a successful NSC examination in 2010 (NSCR, 2011). It is also the reason that those within the province who knew the inside story and those who went out of their way to make a difference to schools agree with the ECDoE that the success story of 2010 is a clear indication of the maturity of its assessment and examination system over the last 152 years; a long arduous journey, from 1858 to 2010 (NSCR, 2010). The following

sections will highlight the program that laid the foundation for the work that produced the 58.3% of 2010. It is normal for various individuals within and outside of the education arena, to attribute the success of the Class of 2010 to certain things that were done right or just to sheer luck. Below is a mention of such possibilities.

4.2 Possible reasons for the gains of 2010

Against the tides that continue to plague education in the Eastern Cape, running credible examinations has been one of the few reasons that make the province to hold its head high. Over the years the Department has gone from strength to strength with the examinations directorate achieving strides despite the fact that the province has large numbers of Grade 12 learners if compared to provinces like the Western Cape. In 2010 the Eastern Cape provided the third largest number of the Class of 2010 after KwaZulu-Natal and Limpopo provinces respectively (NSCR, 2010). One then begins to appreciate the difficult circumstances that might otherwise put in jeopardy such an elaborate process for the Assessment and Examinations Directorate provincially; despite all these pressures it continues to bring hope to the thousands of learners in this province by delivering sterling work. The following paragraphs will shed some light on the programs and plans that might have brought the Eastern Cape Province some victory despite the huge challenges the Grade 12 Class of 2010 experienced.

4.2.1 THE DEPARTMENT OF EDUCATION'S STRATEGIC PLAN FOR 2010 - 2014

This Strategic Plan was based on the Medium Term Strategic Framework (MTSF) of the new Administration in 2009 for the period 2009 to 2014. In guiding the strategic plan of the ECDoE; the then MEC of Education stressed that the plan should be congruent to the decision about the priorities of the Council for Education Ministers (the MINMEC for Education) for the Basic Education Sector:

- Bachelor's Degree qualifiers (university passes);
- Maths & Science pass rate;
- Improved literacy and numeracy in schools especially in Grades 3, 6 and 9;
- High quality of teaching & learning with particular focus on curriculum coverage and LTSM delivery; and
- Ensuring universal Grade R by 2014 and access to quality ECD.

This MEC then committed himself to the following priorities over and above the MINMEC priorities by identifying the following focus areas:

- Improving learner outcomes by progressively working towards meeting the national targets, with a dedicated focus on Mathematics and Science.
- Stabilising dysfunctional schools through supporting the under-performing schools.
- Teacher development by addressing the content gap at all levels and providing leadership development programmes.
- Basic resourcing of poorer schools to ensure a more conducive atmosphere to quality teaching and learning taking place.
- Leading and championing the Quality Teaching and Learning and the Foundations for Learning Campaigns.

He concludes the Strategic Plan document by stating that the period 2010/11 to 2014/15 was critical as far as turning around Education in the Eastern Cape was concerned.

Therefore, well thought through planning and the setting of clear targets was imperative.

However, the global economic meltdown with the concomitant issue of dwindling revenue for Government made this an even more daunting task, but he pledged that the

Department and himself remained committed to deliver quality education to the learners of the Eastern Cape Province. On the 7th January 2009 the ex-MEC of Education, launched the LEARNER ATTAINMENT IMPROVEMENT STRATEGY (LAIS) which spelt out *A MASTER PLAN FOR TOTAL LEARNER PERFORMANCE AND SCHOOL MANAGEMENT IMPROVEMENT for 2010*.

General consensus is shared in the Department and amongst stakeholders that this plan reflected an honest introspection into the different layers of the Department. It gave a clear indication of what had to be done. What also helped is the commitment and enthusiasm of the political head; as this had a transmittable effect on the rest of committed officials, schools and teachers. On the down side the Master Plan became associated with him personally because he owned it and demanded the same from everyone. When the politics again came into play once again in education in the province the MEC resigned. The association of the Master Plan with him meant that in 2011 the plan could not be carried through and therefore momentum was lost.

4.2.2 A MASTER PLAN FOR TOTAL LEARNER PERFORMANCE AND SCHOOL MANAGEMENT IMPROVEMENT – 2010

The ex-MEC launched the Master Plan and in his speech he stated that Public Education and the schooling system in our Province has experienced consistent instability over the past years which manifested itself in school dysfunctionality, underperformance, high vacancy rates and poor implementation of the New Curriculum Statements (NCS). The most glaring indicator of this gloomy scenario has been the constant dismal performance of our Matric classes over the years. This is a situation that seems to have an enormous capacity to defy all attempts that have been employed in a variety of modes every new academic year. The ideal of rendering a quality education service that meets the expectations of the entire community in the Province, as enshrined in the Schools Act and Mission Statement of the Department, has remained relatively unattainable in so far as the education outcomes are concerned. In the same spirit he promised that the search and quest for the most effective strategy to bring the province the desired goals; continues unabated until the most viable strategy that will effectively turn the situation around, is located. He postulated that the plan is a well thought strategic intervention that is informed by all of the previous experiences, findings, surveys and discussions and it is a response to the scenario that has been sketched out above. Through this plan the Department seeks to mobilise its forces, utilise its resources in a well calculated way, pursue clear targets in the short, medium and long term and use the challenges of the past as a catapult to enable it to eventually turn the corner and sustain good performance practices throughout the Basic Education Schooling System. The Master Plan is outlined below as presented to the public:

2.1 Situational Analysis

2.1 Identified problems and findings 2.1.1 Weak management by principals and School Management Teams (SMT's);

2.1.2 Deficient curriculum implementation;

2.1.3 Inadequate Learner Teacher Support Material (LTSM) resourcing;

2.1.4 High vacancy rate in critical subjects;

2.1.5 Content gap among educators;

2.1.6 Poor Institutional Leadership;

- 2.1.7 Ineffective Subject Advisory Services;
- 2.1.8 Dysfunctionality of schools;
- 2.1.9 Ineffective Circuit Management that lacks accountability;
- 2.1.10 Role ambiguity between District and Head Office;

NB: The above list relates only to learner attainment and curriculum implementation and is not the whole list of issues challenging our Education System.

2.2 Specific Indicators of School Dysfunctionality

- 2.2.1 Learner and Educator Absenteeism;
- 2.2.2 Absence of and /or non-adherence to school policies;
- 2.2.3 Erratic contact time between Educator and Learner;
- 2.2.4 Late arrival and early departure from school by Educators;
- 2.2.5 Teaching far less than NCS prescribed time (e.g. 3 hours rather than 7 hours; time tabling and class attendance);
- 2.2.6 Absence of management systems;
- 2.2.7 Total breakdown of discipline at all levels of the school;

2.3 Interventions Made To Date

- 2.3.1 School readiness visits;
- 2.3.2 Provincial on-site school support programs;
- 2.3.3 District Multi-Disciplinary Teams annual support programs;
- 2.3.4 National interventions;

3. The 2010 Strategy

3.1 Early Commencement of Academic Activities

All the schools in the Province are expected to finalise their plans on 11 January 2010 including time-tabling; lesson planning and assessment planning for the year. Teaching should commence in earnest on 12 January 2010. The District Multi-Disciplinary Teams will monitor the readiness of schools to commence the academic year with teaching and learning on the very first day and will focus on the following:

- (a) Admissions;
- (b) Time Tables and subject allocation;

- (c) Educator attendance;
- (d) Teaching and learning;
- (e) Availability of Learner Teacher Support Material (LTSM);
- (f) Basic school necessities e.g. chalk, dusters, educator and learner attendance registers;
- (g) Learner Progression and Promotion;

NB: Action would be taken on irregular findings and Line Function Managers at each level should be held accountable. There were later contestations on this issue by some schools and officials who felt that this placed them under the spotlight. Some schools just never place LTSM orders on time and this always compromises the timeous start of teaching and learning. The Department on its side as well has not managed LTSM procurement well and schools are always complaining about this as schools usually open without adequate stationery being delivered.

3.2 Fortnightly Syllabus Coverage Reports

Principals of schools will be expected to submit progress reports to the Circuit Manager every fortnight indicating the extent to which they have complied with lesson plans and pace setters.

3.3 Quarterly Analysis of Results and Performance Festivals

The monthly and quarterly tests will be analysed in the fashion of the end of the year results and remedial and accountability measures will apply in consequence of school performances. Competitive performance festivals will be arranged whereby Principals, Subject Advisors and Circuit Managers will showcase their achievements and milestones of the quarter. The Grades that will be targeted for intensified teaching will be Grade 9 to 12 and this programme will commence on 01 February 2010. Apart from afternoon and Saturday classes, there will be autumn schools since there will be no winter schools this year due to the 2010 tournament.

3.4 Subject Advisors as Mentors and School Resources

The Subject Advisors will be allocated the underperforming schools to monitor, support and monitor on a daily basis. They will also lead the teams that analyse and process the

fortnightly reports of principals. As a Quality Assurance measure, a Subject Advisor will not analyse the reports of his/her own principals.

3.5 Accountability of Circuit Managers

The Circuit Managers will be held accountable for school functionality in their circuits and must specifically contract to eliminate educator absenteeism, early dismissal of schools and loss of teaching time. All Circuit Managers will be expected to mentor the school management teams, particularly the principals, ineffective school management to ensure school functionality.

3.6 Integrated Planning and Co-ordination of Activities within Districts

The planning of daily, weekly and monthly activities by IDS & G, Curriculum and ESSS in districts should be done collectively so as to deliver a united service to the school. In order to avoid tearing school plans asunder and sending competing and conflicting messages to schools, the activities of these sections must be well co-ordinated and Multi-Disciplinary Teams must have a unity of purpose. Analysis of weekly progress by the schools must be done jointly and collective feedback be sent to schools via the Circuit Manager and Subject Advisor.

3.7 Curtailment of Workshops

The use of Workshops as a method of policy implementation and pursuit of business plans has the unfortunate effect of competing with teaching and learning for educators and school support for education management. In 2010 the Department is putting a high premium on classroom practice. Workshops will have to be curtailed to a bare minimum and alternative methods of pursuing business plans be employed.

3.8. Grade 3, 6 and 9 Common Examinations

The concentration of learner attainment improvement strategies exclusively on Grade 12 has not yielded the positive results that were hoped for. It is both short sighted and unproductive. The Curriculum Section (Head Office and Districts) will work on and implement a project in terms of which the Grade 3, 6 and 9 classes pursue the same pace

setters and similar lesson plans. Common papers will then be set in June and November 2010 with a similar style of invigilation and analysis of results in Grade 12.

The Language Policy Implementation Office has been tasked to translate Mathematics and Science and Technology for Grade 6 and 9 for the common exams. Learners would not be required to write in isiXhosa but they would receive a bilingual exam script and can write in English. Bilingual English /Xhosa or Sesotho question papers would be sent to schools to pilot the effectiveness of such a strategy.

4. Staff development

4.1 Course for Principals of Under Performing Schools

The principals of the underperforming schools that will emerge on 7 January 2010 will be put on a management course as from 01 February 2010 focusing on their role as leaders of Curriculum Implementation. A sample of these principals will also be taken to a ten (10) day Leadership Course at the Cape Teaching Institute of the Western Cape for an alternative experience.

4.2 Motivation and Upskilling of Teachers with Content Gap in Killer Subjects selected From Serial Underperforming Schools

Subject teachers of identified killer subjects (Mathematics and Physical Science) in the serial underperforming schools will be put on an intensive revision course to update them in the content areas they have difficulty with. The course will be two weeks a month commencing on 01 February 2010.

4.3 Subject Advisors' Course in Facilitation Skills

This course will be conducted during the March ten (10) day vacation of schools when the Subject Advisors do not visit schools.

4.4 Remedial Courses for Underperforming Schools

Targeted follow up courses for the principals attending the February course will be conducted during the June school holidays.

5. Stabilisation of the schooling system

5.1 Dealing with the Vacancy Rate

The Human Resource Administration Unit will do a comprehensive audit of vacancies in schools during the first ten days of the new academic year. This will form the basis of an aggressive program of filling of vacancies through Quarterly Bulletins. The new staff establishment will be effectively implemented.

5.2 Finalisation of the Process of Conversion of Temporal Educators

This process will be completed on 31 January 2010.

5.3 Managing the Incidence of Displaced Educators and Officials

A Task Team has been put in place to do an audit of displaced Educators and long standing disciplinary cases. This project will culminate in the settling of unresolved cases by March 2010.

5.4 Training of un-qualified and under-qualified Teachers

In addressing the challenges facing the DoE in the context of skills shortage in schools in particular and priority areas identified by MEC the Skills Development Committee meeting resolved that:

1. As a principle, the skilling of unqualified & under-qualified educators (as per PELRC agreements) to attain REQV 13 status should be phased in for the period of three years starting in February 2010.
2. The un- & under-qualified educators must be priorities in the NPDE Budget for 2010 which is R22m.
3. In the event of insufficient funds in the targeted fund, a “tap” from the Bursary Fund should be considered.
4. Learners recruited (Grade 12’s) for the teaching profession are catered for in the B.Ed Learnership program (R10m) and must be prioritized. The targeted no. is 263 for 2010.
5. The 23 top students to be rewarded by the MEC to be funded continuously. The training of principals on leadership and management skills is funded to the tune of R1.1m for the intake of 240 learners for an ACE Learnership.

6. Quality learning and teaching campaign (QLTC)

The spirit and purport of the QLTC must pervade the whole strategy for Learner Attainment Improvement and its objectives will be the building blocks for community mobilisation and partnerships with all stakeholders. In order for the Programme of Action to have the desired impact on the education system in our Province, all departmental officials at all levels and the stakeholders must make a commitment to Code for Quality Education. The District Education Fora will closely monitor the implementation of this project.

7. The Foundations for Learning Campaign (FFL)

The national focus on improving the reading, writing and numeracy abilities of all South African children must be put to optimum use in the under-performing schools and their feeder schools. There is a general cry amongst these schools that the Grade ten learners lack the basic skills for reading, writing and for grasping the mathematical concept.

8. Learner welfare and access to schools

The bulk of our schools, especially the underperformers, are situated in rural areas where access to schools is difficult due long distances and lack of access roads. The Scholar Transport Service will have to be adjusted to assist learners to be readily and timeously available for classes. The capacity of many learners to do well at school and their concentration span is compromised by fatigue and hunger. It is for this reason that the School Nutrition Programme and the Scholar Transport Serviced must be used collaboratively to enhance the ability of learners to benefit from the Learner Attainment Improvement Strategy.

9. The Mother Tongue based- Bilingual Education Program (MTBBE)

Language has been found by various research studies to be a barrier to the majority of our learners whose home language is different than that of learning and teaching (LoLT). The Department will also pilot the implementation of mother tongue based bilingual education throughout the province this year, and to that extent, a dedicated unit called the Language Policy Implementation Office (LPIO) is being established.

10. Competency testing of officials

Certain levels of management, especially those responsible for monitoring and supporting schools, will undergo competency tests to identify gaps and compatibility.

In Conclusion

These plans would be backed up by the Programme of Action that was developed in the recent LAIS Summit and the guiding principles for the strategy will be Discipline, Accountability, Value for Money and Efficient Time Management (ECDoE, 2009).

4.2.3 MASTER PLAN PROJECTS OF THE LAIS

To streamline implementation of the Master Plan a set of projects were designed to cover each of the areas that were posing challenges; each project was managed by a Chief Director and a Director was designated as a Project Leader. In each project a number of Chief Education Specialists (CESs) were assigned operational tasks to execute the project needs. The significance of the hierarchical structure was that it had the authority of Executive Management; Senior Management with the Directors and Middle Management involvement through the CESs. Government processes view this hierarchy as important; some officials will not do anything without the stamp of approval from this hierarchy. In the majority of cases this tampers with the flow and momentum of operations and implementation.

All Project members met on a Monday morning at the beginning of each month to report on progress and challenges to a session chaired by the Deputy Director General (DDG). The MEC would either join the meeting or would be briefed directly by the DDG on the same day. This gives one a sense of how the Master Plan contributed to the gains in 2010 as the momentum was sustained at all levels. Below are projects that were designed to implement the LAIS:

1. Analysis of Reports Project Team
2. Skills Development Project Team
3. Common Exams Project Team
4. On-site School Support Project
5. Educator and Learner attendance

6. Resourcing Strategy Project Team
7. QTLC & FFL Projects
8. Relations Management Advisory Project Team
9. Rationalization Project
10. NSF Implementation Project
11. Strategic, Oversight and Accountability Project
12. Learner Welfare Project, including (Hostels and Independent schools).

2010 WORLD CUP CAMPAIGN FOR TEACHING & LEARNING: GRADE 12 HOLIDAY ACTIVITIES

In the preface to the document Grade 12 Holiday Activities supplement, there is a message to teachers and learners that calls them to embrace the once-in-a lifetime opportunity presented to us by hosting the 2010 Soccer World Cup. There is also an acknowledgement of how this event would have an impact on teaching and learning. The Grade 12 Learner Support Program is an important leg of the Learner Attainment and Improvement Strategy of 2010 (Matric Guide, 2010). The Eastern Cape Department of Education planned and implemented a two phase Learning and Teaching Campaign. Phase 1 involved activities and exercises to generate interest and participation in Grade R-12 learners in the World Cup. Phase 2 involved a holiday activity strategy intended to ensure that learners from Grades 3-12 exercise their intellectual capacity periodically over the long five week break from formal schooling. In respect of Grade 12 learners, the holiday activity strategy included radio lessons, additional classes, winter schools and DVD lesson screenings. The Matric Question and Answer Supplement was an integral part of the campaign targeting selected subjects that contributed to underachievement in previous years in the province (Matric Guide, 2010). It was hoped that by publishing these exemplars and the memoranda, Grade 12 learners would perform better by receiving assistance from teachers and parents by devising a clear plan of how to use this supplement before learners went on holiday. Some schools opened for a morning sessions in the June Holidays and used the supplement and other available materials.

An exemplar of Questions and Answers on **English First Additional Language; Mathematics, Mathematical Literacy; Accounting; Physical Sciences; Life Sciences and Geography** were published in the Daily Dispatch and the Herald. 71 000 copies were printed for distribution

to schools and those members of the public who would not need to use the supplement were asked to donate it to a Grade 12 learner who would use it. Copies were printed for every Grade 12 learner in the province to use during the June-July school holiday as it coincided with the 2010 Soccer World Cup. The fact that 2010 was four days shorter than 2009 and the five week holiday which was a week extra was taken into consideration. In using the supplement, teachers and learners could choose to use any option of the following:

- Additional classes for curriculum coverage
- Remedial/re-teaching of lessons
- Winter school programmes
- Assignments for learners on selected topics
- Tests on selected aspects
- Study groups by learners
- Individual work at home by learners

This thesis is not concerned only about the successes of the Grade 12 Learner Support Programme, but a background understanding of factors that have contributed to the 2010 results is crucial. These have been outlined above and these measures were put in place in order to boost the 2010 Grade 12 results and education more generally. Furthermore, this needs to be viewed against the wider backdrop of the South African examination process as outlined below.

4.3 An outline of the assessment and examination processes in South Africa

4.3.1 Structures governing the examinations

The Department of Basic Education (DBE) together with the Department of Higher Education (DHE) manages the entire processes of the National Senior Certificate (NSC) and its counter-part, the Adult Basic Education and Training (ABET) Level 4 examinations. The role of provinces then is to conduct and administer the examinations; they implement, support and manage the assessment processes on behalf of the DBE and DHE respectively through the Directorate: Assessment and Examinations (NSCR, 2010). The Inter-District and Assessment and Examination Committee (IDAEC) was established by the department in 2000 to assist the examinations directorate in the mammoth task of coordinating

examinations. In 1996 the Inter-Provincial Assessment and Examination was established where the director of Exams (and the chief director of curriculum in the EC) sit as members of this committee. IPEAC is comprised of provincial heads of examinations from both public and private bodies and is a sub-committee of the Heads of Department Committee (HEDCOM). The other role players are Higher Education South Africa (HESA), UMALUSI, South Africa Qualification Authority (SAQA), the Independent Examination Board (IEB) and Teacher Unions. IPEAC supports the national and provincial department of education in ensuring that the administration and management of public examination processes are implemented as per the national norms and standards set. With such an elaborate examinations governance structure it is hoped that the results at the end of each year are a reflection of a thorough process which has undergone scrutiny.

4.3.2 Question papers and marking processes

The DBE sets question papers while Provinces must budget for printing, packing and distribution of the question papers. The marking process is facilitated by the provincial education department using standardised marking guidelines from the DBE. Markers are appointed by provinces and they receive training on the guidelines for marking. A recent requirement for markers is that they must have good passes in the subject they teach.

4.3.3 Obtaining the National Senior Certificate

To obtain the National Senior Certificate a learner must:

1. Offer seven approved subjects and provide full evidence of School Based Assessment (SBA) for each subject.
2. Must complete the programme requirements for Grade 10, 11 and 12 separately and obtain distinct outcomes and associated standards for all the standards required.
3. Must comply with internal assessment requirements for Grades 10, 11 and 12, and the external assessment requirements of Grade 12.
4. Must achieve 40% in three subjects, one of which is an official language at Home Language level.
5. Must achieve 30% in three subjects.
6. Must provide full evidence in the SBA component in subject failed.

This is further explicated in the chart below:

SUBJECT		LEVEL OF ACHIEVEMENT
1 Home Language		40%
1 Home or First Additional Language		2x subject – 40%
Mathematics or Mathematical Literacy		3x subject – 30%
Life Orientation		1x subject less than 30%
3x Subjects selected from approved subject list		Evidence of SBA is provided
ACHIEVEMENT LEVEL	ACHIEVEMENT DESCRIPTION	MARKS %
7	Outstanding Achvm	80 - 100%
6	Meritorious Achvm.	70 – 79
5	Substantial Achvm.	60 – 69
4	Adequate Achvm.	50 – 59
3	Moderate Achvm.	40 – 49
2	Elementary Achvm.	30 – 39
1	Not Achvd.	0 – 29

Figure 4.1 NSC Achievement Requirements (NSCR, 2010).

The above table gives an indication of the various levels as illustrated in 4.3.3. The achievement levels for Grade 12 have been lowered over the years as a result of the dismal results that are quite a disappointment. In the public domain there has been an outcry over the low achievement levels, the bar is set very low at Level 3; while Higher Education Institutions accept a Level 4 in gateway subjects like Mathematics and Science. This study puts across that the average performance of learners who experience a language mismatch is at 40%; unfortunately, they are in the majority in the country: Black African language learners who are in poor schools.

4.4 Minimum admission requirements to Higher Education

4.4.1 Higher Certificate (HC)

- NSC with minimum of 30% in the Language of Learning and Teaching (LoLT) of the Higher Education Institution as certified by UMALUSI.
- Institutional and programme needs may require additional combinations of recognized NSC subjects and levels of achievements.

4.4.2 Diploma

- NSC – minimum of 30% in Language of Learning and Teaching (LoLT).
- Achievement rating of 3 (moderate achievement) (40-49%) or better in four (4) recognized NSC 20 – credit subjects.
- Institutional and programme needs may require additional combinations of recognized NSC subjects and levels of achievement.

4.4.3 Bachelors Degree

- NSC with a minimum of 30% in LoLT.
- Achievement rating of 4 (adequate achievement, 50-59%) or better in four subjects chosen from the recognized 20-credit NSC subjects from the designated subject list.

The table below lists the Department of Basic Education's Subject list for Grade 12:

Accounting	Engineering Graphics & Design	Mathematics
Agricultural Science	Geography	Mathematical Literacy
Business Studies	History	Music
Consumer Studies	Information Technology	Physical Science
Dramatic Arts	Languages	Religion Studies
Economics	Life Sciences	Visual Arts

Figure 4.2 Designated NSC Subject List

Of this wide list of subject choice, more than 70% of learners in Grade 12 take Mathematical Literacy; a subject that ensures them of NOT gaining entry in university programmes.

4.5 DBE ACTION PLAN SCHOOLING 2014 AND TARGETS

Indicator	Subjects	2008 40% & above	2009 40% & above	2010 40% & above	2014
Increase in the numbers of Grade 12-eligible for Bachelor programme and passes in Maths.	Mathematics	89 789	85 356	81473 (127785)	180 000

Figure 4.3 Department of Education Schooling 2025

Above is an outline the DBE's 2014 Action Plan and the Grade 12 related targets.

The improvement of the National Senior Certificate results is located in the broader Action Plan 2014-towards Schooling 2025 of the DBE. The strategy for improving Grade 12 results seeks to ensure that every level of education construct an appropriate Grade 12 improvement plan (NSLA, 2011).

Content of NSC Mathematics

Below is an illustration of the content of Grade 12 Mathematics and 40% secures a pass.

Class observation illustrate that teachers concentrate more on Paper 1 and rarely do justice to Paper 2.

Paper 1 Patterns and sequences ± 30 Annuities and finance ± 15 Functions and graphs ± 35 Algebra and equations ± 20 Calculus ± 35 <u>Linear programming ± 15</u> Total = 150 points	Paper 2 Coordinate geometry ± 40 Transformations ± 25 Trigonometry ± 60 <u>Data handling ± 25</u> Total = 150 points
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Figure 4.4 Mark Allocation of the NSC Mathematics Exam

4.6 The disappointing story of Mathematics in the NSC Examinations

Despite all the interventions made by the national and provincial education departments with the assistance of non-governmental organisations and individuals; the following table tells a story of just how difficult it is for our learners to get past the 40% mark to pass Mathematics.

Provinces	0-39% Red	40-49% Amber	50-100% Green
EC	554	86	242
FS	118	35	150
GP	200	67	456
KZN	738	341	583
LP	739	174	456
MP	251	58	205
NW	122	44	202
NC	47	10	70
WC	94	27	271
National	2 831	842	2 635

Figure 4.5: Grade 12 Mathematics performance per province (NSLA DoBE, 2011).

4.7 NATIONAL LANDSCAPE OF THE 2010 RESULTS FOR ALL PROVINCES

Prov.	EC	FS	GP	KZN	LP	MP	NW	NC	WP	NAT.
Schools	907	316	742	1691	1416	518	376	134	416	6516
0%	5	1	1	4	6	0	0	0	1	18
100%	44	40	94	118	37	12	42	27	90	504
0-19%	53	1	5	35	57	18	1	1	1	172
20-39.9%	207	15	23	172	283	111	11	9	13	844
40-59.9%	237	69	114	355	413	162	67	24	69	1510
60-79.9%	228	115	191	512	401	134	122	36	109	1848
80-100%	182	116	409	617	262	93	175	64	224	2142

Figure 4.6 Overall 2010 Pass Rate Scores per Province

When this work was started it was hoped that it would be finished in 2011 before the release of the 2011 results. To compensate for not reaching that goal, efforts were made to access the 2011 results for the Mathematics and Language for the Provincial scores in Section B. The process of the Grade 12 final examination is often misunderstood and is somehow associated with the writing and the release of the results only. Section A has sketched out a necessary background into the Grade 12 assessment and examination processes; and has outlined the general performance of the Class of 2010, thereby providing a qualitative overview based on policy documents collated from the Eastern Cape and National Basic Education Department. Section B will present the results of the sampled schools with selected subjects over 4 years (including 2011). Chapter 5 will be dedicated to an in-depth analysis and interpretation of these results and contain what recommendations can be generated for the Department of Basic Education.

4.8 SECTION B: Presentation of Data

Gaining a good pass in Matric or Grade 12 for South African students opens vistas of opportunity to advance Further and Higher Education. Employment agencies use Matric as a basic requirement even for low paying jobs such as security companies who train security guards. A pass not in the Home Language, in the language of learning and teaching (LoLT) is a must to study towards a degree at 30% (usually English and to a lesser extent Afrikaans). We all know that no university is going to register a student with a 30% in English for Law, Economics or in the Sciences. That is why some HEIs insist on entry tests or bridging courses in Academic English. To them little knowledge of English equals little possibility of academic achievement. Further to that a good pass in mathematics (Level 4 = 50-59% minimum) instantly opens doors for a wide range of careers that universities offer. A low pass or a fail in mathematics limits career choices to a point where students have to re-write or repeat another year of studying mathematics to meet the entry requirements of a faculty of their choice. Passing Matric well is therefore paramount in the lives of ordinary South Africans, especially the poor. It can mean a brighter future when the student graduates and gets a good job. Matric failure can spell doom and a simple repeat of a life of destitution. It is vital to diagnose pressure points that contribute to Matric failure and address them.

4.9 Scope and size of the National Senior Certificate (NSC)

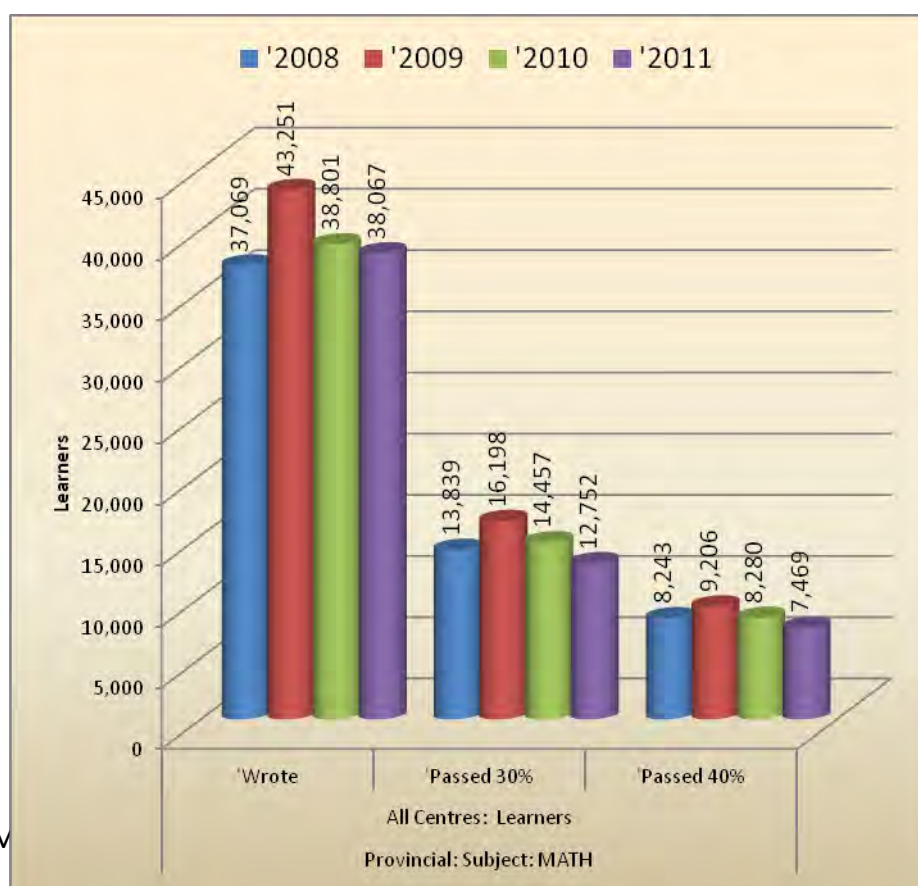
2010 GRADE 12 STUDENT PROFILE		
Number of learners	REGISTERED	
	WROTE	64, 090
	PASSED	37, 364
	FAILED	<u>26, 442</u>
Number of learners	BACHELORS	10, 225
	DIPLOMA	15, 281
	HIGHER CERTIFICATE	11, 711
	NATIONAL SENIOR CERTIFICATE	147

Figure 4.7 2010 Grade 12 Student Profile

4.10 NUMBERS AND PERCENTAGES OF PASS RATES IN MATHEMATICS 2008-2011

	Provincial Subject: MATHS		
	All Centres: Learners		
	Wrote	Passed 30%	Passed 40 %
2008	37,069	13,839	8,243
2009	43,251	16,198	9,206
2010	38,801	14,457	8,280
2011	38,067	12,752	7,469

Figure 4.8



Mathematics performance was particularly a bad year as compared to 2008 and 2011. The 2009 performed higher than the 2010 cohort.

4.10: All learners who Passed Mathematics 2008-2011

	Provincial Subject: MATHS
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	All Centres: Learners	
	Passed 30%	Passed 40%
2008	37.3	22.2
2009	37.5	21.3
2010	37.3	21.3
2011	33.5	19.6

Figure 4.9

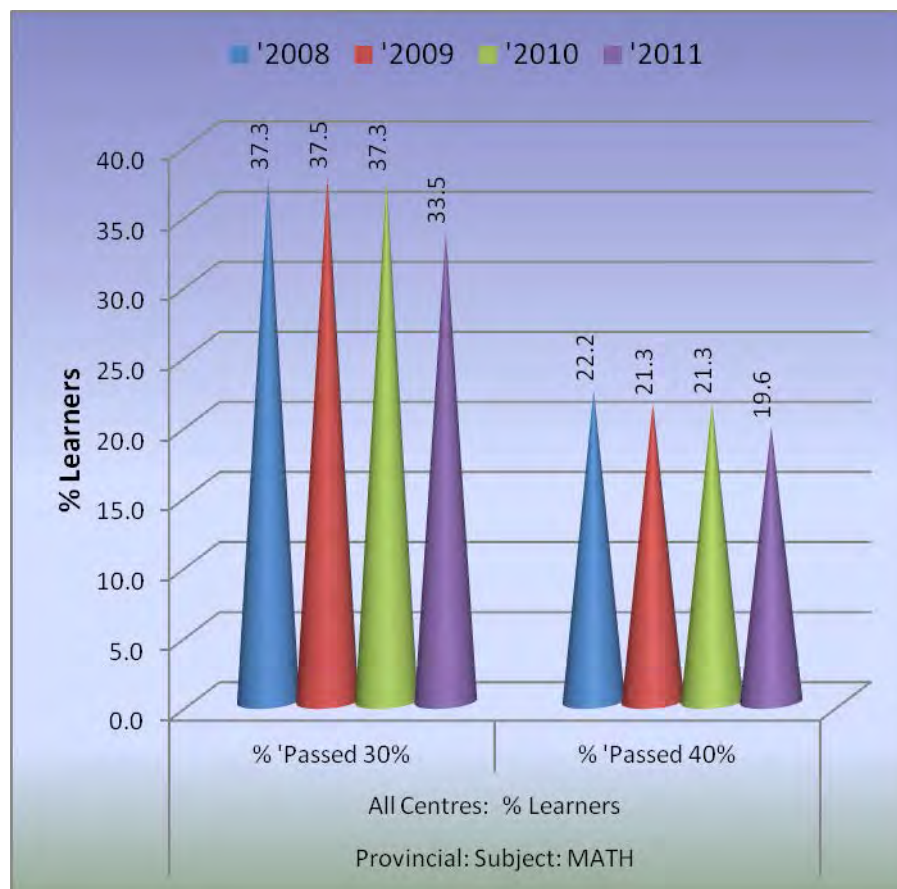


Figure 4.11: Percentage of Learner Pass Rates for Mathematics 2008-2011

The above data displays that 2010 was a better year for learners despite the World fever that gripped the country. In 2011 there is a disappointing dip that highlights the fact that we are not winning the fight against an extreme failure rate in mathematics for ESL learners. Our best year is 2008 with 22.2% learners achieving over 40% and above.

4.11 Sampled population for the study

SCHOOL	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2010-2009

School MAH	79	85	62	61	71	59	77.2	83.5	95.2	11.6
School MBH	126	147	173	120	135	147	95.2	91.8	85.0	-6.9
School MCH	82	81	85	81	80	85	98.8	98.8	100.0	1.2
School MDH	85	92	96	79	90	93	92.9	97.8	96.9	-1.0
School MEH	79	83	87	79	83	87	100.0	100.0	100.0	0.0
School MFH	120	91	119	108	78	111	90.0	85.7	93.3	7.6
School MGH	150	186	46	60	70	34	40.0	37.6	73.9	36.3
School MHH	117	148	161	68	93	114	58.1	62.8	70.8	8.0
School MIH	64	56	106	36	43	83	56.3	76.8	78.3	1.5
*School MJH	19	19	24	12	8	5	63.2	42.1	20.8	-21.3

Figure 4 MH 2010 Results of Sample schools (NCSR, 2011).

KEY USED FOR EACH OF THE SAMPLED SCHOOLS:

- i. FM - Female. FM stands for female students who are registered to write the NSC examinations for a particular subject.
- ii. ML – Male. ML stands for male students who are registered to write the NSC examinations for a particular subject.
- iii. NO. – Number. NO. stands for the number of students registered to write that particular subject.
- iv. Subj- Subject. Subj. Is a shortened version of Subject or Learning Area that a student has registered to write.
- v. LoLT – Language of Teaching and Learning. LoLT is a shortened version of what used to be called ‘medium of instruction’ referring to the language used as medium of teaching. For some learners; the LoLT is the same as the Home Language; for the majority of learners in the province; the LoLT is not the same as their home language. In most cases it is English and Afrikaans to a lesser extent.
- vi. HL – Home Language. HL stands for what other people call mother tongue, or first language. Some students do two home languages.

vii. FAL – First Additional Language. FAL stands for the second language level at which students take English, Afrikaans or isiXhosa. For the majority of learners in the province; English is taken at First Additional language level. A recent development is that students choose to study both their Home Language (whether isiXhosa or Afrikaans) and the LoLT at Home Language level and therefore do not register any First Additional Language.

4.12 2010 Grade 12 Results of School MAH (95.2% Pass Rate)

School	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0- 29%	30- 39%	40- 49%	50- 59%	60- 69%	70- 79%	80- 100%
MAH	Coloured	Female	AFRHL	6	6	0	0	2	4	0	0	0
MAH	White	Female	AFRHL	3	3	0	0	0	0	2	0	1
MAH	Black	Male	AFRHL	1	1	0	0	1	0	0	0	0
MAH	Coloured	Male	AFRHL	5	5	0	0	4	1	0	0	0
MAH	White	Male	AFRHL	1	1	0	0	0	1	0	0	0
MAH	Black	Female	ENGHL	22	22	0	1	9	12	0	0	0
MAH	White	Female	ENGHL	1	1	0	0	0	0	0	1	0
MAH	Black	Male	ENGHL	20	20	0	1	7	11	0	1	0
MAH	Coloured	Male	ENGHL	1	1	0	0	0	0	1	0	0
MAH	White	Male	ENGHL	3	3	0	0	1	2	0	0	0
MAH	Coloured	Female	ENGFA	6	6	0	1	0	4	1	0	0
MAH	White	Female	ENGFA	2	2	0	0	0	0	2	0	0
MAH	Black	Male	ENGFA	1	1	0	0	0	1	0	0	0
MAH	Coloured	Male	ENGFA	5	5	0	1	4	0	0	0	0
MAH	White	Male	ENGFA	1	1	0	0	0	0	1	0	0
MAH	Black	Female	MATH	14	13	1	3	7	2	0	1	0
MAH	White	Female	MATH	1	1	0	0	0	0	0	0	1
MAH	Black	Male	MATH	10	7	3	3	1	1	1	0	1
MAH	Coloured	Male	MATH	1	1	0	0	0	0	0	0	1
MAH	White	Male	MATH	4	4	0	3	0	1	0	0	0

Figure 4.MAH 1

WROTE			PASSED			% PASSED			CHANGE
2008	2009	2010	2008	2009	2010	%	%	%	2010-2009

MAH	79	85	62	61	71	59	77.2	83.5	95.2	11.6
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Figure 4.MAH 2

4.13 2010 Grade 12 Results of School MBH (85.0% Pass Rate)

SCHOOL	Population Group	Gender	ShortAlpha Code	Total Wrote	Passed 30%	0-29%	30-39%	[40-49%	50-59%	60-69%	70-79%	80-100%
MBH	Black	Female	ENGFA	112	112	0	3	16	54	33	6	0
MBH	Black	Male	ENGFA	62	62	0	3	21	30	7	1	0
MBH	Black	Female	XHOHL	112	112	0	0	0	5	51	54	2
MBH	Black	Male	XHOHL	62	62	0	0	0	8	40	14	0
MBH	Black	Female	MATH	92	65	24	22	23	15	6	1	1
MBH	Black	Male	MATH	43	35	8	12	12	4	5	0	2

Figure 4.MBH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
MBH	126	147	173	120	135	147	95.2	91.8	85.0	-6.9

Figure 4 MBH 2

4.14 2010 Grade 12 Results of School MCH (100.0% Pass Rate)

School	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MCH	Coloured	Female	AFRHL	10	10	0	0	0	3	7	0	0
MCH	White	Female	AFRHL	24	24	0	0	2	3	9	8	2
MCH	Coloured	Male	AFRHL	11	11	0	0	2	8	1	0	0
MCH	White	Male	AFRHL	14	14	0	0	2	5	4	3	0
MCH	Black	Female	ENGHL	12	12	0	0	0	7	4	1	0
MCH	White	Female	ENGHL	5	5	0	0	0	2	2	0	1
MCH	Black	Male	ENGHL	6	6	0	0	1	4	1	0	0
MCH	Coloured	Male	ENGHL	1	1	0	0	1	0	0	0	0
MCH	White	Male	ENGHL	4	4	0	0	0	4	0	0	0
MCH	Coloured	Female	ENGFA	10	10	0	0	1	6	2	1	0
MCH	White	Female	ENGFA	22	22	0	0	1	3	10	6	2
MCH	Coloured	Male	ENGFA	11	11	0	0	6	5	0	0	0
MCH	White	Male	ENGFA	14	14	0	0	2	4	6	2	0
MCH	Black	Female	MATH	7	6	1	4	2	0	0	0	0
MCH	Coloured	Female	MATH	3	2	1	2	0	0	0	0	0
MCH	White	Female	MATH	13	11	1	2	3	1	2	1	3
MCH	Black	Male	MATH	3	1	2	0	0	1	0	0	0
MCH	Coloured	Male	MATH	2	2	0	2	0	0	0	0	0
MCH	White	Male	MATH	11	11	0	2	1	3	3	1	1

Figure 4.MCH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
MCH	82	81	85	81	80	85	98.8	98.8	100.0	1.6

Figure 4. MCH 2

4.15 2010 Grade 12 Results of School MDH Pass Rate 96.9%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MDH	Black	Male	ENGHL	82	82	0	1	29	34	17	1	
MDH	Coloured	Male	ENGHL	5	5	0	0	4	0	1	0	
MDH	Indian	Male	ENGHL	1	1	0	0	0	0	0	1	
MDH	White	Male	ENGHL	8	8	0	0	1	3	2	2	
MDH	Black	Male	ENGFA	0	0	0	0	0	0	0	0	
MDH	Black	Female	ENGFA	0	0	0	0	0	0	0	0	
MDH	Black	Male	XHOHL	0	0	0	0	0	0	0	0	
MDH	Black	Male	XHOHL	49	49	0	0	1	7	30	11	
MDH	Black	Male	MATH	0	0	0	0	0	0	0	0	
MDH	Black	Male	MATH	46	40	6	14	9	8	7	1	
MDH	Coloured	Male	MATH	3	1	1	1	0	1	0	0	
MDH	Indian	Male	MATH	1	1	0	0	0	0	0	0	
MDH	White	Male	MATH	3	3	0	0	0	0	3	0	

Figure 4.MDH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
School MDH	85	92	96	79	90	93	92.9	97.8	96.9	-1.0

Figure 4. MDH 2

4.16 2010 Grade 12 MEH RESULTS (100.0% Pass Rate)

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MEH	Black	Female	ENGHL	78	78	0	0	3	15	34	22	8
MEH	Coloured	Female	ENGHL	4	4	0	0	0	2	2	0	0
MEH	Asian	Female	ENGHL	1	1	0	0	0	0	1	0	0
MEH	White	Female	ENGHL	3	3	0	0	0	1	2	0	0
MEH	Indian	Female	ENGLHL	1	1	0	0	0	0	0	0	0
MEH	Black	Female	AFRFA	42	42	0	1	4	16	14	6	0
MEH	Coloured	Female	AFRFA	4	4	0	0	0	0	1	3	0
MEH	Asian	Female	AFRFA	1	1	0	0	0	0	0	0	0
MEH	White	Female	AFRFA	3	3	0	1	2	0	0	0	0
MEH	Indian	Female	AFRFA	1	1	0	0	0	0	0	0	0
MEH	Black	Female	XHOFA	36	36	0	0	1	0	16	19	0
MEH	Black	Female	MATH	42	39	3	6	6	12	14	1	0
MEH	Indian	Female	MATH	1	1	0	0	0	0	0	0	0

Figure 4.MEH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
MEH	79	83	87	79	83	87	100	100	100	0.0

Figure 4 MEH 2

4.17 2010 Grade 12 Results of School MFH (93.30% Pass Rate)

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MFH	Black	Female	ENGFA	68	68	0	1	19	34	14	0	0
MFH	Black	Male	ENGFA	39	39	0	1	15	14	8	1	0
MFH	Black	Female	XHOHL	42	42	0	0	0	2	21	19	0
MFH	Black	Male	XHOHL	24	24	0	0	0	2	17	5	0
MFH	Black	Female	SESHL	26	26	0	0	0	0	1	10	15
MFH	BLACK	Male	SESHL	15	15	0	0	0	1	2	6	6
MFH	BLACK	Female	MATHS	77	70	7	26	25	8	8	3	0
MFH	Black	Male	MATHS	42	31	11	12	8	4	1	2	4

Figure 4. MFH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
MFH	120	91	119	108	78	111	90.0	85.7	93.3	7.6

Figure MFH 2

4.18 2010 Grade 12 Results of School MGH (73.9 % Pass Rate)

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MGH	Black	Female	ENGFA	25	25	0	11	9	4	1	0	0
MGH	Black	Male	ENGFA	21	21	0	8	9	3	1	0	0
MGH	Black	Female	XHOHL	5	5	0	0	0	0	5	0	0
MGH	Black	Male	XHOHL	3	3	0	0	0	2	1	0	0
MGH	Black	Female	SESHL	20	20	0	0	1	6	8	3	2
MGH	BLACK	Male	SESHL	18	18	0	0	0	5	9	4	0
MGH	BLACK	Female	MATHS	11	11	6	2	1	2	0	0	0
MGH	Black	Male	MATHS	12	9	3	3	4	0	1	1	0

Figure 4. MGH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
MGH	150	186	46	60	70	34	40.0	37.6	73.9	36.3

Figure 4. MGH 2

4.19 2010 Grade 12 Results of School MHH (70.8 % Pass Rate)

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MHH	Black	Female	ENGFA	84	83	1	14	39	18	11	0	0
MHH	Black	Male	ENGFA	76	74	2	20	34	17	2	1	0
MHH	Black	Male	ENGHL	1	1	0	1	0	0	0	0	0
MHH	Black	Female	XHOHL	39	39	0	0	0	2	21	16	0
MHH	Black	Male	XHOHL	39	39	0	0	0	6	25	8	0
MHH	Black	Female	SESHL	45	45	0	0	0	1	8	28	8
MHH	BLACK	Male	SESHL	37	37	0	0	0	1	25	11	0
MHH	BLACK	Female	MATHS	85	31	54	17	8	2	3	1	0
MHH	Black	Male	MATHS	78	46	32	24	7	5	5	4	1

Figure 4. MHH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
MHH	117	148	161	68	93	114	58.1	62.8	70.8	8.0

Figure MHH2

4.20 2010 Grade 12 Results of School MIH (78.3% Pass Rate)

SCHOOL	Population Group	Gender	Sh. Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MIH	Black	Female	ENGFA	58	57	1	14	27	10	4	2	0
MIH	Black	Male	ENGFA	49	48	1	8	25	12	3	0	0
MIH	Black	Female	XHOHL	33	33	0	0	0	6	20	7	0
MIH	Black	Male	XHOHL	32	32	0	0	1	7	19	5	0
MIH	Black	Female	SESHL	25	25	0	0	0	6	10	7	2
MIH	BLACK	Male	SESHL	17	17	0	0	0	3	12	2	0
MIH	BLACK	Female	MATHS	20	13	7	5	4	3	1	0	0
MIH	Black	Male	MATHS	18	13	5	7	3	2	0	1	0

Figure 4. MIH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
MIH	64	56	106	36	43	83	56.3	76.8	78.3	1.5

Figure 4. MIH 2

4.21 2010 Grade 12 Results of School MJH (20.8 % Pass Rate)

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MJH	Black	Female	AFRHL	2	2	0	1	1	0	0	0	0
MJH	Coloured	Female	AFRHL	7	7	0	1	5	1	0	0	0
MJH	Coloured	Male	AFRHL	12	12	0	6	5	1	0	0	0
MJH	Black	Female	ENGFA	4	4	0	1	2	1	0	0	0
MJH	Coloured	Female	ENGFA	7	7	0	5	1	1	0	0	0
MJH	Black	Male	ENGFA	1	1	0	1	0	0	0	0	0
MJH	Coloured	Male	ENGFA	13	11	2	5	4	2	0	0	0
MJH	Black	Female	XHOHL	2	2	0	0	0	1	1	0	0
MJH	Black	Male	XHOHL	1	1	0	0	0	1	0	0	0

Figure 4. MJH 1

	WROTE			PASSED			% PASSED			CHANGE
	2008	2009	2010	2008	2009	2010	%	%	%	2010-2009
MIH	19	19	24	12	8	5	63.2	42.1	20.8	-21.3

Figure 4. MJH 2

Conclusion

Chapter 4 dealt with the data presentation of the sampled schools. The descriptive data provides background information on the strategies employed by the Department of Basic Education in the Eastern Cape in their attempt to improve the 2010 Grade 12 results in what was a tumultuous year, associated with teacher union strikes and the Soccer World Cup. Chapter 5 will be committed to the interpretation of the quantitative data presented in Section B of chapter 4, while also providing further statistical analysis. Furthermore, the following chapter as well as chapter 6 will pick up on trends from the 2010 statistics and try to make sense of how performance in the home language and LoLT relates to performance in mathematics.

CHAPTER 5

DATA INTERPRETATION

5.1 Introduction

In this chapter, an in-depth interpretation of the 2010 Grade 12 Mathematics and Language data is presented. In South Africa a major finding of the 2004 Grade 6 systemic evaluation study, was that language medium was a deciding factor in whether the learners evaluated did well or poorly academically in Mathematics, Language (LoLT) and in Natural Science. The 2010 Grade 12 cohort who wrote the National Senior Certificate (NSC) happens to be the same group of learners who were evaluated while in Grade 6 in 2004. I am aware that many learners drop out of the system over the years and some of them might have not been part of the 2004 sample. It is significant to note that a random sample of public schools was selected across 24 districts in the Eastern Cape in 2004 for the systemic evaluation. Of the 180 sample schools a total of 5 373 learners were from this province (IPSER, 2005). It is not unreasonable to therefore make the assumption that it is possible to juxtapose the interpretation of 2004 to that of the 2010 group to find similarities or differences. It was established that a significant number of the 2004 Grade 6 class was still within the system doing Grade 12 in 2010.

As mentioned in Chapter 3; 9 of the 10 sample schools are termed 'high performing or functional' schools in the province and are deliberately chosen as such to limit the variable of dysfunctionality, often used to explain under-performance. Only one school (MJH) is included in the sample as an underperforming school to illustrate what happens when everyone gives up on children. The surface impression of the 9 schools is promising and the province takes great pride in the fact that although there is a downward pull by the majority of poor learners in our schools; these schools continue to perform. Going beyond the surface of what seems like a successful system for producing highly talented learners in mathematics, a more complex picture emerges, one that begins to question why the issue of language takes a back seat in all the endeavors that are taken to improve mathematics achievement. That is not to say there are no examples of talented students, good schools,

and excellent teachers, supportive parents and committed departmental officials. The main story that is emerging from this research is that the quest to achieve good results for mathematics in South Africa is not necessarily an easy one, and by looking into the results of these 'good schools' we can begin to appreciate both the challenges and opportunities found in schools in the Eastern Cape. If schools like the ones that are sampled can present the kind of performance as witnessed in this chapter then one can only imagine what is there to expect from schools that struggle with the many ills that beguile the education of the poor in South Africa.

A number of qualifications must be made before reporting on the analysis per school. South Africa is too large and diverse a nation to characterize in any simple way, especially in a study of this nature. The focus has been simplified to one province the Eastern Cape which by itself has an immensely diverse school system. There are definitely issues that are common across schools in South Africa also found in the sampled schools. This is the reason that in chapter 4 an overview of the Grade 12 performance in mathematics across the nine provinces is given and it does not present an encouraging picture.

A second simplification is the decision to give snapshots of the schools in the study, rather than in-depth case studies. A third simplification was to focus on reporting on the Mathematics and Home Language and LoLT performance of these schools in 2010 without delving too deeply into the many cultural, historical, and economic forces that have shaped the system. A brief background of the location and history of each school is presented. An analysis of these forces would be beneficial for understanding why learners who speak a language that is different from the LoLT continue to underperform in mathematics.

While an in-depth analysis of performance in Language and Mathematics is central in this chapter; summary reports of parent interviews are also infused wherever possible. Cotton and Wikelund (2001) posit that the more intensively parents are involved in their children's learning, the more beneficial the achievement effects are. Parents and learner responses about factors associated with the achievement in Mathematics and Language were sifted for the most relevant; as they tended to give perceptions of the school which might not

actually be about factors associated with learning Mathematics and Language at the school. They are scattered all over the analysis as per agreement with the research participants.

The following table is a layout of achievement levels for the National Senior Certificate and a definition of the various codes of achievement. A Level 1 is a fail for learners and is not catered for in the data graphs that will follow. Most people locally and internationally have been very critical of the low expectation of obtaining a pass in Grade 12; the reason being that Higher Education Institutions have not lowered their admission requirements for what are called Gateway Subjects viz. mathematics and science. HEIs still expect learners to have achieved a minimum Level 4 (50-59%) and above to register for mathematics and science related subjects. Anything less than that, even though it is a pass, it means very little for the learner. The current Minister of Education has bowed down to pressure to upgrade the passing level and in 2013, in the announcement of the 2012 Grade 12 results; she made an announcement that the minimum pass rate will be upgraded very soon. This kind of announcement, while welcome in some corners – it will be met with mixed feelings from the different stakeholders depending on whether just passing is important even though you go nowhere with the certificate or whether a quality pass means a lot for students.

5.2 Language, LoLT and Mathematics achievement per school

5.2.1 SCHOOL MAH 2010 OVERALL PASS RATE 95.2%

School	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MAH	Coloured	Female	AFRHL	6	6	0	0	2	4	0	0	0
MAH	White	Female	AFRHL	3	3	0	0	0	0	2	0	1
MAH	Black	Male	AFRHL	1	1	0	0	1	0	0	0	0
MAH	Coloured	Male	AFRHL	5	5	0	0	4	1	0	0	0
MAH	White	Male	AFRHL	1	1	0	0	0	1	0	0	0
MAH	Black	Female	ENGHL	22	22	0	1	9	12	0	0	0
MAH	White	Female	ENGHL	1	1	0	0	0	0	0	1	0
MAH	Black	Male	ENGHL	20	20	0	1	7	11	0	1	0
MAH	Coloured	Male	ENGHL	1	1	0	0	0	0	1	0	0
MAH	White	Male	ENGHL	3	3	0	0	1	2	0	0	0
MAH	Coloured	Female	ENGFA	6	6	0	1	0	4	1	0	0

MAH	White	Female	ENGFA	2	2	0	0	0	0	2	0	0
MAH	Black	Male	ENGFA	1	1	0	0	0	1	0	0	0
MAH	Coloured	Male	ENGFA	5	5	0	1	4	0	0	0	0
MAH	White	Male	ENGFA	1	1	0	0	0	0	1	0	0
MAH	Black	Female	MATH	14	13	1	3	7	2	0	1	0
MAH	White	Female	MATH	1	1	0	0	0	0	0	0	1
MAH	Black	Male	MATH	10	7	3	3	1	1	1	0	1
MAH	Coloured	Male	MATH	1	1	0	0	0	0	0	0	1
MAH	White	Male	MATH	4	4	0	3	0	1	0	0	0

Figure 5.1 MAH

BACKGROUND SUMMARY:

School MAH is a former model-C school with a good infrastructure and adequate resources. The school is situated in the middle of a small town and was built for the small Afrikaner community in the town. Over the years a small group of isiXhosa speakers was allowed access without any introduction of an African language to date. In 2008 79 learners achieved 77. 2% and a high number of failures (18). The pass rate went up in 2009 – 83.5 with less learners. 2010 was a good year with a 95.2% pass rate with even fewer learners. In 2011, there are lower learner numbers (54); but there is a downslide at 90.7%. The school management says the increase in Black learners means a higher failure rate in mathematics.

PERFORMANCE IN AFRIKAANS HOME LANGUAGE School MAH no=16

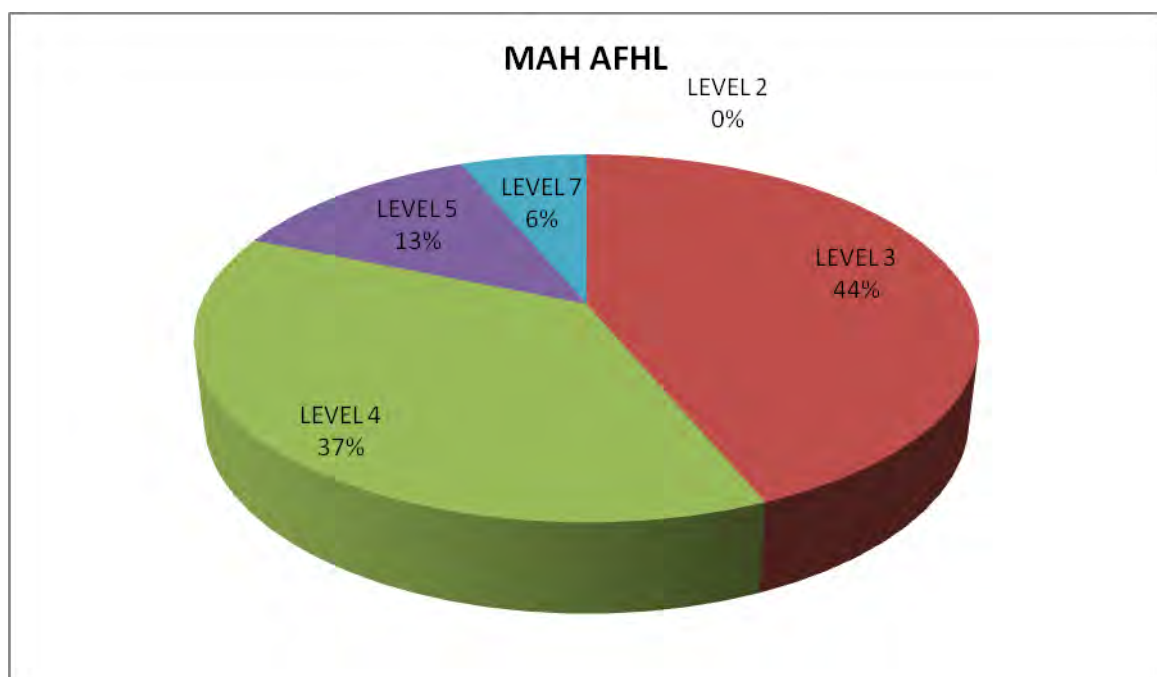


Figure 5.2

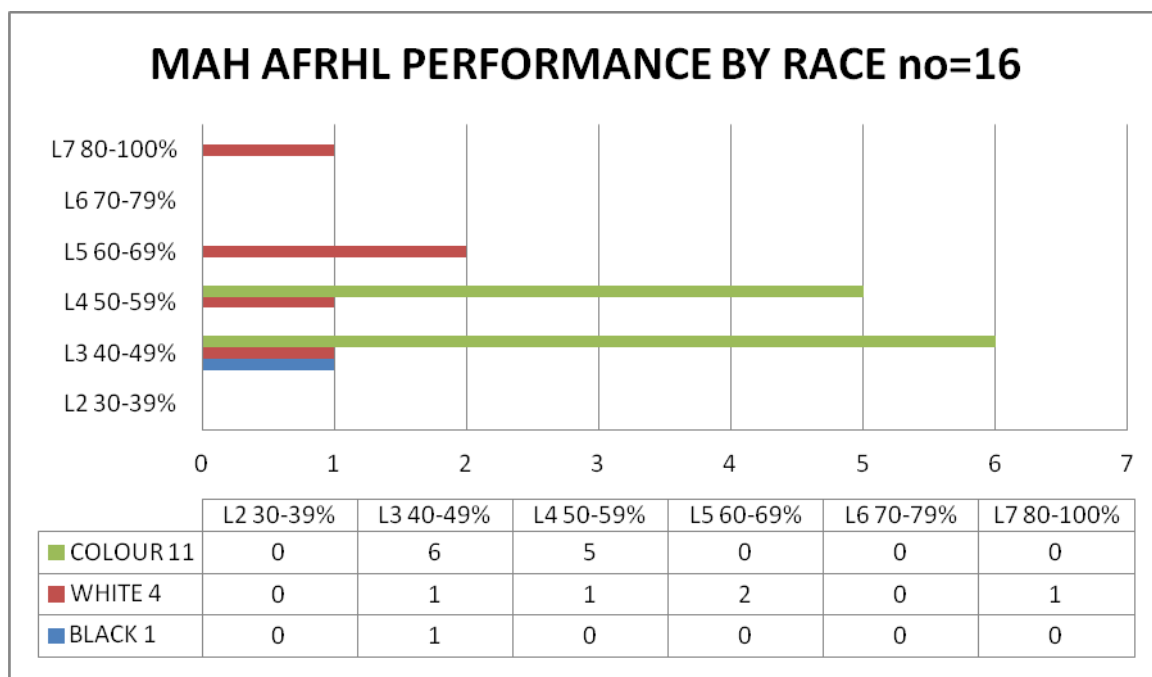


Figure 5.3

SUMMARY ANALYSIS: AFRIKAANS HOME LANGUAGE SCHOOL MAH

Of the 62 Grade 12 learners in 2010 at School MAH, 43 are Black; yet no African language is offered. There is a 100% pass rate for Afrikaans Home Language with female learners outperforming males; but the quality of the 100% is not impressive. 43% of learners sit at 40-49% (Level 3); 33% sit between at 50-59% (Level 4). Only 2 students (15%) managed 60-69%; while there are no Level 6 passes and 1 (6%) White female learner sits at Level 7 (80-100%). Coloured students are the majority in this group (11). Their performance is between 40% and 50%; still below 60%. This can be attributed to the variety of Afrikaans that Coloured learners speak; which might be quite different from the standard form. White learners (4) in the minority; 1 sits in the low pass category; the rest present a good spread across the 50%-60% range also achieving a distinction. There is one Black learner and they have achieved moderately.

PERFORMANCE IN ENGLISH HOME LANGUAGE SCHOOL MAH no=47

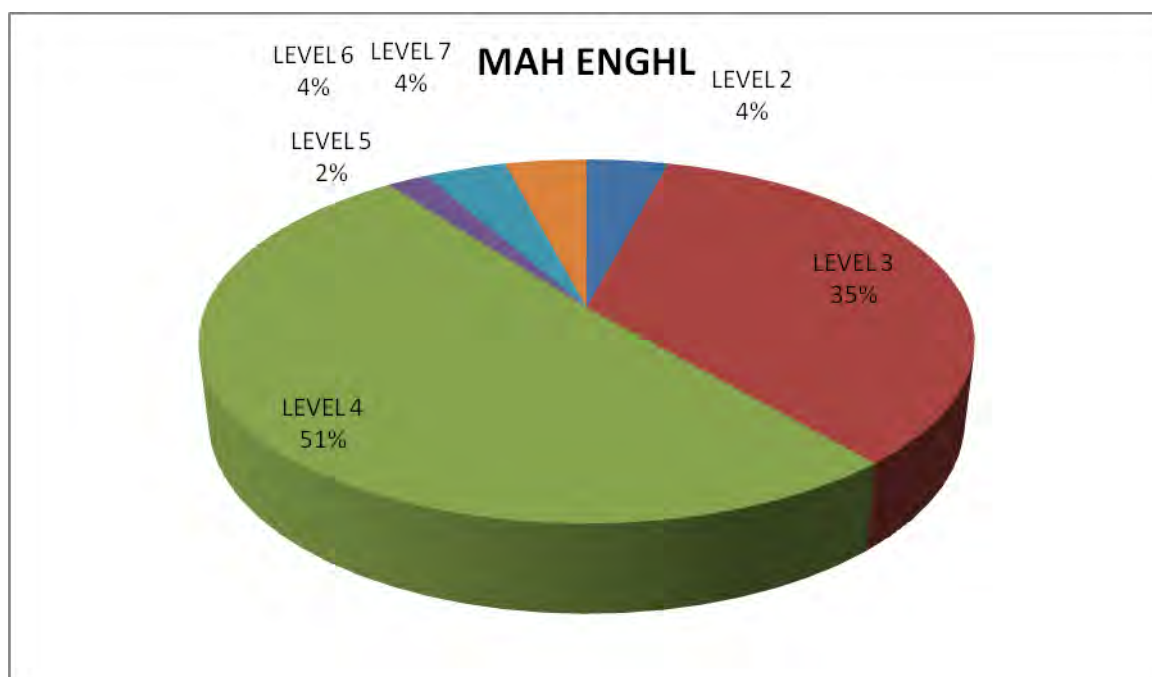


Figure 5.4

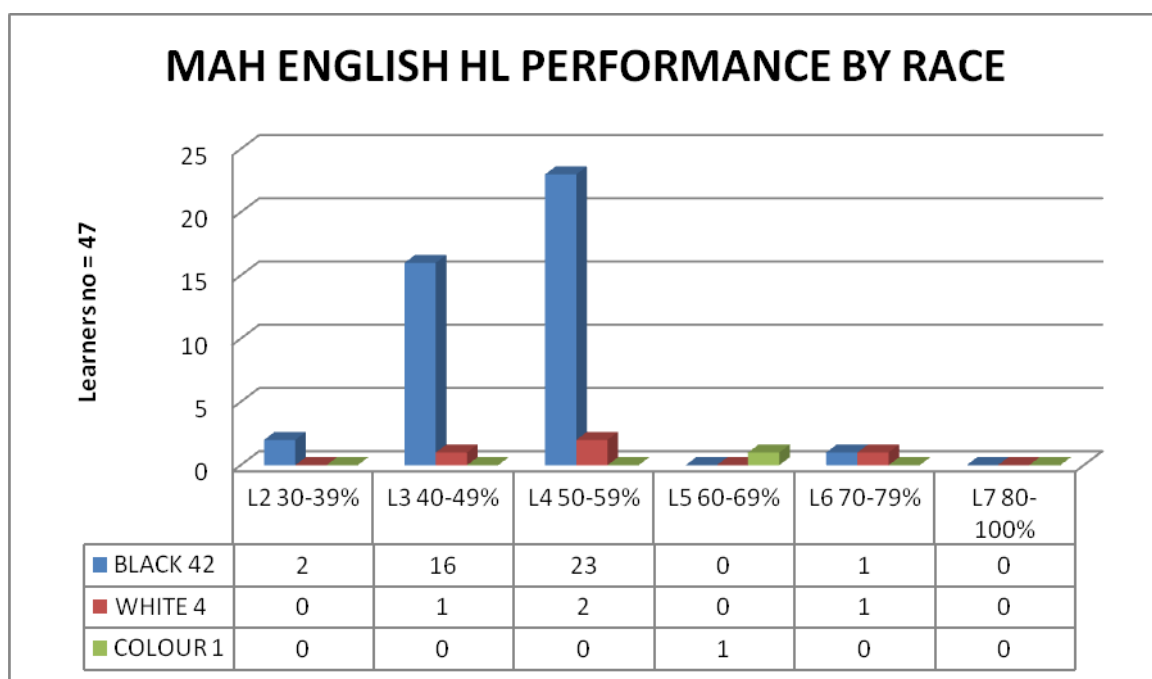
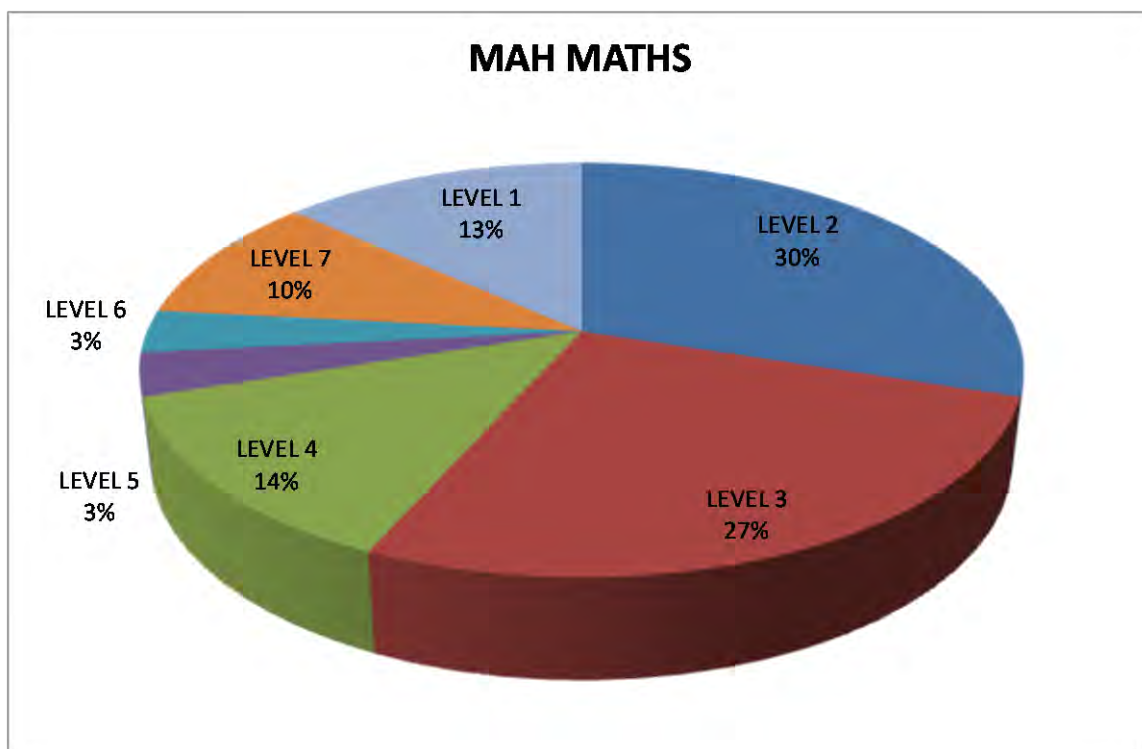


Figure 5.5

SUMMARY FINDINGS: ENGLISH HOME LANGUAGE SCHOOL MAH

The 47 learners produced a 100% pass rate for English Home Language. This group has more learners because Black learners take English at HL level as isiXhosa or any other African

language is not offered. The English HL group has moved 1 level up with 51% of learners at Level 4 (50-59%), followed by 35% at Level 3 (40-49%). Two Black learners performed at Level 2; which is the lowest performance in the English Home Language group; spreading between 40% - 79%. The rest of the Black learners are concentrated between 40% and 59% and only 1 Black learner achieves at Level 6. The spread for White learners is similar to that of the Afrikaans HL group. Unlike in the Afrikaans HL group; there are no Distinctions (Level 7) across all races. A common expectation on Black learners is that that they will get better results in English/LoLT and Mathematics when they attend ex-Model C schools. The fact that they usually have a better command of English than their Black counterparts elsewhere is thought to place them at an advantage than the rest. Saunders (1988) posits that caution must be exercised when comparing monolinguals/bilinguals on tests and particularly if, as often happens, the bilinguals are tested in only one of their languages, the second language.



PERFORMANCE IN MATHEMATICS SCHOOL MAH no=30

Figure 5.6

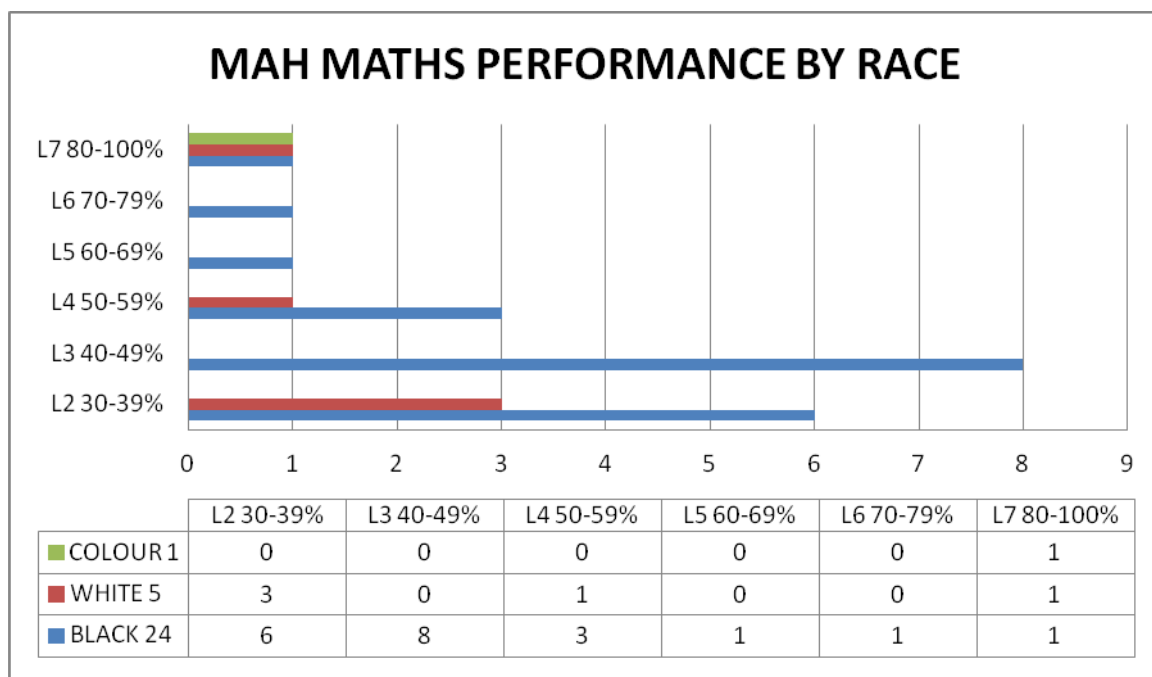


Figure 5.7

SUMMARY ANALYSIS:

4 Learners failed (13%), and all of them Black. The majority (35%) performed at the minimum pass rate of Level 2 Elementary Achievement (6 Black and 3 of the 4 White Males); followed closely by 31% sitting at 40-49% (Level 3 all Black). 4 Learners are at Level 4 with 3 Blacks and 1 White learner. 1 Black learner is sitting at Level 5 and another is sitting at Level 6. 3 Learners are sitting at Level 3 with one learner per race. The only Coloured learner who wrote mathematics in Afrikaans gets a Level 7; a distinction. Comparing the two home languages and mathematics; English students perform at an average of 51% followed by Afrikaans at an average of 44% while mathematics is last at the minimum of 35% (Level 2). If the requirement of a Bachelors degree requires a achievement rating of 50-59% or better in four subjects (especially mathematics) then it is obvious that of the 24 Black students in School MAH; only 6 learners would be able to register for Accounting; Medicine; Pharmacy etc. The quality of the passes in mathematics is therefore unsatisfactory for a school that is deemed as a high performing school. Of the 62 learners who wrote Grade 12 in 2010 at School MAH; more than 30 learners wrote mathematics; 32 learners wrote mathematical literacy; either by choice in Grade 10 or by an elimination criteria that is called 'mathematics aptitude sifting' where schools sift learners in Grade 9 who perform below 50% in

mathematics and push them to do mathematics literacy so as to maintain their 100% pass rate.

The impression created by schools like School MAH; who over three years moved from 77% to 95.2% in 2010; is that of ‘high achievement’. These statistics and subsequent analysis tell a story that reflects the fact that despite positive reports about ‘high achievement’ by the school, there are deep and widespread problems in terms of quality and access to education for all students – these untangle the impression of what is called a “myth of high achievement” (Smith J et.al. 2010). The performance in mathematics of Black learners indicates that the achievement rating of 4 (50-59%) or better to be accepted by HEIs for a recognized degree is not attainable. Learning English at HL Level did not translate to better results for Black learners. This data challenges the commonly held view that attending ex-Model C schools places Black learners on par with White learners. In this case, they still underperformed in mathematics.

5.2.2 SCHOOL MBH 2010 PASS RATE: 85.0%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MBH	Black	Female	ENGFA	112	112	0	3	16	54	33	6	0
MBH	Black	Male	ENGFA	62	62	0	3	21	30	7	1	0
MBH	Black	Female	XHOHL	112	112	0	0	0	5	51	54	2
MBH	Black	Male	XHOHL	62	62	0	0	0	8	40	14	0
MBH	Black	Female	MATH	92	65	24	22	23	15	6	1	1
MBH	Black	Male	MATH	43	35	8	12	12	4	5	0	2

FIGURE 5.8

BACKGROUND SUMMARY:

School MBH is a Black school that is located to serve a low-base Black middle income area; and has feeder schools that are rural. A powerful and dedicated teacher group competes well with ex-Model C schools in producing quality Bachelor passes in mathematics and science. The story of School MBH is a sad one currently; once a bastion of hope for both poor and low base middle class children; parents flock to the school in numbers and fight for a place for their children at this school. The pass rate of the school has gone down with the

increase in the number of learners. In 2008, 126 learners achieved 95.2%. In 2009, 147 learners achieved 91.8%. In 2010 another increase in numbers, 173 learners; produced 85.0%; a drop of 6.9%.

Partly to blame is a system of education that allows schools to adopt a lethargic attitude where indolence is tolerated. Black parents then have no other choice or finances to send their children anywhere else to get a better education. This creates a pressure point for the one school that is performing well in the area and stretches the number of resources that create quality education for the poor. In the same school another pressure point is the Black middle class; when their children fail or drop out of ex-Model C schools they are sent to School MBH as a 'less pressurizing' environment. One of the defining characteristics of most ex-Model C schools, are the entry tests they subject new learners to even though it is not allowed by SASA (1996). On the other hand Black schools never test learners on entry and must therefore always find a balance between the educationally challenged, language and poverty.

Performance In IsiXhosa Home Language School MBH: no =174

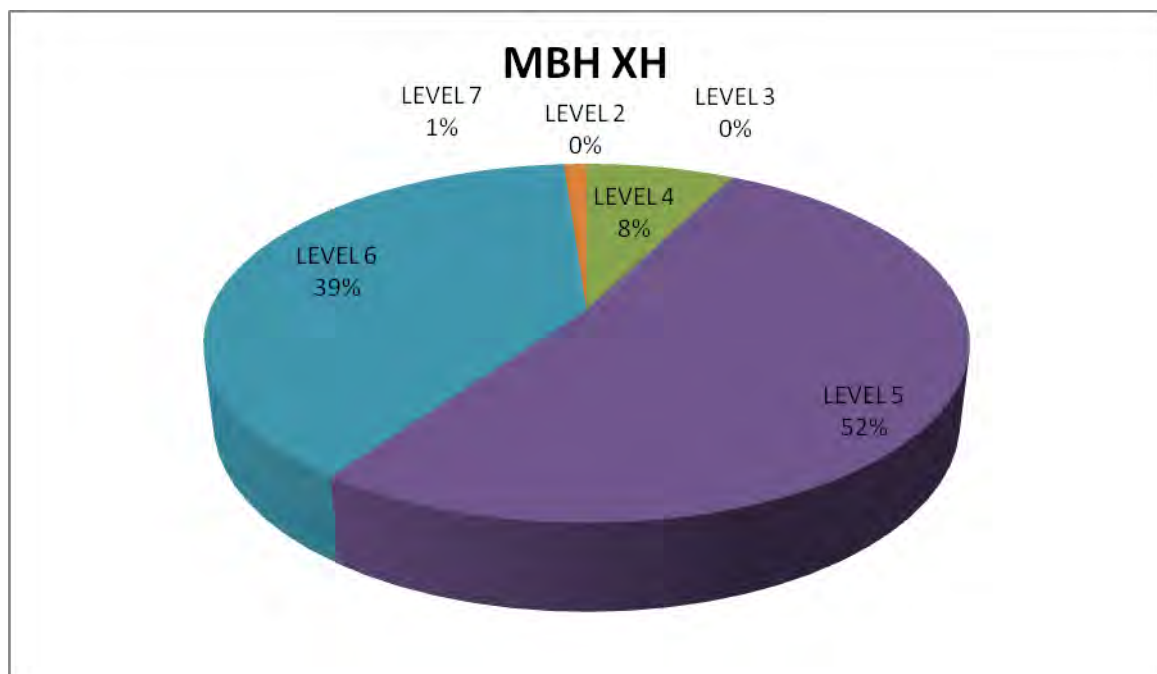


Figure 5.9

SUMMARY ANALYSIS: ISIXHOSA HL MBH

All learners achieved a 100% pass in isiXhosa Home Language. The majority of learners, 52% (91) performed at Level 5; a great achievement to School MAH; followed by 68 learners in Level 6. A minimum of 13 learners sit in Level 4 (8%); while 2 female learners achieved distinctions at Level 7. School MBH has the biggest group of learners and yet they produced good quality passes in the Home Language. It is unfortunate that these learners only study isiXhosa as a subject and do not use the proficiency in it to study mathematics and other subjects. Compared to a well resourced school like MAH; these learners outperformed both the Afrikaans and English Home Language group so far. It is a common view that because of the Digraphs and Trigraphs in isiXhosa; it is a very difficult language to learn to read and write. This was then a phenomenal performance by this large group of learners.

PERFORMANCE IN ENGLISH FAL SCHOOL MBH no=174

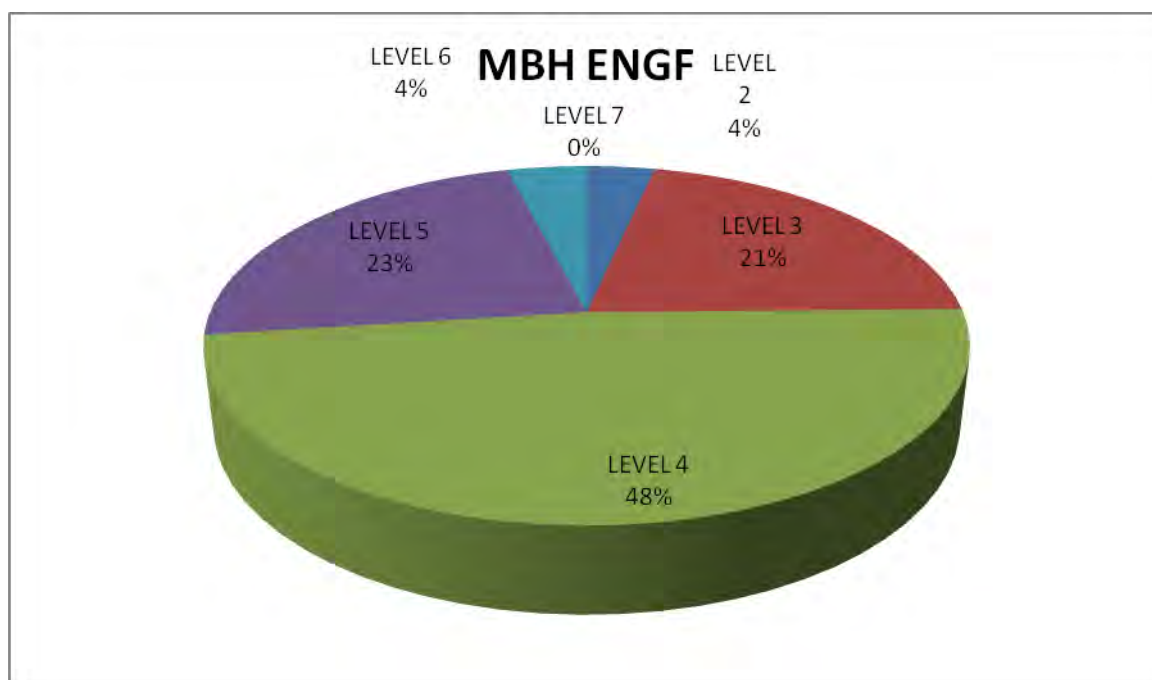


Figure 5.10

All 174 learners passed producing a 100% pass rate in EFAL which is their Language of Learning and Teaching. The majority of learners 48% (84) are sitting at Level 4 (50-59%); one level below their performance in isiXhosa Home Language; but still very good. The majority of English Home Language group at School MAH performed at this level. 23% sit at Level 5 (60-69%) followed closely by 23% (37) at Level 3 (40-49%). There is an equal split between

females and males (6) for the minimum score of Level 2 (30-39%). A significant factor compared to their performance in isiXhosa is the fact that there is no Level 1, 2 and 3 in isiXhosa Home Language. In English FAL there are no Level 1s; 4% sit on Level 2 while a 23% sit on Level 3. So their best performance is in the Home Language. Their performance in ENG FAL will be an important indicator of how much they will manage other subjects; including mathematics. It is important to remember that although these learners take English at First Additional Language; the mathematics curriculum is designed at English HL level. The language presentation in textbooks, tests, assessments and in all other forms is the same for all learners regardless of whether they do English at HL or as FAL.

PERFORMANCE IN MATHEMATICS SCHOOL MBH no=135

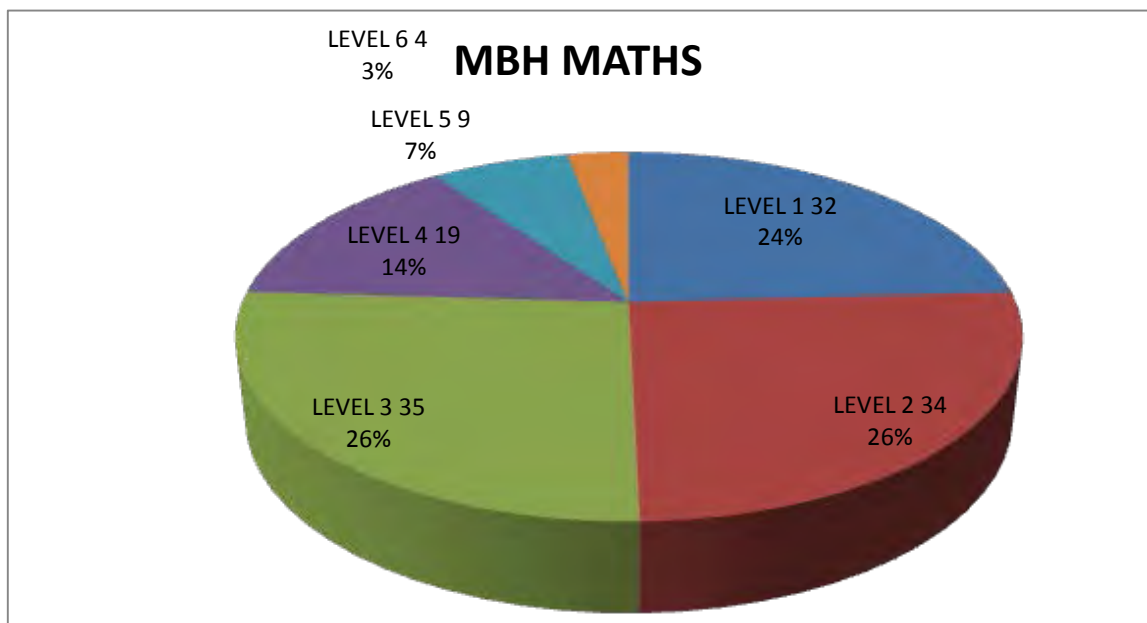


Figure 5.11

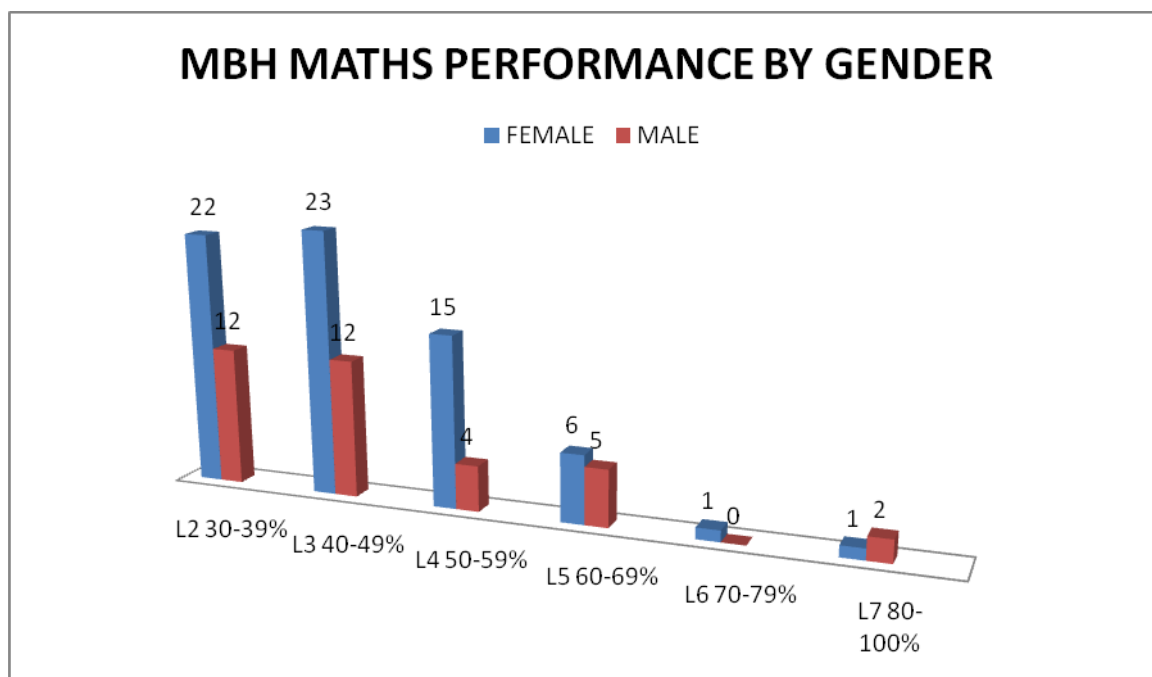


Figure 5.12

SUMMARY ANALYSIS: MATHEMATICS SCHOOL MBH

Of the 174 Matriculants in School MBH a staggering 135 learners take pure mathematics and only 39 learners take mathematical literacy. That is significant considering that most schools encourage their learners not to take pure mathematics. Learner interviews revealed that they are actually encouraged to take mathematics and not mathematical literacy in Grade 9 already. By the time they must choose in Grade 10, they are made aware of the disadvantages of taking mathematical literacy for further studies. There is a split of 26% between Level 2 (30-39%) and Level 3 (40-49%). 24% (32) of learners failed the exam. 14% achieve Level 4; 7% achieve Level 5 (60-69%) and Level 6 and 7 present a combination of 3% (1 learner at Level 6 and 3 Distinctions). Like in School MAH, an ex-Model C school the bulk of learners sit between Level 2 and 3, with less resources and less proficiency in English.

What makes these learners to perform at more or less the same levels with those at the historically advantaged schools? There are different answers; one is the use of code switching until learners understand, the other reason is in a phenomenon that is only practiced in Black schools: Winter, Summer, Spring, Saturday, vacation school and incubation camps which increases opportunities to learn. Black Grade 12 learners finish school late everyday; they come to school during weekends; they camp at school during

vacation time; to ensure a pass. Some parents report that they have to bring mattresses and other necessities; including taking turns to provide security at the school against bad elements who often see this as an opportunity for criminal activity.

The disadvantage of the mismatch between HL and LoLT is demonstrated clearly in these results; learners at School MBH could not sustain the sterling performance in isiXhosa for mathematics. The results are impressive given the language barrier they experience; but 32 learners are too many to fail after all the effort. Teachers report that a lot of time is wasted on repetition; translation of concepts from English to isiXhosa, and then back to English by both teachers and learners; leaving very little time to complete the NSC Mathematics Curriculum. A choice must be made on whether to do everything in the pace setter and leave learners as confused as ever; or select some concepts that learners will be sure of in the exam and later on as they move to higher education. Both teachers and learners accept that not everything will be covered; a very sad reality. A disadvantage of this scenario is the fact that sometime the examiner does not set what learners have studied and it might mean a high number of failures.

5.2.3. SCHOOL MCH 2010 PASS RATE: 100%

School	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MCH	Coloured	Female	AFRHL	10	10	0	0	0	3	7	0	0
MCH	White	Female	AFRHL	24	24	0	0	2	3	9	8	2
MCH	Coloured	Male	AFRHL	11	11	0	0	2	8	1	0	0
MCH	White	Male	AFRHL	14	14	0	0	2	5	4	3	0
MCH	Black	Female	ENGHL	12	12	0	0	0	7	4	1	0
MCH	White	Female	ENGHL	5	5	0	0	0	2	2	0	1
MCH	Black	Male	ENGHL	6	6	0	0	1	4	1	0	0
MCH	Coloured	Male	ENGHL	1	1	0	0	1	0	0	0	0
MCH	White	Male	ENGHL	4	4	0	0	0	4	0	0	0
MCH	Coloured	Female	ENGFA	10	10	0	0	1	6	2	1	0
MCH	White	Female	ENGFA	22	22	0	0	1	3	10	6	2
MCH	Coloured	Male	ENGFA	11	11	0	0	6	5	0	0	0
MCH	White	Male	ENGFA	14	14	0	0	2	4	6	2	0
MCH	Black	Female	MATH	7	6	1	4	2	0	0	0	0
MCH	Coloured	Female	MATH	3	2	1	2	0	0	0	0	0
MCH	White	Female	MATH	13	11	1	2	3	1	2	1	3
MCH	Black	Male	MATH	3	1	2	0	0	1	0	0	0
MCH	Coloured	Male	MATH	2	2	0	2	0	0	0	0	0
MCH	White	Male	MATH	11	11	0	2	1	3	3	1	1

Figure 5.13

SUMMARY BACKGROUND:

School MCH is an ex-Model C school that has maintained a Grade 12 class of not more than 85 learners over the years. The slight increase of between 1-4 learners has worked to their advantage. Like School MAH no African Languages are offered. Black students are in the minority as the school has always been an Afrikaans school in the past. Social and Language Transformation are at a very slow pace as the school continues to service mainly the white community. Black learners and parents report gaining entry to the school as difficult, but social integration while at the school is allegedly harder. White parents interviewed feel that the situation is justifiable; they want the government to crack the whip on lazy Black teachers so that Black parents do not feel the need to fill up the few spaces meant for English and Afrikaans children. The school has an impression of a 'high performing school' with a 100% pass in 2010.

PERFORMANCE IN AFRIKAANS HOME LANGUAGE SCHOOL MCH no=59

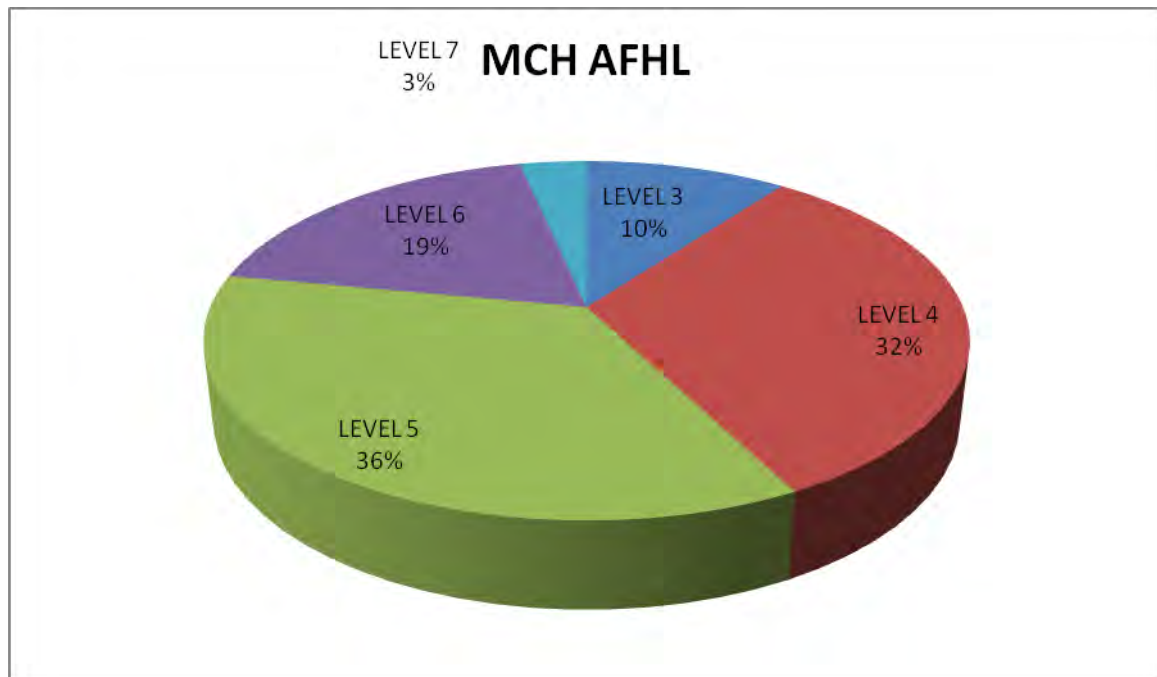


Figure 5.14

AFRIKAANS HOME LANGUAGE PERFORMANCE BY RACE SCHOOL MCH

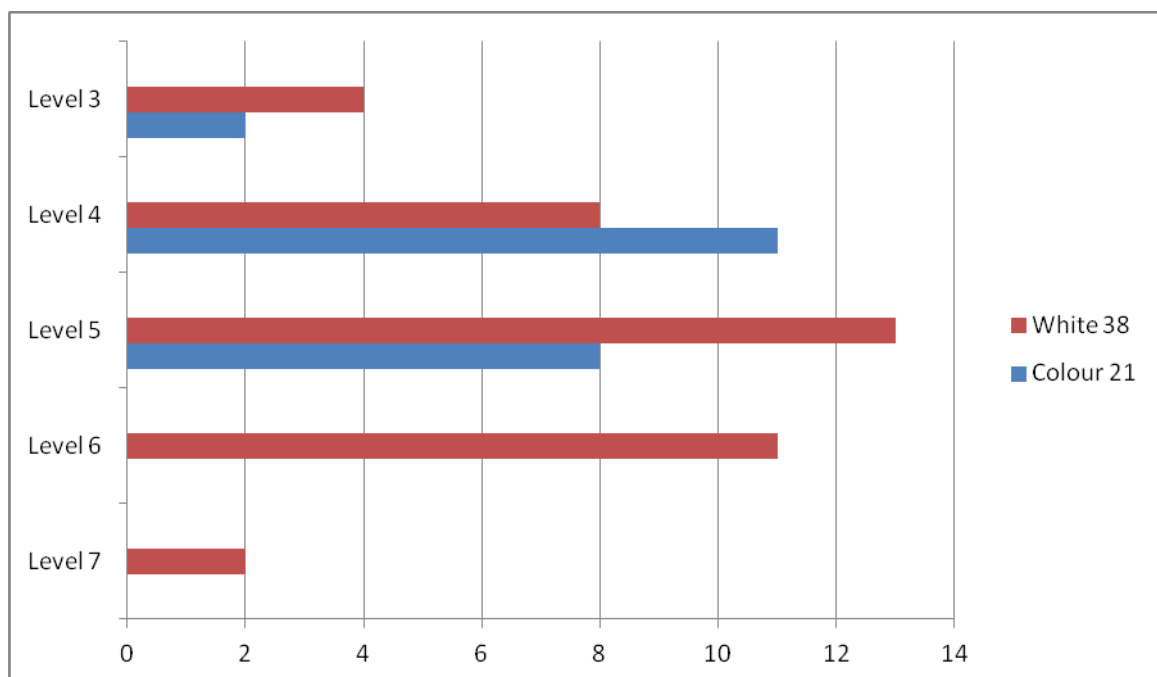


Figure 5.15

SUMMARY ANALYSIS: AFRIKAANS HOME LANGUAGE SCHOOL MCH

There is a 100% pass rate for AF home language; with the majority of learners, 36% sitting at Level 5 (60-69%); followed closely by 32% of learners sitting at Level 4 (50-59%). 19% sit at Level 6 (70-79%) while 10% sit at Level 3 (40-49%). White female learners performed exceptionally well; contributing significantly to White learners outperforming Coloured learners. These learners learn mathematics using their mother tongue; Afrikaans.

PERFORMANCE IN ENGLISH HOME LANGUAGE SCHOOL MCH no=28

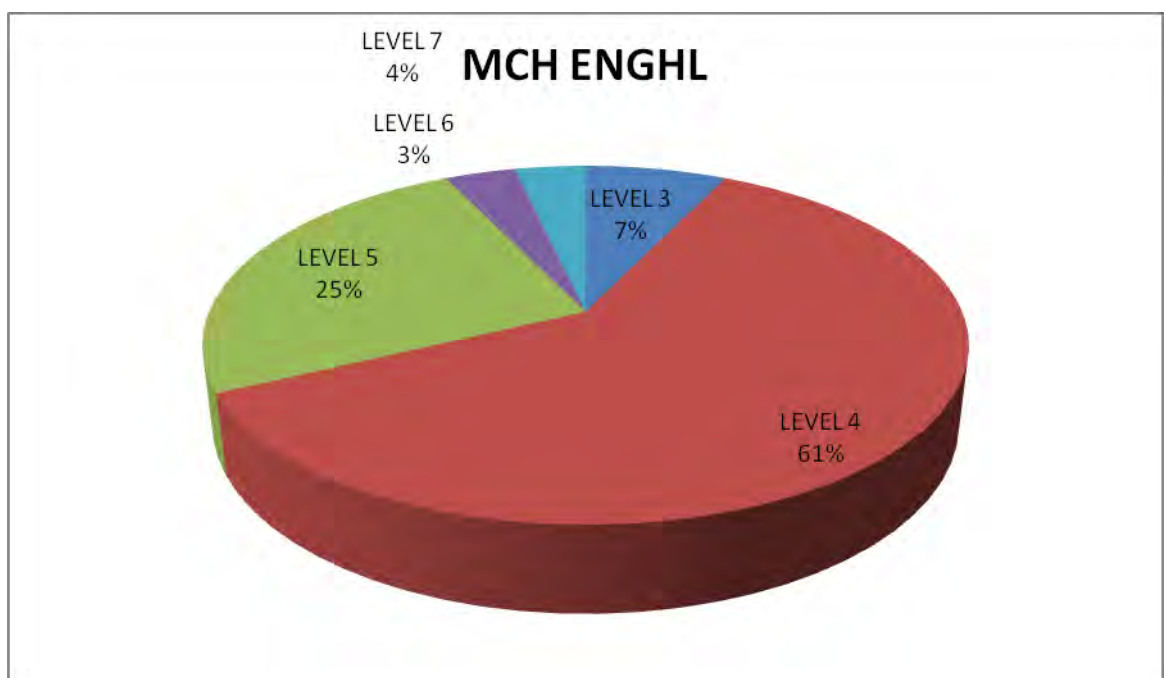


Figure 5.16

PERFORMANCE IN ENGLISH HOME LANGUAGE BY RACE MCH

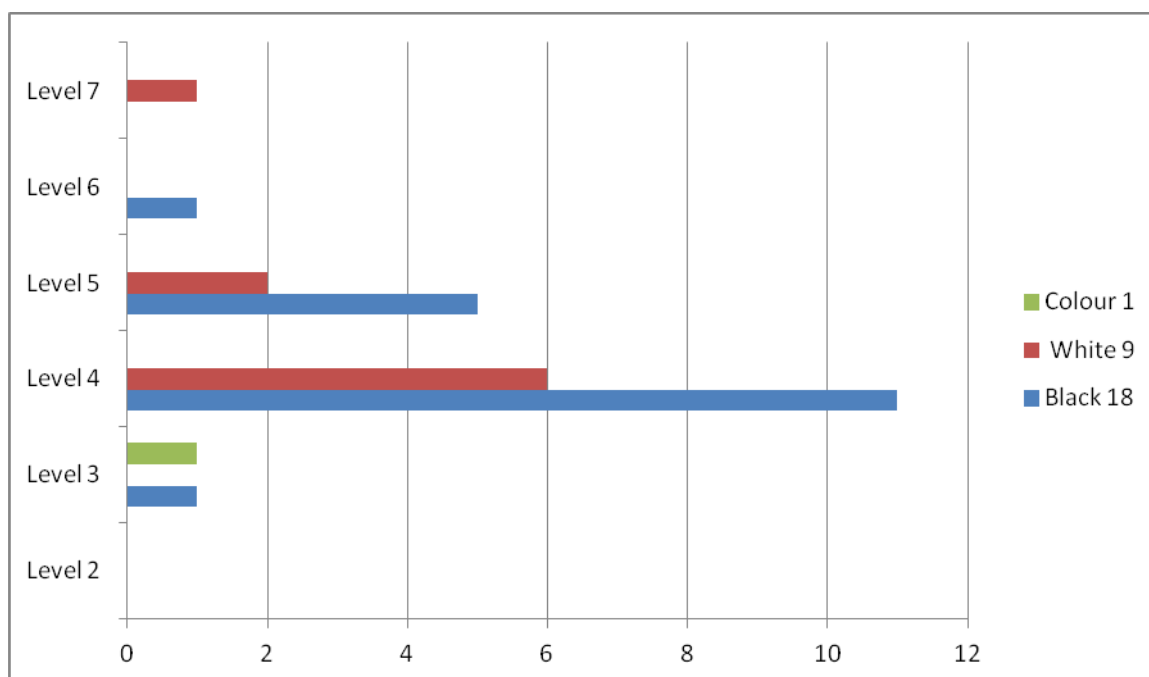


Figure 5.17

SUMMARY ANALYSIS: ENGLISH HOME LANGUAGE SCHOOL MCH

Black learners are in the majority in this group, as no African language is offered. The majority of learners performed at Level 4 (50-59%). 25% of learners sit at Level 5 with a reduction in number for the higher levels. The majority of learners in the Afrikaans group at School MCH performed at Level 5; it could be expected of mother tongue speakers of Afrikaans. The typology of Black learners as English Home Language learners, disadvantages these learners as they do not perform at Home Language optimally as seen in Black schools.

A pattern is emerging: whenever Black students register English as their Home Language, the quality of their performance in language is compromised. They are in the majority in the province to create a down-pull for these schools. The quality of the 100% for Black learners at the school means little when compared to the quality of passes in isiXhosa in School MBH. The impression of 'high performance' with the 100% pass rate in this school is therefore untangled by this data. The Afrikaans home language group at MCH outperformed the English group; but still made a good pass and that is commendable given the fact that they are not English HL speakers.

PERFORMANCE IN MATHEMATICS SCHOOL MCH no=39

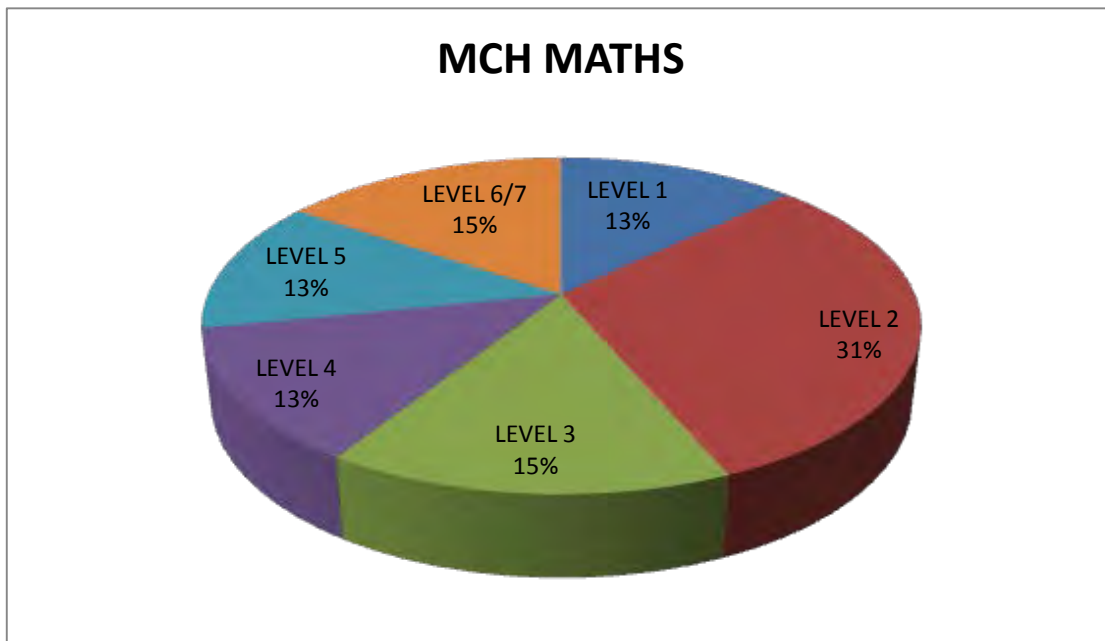


Figure 5.18

MATHEMATICS PERFORMANCE BY RACE SCHOOL MCH no=39

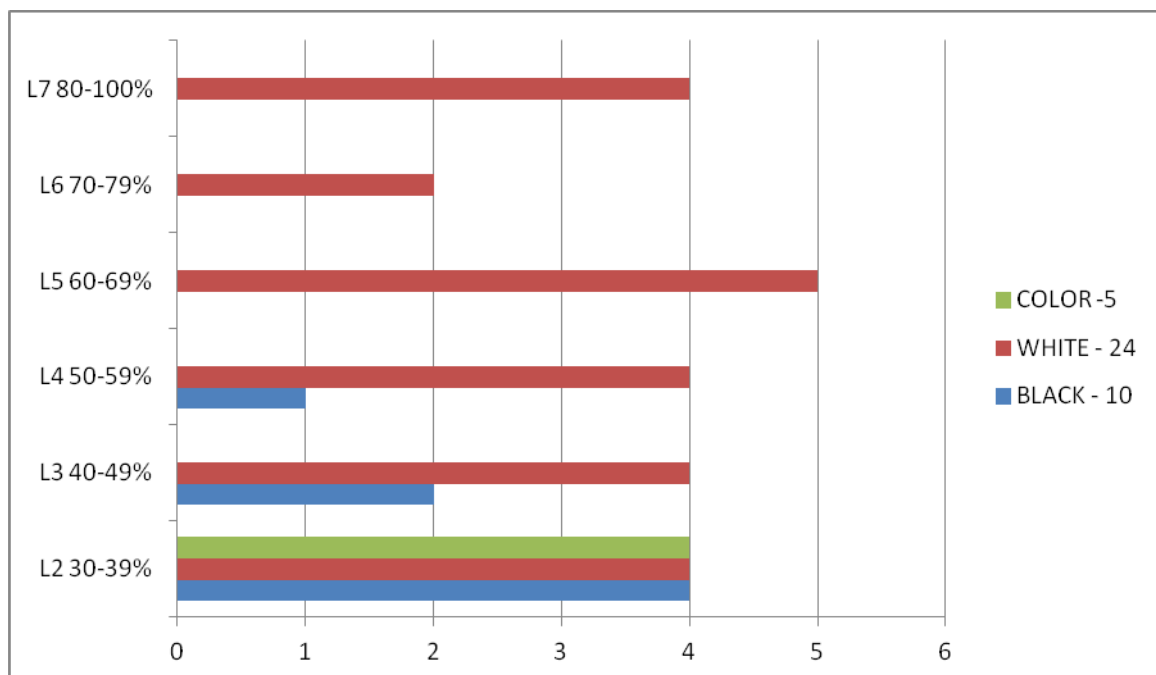


Figure 5.19

SUMMARY ANALYSIS: MATHEMATICS SCHOOL MCH

For a school that has an impression of 'high achievement'; there is a low registration of mathematics at this school. Of the 87 Matriculants in 2010 only 39 registered for

mathematics. Teachers confirmed that learners are 'academically sifted' for mathematics at the end of Grade 9; those who performed below 50% in their Grade 9 exam are automatically excluded. The mathematics class is a dual-medium class where the teacher uses both English and Afrikaans to teach learners. Black learners reported that it is very challenging to maximally understand mathematics in the to-ing and fro-ing between the two languages.

The acquisition of mathematical ability is a subtle process, but dialogue between the learner and teacher is imperative, and this depends on effective communication (Jacobsen, 1975). If half the teaching time is spent on two languages that are not the home language of Black learners; low performance for them should be expected even in a 'high performance school'. 13% of learners failed the exam, 3 are Black and 1 is White. It was interesting to note from the teacher that the one White learner who failed is an Afrikaans speaker, whose parents want him to be in the English Home language class as they view this to be the 'in-thing'. The majority (31%) sit at Level 2 (30-39%); followed by a wide margin of 15% at Level 3 (40-49%). There is a split of Level 5 and 6 at 13% and a combination of 15% composed of 2 Level 6 learners and 4 Level 5 learners, all White. Coloured learners; the least registered for mathematics perform poorly at only Level 2, followed by a spread of Black learners concentrated between 0-29% to 40-49%. One Black learner is sitting at 50-59%; the highest level for Black students in this group. All White males pass with a concentration on Level 4 (50-59%) and Level 6 (60-69%) plus 1 Distinction. White females have the most number of registrations for mathematics. One fails; and the rest of the 11 are spread across the levels with 3 Distinctions. For a 100% school, the average achievement of Level 2 (30-39%) in mathematics is low.

The performance of Black learners at MCH in mathematics is lower than at MBH; a Black school with less resources. There appears to be a direct relationship across various school subjects between instruction in the student's native language and high achievement in the subject (Coffland & Cuevas, 1979; Cuevas & Llabre, 1981; Granado, 1976; Tsang, 1976). This rings true for White learners as their good performance is testimony to this fact.

5.2.4 SCHOOL MDH 2010 PASS RATE 96.9%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MDH	Black	Male	ENGHL	82	82	0	1	29	34	17	1	0
MDH	Coloured	Male	ENGHL	5	5	0	0	4	0	1	0	0
MDH	Indian	Male	ENGHL	1	1	0	0	0	0	0	1	0
MDH	White	Male	ENGHL	8	8	0	0	1	3	2	2	0
MDH	Black	Male	ENGFA	0	0	0	0	0	0	0	0	0
MDH	Black	Male	XHOHL	49	49	0	0	1	7	30	11	0
MDH	Black	Male	MATH	0	0	0	0	0	0	0	0	0
MDH	Black	Male	MATH	46	40	6	14	9	8	7	1	1
MDH	Coloured	Male	MATH	3	1	1	1	0	1	0	0	0
MDH	Indian	Male	MATH	1	1	0	0	0	0	0	0	1
MDH	White	Male	MATH	3	3	0	0	0	0	3	0	0

Figure 5.20

SUMMARY BACKGROUND:

School MDH is a prestigious and exclusive public school for boys that prides itself in a very English colonial history. Although expensive; the school's waiting list is known to be very long as the middle class compete for the limited spaces for their charges. The school has a pre-school linked to it to ensure that they all their learners have come through their ranks. The school is quite expensive for a public school, but this does not deter people. The school recruits learners who excel in sport even from rural areas; most of them have had very little exposure to English medium education. It therefore works for them that isiXhosa and English are offered at Home Language level; so that if they do not do well in English Home language level; they can still go through with a 30% in English as LoLT of the HEI they want to go to; if they pass isiXhosa at Home Language Level with 40% and above. Grade 12 learners have to pass the Home language at 40% and the FAL at 30% to pass Matric; schools can choose which language/s as Home language/s or as FAL. This language combination has made the school very popular. Over three years, the school seems to be negatively affected by the increase in learner numbers; with a drop of -1.0% in 2010. This could also be attributed to the allegation of over-focusing in sports than academics; attracting students who are not necessarily bright, but sports inclined.

PERFORMANCE IN ISIXHOSA HOME LANGUAGE SCHOOL MDH no = 49

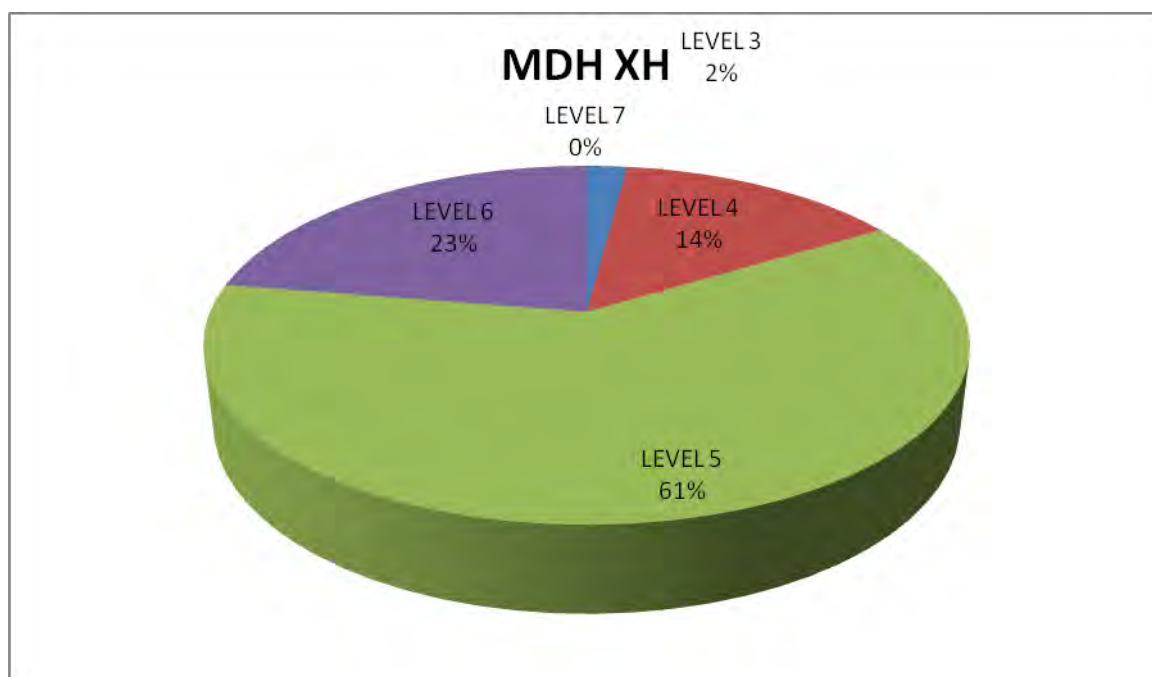


Figure 5.21

SUMMARY ANALYSIS:

These learners achieved a 100% pass rate for isiXhosa HL. The majority of learners (61%) achieved Level 5 (60-69%); followed by 23% of learners who sit at Level 6 (70-79%). 14% are sitting at Level 4 (50-59%) with only 2% at Level 2. These are impressive results for learners who are taking two subjects at Home Language level. Black students who took Afrikaans FAL performed at an average of Level 2; 30-39%; three levels behind the performance of the isiXhosa Home Language group in their school. Afrikaans at HL was phased out due to low demand and is only offered at FAL; while isiXhosa has over the years been elevated to HL level. Black learners choose between taking both isiXhosa and English at HL level; or either taking English at HL and Afrikaans as FAL. In the 2010 group; most learners (49) took up English and isiXhosa at HL level; while 33 learners combined English HL with Afrikaans FAL.

ENGLISH HOME LANGUAGE SCHOOL MDH no = 96

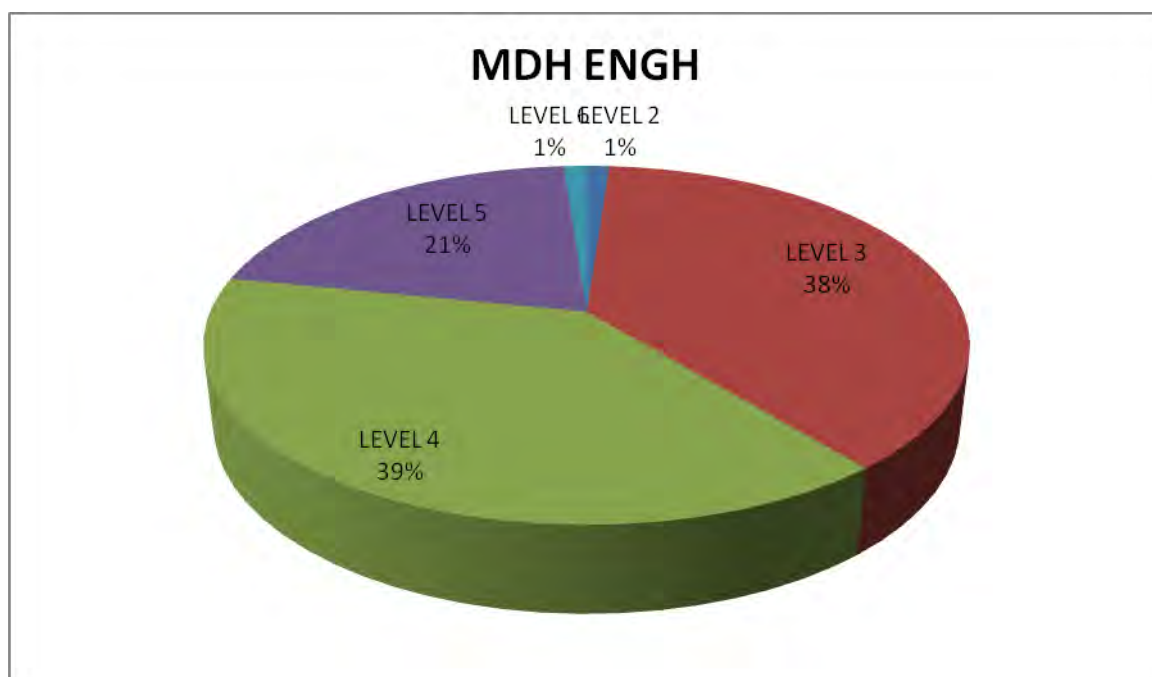


Figure 5.22

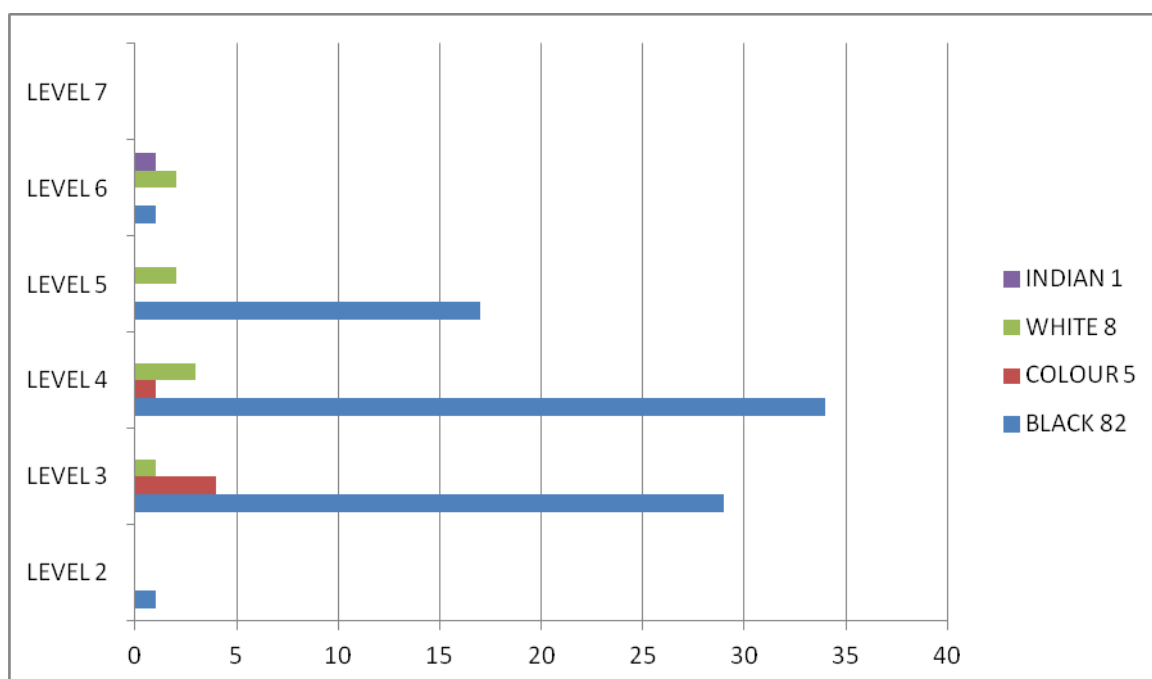


Figure 5.23

SUMMARY ANALYSIS:

The majority of learners, 39% are concentrated at Level 4 (50-59%) for English Home language, one level down from the isiXhosa Home Language group. Followed closely by 38% of learners in Level 3 (40-49%); also a regression from the home language group and then

21% of learners sit in Level 5 (60-69%). Black learners at School MDH have very strong oral skills in English; compared to their Black counterparts in typically Black schools. The result that we see is that their perceived strength is limited to what Krashen refers to as Basic Interpersonal Communication Skills (BICS) versus Cognitive Academic Language Proficiency better known as CALP (Krashen, 1996). Their home language is a better marker of their language abilities. It is interesting how these learners categorise themselves as English Home language speakers, even post-high school at HEIs because they attended ex-Model C schools. When learners at schools like MDH start speaking English from an early age; there is usually a buzz of excitement to a point where parents claim that their child does not speak the home language. This also attests to the theory that in an environment like the Eastern Cape where very few people speak English as home language outside of the school; the language abilities of the learners in the target language will be limited. Despite the above analysis; learners have achieved a good pass in English Home Language at school MDH; though it is lower than their performance in isiXhosa; implications of this performance in mathematics are of interest for purposes of this study.

PERFORMANCE IN MATHEMATICS no = 96

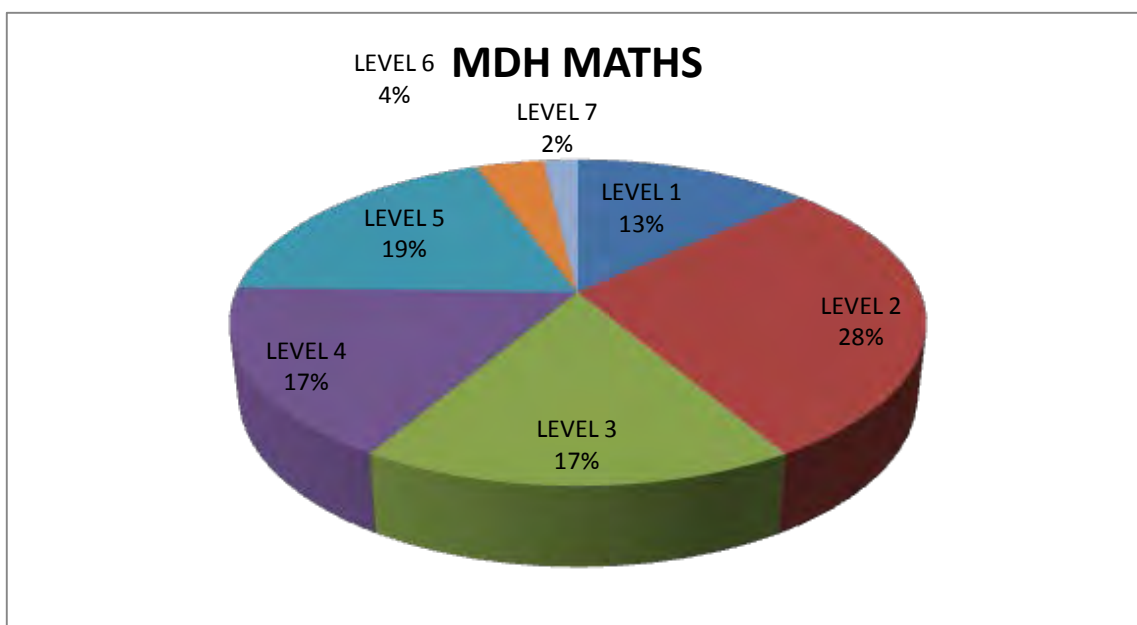


Figure 5.24

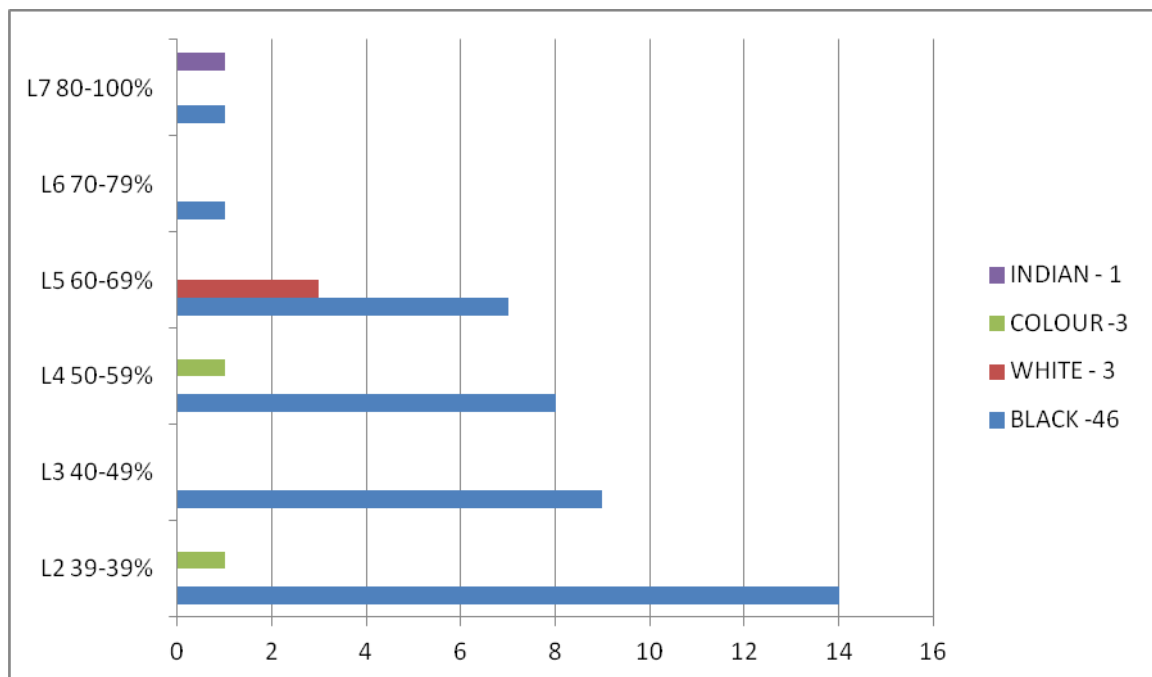


Figure 5.25

SUMMARY ANALYSIS:

Of the 53 learners that wrote mathematics at School MDH, 13% (7) of learners failed it; 6 are Black and 1 Coloured. The majority, 28% (15 learners) achieved at Level 2 (30-39%); this is more or less the average performance of School MBH where there was an equal split between Level 2 and Level 3 achievement. There is a nice spread for Black learners between Level 3, 4 and 5. One Black male sits at Level 6 (70-79%); and another sits at Level 7 (80-100%). The only Indian does extremely well both at Language (70-79%) and mathematics (80-100%). The 3 White learners do very well in mathematics and achieve at Level 5 (60-69%). It seems clear that students who speak other languages at home must attain some proficiency in English if they are to benefit from mathematics instruction in that language. The student who comes from a home where English is the only language spoken will be familiar with many of the linguistic structures to be encountered in the mathematics classroom. One cannot make the same assumption for second-language learners (Morris, 1975).

5.2.5 SCHOOL MEH OVERALL PASS RATE 100%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MEH	Black	Female	ENGHL	78	78	0	0	3	15	34	22	
MEH	Coloured	Female	ENGHL	4	4	0	0	0	2	2	0	
MEH	Asian	Female	ENGHL	1	1	0	0	0	0	1	0	
MEH	White	Female	ENGHL	3	3	0	0	0	1	2	0	
MEH	Indian	Female	ENGLHL	1	1	0	0	0	0	0	0	
MEH	Black	Female	AFRFA	42	42	0	1	4	16	14	6	
MEH	Coloured	Female	AFRFA	4	4	0	0	0	0	1	3	
MEH	Asian	Female	AFRFA	1	1	0	0	0	0	0	0	
MEH	White	Female	AFRFA	3	3	0	1	2	0	0	0	
MEH	Indian	Female	AFRFA	1	1	0	0	0	0	0	0	
MEH	Black	Female	XHOFA	36	36	0	0	1	0	16	19	
MEH	Black	Female	MATH	42	39	3	6	6	12	14	1	
MEH	Indian	Female	MATH	1	1	0	0	0	0	0	0	

Figure 5.26

BACKGROUND SUMMARY:

MEH is a public school; very expensive and is only for girls; like School MDH the middle class do everything to get their children there. The school has maintained a 100% pass over the years and is also considered a 'high performance school'. The school works very hard to maintain the 100% impression by making sure that very few learners come from outside; there is a primary school attached to it and it feeds the High school. The school exercises academic sifting from Grade R through the intelligence interviews that are not allowed by the (SASA, 1996). Learners who do not speak English are not accepted; so parents start placing their young ones in English speaking pre-schools so that they have a better chance of acceptance at this sought after school. Like in School MDH, no Afrikaans is offered as Home Language, so Afrikaans learners take English as Home Language and Afrikaans as FAL.

PERFORMANCE IN ENGLISH HOME LANGUAGE SCHOOL MEH no=87

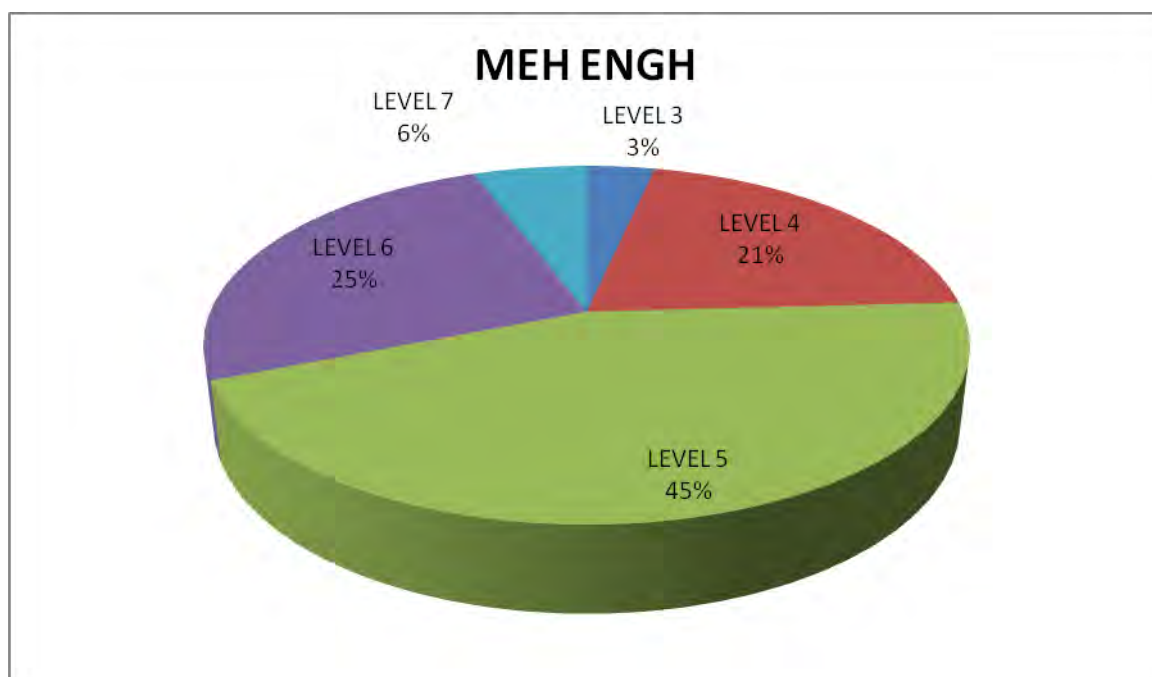


Figure 5.27

ENGLISH HOME LANGUAGE PERFORMANCE BY RACE SCHOOL MEH

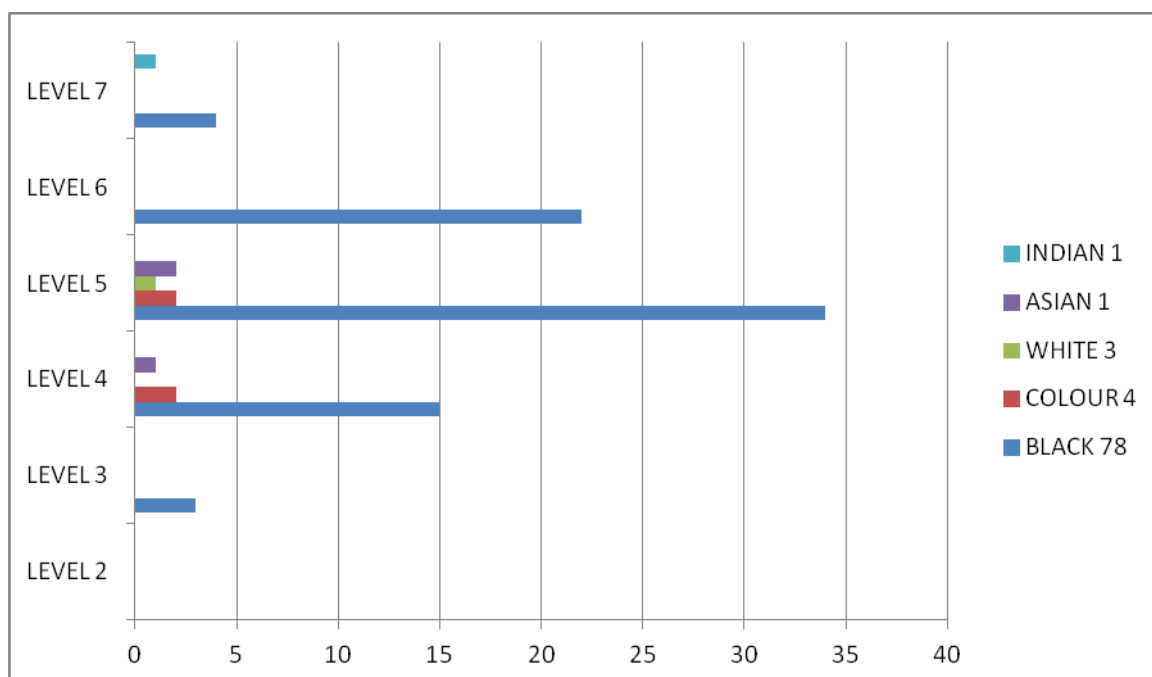


Figure 5.28

SUMMARY ANALYSIS:

The 87 students achieved a 100% in the English Home Language. The majority; 45% (39) of learners sit at Level 5 (60-69%) mostly Black; followed by 26% at Level 6 (70-79%); only Black learners and at Level 7; 4 Blacks get distinctions and the only Indian; also gets a distinction.

This performance is more impressive than the other sampled English Home Language groups. Does this performance in English Home Language suggest the variety in the roles language plays in mathematics instruction? Different linguistic activities serve different purposes when mathematical concepts and skills are being acquired. Students require considerable proficiency in both their first and second languages if they are to cope with the range of linguistic activities required for learning mathematics. This sterling performance in English as the language of instruction puts these students at an advantage over those who struggle with it. Coming from well resourced middle class homes helps these learners.

MEH AFRIKAANS FAL no=51

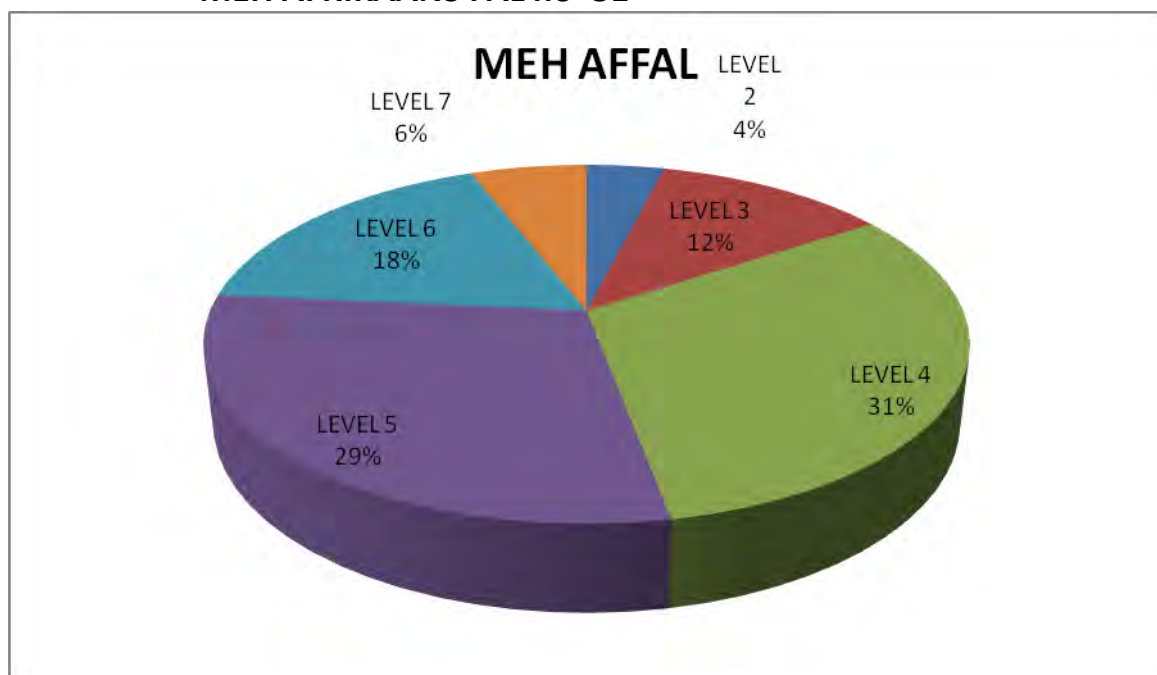


Figure 5.29

SUMMARY ANALYSIS:

Of the 78 Black learners at School MEH, 42 chose Afrikaans as their FAL; institutional arrangements including Higher Education; still place a high premium on the English-Afrikaans combination; African languages are a 'nice to have' skill but not really a requirement (Setati, 2006). The majority; 31% perform at Level 4; followed closely by 28% of learners at Level 5, and 18% at Level 6. 6% of learners achieve Level 7 (80-100%) while 4% of learners sit at the moderate achievement Level 2 (30-39%). This performance is one level lower than the Home Language performance. This group of learners has majority isiXhosa learners; it will be interesting to compare this performance with that of the learners who chose isiXhosa as FAL. This is a racially mixed sample, and all the other racial groups take the

Afrikaans English combination. It is interesting how only Black learners make the cross over from the obvious choice of isiXhosa FAL to do Afrikaans FAL; the reasons for that have been mentioned in this analysis that the linguistic market demands this combination and is a direct result of the 50-50 rule of 1925. The new Constitution (1996) and the Language in Education Policy (1997), places a high premium on multilingualism, but practice both at school and at Higher Education Institutions is largely unchanged. The students interviewed felt that isiXhosa FAL was not a choice for them as they were worried about university; they would rather struggle with Afrikaans to ensure access to HEIs and job security after school.

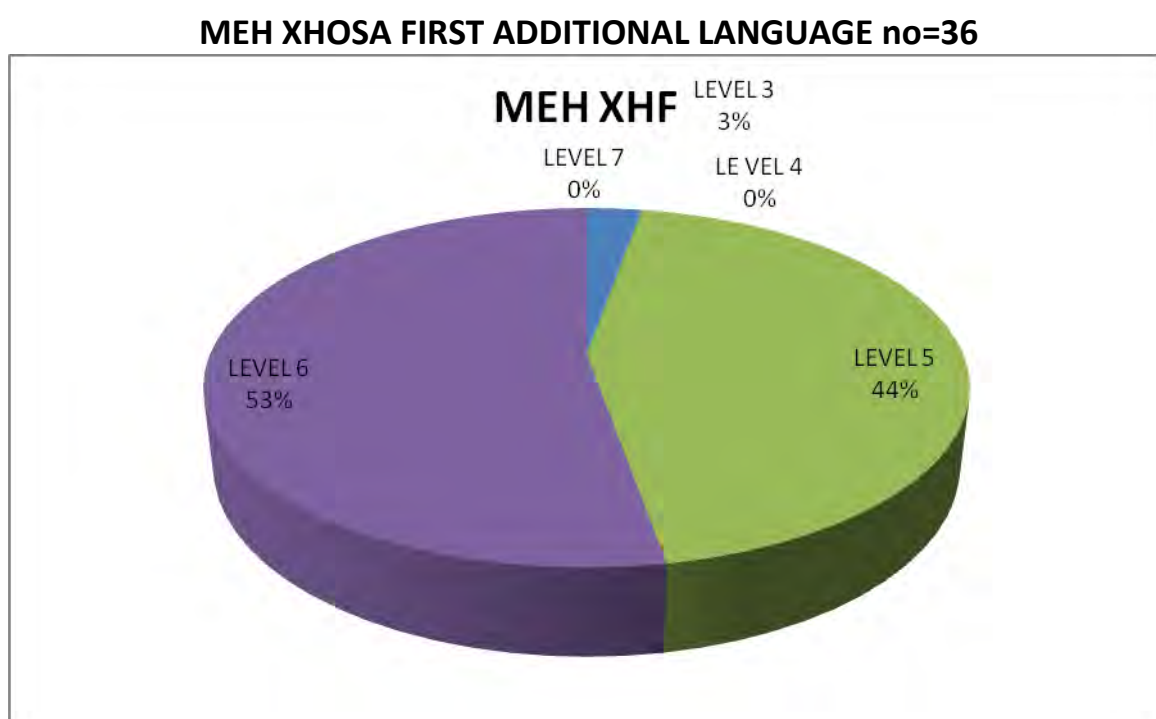


Figure 5.30

SUMMARY ANALYSIS:

Of the 78 Black learners, 36 chose isiXhosa FAL; the majority, 53% achieve at Level 6 (70-79%); followed by 44% at Level 5. The learners are concentrated at Level 6 with one learner at Level 3. There are no learners at Level 2 and no learners on Level 7. These learners are two levels ahead of the isiXhosa learners who chose to study Afrikaans as FAL; this performance demonstrates that given the opportunity, learners can achieve better in their mother tongue. This also points to the fact that mother tongue speakers of isiXhosa do not need to be offered the mother tongue at FAL level. In 2011; the school has since upgraded isiXhosa to Home language level; as a subject. It therefore means that currently; both

isiXhosa and English are done at a Home Language level. This language upgrade offers similar advantages to the one in School MDH where learner chances of success are increased because of two Home Languages.

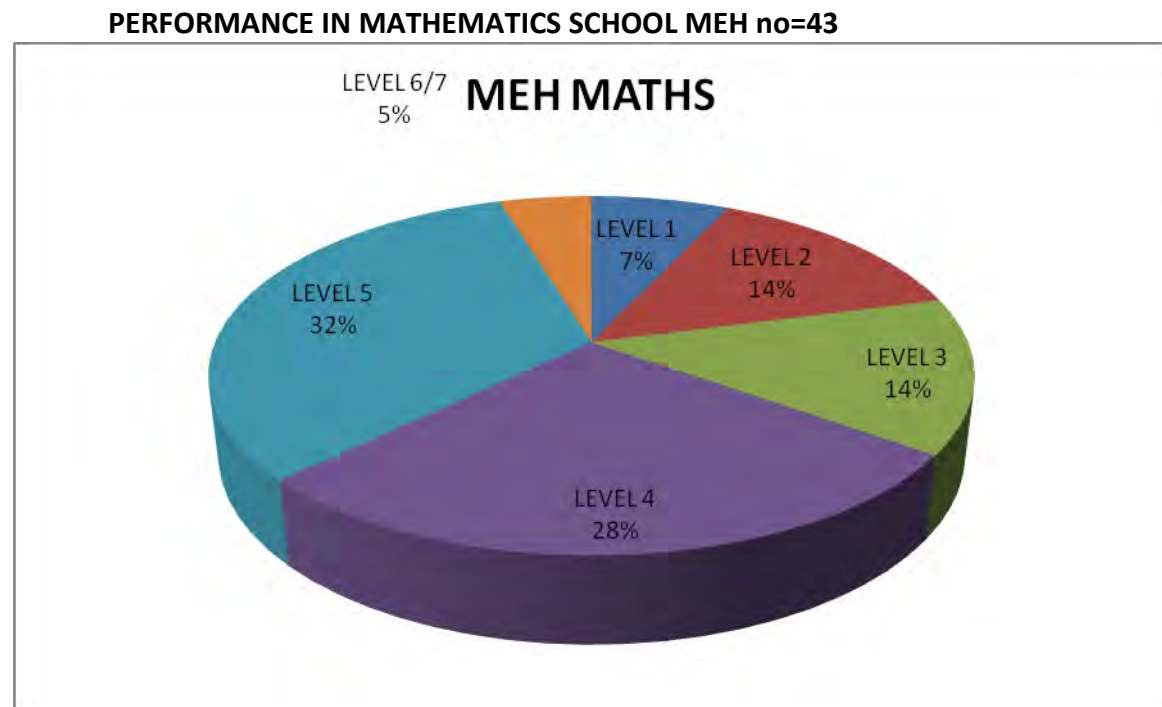


Figure 5.31

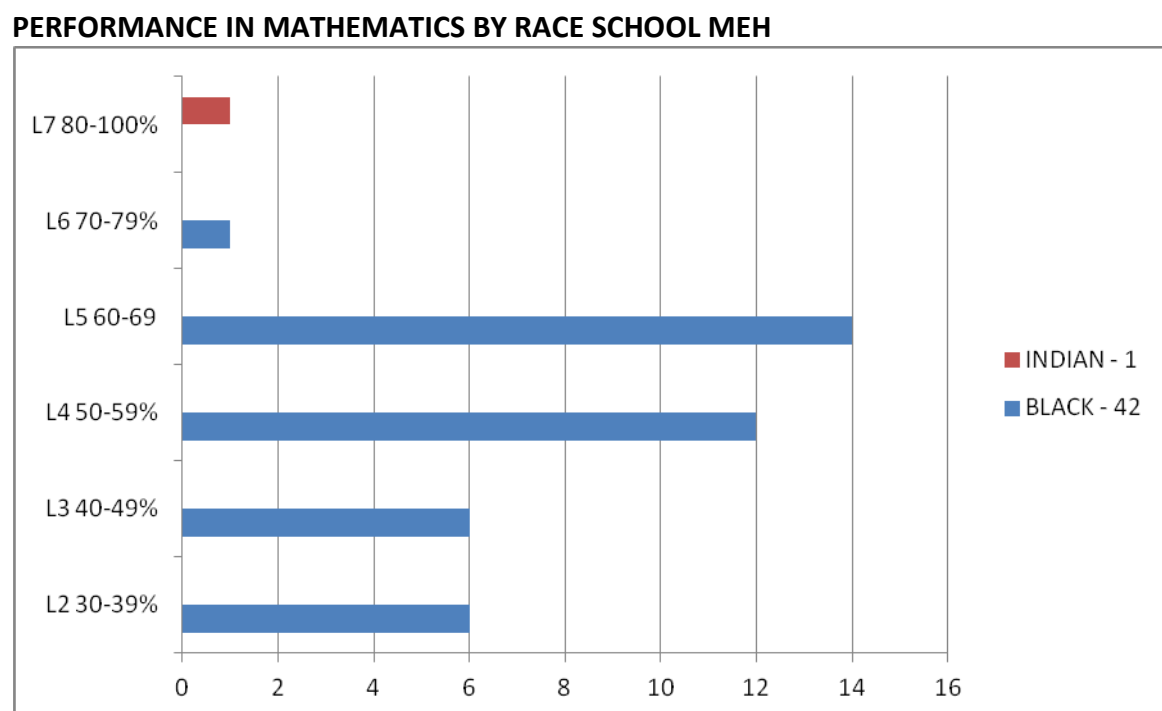


Figure 5.32

SUMMARY ANALYSIS:

Of the 87 Grade 12 learners at School MEH; only 43 students registered for pure mathematics; the split between mathematical literacy and pure mathematics is half-half. No White or Coloured learners register for pure mathematics. Of the 72 Black students at School MEH, 42 students registered for pure mathematics and the only Indian; also registers for mathematics. There are 3 failures (7%) out of the 42 Blacks who registered for pure mathematics. The average performance of these learners (32%) in mathematics is at Level 5; followed by Level 6 (25% of learners) and another big group 21% sits at Level 4: A remarkable achievement by these girls.

The relationship between language factors and mathematics achievement is not clearly understood, although it is obviously reasonable to assume that a mastery of mathematical concepts presupposes some facility with the language used to express, characterize, and apply those concepts (Cuevas, 1984). As far back as 1912, Thorndike noted, as discussed in chapter 2, that the measurement of ability in arithmetic is actually a measurement of two different things: sheer mathematical insight and knowledge, on the one hand; and acquaintance with language, on the other. Researchers have found high positive correlations between mathematics achievement and reading ability. The ability to read mathematics in a second language is obviously influenced by a variety of language skills (Cuevas, 1984). To explain the high performance of these girls in mathematics might be found in a Cossio (1978) study; which found a positive correlation between mathematics achievement and second-language ability. Black learners did extremely well in English Home Language; enabling them to do well in mathematics. Middle class parents can afford books; supplementary educational material and the necessary exposure to English outside of the classroom that poor learners do not have. Parents report that as professionals they are better able to compensate where the school falls short moving between the two languages.

Parents at school MEH have also reported that they pay extra for mathematics tutoring. What Black learners have as summer; winter and spring school incubation in the poor communities by sleeping at the school; these middle class Black learners have extra tuition offered throughout the year. It is interesting that the same Black lady who offers extra classes to boarding students at the school; offers the same classes to learners from other

schools on weekends. She reported that she gives them examples in isiXhosa and then transfers the knowledge back to English quite often. The interesting part for this research in this practice is that, teachers at School MFH might not practice code-switching/mixing in the classroom to teach mathematics; parents and the extra help find it useful to facilitate concept transfer – so the need to use the mother tongue in scaffolding mathematics is not confined to learners in poor schools only; it is a general natural need that should be acknowledged in multilingual mathematics classrooms.

5.2.6 SCHOOL MFH 2010 PASS RATE: 93. 3%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MFH	Black	Female	ENGFA	68	68	0	1	19	34	14	0	0
MFH	Black	Male	ENGFA	39	39	0	1	15	14	8	1	0
MFH	Black	Female	XHOHL	42	42	0	0	0	2	21	19	0
MFH	Black	Male	XHOHL	24	24	0	0	0	2	17	5	0
MFH	Black	Female	SESHL	26	26	0	0	0	0	1	10	15
MFH	BLACK	Male	SESHL	15	15	0	0	0	1	2	6	6
MFH	BLACK	Female	MATHS	77	70	7	26	25	8	8	3	0
MFH	Black	Male	MATHS	42	31	11	12	8	4	1	2	4

Figure 5.33

BACKGROUND SUMMARY:

School MFH was formerly a mission school privately run by the Catholic Church in the past; in the middle of a rural area. Cut from the influence of town life and the buzz of the township, the school has a track record of excellence. During apartheid years parents from other provinces would send their children to this school to hide away from the police or from the disturbed state of affairs in black schooling. Over three years the school had a big group of 120 in 2008, achieving 90%; in 2009 the number dropped to 91 learners and also took a knock with 85.7%. In 2010 it regained strength with a larger group of students of 108 and a superb achievement of 93.3% gaining 7.6%. Below is an examination of the quality of this quantitative achievement; it would be interesting to see whether this sterling performance can be sustained in the Home Language, in the Language of Learning and Teaching (LoLT) and in Mathematics.

PERFORMANCE IN ISIXHOSA HOME LANGUAGE SCHOOL MFH no=66

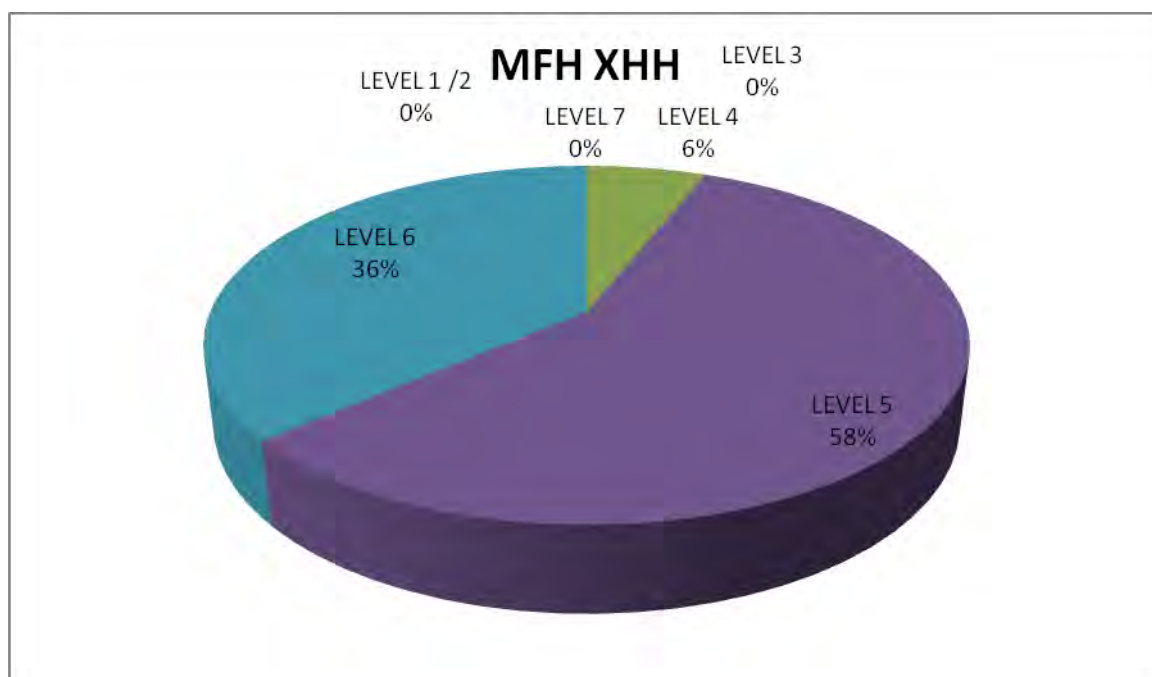


Figure 5.34

The isiXhosa Home Language group at school MFH achieved a 100% pass; with the majority (58%) of learners sitting at Level 5 (60-69%). The next big group (36%) has achieved even better at Level 6 (70-79%) and there are no distinctions. A minority (6%) sits at Level 4 (50-58%) and this is the lowest achievement for this language group in the Home language.

PERFORMANCE IN SESOTHO HOME LANGUAGE SCHOOL MFH no=41

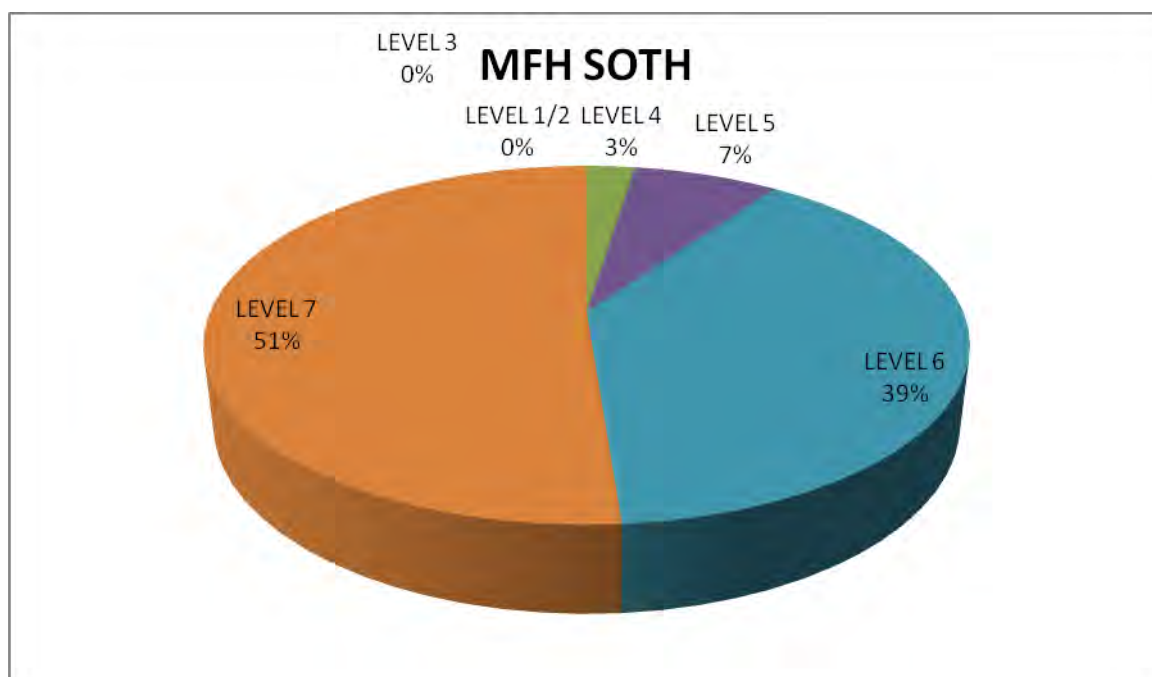


Figure 5.35

SUMMARY ANALYSIS:

Sesotho Home Language learners are in the minority at the school while the area is a predominantly Sesotho speech community. Learners start school completely bilingual in Sesotho-isiXhosa, and it is a marvel to observe teaching in the Foundation Phase (Grade 1-3); where the teachers are completely bilingual and move between the two languages with ease to teach Literacy, Numeracy and Life Skills. Challenges begin in the Intermediate Phase where teachers disregard this bilingualism and concentrate on subject teaching in English.

This group outperforms all the sampled groups in Home Language with the majority (51%) performing on Level 7 – with 21 distinctions. The next big group (39%) sit at Level 6 (70-79%) also a phenomenal achievement with a minority of learners (3) sitting at Level 5 and one learner at Level 4. This group also outperforms the isiXhosa home language group in the same school. The passion and experience of the teacher was highlighted by all in the school.

ENGLISH FAL PERFORMANCE SCHOOL MFH no=107

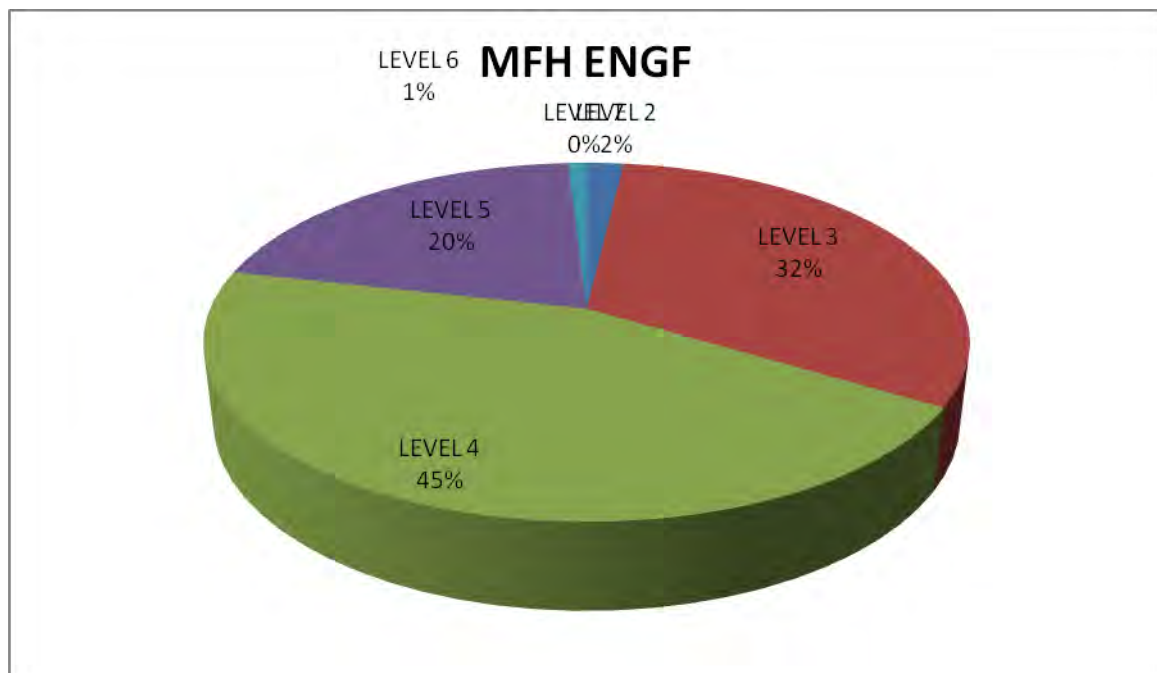


Figure 5.36

SUMMARY ANALYSIS:

This group achieved a 100% pass rate, with a concentration around Level 3 to Level 5. The majority of learners (45%) sit at Level 4; although this performance is above 50% and not

bad at all; it is still much lower than the performance of these learners in their home languages (Sesotho – average Level 7 and isiXhosa average was Level 5. One can safely articulate that this is a downgrade when compared to the home language performance. The next large group (32%) sits at Level 3 while another big one (20%) performed at Level 5. The most concerning fact is that learners like these at school MFH, as can be expected in rural South Africa have limited opportunities and exposure to English outside of the classroom; while they are expected to learn mathematics in it. It is ironic that while they would excel in their home language, this language competence would not be used as a language of teaching and learning for any content subjects, including mathematics. Once again, one can almost predict that this performance in English presupposes performance in mathematics.

PERFORMANCE IN MATHEMATICS SCHOOL MFH no=119

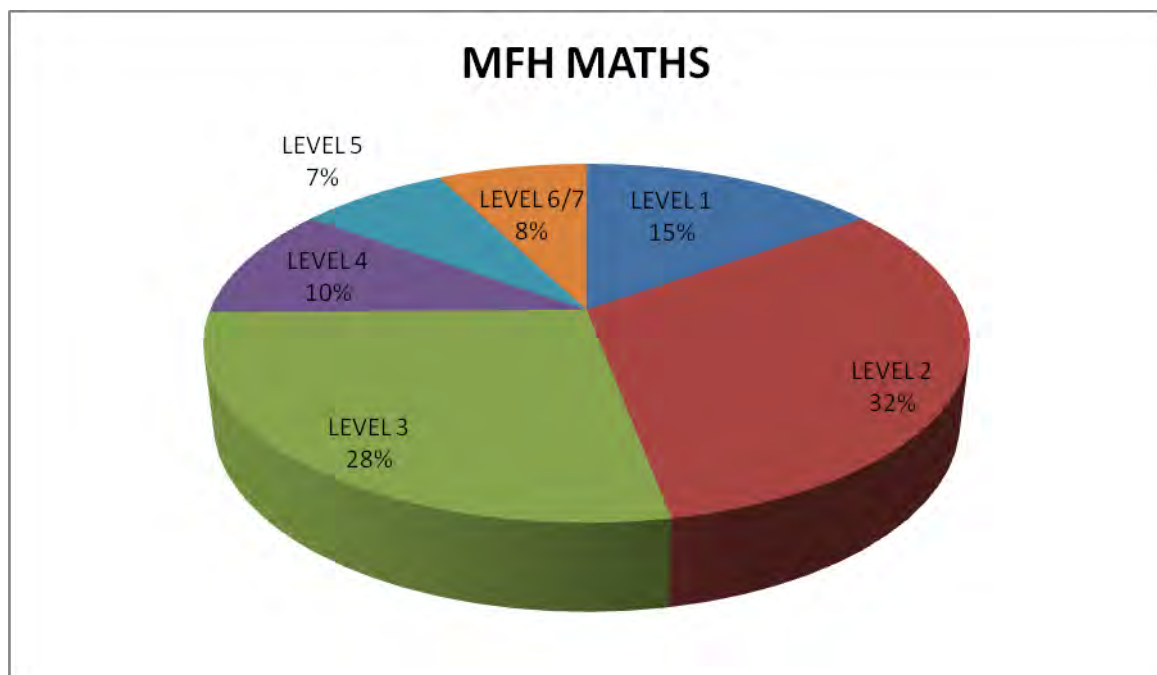


Figure 5.37

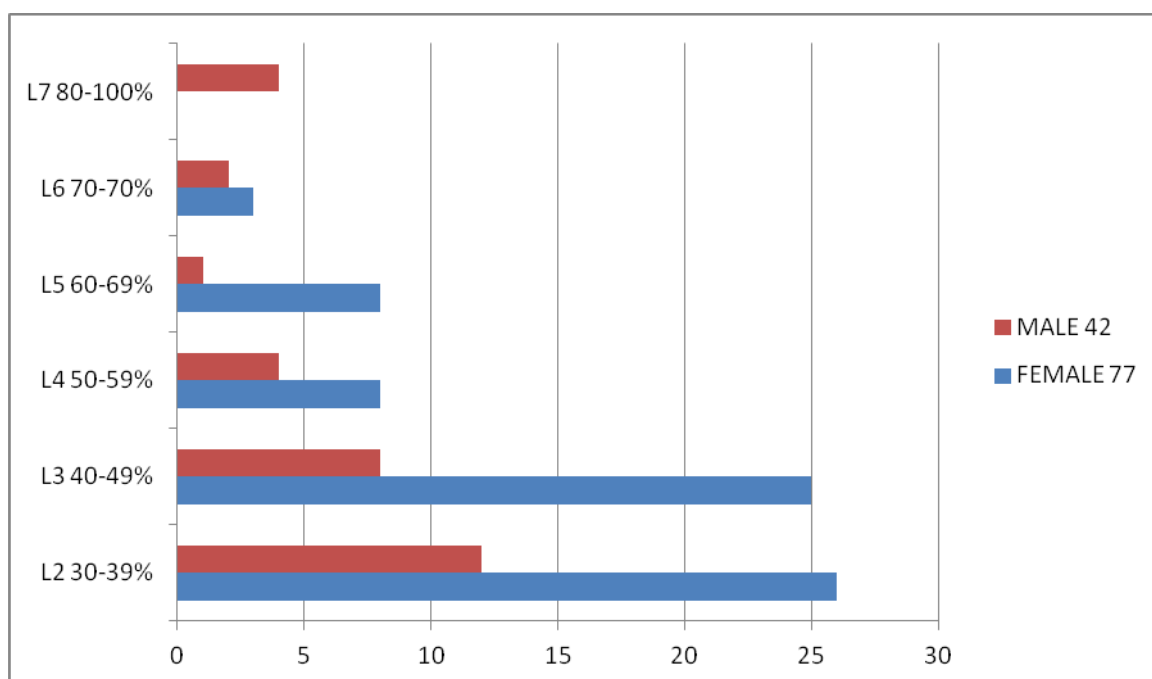


Figure 5.38

SUMMARY ANALYSIS:

The bigger number of mathematics candidates is larger than full time candidates because of learners who failed mathematics in the previous year and return to re-write it. 15% of learners fail the exam; the majority (32%) perform at Level 2 (30-39%). Although the school achieved an impressive overall pass rate of 93% in 2010; of the 119 learners who registered for mathematics; only 30 manage a Bachelor degree level (Level 4 and above) to mathematics related courses. 33 learners manage a Diploma Level 3 (40-49%); while 30 will be accepted to study towards a Certificate at Level 2 (30-39%). There are more females than males in this sample; with male learners performing at higher levels than female learners.

5.2.7 SCHOOL MGH 2010 PASS RATE: 73.9%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MGH	Black	Female	ENGFA	25	25	0	11	9	4	1	0	0
MGH	Black	Male	ENGFA	21	21	0	8	9	3	1	0	0
MGH	Black	Female	XHOHL	5	5	0	0	0	0	5	0	0
MGH	Black	Male	XHOHL	3	3	0	0	0	2	1	0	0
MGH	Black	Female	SESHL	20	20	0	0	1	6	8	3	2
MGH	BLACK	Male	SESHL	18	18	0	0	0	5	9	4	0
MGH	BLACK	Female	MATHS	11	11	6	2	1	2	0	0	0
MGH	Black	Male	MATHS	12	9	3	3	4	0	1	1	0

Figure 5.39

BACKGROUND SUMMARY:

School MGH is located in a deep rural predominantly Sesotho community; with a large number of amaXhosa in their midst. Learners start school completely bilingual with Sesotho-Xhosa. Opportunities to hear English outside of the classroom are very rare; the English teacher therefore becomes the only source for acquisition and role modeling the language. There is no electricity; therefore television is battery or generator operated for a few middle class families. The school has recently introduced incubation for Grade 12 learners. In 2010 the school gained 73.9% with the dramatic reduction in numbers (150 in 2008 to 46 in 2010); gaining 36.3% the biggest increase in the sample. The analysis will inform on the quality of this phenomenal gain.

PERFORMANCE IN ISIXHOSA HOME LANGUAGE GROUP no=8

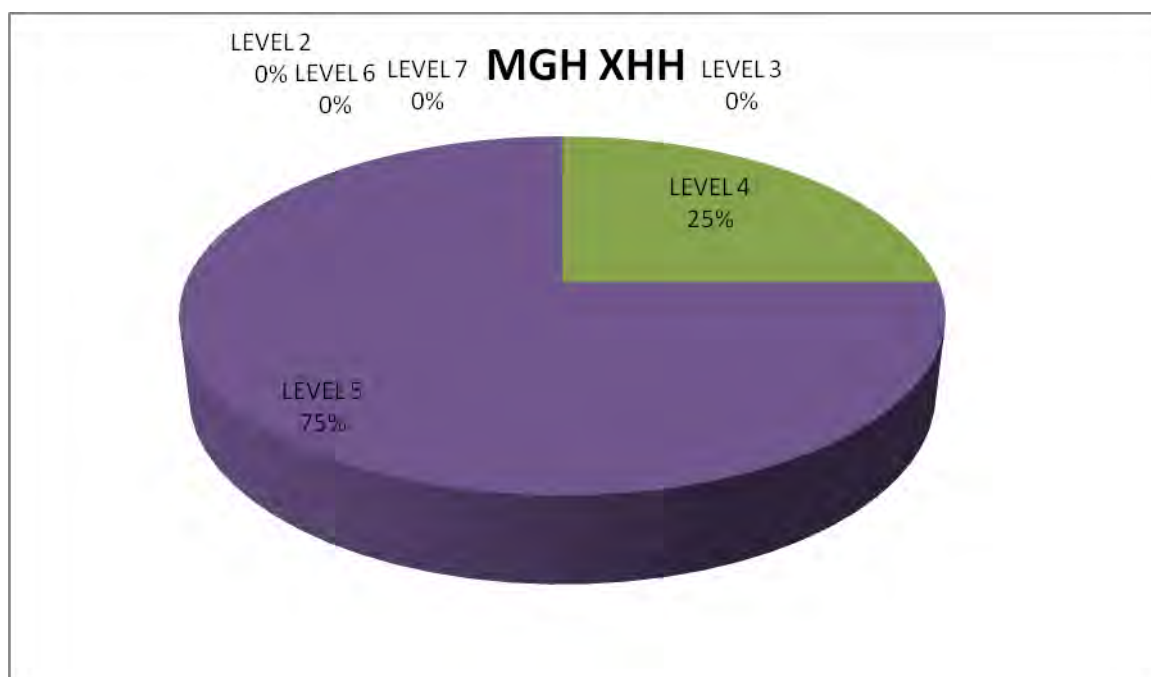


Figure 5.40

SUMMARY ANALYSIS:

This is the smallest isiXhosa home language group in the whole sample. The majority (75%) perform at Level 5 (60-69%) with a minority (25%) a level down at Level 4. There are no failures; and no distinctions. A level 5 is a good passing level and will make a significant contribution towards the total score for Grade 12 students. In comparison with the Sesotho Group in the same school; the Sesotho language group has outperformed this group. One

would assume that a small class size ensures maximal individual attention and therefore sterling results compared to a bigger group. A pattern has emerged in the sampled isiXhosa groups with Level 5 seeming to be the average performance of the majority of students. It might be linked to claims of the high level of difficulty that the paper was reported to be. There were a number of complaints from schools that the paper was too steeped in archaic grammar and too much was expected of students at Grade 12 level. Verification of this claim was not important for this research.

PERFORMANCE IN SESOTHO HOME LANGUAGE no=38

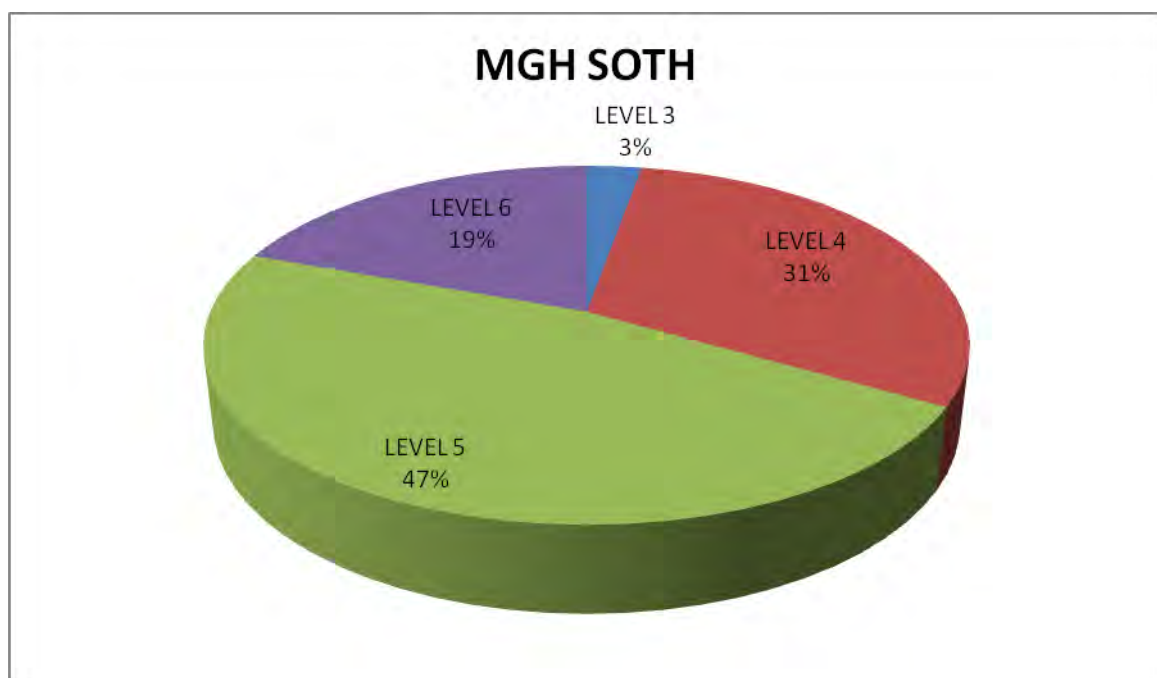


Figure 5.41

SUMMARY ANALYSIS:

In this group there are 30 more learners compared to the isiXhosa language group. This group of students has achieved a 100% pass and has a spread concentrated across Level 4, 5 and 6. Like in the isiXhosa group the majority (47%) perform at Level 5; the next group (31%) at Level 4 and upgrade with 19% on Level 6; an improvement from the isiXhosa group and a bonus with 3% of students achieving distinctions. There is a notable remarkable performance of the Sesotho learners in this study which must be commended. The Sesotho speech community is a relatively small in terms of numbers in the Eastern Cape, so support for the language is below expectation from the Department and materials. Similar to the

way minority languages are treated and experience hegemony from dominant majority language groups; it is the same for Sesotho in the Eastern Cape. For these learners to achieve remarkable results is noteworthy.

PERFORMANCE IN ENGLISH FIRST ADDITIONAL LANGUAGE no=46

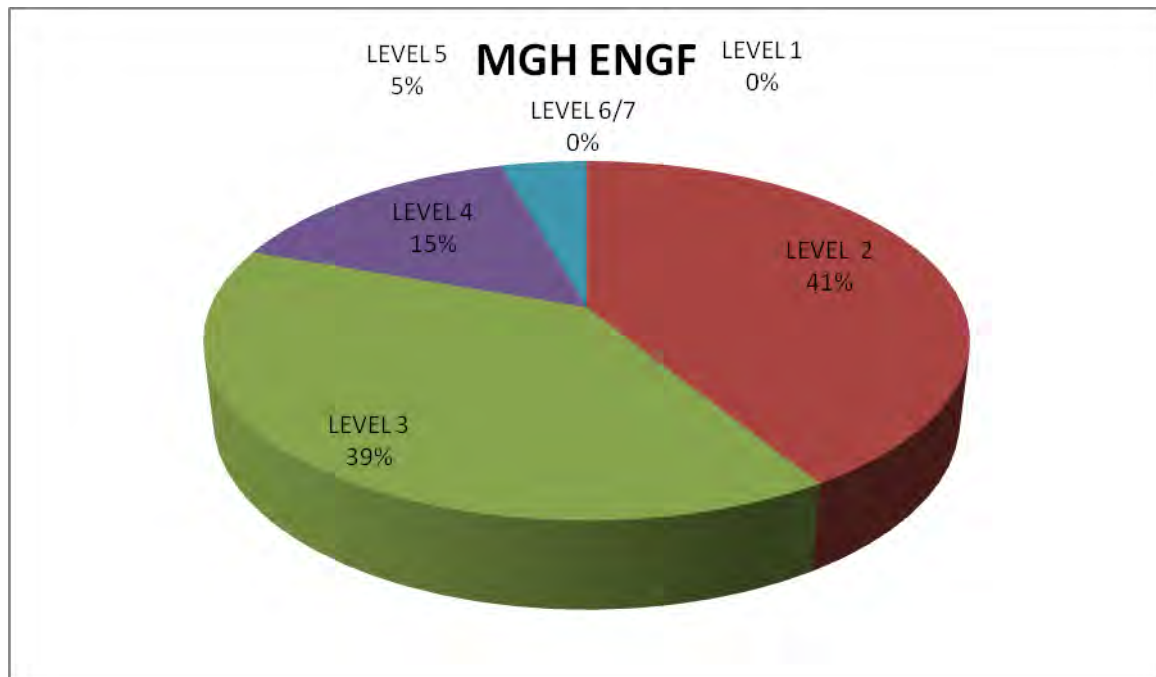


Figure 5.42

SUMMARY ANALYSIS:

All learners have passed achieving a 100% pass rate; the crucial question is the quality of this 100% pass, in a language they are supposed to learn mathematics and all other content subjects in. The majority, 41% of learners have achieved the minimum 30-39% (Level 2). It literally means that their access to a Bachelor degree is limited. 39% have achieved a Level 3, which is also low but adequate for a Diploma pass. Only 2 learners out of 46 attained the 50-59% level 5 that is required to do degree courses post-Matric.

The disadvantage of being poor and rural is demonstrated in this scenario. Learners are not exposed to English outside of the classroom; there is no electricity for them to watch television; an instrument where most learners learn the language outside of the classroom. At this point in the research it is safe to assume that a low achievement in English as LoLT

presupposes a low achievement in mathematics; any deviation from this assumption would be a miracle for these learners.

PERFORMANCE IN MATHEMATICS SCHOOL MGH no=23

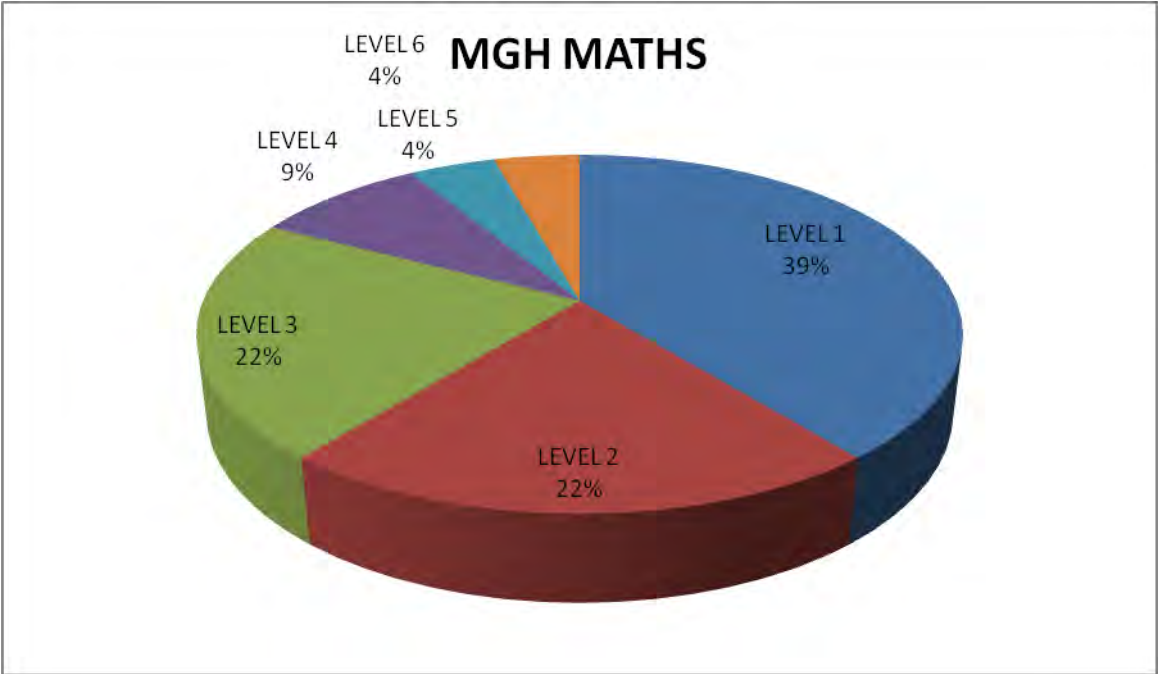


Figure 5.43

SCHOOL MGH MATHEMATICS PERFORMANCE BY GENDER

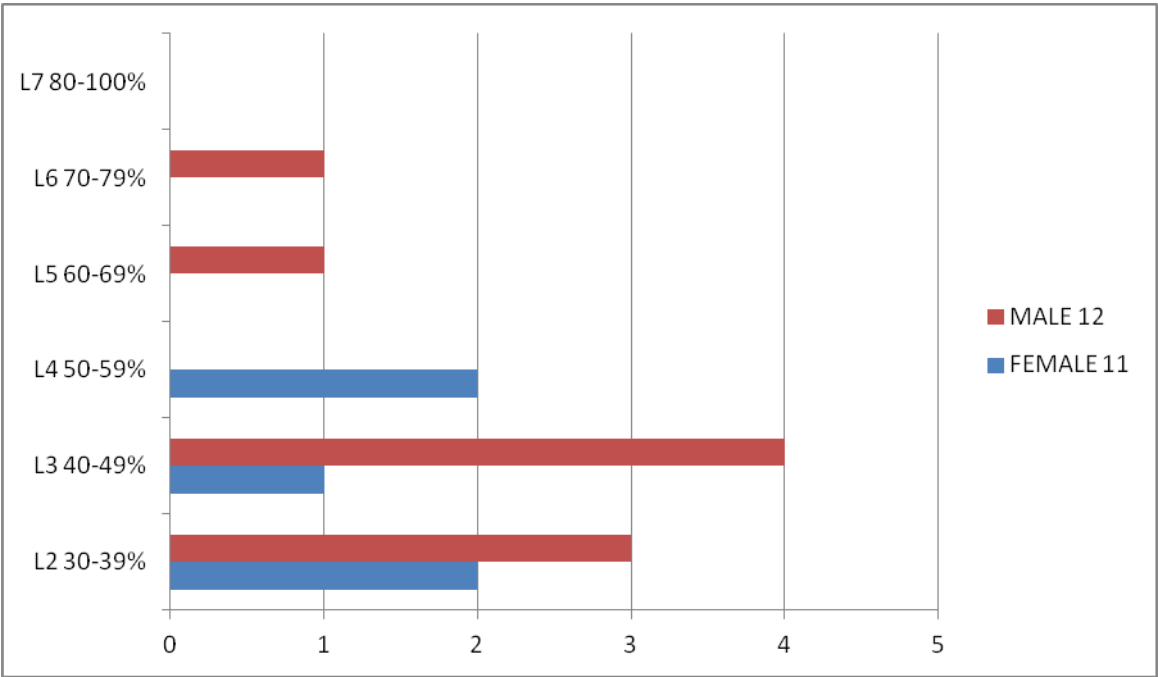


Figure 5.44

SUMMARY ANALYSIS:

Exactly half of the 46 learners registered for mathematics. The majority, 39% failed mathematics. There is an equal split between Level 2 and 3 with 22% of learners on each level. 4% learners sit at Level 4 and one each sit at Level 5 and 6. There is a severe shortage of teachers who are qualified to teach mathematics, so schools are desperate to get any teacher who can teach mathematics. There is a qualified mathematics teacher at the school who is a foreign national. Learners indicated that they struggle to get through the mathematics terminology with his heavily accented English as a result it takes double the time to move onto new concepts. Adler (1998) puts a high premium on the 'more experienced other' as the teacher; to achieve the intended outcome for the learner of mathematical excellence; this excellence includes the ability to talk within, and about mathematics (Adler, 1998). If learners are unable to move beyond the basic level of understanding the teacher's language; moving towards understanding mathematical talk and register will be severely hindered. Without being misunderstood as xenophobic or even racist; I am not supportive of the practice that has been on the increase in schools as a result of the shortage of mathematics teachers; of taking the first available foreign national to teach mathematics. Teaching qualifications are not considered and a check on whether learners will cope with heavy accents is not done. When learners fail; other teachers, parents and learners complain leading to vicious xenophobic attacks and clashes. Learners should always come first when any teacher is employed.

5.2.8 SCHOOL MHH 2010 70.8%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MHH	Black	Female	ENGFA	84	83	1	14	39	18	11	0	0
MHH	Black	Male	ENGFA	76	74	2	20	34	17	2	1	0
MHH	Black	Male	ENGHL	1	1	0	1	0	0	0	0	0
MHH	Black	Female	XHOHL	39	39	0	0	0	2	21	16	0
MHH	Black	Male	XHOHL	39	39	0	0	0	6	25	8	0
MHH	Black	Female	SESHL	45	45	0	0	0	1	8	28	8
MHH	BLACK	Male	SESHL	37	37	0	0	0	1	25	11	0
MHH	BLACK	Female	MATHS	85	31	54	17	8	2	3	1	0
MHH	Black	Male	MATHS	78	46	32	24	7	5	5	4	1

Figure 5.45

BACKGROUND SUMMARY:

School MHH like MFH and MGH is in a bilingual Sesotho-isiXhosa area, in a far flung outlying rural area. With the increase in learner numbers over three years it has subsequently increased its pass rate; 58.1 -2008, 62.8 – 2009 and there was 8.0% gain in 2010 with 70.8%. This school has a similar background to that of the other Sesotho-isiXhosa bilingual schools.

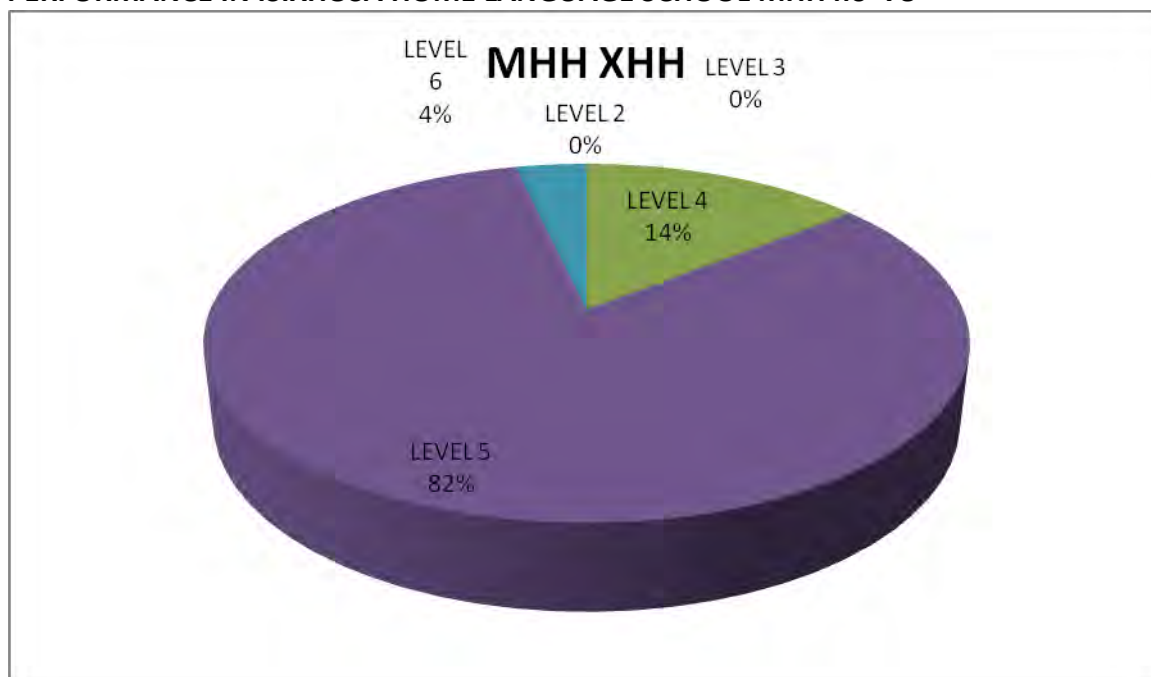
PERFORMANCE IN ISIXHOSA HOME LANGUAGE SCHOOL MHH no=78

Figure 5.46

SUMMARY ANALYSIS:

A 100% pass rate was achieved with no Level 2, 3 and 7s. The majority of learners (82%) performed at Level 5, followed by another significant group (14%) in Level 6 and a minority in Level 4 (4%). There is unusually an equal number of females and males with girls outperforming the boys. An interesting claim made by both parents and learners in this school is that for the primary phase of their lives being in a Sesotho or isiXhosa class is not an issue as they might spend some years in either class depending on the availability of teachers and whether the school nearby offers the other language or not. It is in high school when they really start thinking about their identity and go through traditional rites of passage that they make a particular language choice. When questioned about the criteria for the choice; the majority responded that usually they choose the main language according to their ethnic background; because boys would soon undergo traditional

initiation with their family customs spoken in the language of the family. The differences and sometimes similarities in culture and tradition start to pronounce and affirm identities. It is therefore phenomenal that they can still perform at more or less the same level and sometimes even better than those learners who grow up with one home language.

SCHOOL MHH: SESOTHO HOME LANGUAGE: TOTAL No of Learners: 82

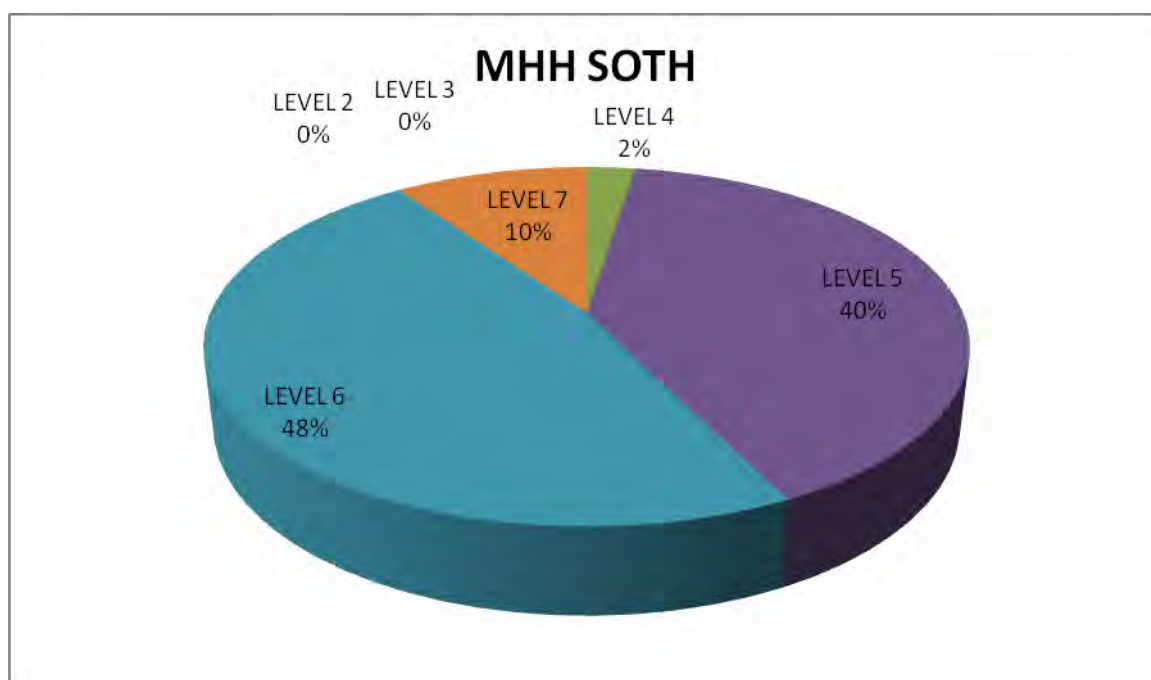


Figure 5.47

SUMMARY ANALYSIS:

This group also achieved a 100% pass rate with remarkable achievement levels that are much higher than the isiXhosa group in the same school. The majority (48%) performed at Level 6 (70-79%); the next group (40%) performed at Level 5 and the following one (10%) received distinctions. The lowest performance is at Level 4; a level that these learners struggle to get for English FAL and mathematics.

PERFORMANCE IN ENGLISH HOME LANGUAGE no=1:

1 Learner takes English as Home Language; he performs at the low Level 2; a dismal performance. This learner is a foreign national; the school does not have the appropriate skills and materials to support English Home Language learning. The registration of one learner as English Home Language in an environment where hardly anyone speaks the

language is problematic. With the increase of foreign nationals in South Africa, the challenge of providing these children other languages as Home Language is becoming an issue that schools are unable to solve; assimilation becomes the only option and language loss eventually happens. A common trend in township primary schools is to offer foreign learners the local language; by the time they reach High School they know the local language well. The DoBE has not addressed the issue of language for foreigners.

ENGLISH FAL PERFORMANCE SCHOOL MHH no=160

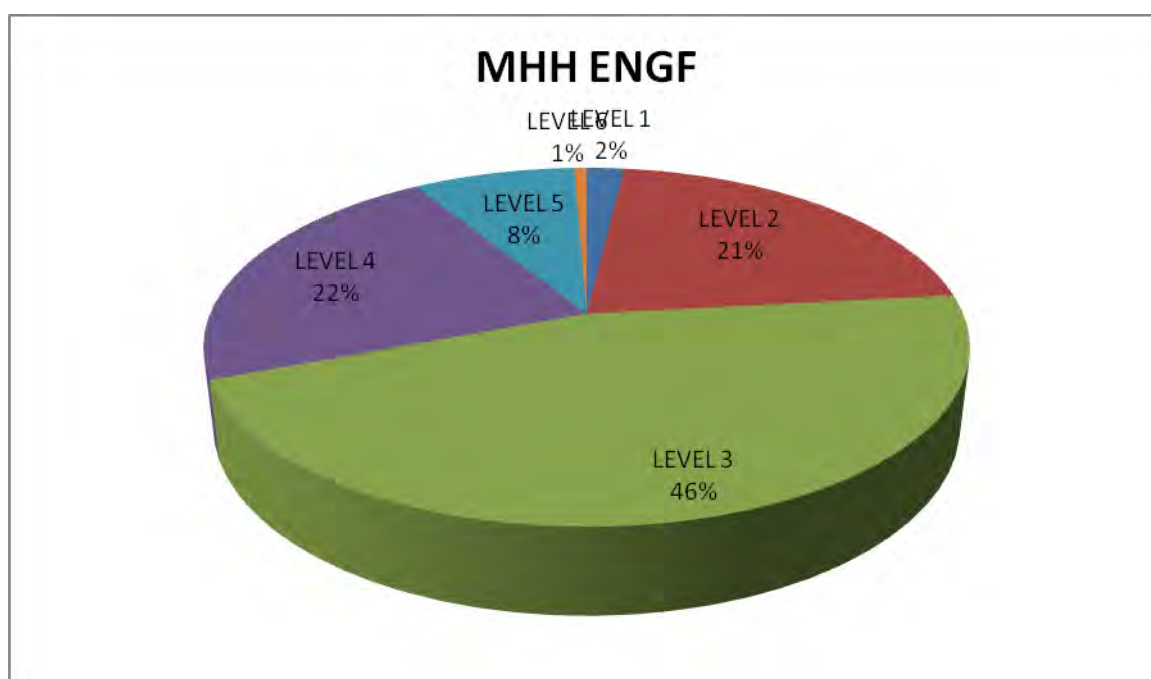


Figure 5.48

SUMMARY ANALYSIS:

2% of learners fail the exam; while the majority (46%) performed at Level 3 (40-49%). Two big groups 22% and 23% perform at Level 4 and Level 2 respectively. 13% of learners perform at Level 5; and only one learner out of 160 learners sits at Level 6. When one compares this performance in English FAL to the performance in home language; this performance is a downgrade. There are no failures in home language and the lowest performance is Level 5 for Sesotho and Level 4 for isiXhosa. If the majority performs at the moderate Level 3; then one wonders how much understanding actually happens in the mathematics classroom. It is therefore not unreasonable to predict low performance in mathematics for school MHH; like in the other African language schools.

PERFORMANCE IN MATHEMATICS SCHOOL MHH no=163

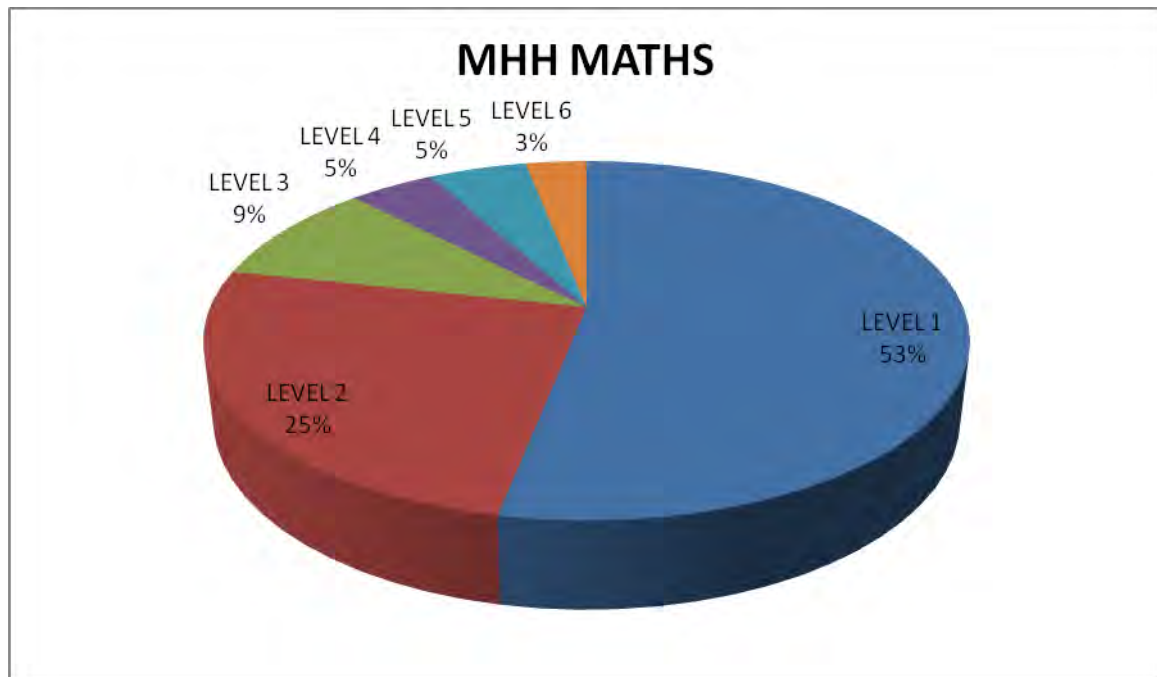


Figure 5.49

PERFORMANCE IN MATHEMATICS BY GENDER

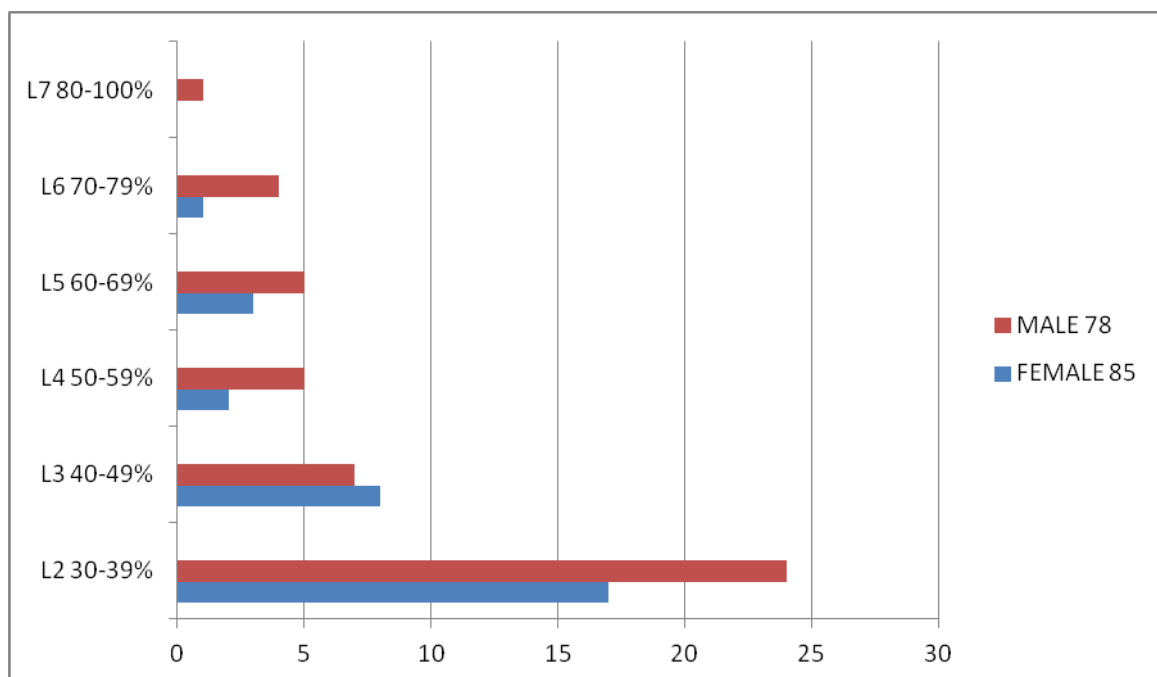


Figure 5.50

SUMMARY ANALYSIS:

The school does not offer mathematical literacy to its learner; all of them must take up pure mathematics. This is done in an effort to increase opportunities of Bachelor passes and entry into courses at HEIs that demand a Grade 12 pass in mathematics. Unfortunately, the majority (53%) fails the exam; this number is more than half the number of learners. The next big group (25%) achieved at the elementary Level 2. 9% are Level 3; 6% are at Level 5 and 5% at Level 4. Amidst this sad story, there is a glimmer of success with one distinction. These results bear testimony to the fact that low proficiency in the language of teaching mathematics limits excellence in mathematics. The increase in pass rate made by the school in 2010 did not translate into quality passes in mathematics and the language of instruction.

5.2.9 SCHOOL MIH 78.3%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0- 29%	30- 39%	40- 49%	50- 59%	60- 69%	70- 79%	80- 100%
MIH	Black	Female	ENGFA	58	57	1	14	27	10	4	2	0
MIH	Black	Male	ENGFA	49	48	1	8	25	12	3	0	0
MIH	Black	Female	XHOHL	33	33	0	0	0	6	20	7	0
MIH	Black	Male	XHOHL	32	32	0	0	1	7	19	5	0
MIH	Black	Female	SESHL	25	25	0	0	0	6	10	7	2
MIH	BLACK	Male	SESHL	17	17	0	0	0	3	12	2	0
MIH	BLACK	Female	MATHS	20	13	7	5	4	3	1	0	0
MIH	Black	Male	MATHS	18	13	5	7	3	2	0	1	0

Figure 5.51

BACKGROUND SUMMARY:

School MIH was a missionary school and is located in a semi-rural area where amaXhosa are in the majority and Basotho also form a significant group. It has a reputation of a 'good' school and is better resourced than other rural schools sampled. Teachers are better able to attend workshops as the proximity between the school and the district office is shorter. Compared to other rural schools, there is a fair amount of teaching and learning facilities. Over 4 years the school gained: 2008 – 56.3, 2009 – 76.8, 2010 – 78.3 and in 2011 there was a slide to 66.0. It is a downslide that the Department needs to address; schools that cross the 70% pass rate are left to manage on their own, while the focus is on underperforming schools. Learners and parents speak highly about the culture of teaching and learning.

PERFORMANCE IN ISIXHOSA HOME LANGUAGE no=65

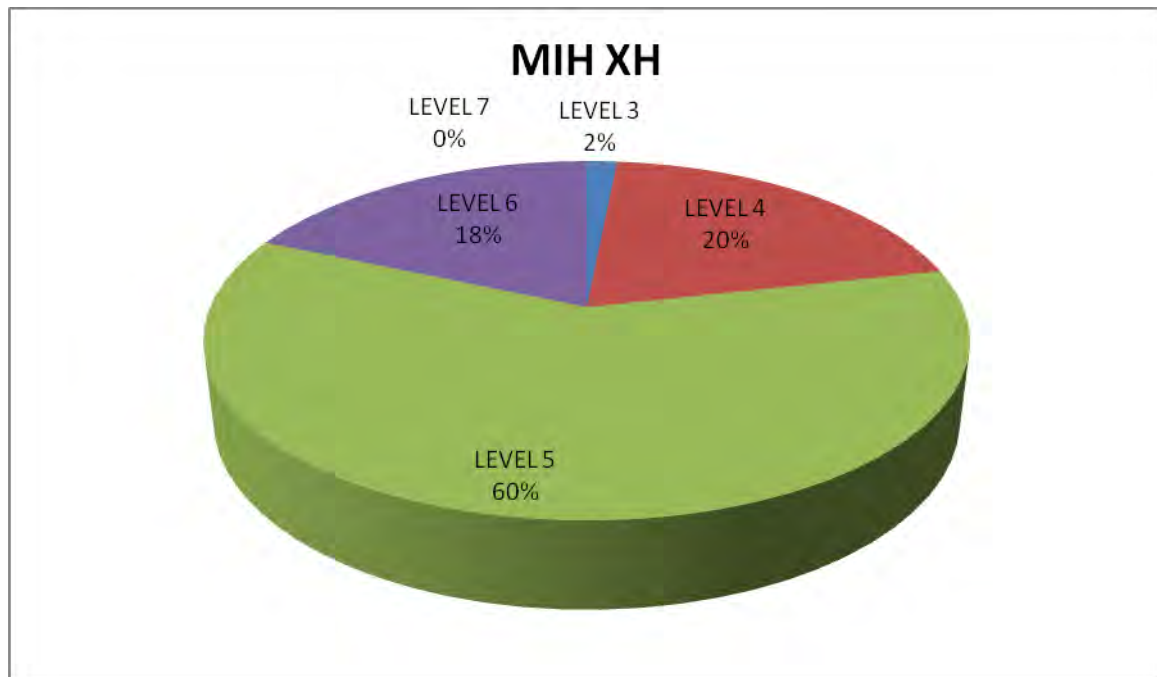


Figure 5.52

SUMMARY ANALYSIS:

This group is bigger than the Sesotho group and has produced a 100% pass rate. The majority (60%) sits at Level 5, which is a very good pass. 20% sit at Level 4 also a good pass and 18% sit at the phenomenal Level 6. For a group of learners who grow up in a Sesotho neighbourhood; they have achieved well in isiXhosa. This is indicative of good language maintenance and learners are the beneficiaries of this societal bilingualism.

Teachers report that the school started out with one language isiXhosa; until a group of parents demanded Sesotho. The school was eventually granted a Sesotho post by the Department and learners were then able to choose. It is interesting to learn that the same group of learners who were studying isiXhosa just went over to the Sesotho class and are doing exceptionally well. This demonstrates yet again the bilingualism that characterizes the area; a phenomenon that can be used to the advantage of the learners. Some schools would rather offer Afrikaans as Second Additional Language than offer learners the other African language to their linguistic repertoire.

SESOTHO HOME LANGUAGE PERFORMANCE no=42

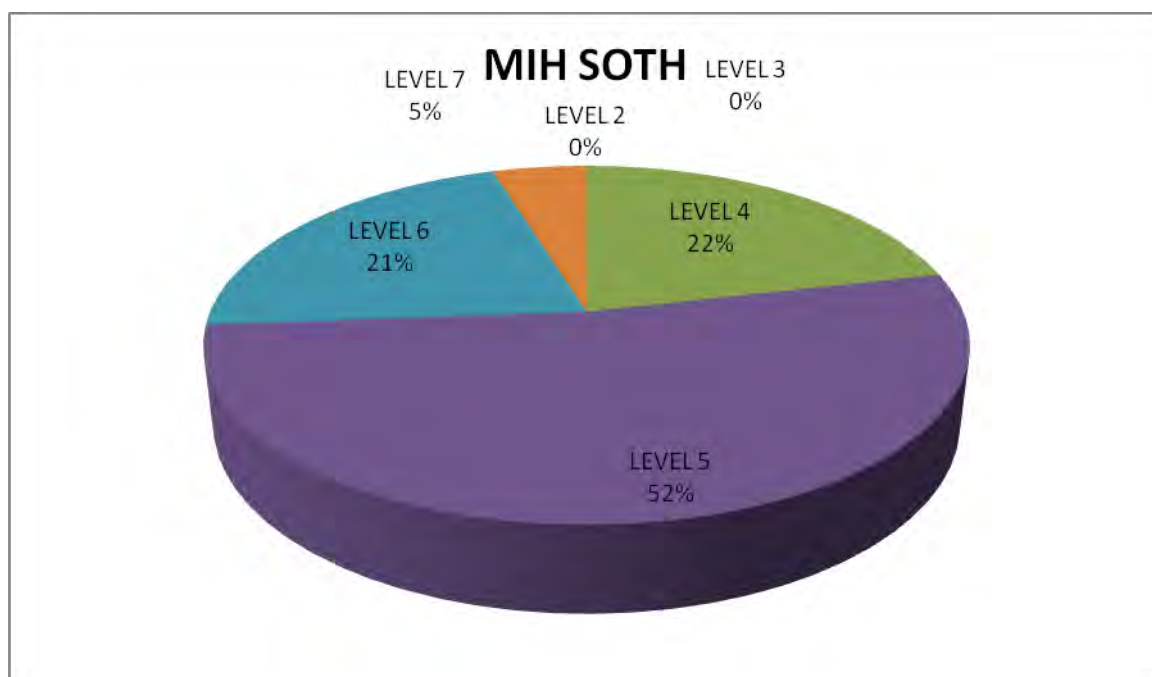


Figure 5.53

SUMMARY ANALYSIS:

The 42 learners achieved a 100% pass rate with no weak passes. The majority (55%) achieved at Level 5; followed by a split in Level 4 and Level 6 of 9 each. 2 Learners achieve distinctions. This is a sterling performance in the home language; this language group has done as well as the isiXhosa group; supporting the hypothesis that learners do well in a language they know best and should therefore be afforded the opportunity to learn in this language.

It is not surprising that learners cannot maintain the good performance that they display in their home language for English FAL and mathematics for various reasons. The most obvious being exposure to the target language outside of the classroom and limited resources, as where there is no print very little literacy happens. In a country where we know that the possibility of addressing just these two issues is unlikely to happen; then the insistence on English mainly schooling does not make sense.

ENGLISH FAL PERFORMANCE SCHOOL MIH no=107

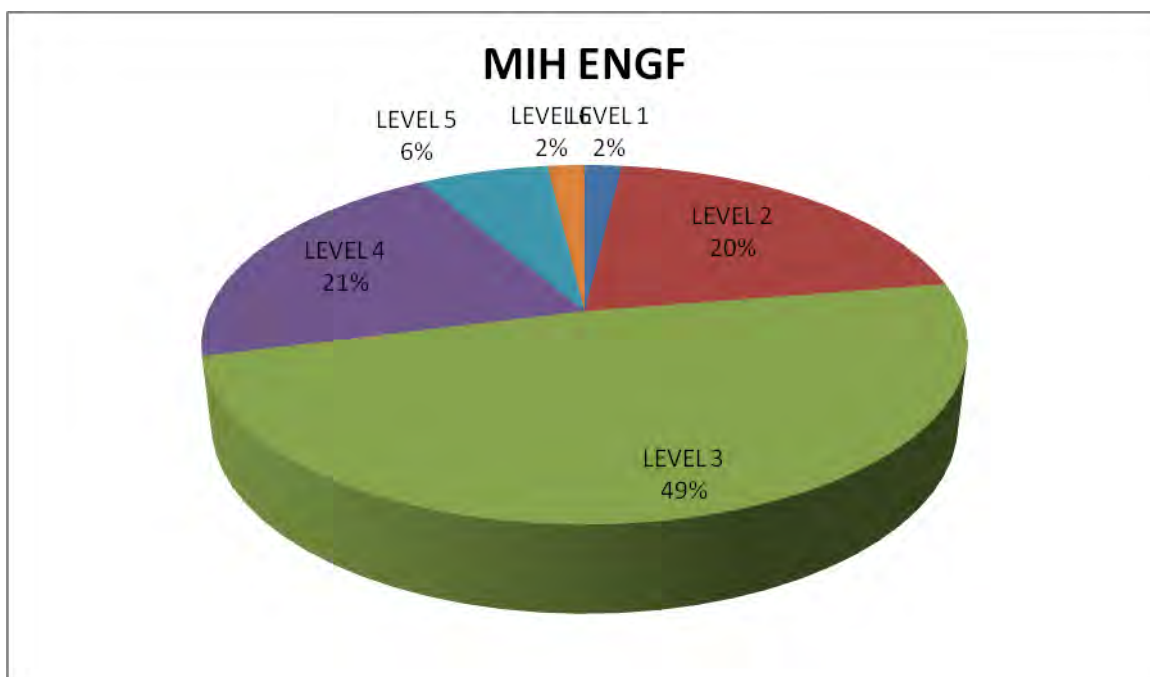


Figure 5.54

SUMMARY ANALYSIS:

Out of 107 learners, 2 failed the exam. The majority achieved moderately at Level 3 (40-49%), followed by 21% at Level 4 and 20% at Level 2. Only 31 learners achieve at Level 4 (adequately – 50-59%) and above. In a subject that they are supposed to learn all their subjects in, this performance is poor.

The following analysis will inform whether the prediction that, because they presented a weak performance in English FAL, this group will also underperform in mathematics like learners in similar English FAL schools. At this stage of the study, one cannot help but be overcome by mixed feelings of guilt, anger, frustration and a great sense of loss for this generation of learners.

MATHEMATICS PERFORMANCE SCHOOL MIH no=38

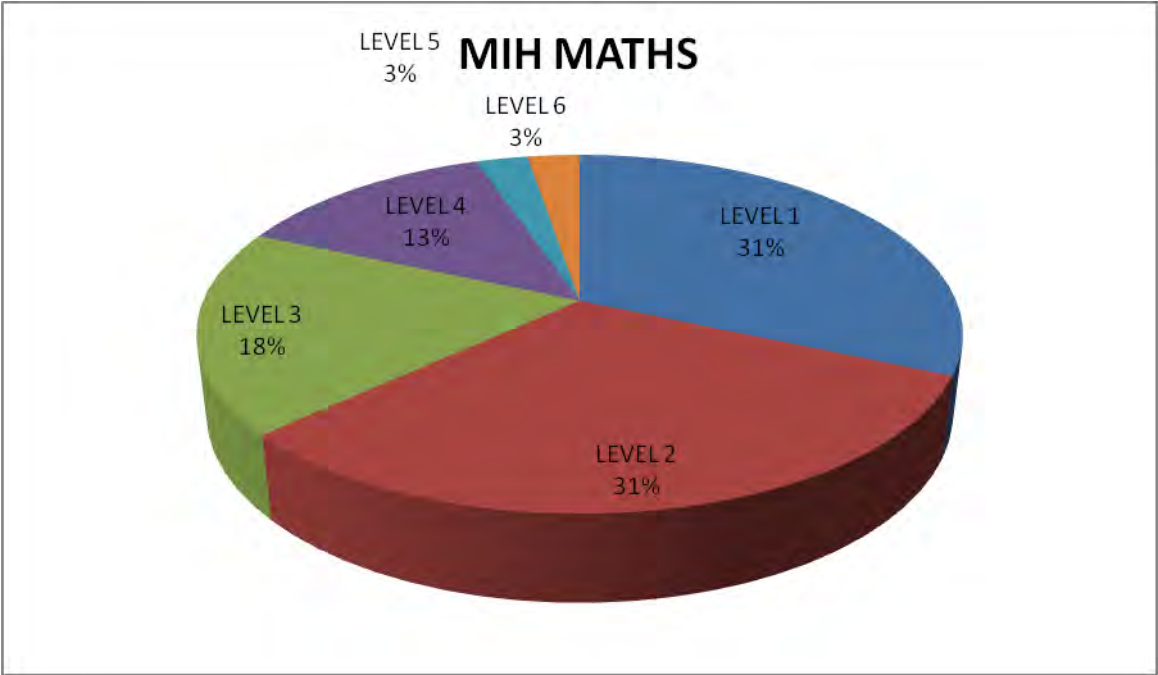


Figure 5.55

MATHEMATICS PERFORMANCE BY GENDER SCHOOL MIH no=38

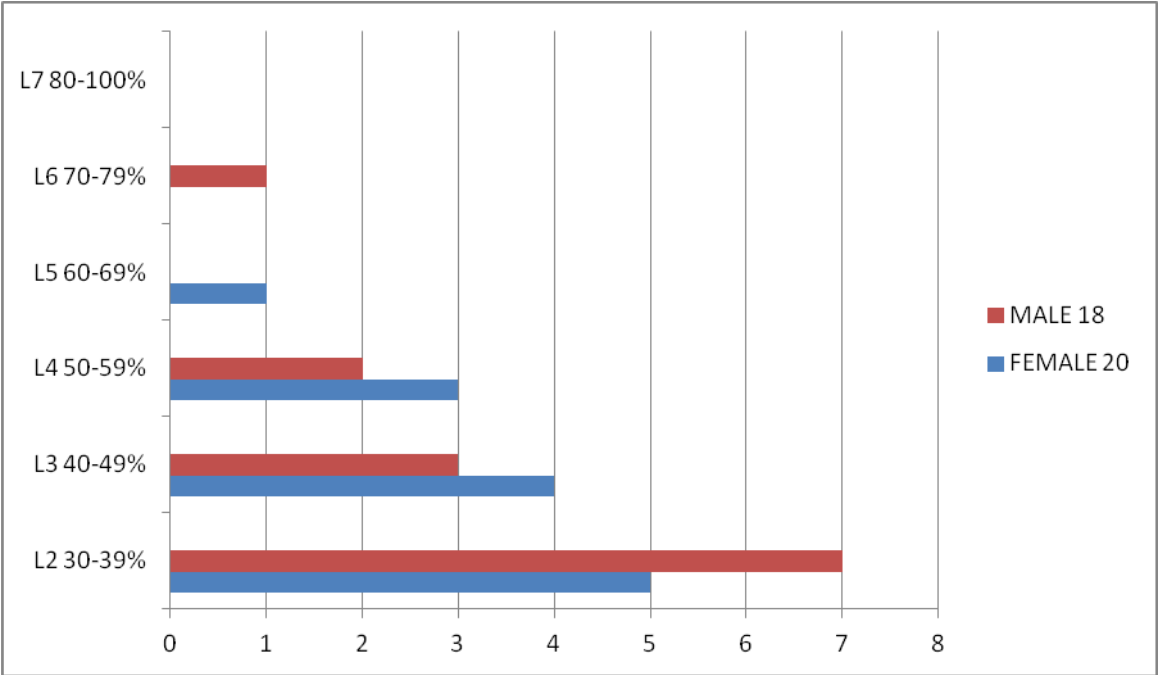


Figure 5.56

SUMMARY ANALYSIS:

Out of 107 learners who registered to write Grade 12 in School MIH, only 38 registered for mathematics. The majority (69 learners) opted for mathematical literacy. There is a 50-50 split between learners who have failed and the average performance of learners in Level 2 (31%); it means that of the 38 learners who registered for mathematics; 12 failed and another 12 performed below the Bachelor degree pass. 18% (7) performed at Level 3 (the moderate pass 40-49%). 13% of learners will at least gain entry to university with Bachelor passes at Level 4. There is also another split at the end of the good performance levels; with another 3% of learners at Level 5 and another 3% at Level 6; something that ensures them of acceptance in careers that are well paying as they demand a good pass of mathematics. The performance of these learners in mathematics was as predicted – low and similar to the other English FAL schools. It is a disappointing state of affairs for such a hard working school.

5.2.10 SCHOOL MJH 20.8%

SCHOOL	Population Group	Gender	Alpha Code	Total Wrote	Passed 30%	0-29%]	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%
MJH	Black	Female	AFRHL	2	2	0	1	1	0	0	0	0
MJH	Coloured	Female	AFRHL	7	7	0	1	5	1	0	0	0
MJH	Coloured	Male	AFRHL	12	12	0	6	5	1	0	0	0
MJH	Black	Female	ENGFA	4	4	0	1	2	1	0	0	0
MJH	Coloured	Female	ENGFA	7	7	0	5	1	1	0	0	0
MJH	Black	Male	ENGFA	1	1	0	1	0	0	0	0	0
MJH	Coloured	Male	ENGFA	13	11	2	5	4	2	0	0	0
MJH	Black	Female	XHOHL	2	2	0	0	0	1	1	0	0
MJH	Black	Male	XHOHL	1	1	0	0	0	1	0	0	0

Figure 5.57

BACKGROUND SUMMARY:

School MJH is a typical example of what happens when everyone gives up on an important institution such as a school. In its heyday, the school was one of the best in the province. The principal's post has been vacant for three years creating a leadership vacuum. The school performance has been declining over the years. The following results bear testimony to the sad state of affairs: 2008 – 63.2%; 2009 - 42.1%; 2010 – 20.8% and in 2011 there was

a 6.2% gain - 27.6%. There is a blame game between teachers, parents, learners and the DoE.

ISIXHOSA HOME LANGUAGE PERFORMANCE SCHOOL MJH no=3

SUMMARY ANALYSIS:

In the past only English and Afrikaans were offered in the school meant for White and Coloured learners. Whites slowly moved out until there were no more Whites in the school. Black learners in the past were forced to take Afrikaans Home Language and English as FAL. IsiXhosa was recently introduced as Home Language and there are still those learners who register for Afrikaans Home language. Of the 24 learners at School MJH, 5 are Black and the other two registered for Afrikaans Home Language. 3 learners registered for isiXhosa Home Language and they achieve an adequate pass at Level 4 (2 learners) and Level 5 (1 learner). AmaXhosa in the area experience the melting pot effect where they speak neither isiXhosa nor Afrikaans fluently; a concoction of both languages is spoken by amaXhosa. It is pleasing that the 3 isiXhosa learners performed well at level 4 and at substantial level 5; the lowest performance in all the isiXhosa Home Language groups across the sample.

AFRIKAANS HOME LANGUAGE PERFORMANCE SCHOOL MJH no=21

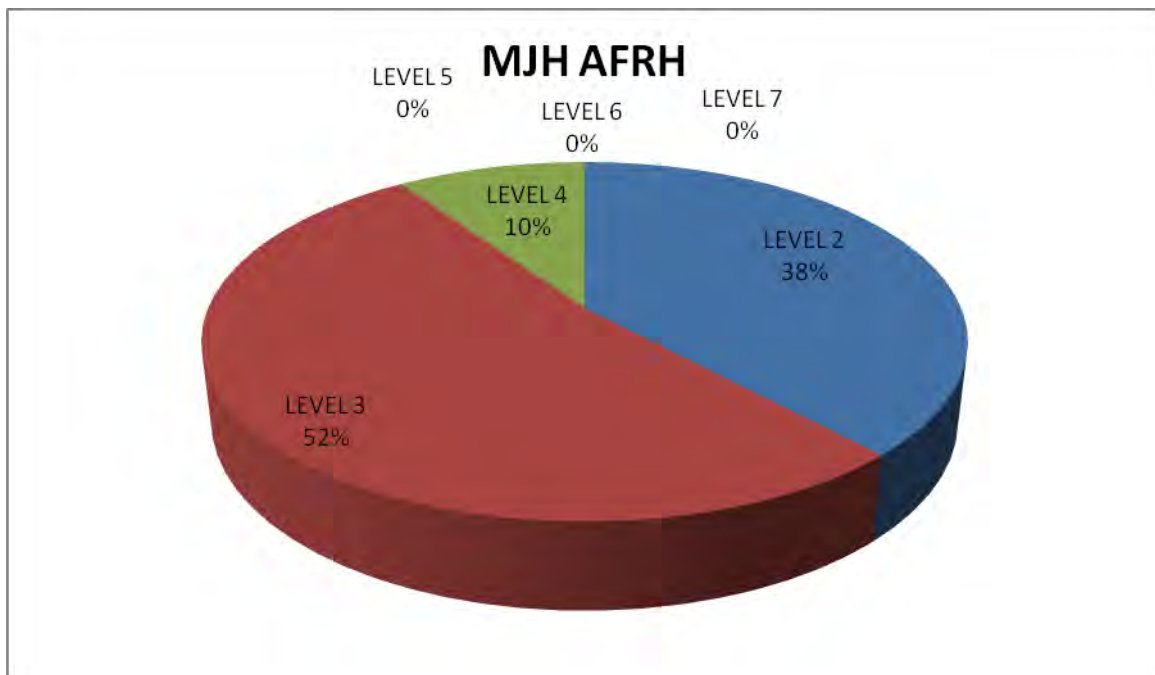


Figure 5.58

SUMMARY ANALYSIS:

All 21 learners passed the exam. Both Black learners perform at Level 2 and Level 3; the majority performance is at Level 3 (52%); which is about 11 learners. 38% (8 learners) perform at Level 2. This is a downgrade when compared to the isiXhosa group performance in the same school. 10% (2 learners) perform at Level 4. Afrikaans might also be affected by the melting pot effect where the school insists on the standard variety, while learners use a local variety. Similar cases are reported in the Western Cape where in the Cape Flats; the community speaks a variety of Afrikaans, different from the standard form, affecting academic achievement of the speakers.

ENGLISH FAL PERFORMANCE SCHOOL MJH

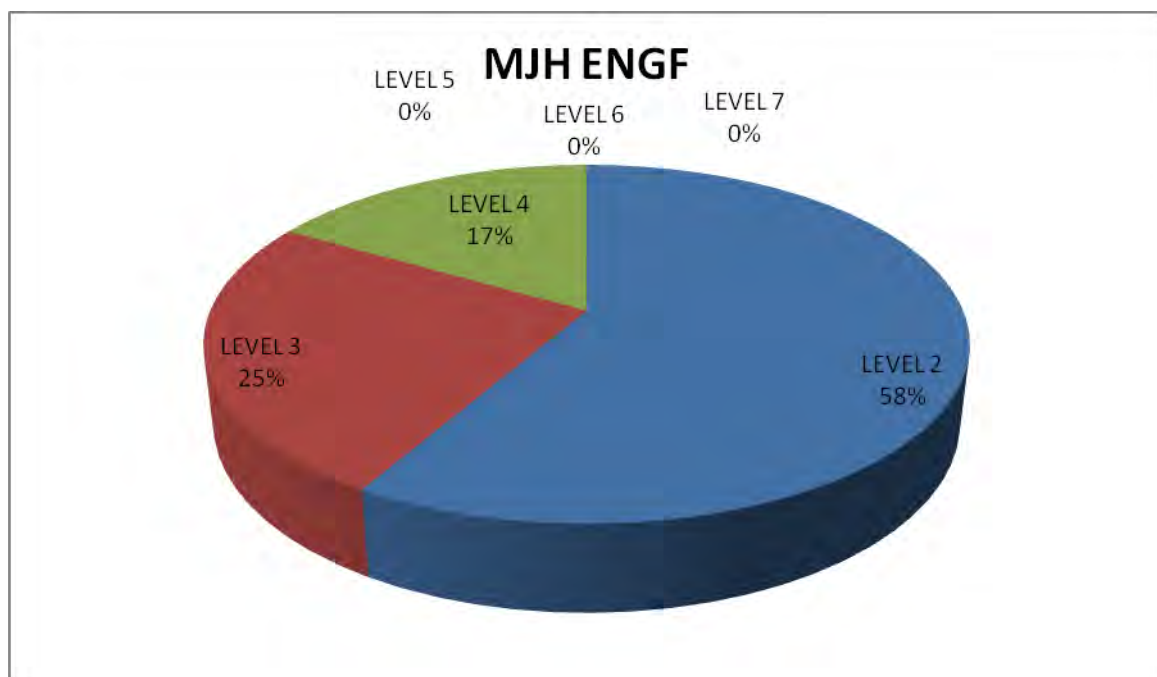


Figure 5.59

SUMMARY ANALYSIS:

The majority (58%) performs at Level 2; 25% perform at Level 3 and 17% perform at Level 4. This is very low performance in a school environment where teachers communicate in English and Afrikaans with learners. As a result of the high failure rate in mathematics, the school phased it out; hoping to limit failures and improve the pass rate. Only mathematical literacy is offered and even that is failed at an alarming rate. School MJH is a typical example

of what the Department of Education terms ‘under-performing school’; this is an unacceptable label coming from an institution that is supposed to curb such occurrences.

5.3 OVERALL SUMMARY PERFORMANCE IN HOME LANGUAGE, LOLT AND MATHEMATICS

5.3.1 AFRIKAANS HOME LANGUAGE GROUP SCHOOL MAH, MCH & MJH

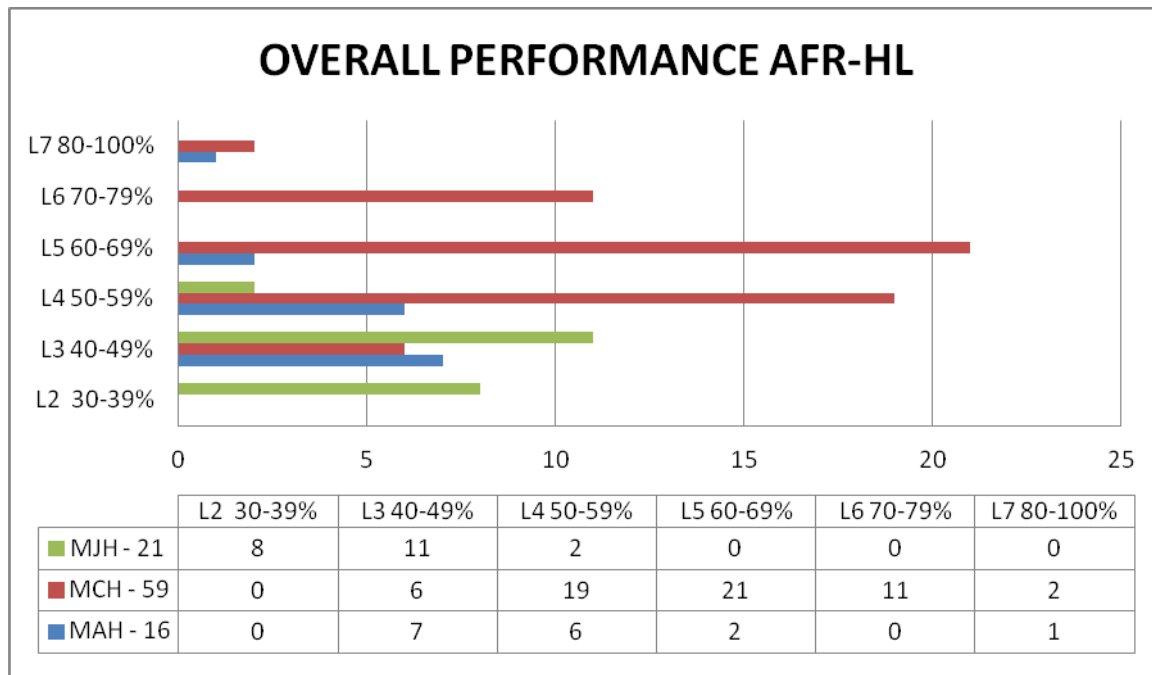


Figure 5.60

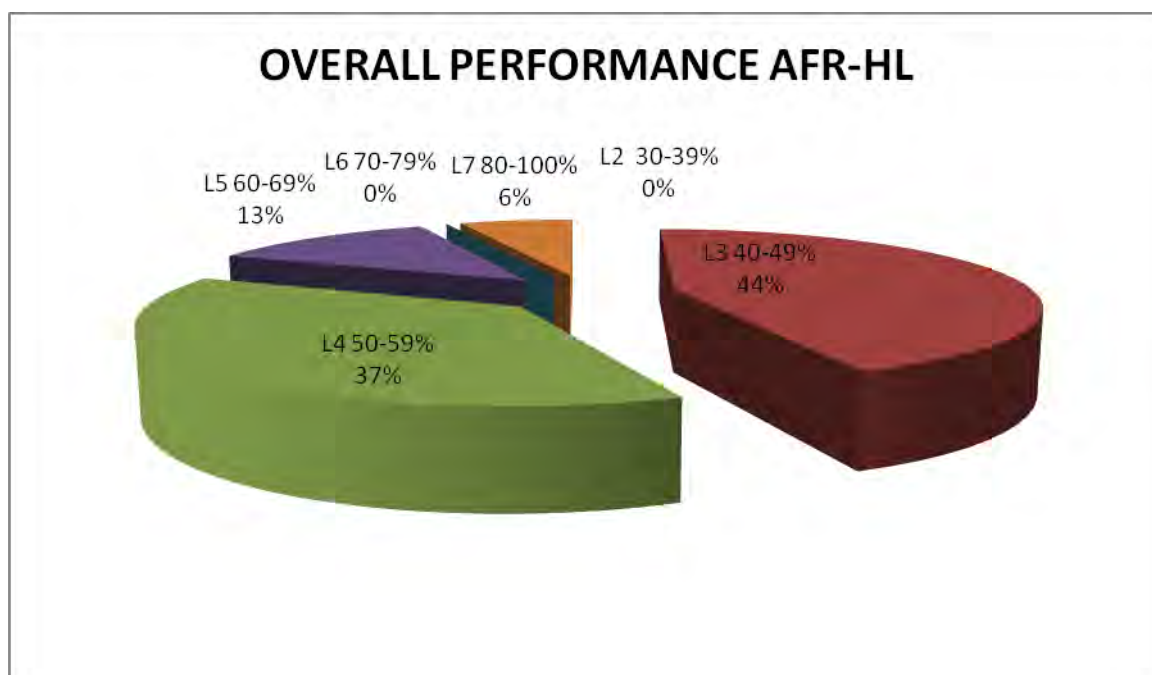


Figure 5.61

5.3.2 ISIXHOSA HOME LANGUAGE GROUP SCHOOL MJH, MIH, MHH, MGH, MFH, MDH, MBH

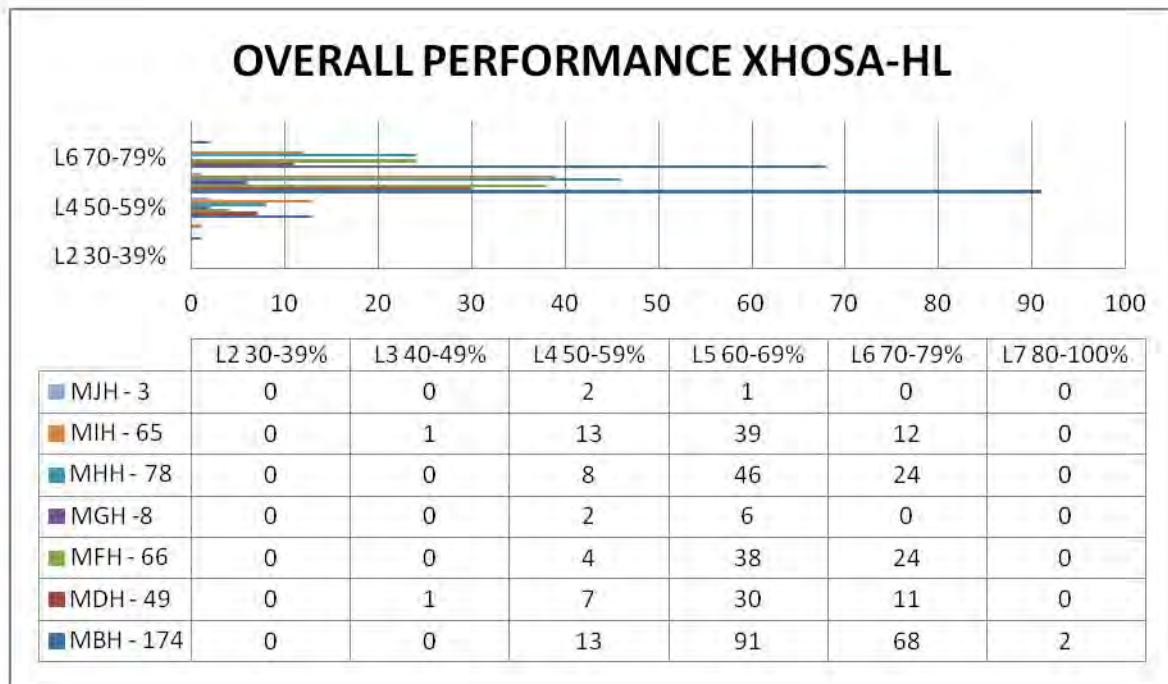


Figure 5.62

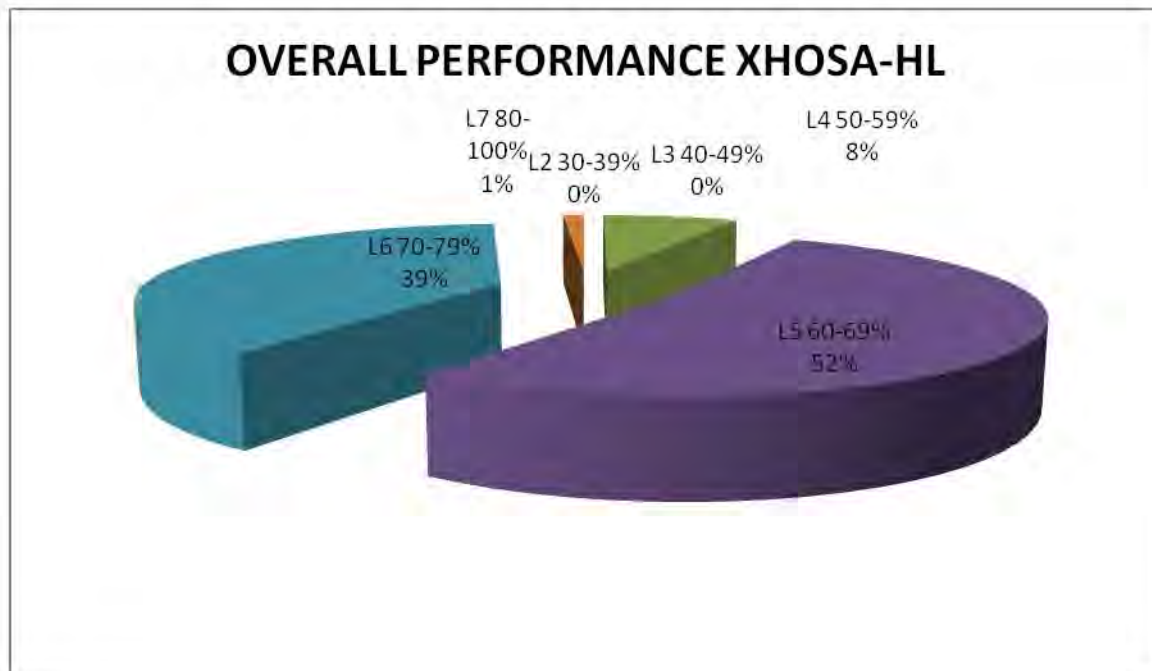


Figure 5.63

5.3.3 SESOTHO HOME LANGUAGE GROUP SCHOOL MIH MHH, MGH, MFH

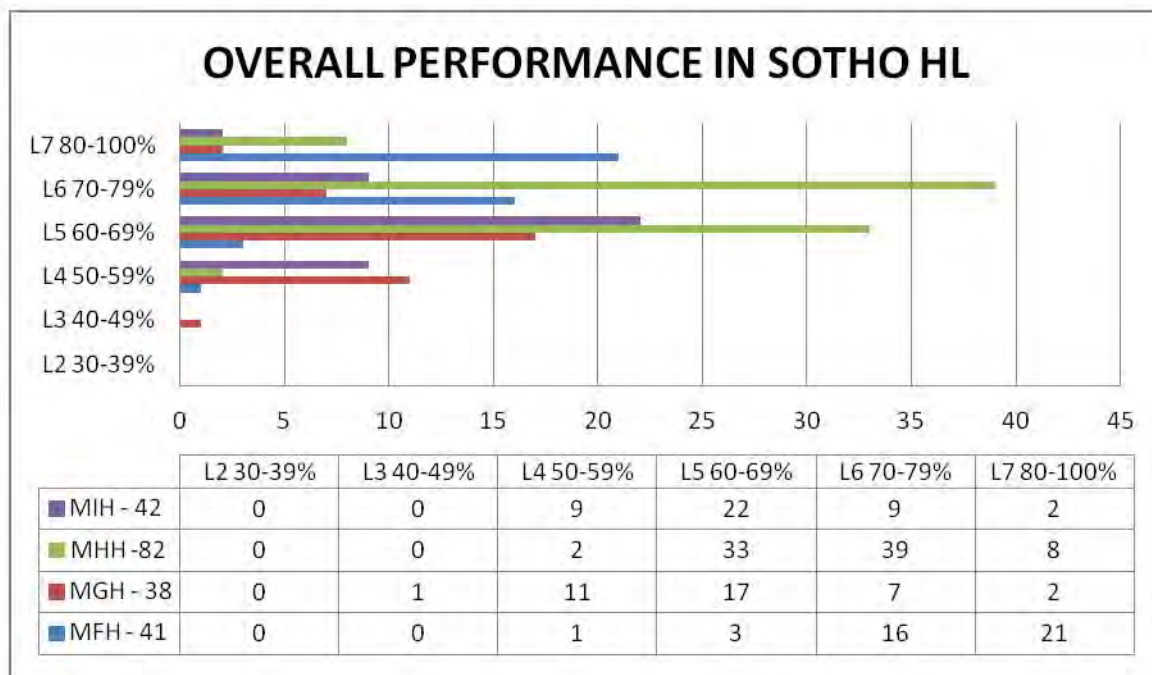


Figure 5.64

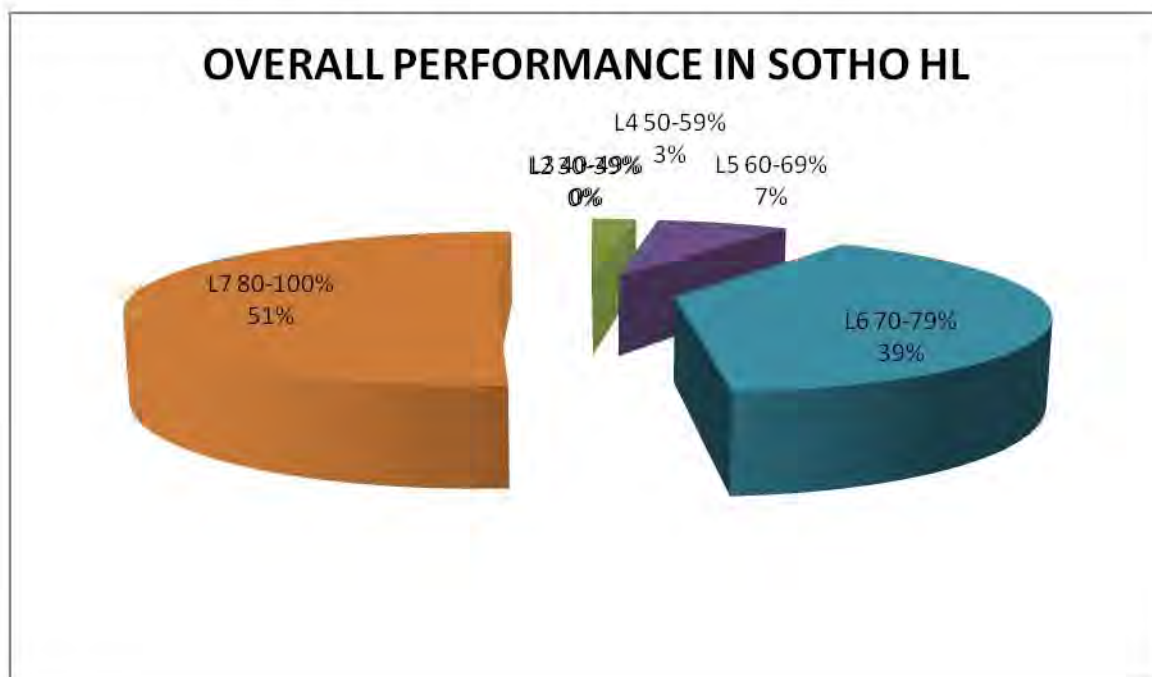


Figure 5.65

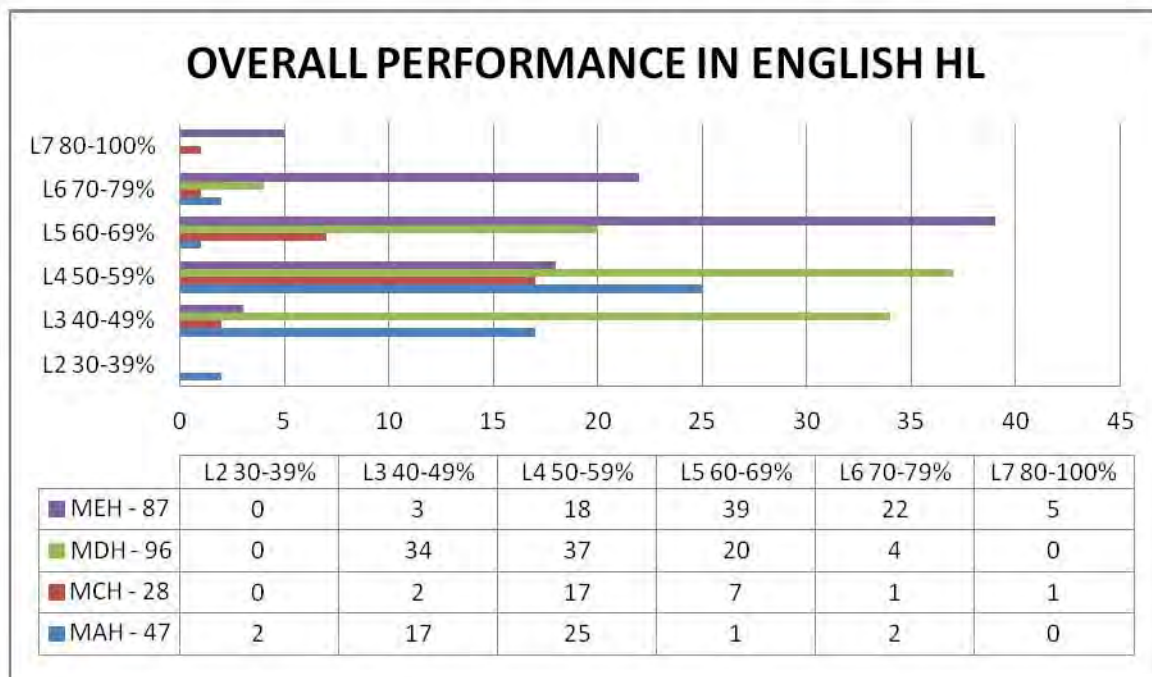


Figure 5.66

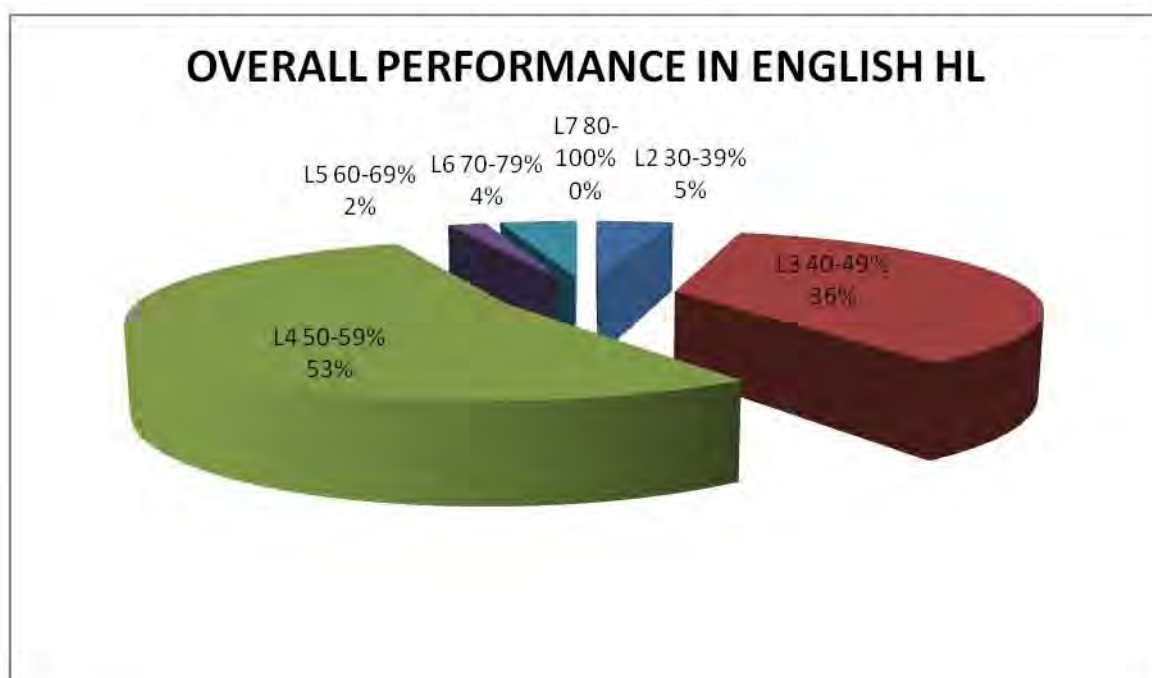


Figure 5.67

5.3.4 ENGLISH FAL GROUP SCHOOL MJH, MIH, MHH, MGH MFH, MBH

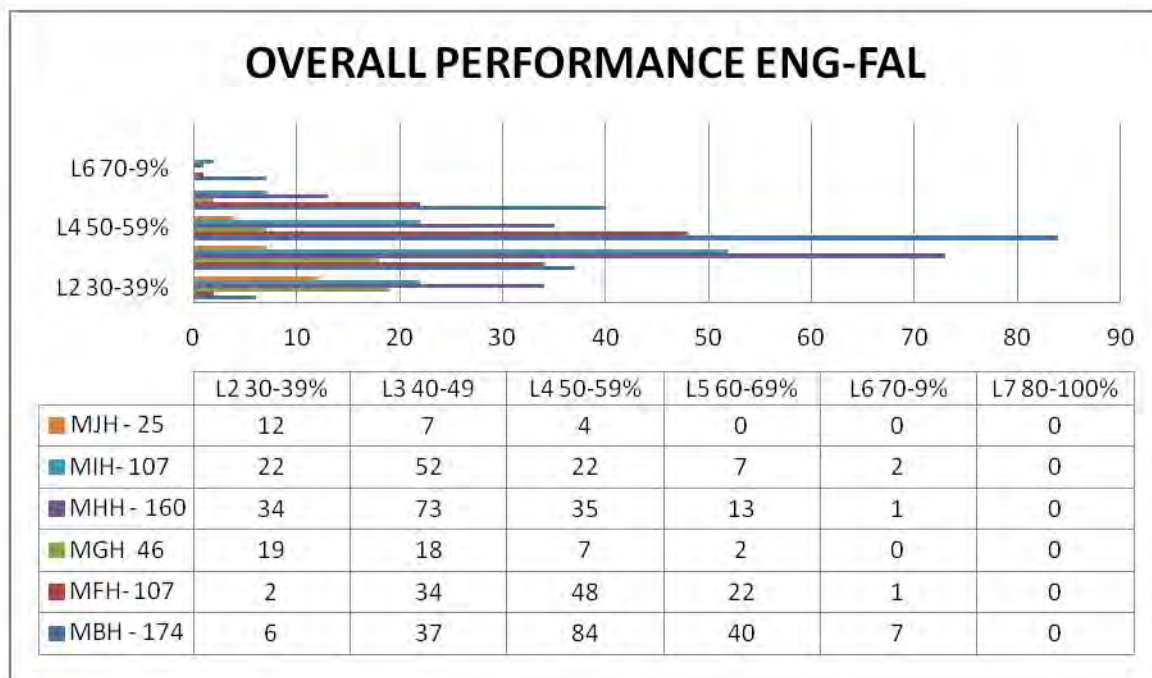


Figure 5.68

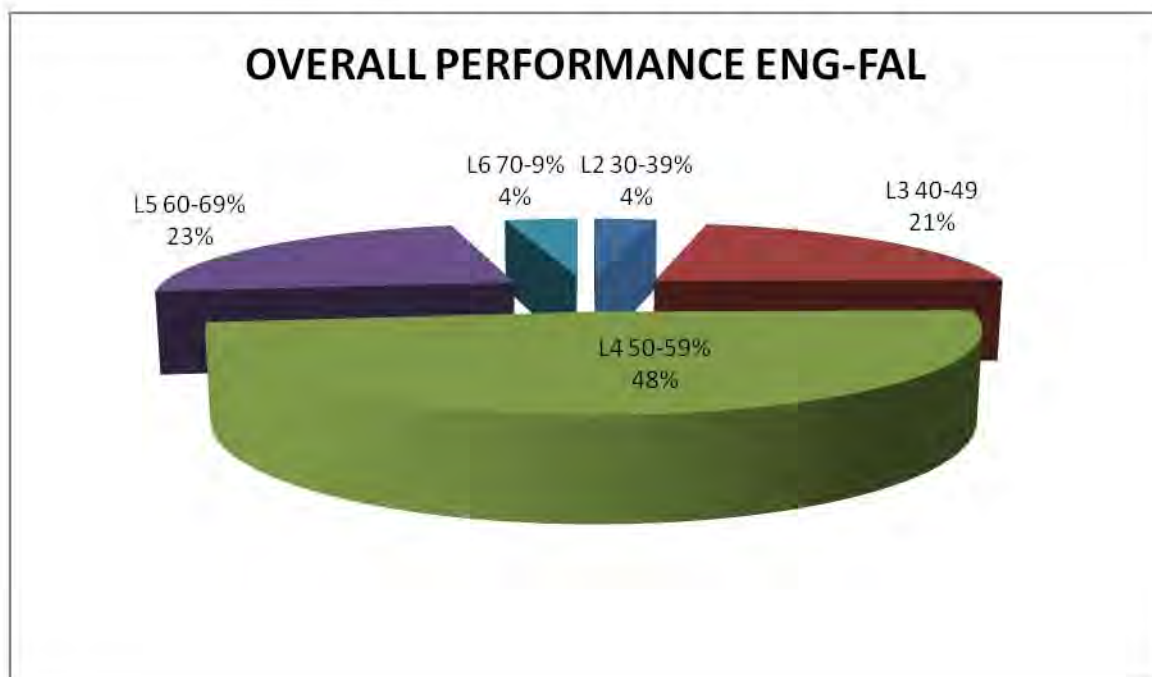


Figure 5.69

5.3.5 OVERALL SAMPLE MATHEMATICS PERFORMANCE

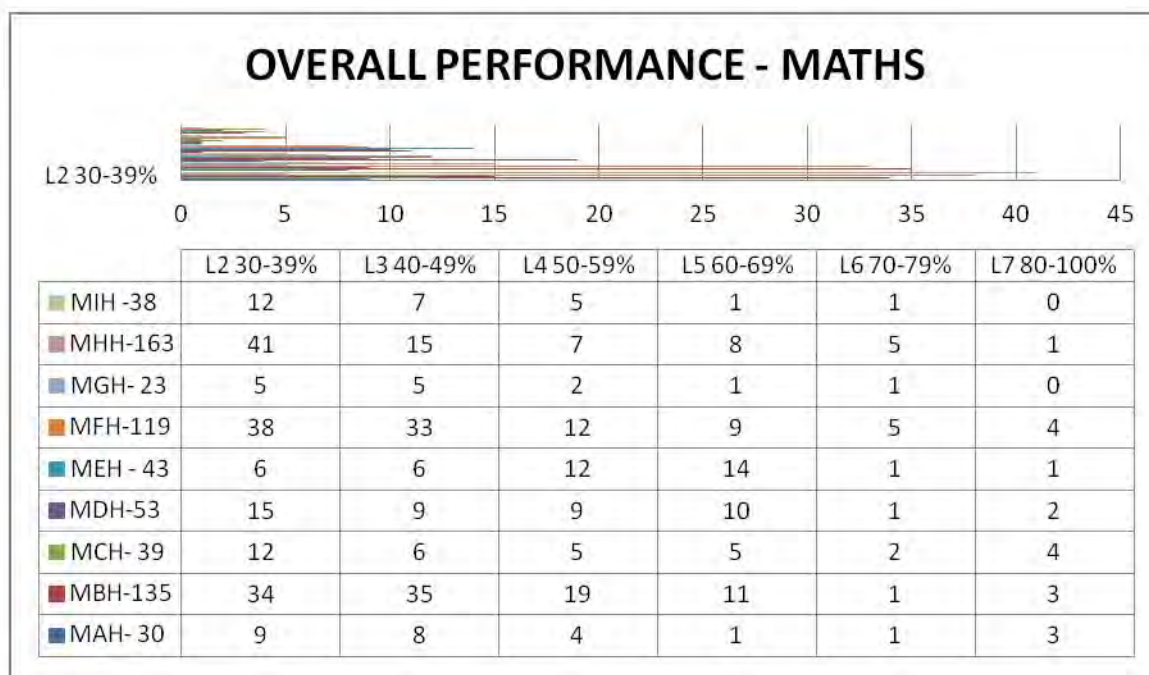


Figure 5.70

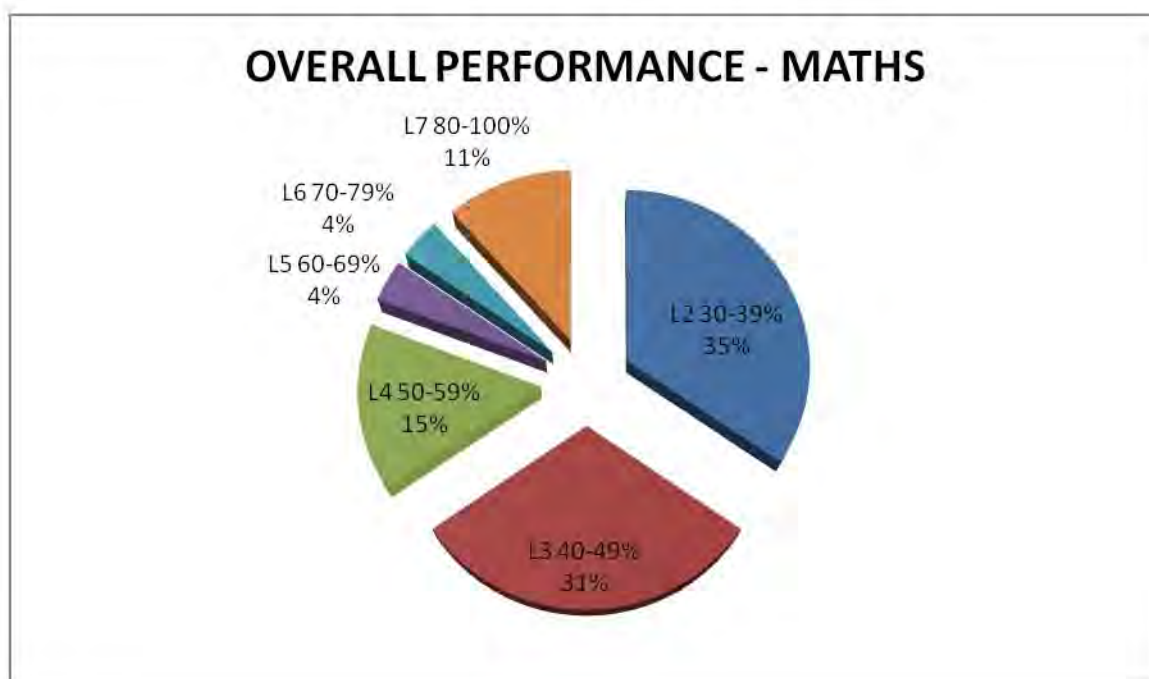


Figure 5.71

5.4 OVERALL SUMMARY ANALYSIS

The following data presented is of the African language groups who study the mother tongue only as a subject; they all offer English as FAL and learn all other subjects as LoLT through it. They achieved so well in the mother tongue that it is disheartening to realize that the excellence demonstrated in their home language cannot be used elsewhere – it is unused competence.

NUMBER 1: OVERALL SAMPLE SESOTHO HOME LANGUAGE ACHIEVEMENT

L1	L2	L3	L4	L5	L6	L7	TOTAL
0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%	
0	0	1	23	75	71	33	203

Figure 5.72

NUMBER 2: OVERALL SAMPLE ISIXHOSA HOME LANGUAGE ACHIEVEMENT

L1	L2	L3	L4	L5	L6	L7	TOTAL
0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%	
0	0	2	49	251	139	2	443

Figure 5.73

NUMBER 3: OVERALL SAMPLE ENGLISH FAL (LOLT) ACHIEVEMENT

L1	L2	L3	L4	L5	L6	L7	TOTAL
0-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-100%	
7	95	221	200	84	11	0	619

Figure 5.74

IN SUMMARY

The Sesotho group outperforms all the Home Language groups including English and Afrikaans home language groups. IsiXhosa is number 2 with English placed number 3. Afrikaans was the least performing group in the 2010 NSC exam.

5.5 2008-2011 OVERALL PROVINCIAL PERFORMANCE ENGLISH FAL/LOLT & MATHEMATICS

5.5.1 ENGLISH FAL/LOLT

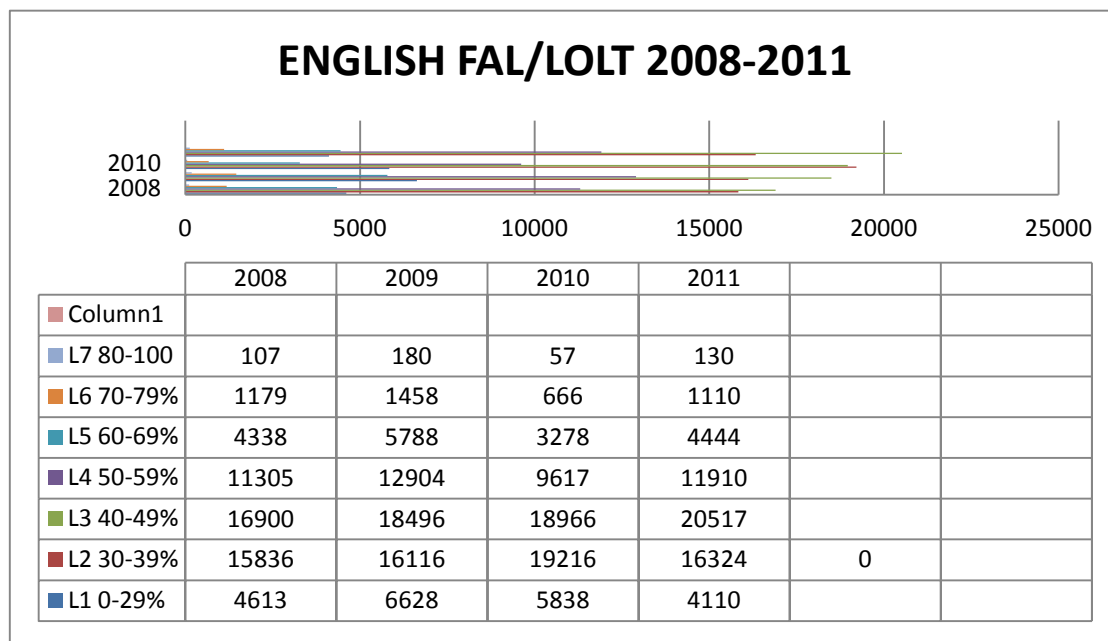


Figure 5.75

The above graph tells a very disheartening story. It is one that attests to the fact that, despite more than 50 years of English mainly Education; learners struggle with English.

5.5.2 OVERALL PROVINCIAL MATHEMATICS PERFORMANCE 2008 – 2011

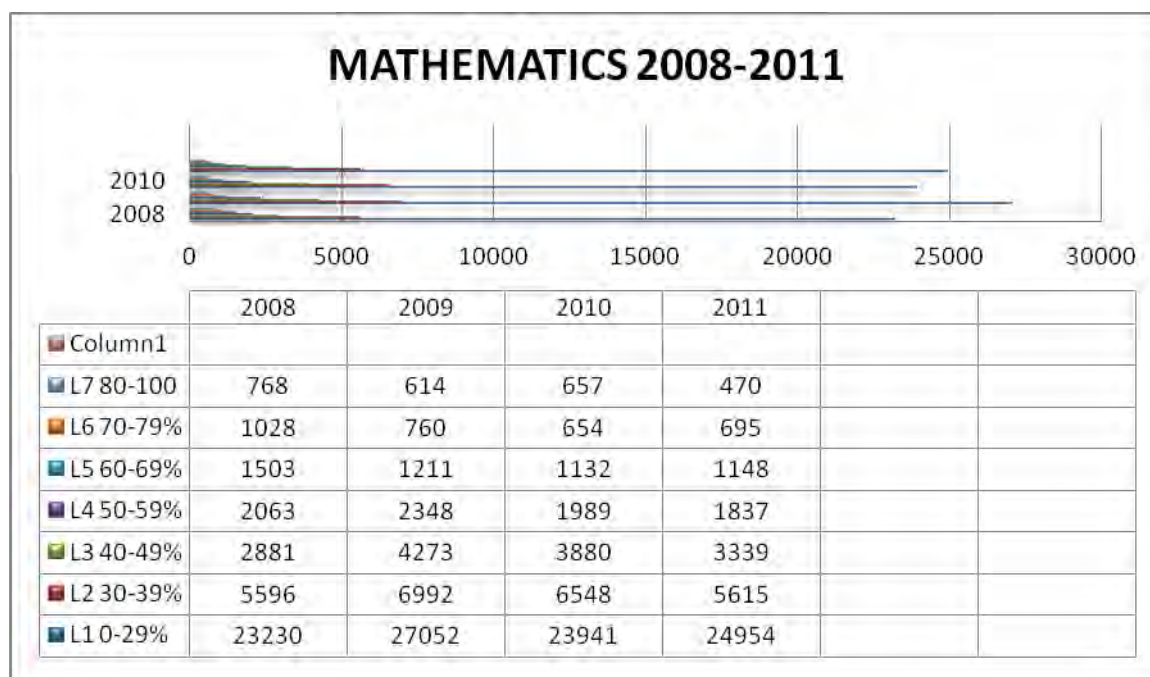


Figure 5.76

Figure 5.70 summarises the country's collective embarrassment with regards to achievement in mathematics. In addition to other strategies, bilingual education seems to be a viable option to counter language barriers in mathematics education.

MINIMUM ADMISSION REQUIREMENTS TO HIGHER EDUCATION		
HIGHER CERTIFICATE (HC)	DIPLOMA	BACHELOR'S DEGREE
- NSC - minimum of 30% in the Language of Learning and Teaching (LoLT) of the Higher Education Institution as certified by UMALUSI	- NSC – minimum of 30% in Language of Learning and Teaching (LoLT) of the Higher Education Institution as certified by UMALUSI.	- NSC with a minimum of 30% in LoLT of the Higher Education Institution as certified by UMALUSI.
- Institutional and programme needs may require additional combinations of recognized NSC subjects and levels of achievements	- Achievement rating of 3 (moderate achievement) (40-49%) or better in four (4) recognized NSC 20 – credit subjects.	- Achievement rating of 4 (adequate achievement, 50-59%) or better in four subjects chosen from the recognized 20-credit NSC subjects from the designated subject list

Figure 5.77 Minimum Admission Requirements to Higher Education

A 100% pass means little if learners have performed below column 2 and 3.

5. 6 OVERALL MATHEMATICS PERFORMANCE SAMPLE SCHOOLS MAH - MIH

SCHOOL	WROTE	FAILED	%	H. CERT	%	DIPLOMA	%	BACHELOR	%
MAH	30	4	7%	9	15%	8	13%	9	15%
MBH	135	32	12%	34	12%	35	13%	34	13%
MCH	39	5	6%	12	15%	6	8%	16	21%
MDH	53	7	7%	15	8%	9	14%	22	21%
MEH	43	3	3%	6	7%	6	7%	28	33%
MFH	119	18	7%	38	16%	33	14%	30	13%
MGH	23	9	19%	5	11%	5	11%	4	9%
MHH	163	86	26%	41	13%	15	5%	21	6%
MIH	38	12	16%	12	16%	7	9%	7	9%
TOTAL	643	176		172		124		171	

Figure 5.78

5.7 OVERALL SUMMARY ANALYSIS: MATHEMATICS PERFORMANCE SCHOOL MAH-MIH

Figure 5.72 illustrates the argument that I am advancing that a 100% pass rate is worthless if it does not translate to a Bachelors degree pass that will allow learners entry to university to access studies towards a career that requires a good pass (Level 5) in mathematics. The story that is presented by the elaborate graphs and illustrations of mathematics achievement in the 2010 sample, is that mathematics remains one of the South African system's most elusive and indefinable goals. In this sample a total of 643 learners registered for mathematics hoping for a better future as a rare skill subject – currently called 'gateway' or at worst 'a killer subject'. The majority (176) of learners in the sample fail with a Level 1 achievement (0-29%). This level is described as a Not-Achieved level; schools do everything in their power to stay away from this level – ironically the majority of learners always do not achieve well in mathematics. The bulk of the Not-Achieved learners (157) come from African language schools; only 19 of the 176 learners are from ex-Model C schools; the reason might be because mathematics registration in ex-Model C schools is the lowest; these schools sift learners in Grade 9 for mathematics aptitude and propensity so as to achieve a good overall pass and better levels of achievement in the subject. While these schools produce 100% pass rate; a comprehensive examination of the quality of the passes presents the opposite.

The next bulk of learners, 172 have only achieved entry at a college to do a Higher Certificate (HC). A Level 2 achievement (30-39%) only guarantees them that. Any learner who has gone through the trouble of attending extra classes – afternoon and weekend classes; and on top the incubation program that characterizes Black education where learners forfeit all winter, summer and spring holidays to study towards a good pass in mathematics – will be disappointed by such an 'elementary pass, it has very little value. Learners soon realize that no university accepts such a low score in mathematics and they have to re-write the subject. Level 2 is the average performance of learners who have passed mathematics in this sample. A worrying factor if one takes into consideration the fact that this sample was selected from good performing school, all except one MJH. The third big group is the Level 3 achievement group (40-49%); for 124 learners in the 2010 Grade 12 sample; it is moderate achievement. It qualifies learners for entry into a Diploma course and not adequate for a Bachelor degree. 75 learners achieve Level 4 (50-59%)

termed 'adequate achievement'; 60 are at Level 5, 18 at Level 6 and another 18 at Level 7. Figure 5.71 illustrates that to gain a Bachelor's pass; learners need achievement in four or more subjects of Level 4 (50-59%) and up. 171 students of the 643 will be eligible for a Bachelor's pass and that cannot be acceptable. Access to English home language early on did not guarantee a good pass in mathematics for Black students in ex-Model C schools.

5.8 Conclusion

This study has corroborated the findings of the 2006 Intermediate Phase Systemic Evaluation Results (2006) for this group of learners when they were doing Grade 6; as still relevant when they wrote Grade 12. The findings were that learners whose Language of Learning and Teaching (LoLT) was the same as their home language performed better in mathematics than those who had a language mismatch.

Malekela (2004) correctly postulates that since most school subjects require transaction through language, both written and oral, understanding the language of instruction facilitates scholastics achievement. Those who have a better command of the language stand a better chance of performing well than those without the mastery of the language of instruction (Malekela, 2004).

Those who are responsible for language policy implementation and for the education of the masses in South Africa must give direction as to whether to maintain the current system where the previously advantaged become the 'continually advantaged' and the 'previously disadvantaged' remain the 'perpetually disadvantaged'. It is a decision that history will judge us for and we can never afford to be found wanting. All indications are that if we maintain this current system; the kind of results we get now will remain as such.

The need to develop and intellectualise African languages for higher status functions like teaching mathematics - is not 'a nice to have' project; the time has come for African languages to speak Science, Mathematics; ICT, Technology and make inroads for the betterment of Africa before it is too late. Language Planning from below has a central role to play where African language speakers take a step back and see the need to involve themselves in language development activities; the trajectory for language planning has

been set in South Africa by individuals like Hartshorne (1992); Neville Alexander (2000); Russell Kaschula et. al., (1995; 2007) Nobuhle Ndimande-Hlongwa, N (2009); Esther Ramani & Michael Joseph (2010), Kathleen Heugh (2000), Vic Webb (2000) and many others. Ours is to enhance and support this work.

CHAPTER 6

CONCLUSION

6.1 Introduction

There are three main focus areas of this chapter; it is to give an overview of the findings of this study as progressed from chapters 1 to 5. Secondly; a view on the proposed way forward is presented as a contribution in the fight against the high failure rate in Grade 12 mathematics and what areas of further study could develop from this work. Lastly the limitations presented by this kind of study are mapped out; particularly a study that is mainly quantitative, with a qualitative angle.

The use of statistical data in this thesis was limited to descriptive statistics to gain a better understanding of how the data relates to the Grade 12 mathematics and language results for the 2010 cohort. Achievement in mathematics for a sample of the 2010 cohort was analyzed and how it relates to the demographic variable of home language. For the Eastern Cape the four official home languages were analyzed viz. Afrikaans, English, isiXhosa and Sesotho. The fundamental focus was whether home language determined differences in performance in mathematics. The following is my conclusion as informed by this study.

6.2 'English Only' is not enough for teaching mathematics to African language learners

This study suggests that amongst other necessities language is a crucial component in learning mathematics. As a direct result of the effects of linguistic hegemony; some sections of society might choose not to acknowledge that teachers are not using English ONLY when teaching Black learners mathematics; even in Grade 12. A growing number of people are beginning to make this important link that African languages are used in classroom interactions in the mathematics classrooms in all Black schools; and in extra classes for ex-Model C learners, either by parents or hired coaches. This practice should not remain a hidden away default option that resurfaces when all else fails. It is a classroom resource that the Department of Education must encourage and acknowledge so that it is structured by design and is mentioned as a useful strategy in its curriculum documents. Code-switching is when an individual (more or less deliberately) alternates between two or more languages as

indicated earlier in this thesis. Code-switching has purposes and there are important social and power aspects of switching between languages as there are between switching between dialects and registers (Baker, 1994). This is typical of multilingual mathematics classes. It ends in mediation though not extending to assessment; as if learners need code-switching for learning; and not when writing tests. Setati et.al. (2002) talks about 'incomplete journeys' when teachers use code-switching as an end, not as a means along the journey to learn mathematics, mathematics terminology and ways of talking about mathematics. The development of appropriate standard mathematics terminology in African language to limit language barriers is a step in the right direction.

6.3 The Centrality of the 'Other' In Multilingual Mathematics Classes

This thesis also corroborates the finding that has been made in other studies that students in multilingual classrooms tend to rely on each other for help in the classroom (Setati et al., 2002); and I go further with the claim that this does not only happen in Black schools; students in ex-Model C schools also get together to prepare for upcoming mathematics exams, and in these get-togethers use the home language to get down deep in explaining difficult concepts. It untangles the myth then that learners in Black schools need extra classes to compensate for the time lost in strikes by teachers and not being in time and in class by teachers. Language is an issue in all mathematics classrooms and learners rich or poor; find ways to manage this dynamic. The same with adults where the Department deploys lead teachers to strengthen their counterparts and learners in mathematics before exams. Teachers find colleagues who are experts in particular subject matter and parents pay tutors to support their charges. There is a general understanding that what the 'other' knows will help in the little that has to be achieved.

6.4 The role of extra classes, holiday and incubation classes in Mathematics learning

A common practice that characterizes Black education and that has come through strongly in this study are extra classes that all Black schools in the sample practice. The Department of Education has not come around to accept that it takes double the time to teach mathematics to learners who have little facility with the language of teaching and learning. Although the challenges presented by language mismatches are presented in all policy documents and curriculum documents as analysed in previous chapters; addressing that

issue is left to the teacher to see what to do about it. The examination time is the same for all learners and the pace setters sent to schools set the same time for teachers to have covered particular topics in mathematics. The Department is gripped by inertia to address this issue and would rather reward a 5% mark as compensation to African language learners for struggling with English in their Grade 12 examinations; something that English and Afrikaans speakers bitterly detest.

To counter the effects of this malady, schools devise means where the time of day for Grade 12 is extended by anything from an hour to three hours. On Saturdays, while English and Afrikaans learners are free; learners in Black schools attend classes. A new practice that is worry-some and will affect this government's performance is the prevalence of incubation classes where learners literally camp at the school before the final exam; right up to the last day of the exam. Only Black learners go through this experience as teachers and state employed tutors use every minute of the day to make up for the content that was lost in translation especially in mathematics and physics. The need for this incubation is quite obvious for learners to stand a chance of passing Grade 12; but it can never be a permanent solution as it is marred with tensions; creates a parallel expensive education system, and alienates learners from their families for two months. Learners report that it is the hardest sacrifice expected of them as they sleep on the floor; share basic food with a group of learners who sometimes steal as hunger pangs set in after exhausting all day and night lessons. Most disturbing is the report that they experience high levels of fatigue with learning everything in a short space of time, without stopping for a month and more; and they fail at the end of it all. They cite this as one of the reasons for wanting to commit suicide; it is too much of a sacrifice to come out of it empty handed with a useless pass or a complete failure. These incubation camps have also been a source of corruption as businesses fight over who will be awarded the business to feed the learners; most people bribe departmental officials to get the award to feed the learners. Tutors also compete to get the employment as an hourly rate is paid that is very enticing.

6.5 The symbolic market

Even though English is a main language of a minority, it is both the language of power and the language of educational and socio-economic advancement, thus it is a dominant

symbolic resource in the linguistic market (Bourdieu, 1991). In South Africa, this is demonstrated in high status functions like education; mathematics has over the years come to be a symbol of this phenomena as indigenous people perceive the subject to have been created in English and therefore cannot be taught in any other language. Government does very little to correct this misconception. Very few people are aware that from 1000 BCE with the Celts, English grew influenced by Latin (Romans); Old Norse which comprised of Old English with the influence of Vikings, from the 1st Century, 5th CE right up the 10th CE where Middle English started taking shape thanks to Arabic, Turkish, Hindi and Malay languages that loaned English terms to refine it as a language of mathematics. The Norman French after the 11th CE plus the Renaissance from the 14th-15th CE pushed English further into modernity – it is the 17th Century that English stabilized as a language of mathematics with strong loans from Greek, French, Arabic etc. (Short, 2003). English was not always the language of mathematics; colonialism and apartheid entrenched English (and Afrikaans to a lesser extent) as languages of power. While the new language policy is intended to address the overvaluing of English and Afrikaans and the undervaluing of African languages, in practice English continues to dominate mathematics teaching. The DoE's description of the mathematics learning area is that mathematics is the construction of knowledge that deals with qualitative and quantitative relationships of space and time. It is a human activity that deals with patterns, problem solving, logical thinking etc., in an attempt to understand the world and make use of that understanding. This understanding is expressed, developed and contested through language, symbols and social interaction (DoE, 1997). Having good facility with English is a prerequisite to achieving in mathematics in South Africa. The symbolic market is therefore not a metaphor but one with transactions that have material, socio-economic consequences for individuals (Lin, 1996). The linguistic market is embodied by and enacted in the many key situations in which symbolic resources, like certain types of linguistic skills, are demanded of social actors if they win access to valuable social, educational, and eventually material resources (Bourdieu, 1991).

6.6 The Primacy of the teacher in Multilingual Mathematics Classrooms

The role that language plays in the expression, development, and contestation of mathematics is best appreciated by a teacher who has strong language skills and can use them to initiate learners into using language as a tool for communicating mathematics and

thinking mathematically. There is a myth in schools that the role of language in mathematics is minimal and mathematics is just about numbers. The DoE policy documents state that mathematics is a language that uses notations, symbols, terminology, conventions, models and expressions to process and communicate information. The branch of mathematics where this language is mostly used is algebra and learners should be developed in the use of this language (DoE, 2004 in Moloi, 2006).

This means that mathematics must not be taught by the teacher writing symbols on the blackboard, rearranging them, getting "answers", asking the class to copy the process and to learn it by heart. Instead the teacher must be trained to involve the children in carefully structured activities, investigations and discussions which will ensure understanding. In short, the teaching of mathematics in a second language must, in effect, adopt the principles which govern the methods of teaching a second language. Cuevas (1996) points to a need for a mathematics curriculum that includes attention to the second-language skills required for achievement in mathematics (Cuevas, 1996). It has emerged in this thesis that in most ex-Model C schools, there is no provision of differentiated instruction to accommodate learners with different mathematics and language abilities; the mistake is to treat learners in an English HL school as if they are on par linguistically and mathematically. The opposite is true in Black schools; there is over-focus on teaching toward the mastery of basic content and skills because learners struggle with English; this may be jeopardizing the opportunities the learners have to learn more advanced mathematics topics like algebra or geometry (Ramirez, 2003). The teacher is central in making decisions on when to strike the balance between easy and advanced topics.

6.7 Class issues – a reality in multilingual classrooms

In trying to understand the factors that are related to students' mathematics performance and learning gains, a pattern has emerged in this thesis that points to the sensitive issue of class disadvantages. While recognizing that schools (and the education system) cannot be held accountable for all the factors that affect mathematics performance, attempts to assess school effectiveness usually take into account variables external to the school (e.g. parents' education, poverty levels) that have a known and strong effect on achievement. Like the 2005 Intermediate Phase Systemic Evaluation Report (IPSER, 2006) concluded; this

thesis also concludes that poor learners do not do well in English LoLT and Mathematics. This fact is corroborated by Ramirez (2003) where in Chile, studies show that urban students with more educated parents and higher family income attain substantially higher mathematics scores than students from rural areas, with less educated parents and lower family income (Mizala and Romaguera, 2000 in Ramírez, 2003). The results of sampled schools where parents paid professional coaches to assist their children were usually better than those in poor schools. With almost more than half the population in South Africa living below the bread-line; we must accept mathematics is always going to present a challenge for poor learners, or something radical to change the status quo must be done.

6.8 Mathematics in English: Perpetuating inequality by limiting access

This study pointed out a few contextual factors which might impact on learners' achievement of mathematics and it is not the first time that these were highlighted. A recent analysis by Moloi (2006) indicates that like many countries of the world, particularly developing countries, South Africa is faced with a challenge to overcome a critical shortage of mathematics teachers as well as to develop a mathematically-skilled workforce in various fields. On the supply side, statistics released by the Department of Education showed that only three percent of all the students enrolled in institutions of higher learning in the year 2000 were in mathematical sciences as an area of specialization (Department of Education, 2005). In prefacing a National Strategy for Mathematics, Science and Technology for 2005-2009, the Department (2004) took cognizance of this limitation and further expressed concern that the teaching of mathematics in schools was often never a first choice to talented mathematics graduates. Consequently, mathematics was often taught by inadequately qualified teachers and this led to a vicious cycle of poor teaching, poor learner achievement and a constant under-supply of competent teachers (DoE, 2004). On the demand side, labour statistics showed that, in the same period, only about nine percent of employed South Africans aged 15-65 years were in occupations that require some mathematical competence, for example, technicians and associate professionals (Department of Education, 2004 in Moloi, 2006). In the medium to long term, this is too modest a human capital to sustain an economy which has shown a phenomenal 4.8 percent growth spurt in the last five years. Evidently, the current demand for mathematically competent potential workers in the country outstrips both the quantitative (outputs) and

qualitative (achievement) supply by far. Besides learner characteristics (e.g. gender, age, intelligence), access in terms of the availability, adaptability and acceptability of learning support materials constitutes one major determinant of the level and quality of learner achievement. There is also awareness of how socio-economic contextual factors can hinder or support access to and success in the curriculum (UNESCO, 2005; Ross and Zuze, 2004 in Moloi, 2006).

This thesis concludes that it is quite possible that the small percentage of learners who achieved well in English/LoLT and in Mathematics in the 2010; are the English and Afrikaans speakers who are the only beneficiaries of mother tongue education from cradle to university (Alexander, 2003).

6.9 Area for further research

Other than the 'dipstick' surveys that have pointed to low levels of achievement in numeracy and pure mathematics, there has been no systematic attempt to research whether the mathematics curriculum is now accessible to all learners from all different contexts - urban and rural and from different socio-economic strata, such that success through the schooling system can be guaranteed to all learners. It would be worthwhile to do a probe into whether the new CAPS (Curriculum Assessment Policy Statement); offers any real hope in widening improved access to mathematics education for the benefit of all learners.

6.10 Limitations of the Study

The most limiting factor is the orientation of the researcher towards Mother Tongue Based Bilingual Education (MTBBE); my passion and interest in this work over the last 14 years added extra time to complete this task as each piece of data and information took me to another topic. As a result the time taken to cut out extra data and extra information to complete the study was just too long. Choosing schools was also challenging for me as I could not help but keep on wanting to add more to the sample, as I felt that a formidable number of schools would make a difference and add value. In the end I had to make peace with the fact that I do not have to include every school and the information that is included is sufficient.

The location of the Sesotho schools was a big challenge but I felt that they deserved to form a significant part of this study because Basotho are in the minority in the province, and rarely does anyone bother about including them as research subjects. My own weakness in Sesotho made me feel that I was imposing either isiXhosa or English on them; doing exactly the same thing that majorities do to minorities.

Lastly; not completing the research in 2011 meant that by the time the study would be completed Grade 12 results for 2011 would be out by January 2012. Nevertheless, the relevance is still there and I did not want the opportunity to miss out on investigating the 2010 group as they were writing the 2005 IPSE (2006) and links from this group are vital for this study. I have included them by updating the three year performance pattern to a four year performance pattern.

6.11 Recommendations

It would be better to standardize the process by ensuring that the terminology that teachers use is consistent; systematic and is fine tuned for rigor and widely broadcast as early as Grade 1 to achieve mathematical literacy. In an attempt to challenge the elitism of school mathematics; its widespread failure and alienation; Jill Adler engaged mathematics teachers in seminars in 1998. In these seminars, she worked with teachers to develop a critical understanding of mathematics as a cultural process and of the mathematics curriculum as a social and political construction. Concerned not only with improving the quality of mathematical learning and teaching; but also with social justice and equity, she went about taking teachers on a journey that is much needed even at this moment, to challenge conceptions of learning and teaching that place success and failure in school mathematics solely within the minds and abilities of either individual learners or teachers (Adler, 1998). As a society we are still married to the idea that those learners who are clever will do well in pure mathematics and those who are not will default to mathematical literacy and the humanities. We do not seem to understand enough about the underlying reasons for success and failure in mathematics. A further probe on how much language impacts on mathematics achievement needs to be pursued within a Mother Tongue Based-Bilingual Education longitudinal study.

6.12 Conclusion

The definition of hegemony as domination which rests on acceptance by those who are dominated will be true if we continue to accept the hegemonic role that English plays to the disadvantage of the majority of learners whose access to mathematics is limited by the language barriers. In this study and others it is shown that providing access to better education and English proficiency early enough for Black learners did not seem to challenge hegemonic relationships between Whites and Blacks (Dalvit, 2008). One would expect that the mathematics results of Black students who attended former Model C schools would compare more or less the same with White students, but they did not. Regardless of their educational background, proficiency in the language of learning and teaching seemed to determine performance in mathematics. This study corroborates the findings of the Intermediate Phase Systemic Evaluation Report (2006) that those learners whose language was the same as the LoLT outperformed those whose language was different from the LoLT (IPSER, 2006). What was true for this group of students when they were in Grade 6; still rings true for them six years later when writing Grade 12. This is true for the majority of learners in South Africa. Thus, communicating mathematically in multilingual classrooms in South Africa means managing the interaction between the following: ordinary English (OE) and mathematical English (ME); formal and informal mathematics language; procedural and conceptual discourses; learners' main language and the Language of Learning and Teaching (Setati, 2002). In an attempt to forge a way forward in this dilemma the following question has to be asked:

- How long are we intending to maintain a system that perpetually disadvantages one group over another in a new democracy?

There can only be one answer – change is needed and desirable. All children are ensured equality in our Constitution and they all deserve an equal opportunity to meaningful education. If the system can provide mother tongue education for English and Afrikaans mother tongue speakers; what reason does the same system have for not providing the same for the African child, who forms part of the majority of learners who already know in Grade 12 that no matter how much they sleep at school for more than 30 days, they may still not pass. Now that South Africa is slowly ridding itself of the remnants of colonialism and the legacy of the injustice of apartheid; we should be aware that the disappointing story

behind achievement in mathematics will always carry with it the crude reminder that as long as the language of the learner is not central in the teaching and learning of mathematics; the results will continue to be a huge embarrassment. The recent 2012 Annual National Assessment Results for mathematics attest to this claim:

Grade 1: 68%	Grade 2: 57%	
Grade 3: 41%	Grade 4: 37%	Grade 5: 30%
Grade 6: 27%	Grade 7: 13%	Grade 9 also a dismal 13%.

A notable pattern is that the higher you go with the grades; the lower the achievement. Learners start out performing at Level 6, then Level 5 and are at Level 4 by Grade 3. After that is a downslide and one wonders about the quality of the Grade 12 that the system will produce three years later. The same Grade 9 who achieved at Level 1 (0-29%) must choose a stream next year and we can already predict the difficulty this learner will have with achieving a Level 4 (50-59%) to gain a Bachelor pass. The sampled learners produced similar results in Grade 6 in 2004; therefore it is not surprising that no amount of extra classes can compensate for the time lost in translation; repetition and sheer loss of interest in a subject that is difficult to master in a language that you only hear within the four walls of the classroom: for the majority of learners in the country; this is their reality. The Department of Basic Education has a prerogative towards all learners in South Africa; especially the majority previously disadvantaged to make education not just accessible for all, but meaningful as well. All indications are that the use of African languages in the teaching of subjects like mathematics and science will ensure wider access to the subjects and facilitate meaningful education. For now only English and Afrikaans speakers have that advantage; it can change if there is enough political will.

It would be a great honor for South Africa to follow the example of the Education Department of the Basque Autonomous Region in Spain; where a concerted effort was made as a result of large failure of learners in the target language to capacitate teachers. A decision was made to implement bilingual schooling models, by providing language training for all teachers in the system gradually over a 25-year period by putting them on paid study leave until they could reach the desired competence levels (Benson, 2008). Currently

teachers can only be employed if they are bilingual, and the training effort is being extended to raising Basque competence in subject specific domains like in mathematics and the sciences. In the wake of dismal performance in Mathematics and Language /LoLT of our learners like in the Basque region; is it too much to ask of the government to do the same for isiXhosa, Sesotho, isiZulu and all other African languages learners? It can never be too much to ask if South Africa is serious about learner centred education; unless the opposite is true.

In concluding this thesis I find the assertion by de Kadt (2003) most fitting. She postulates that our focus has been on communication in English; the focus should be on the need for language – for both the language of teaching and other languages - to serve as a tool in both the educative process, and the world of work. To this end, proficiency has to mean more than merely surface proficiency in the language (de Kadt, 2003). This calls for a need to move away from over focusing on English; all children have a right to opportunities to be taught English very well and to learn it well. That right should not take away their right to access meaningful education in a language they understand better – bilingual education becomes a notably and obviously viable option, to ensure a good grasp of subject matter in content subjects like mathematics in the home language, while a solid foundation for English is laid and supported. In my optimism about the future of bilingualism, I conclude this thesis by stating that I share Nancy Hornberger's (2003) belief that to transform a standardizing education into a diversifying one represents an ideological paradox that challenges implementation of linguistically and culturally appropriate schooling.

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APPENDIX A: REQUEST FOR PERMISSION TO USE NSC DATA IN STUDY

7 MAIN ROAD

KEI ROAD

4920

20 NOVEMBER 2010

THE DIRECTOR

ASSESSMENT AND EXAMINATIONS DIRECTORATE

DEPARTMENT OF EDUCATION

BUNDY BUILDING

KING WILLIAMS TOWN

Dear Sir

PERMISSION TO USE NSC DATA FOR MY POST GRADUATE RESEARCH STUDIES

This is a request to use the Eastern Cape Department of Education's National Senior Certificate results from 2008 to date for Mathematics English Home Language; Afrikaans Home Language, isiXhosa Home Language and English FAL. This study will be used to inform the broader Learner Attainment Strategy of the Department and to enhance the Matric Improvement Plan of the Eastern Cape Department of Education.

Thanking you in anticipation

Yours Sincerely

.....

Ms N Mbude-Shale

Provincial Manager: Language Policy Management Unit

**APPENDIX B: REQUEST FOR PERMISSION TO USE YOUR SCHOOL FOR
INTERVIEWS FOR POSTGRADUATE STUDY**

7 Main Road

Kei Road

4920

17 January 2011

The Principal

Dear Sir/Madam

Permission to use your school for interviews in a Post graduate Study

This is a request to your school for site observations and interviews with Grade 12 parents; learners and some teachers to understand what factors contribute to achievement in Mathematics English Home Language; Afrikaans Home Language, isiXhosa Home Language and English FAL. This study will be used to inform the broader Learner Attainment Strategy of the Department and to enhance the Matric Improvement Plan of the Eastern Cape Department of Education.

Thanking you in anticipation

Yours Sincerely

.....

Ms N Mbude-Shale

Provincial Manager: Language Policy Management Unit

APPENDIX C

EXTRA CURRICULAR FACTORS INFLUENCING RESULTS IN DIFFERENT SCHOOLS

SCHOOL MAH 95.2 gain 11.6	SCHOOL MBH 85.0 down -6.9	SCHOOL MCH 100.0 gain 1.2%	SCHOOL MDH 96.9 down -1.0	SCHOOL MEH 100.0 Constant

SCHOOL MFH 93.3 gain 7.6	SCHOOL MGH 73.9 gain 36.3	SCHOOL MHH 70.8 gain 8.0	SCHOOL MIH 78.3 gain 1.5	SCHOOL MJH 20.8 down -21

APPENDIX D: QUALITY OF MATHEMATICS PASSES

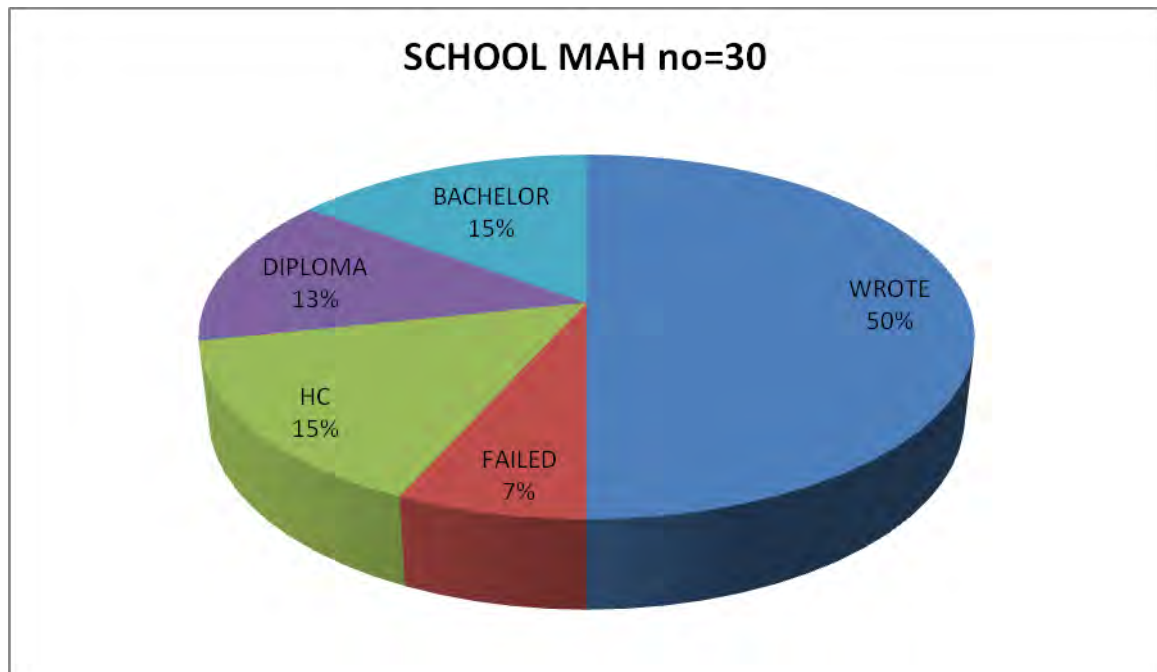


Figure App D 1

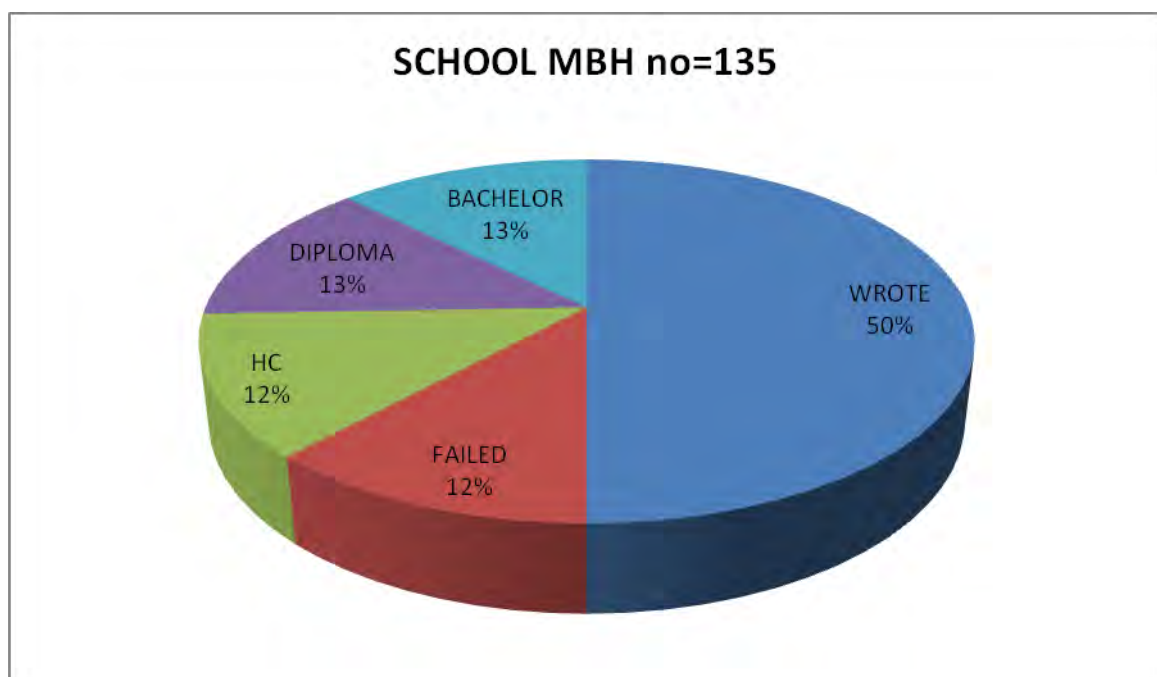


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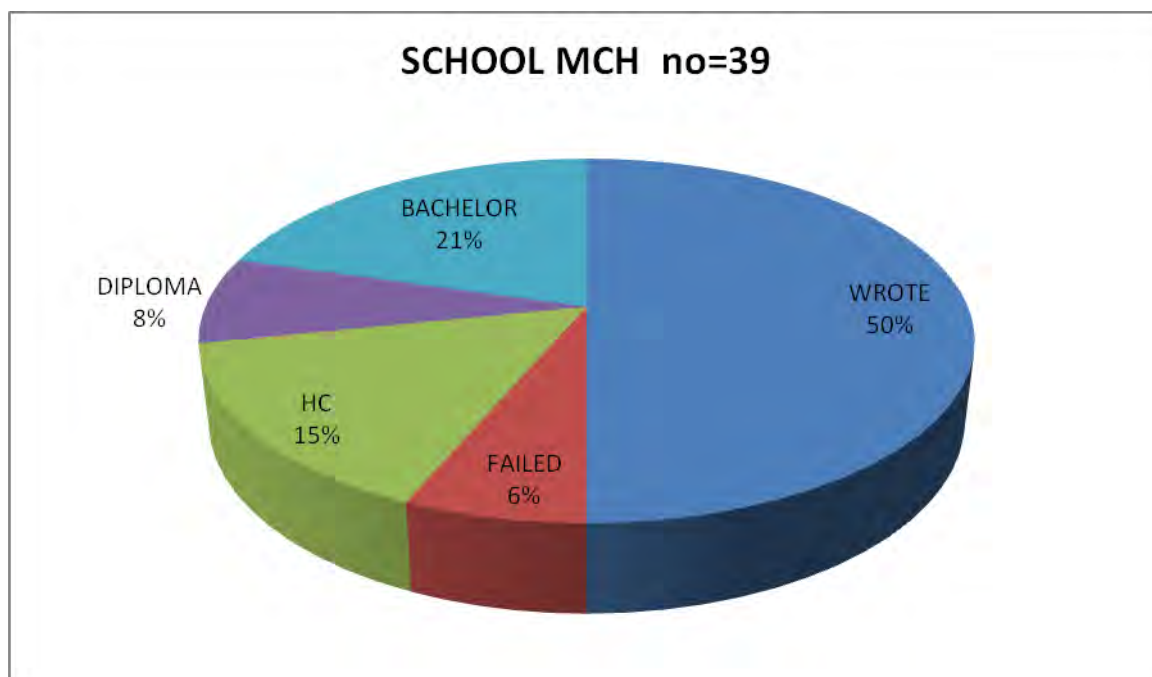


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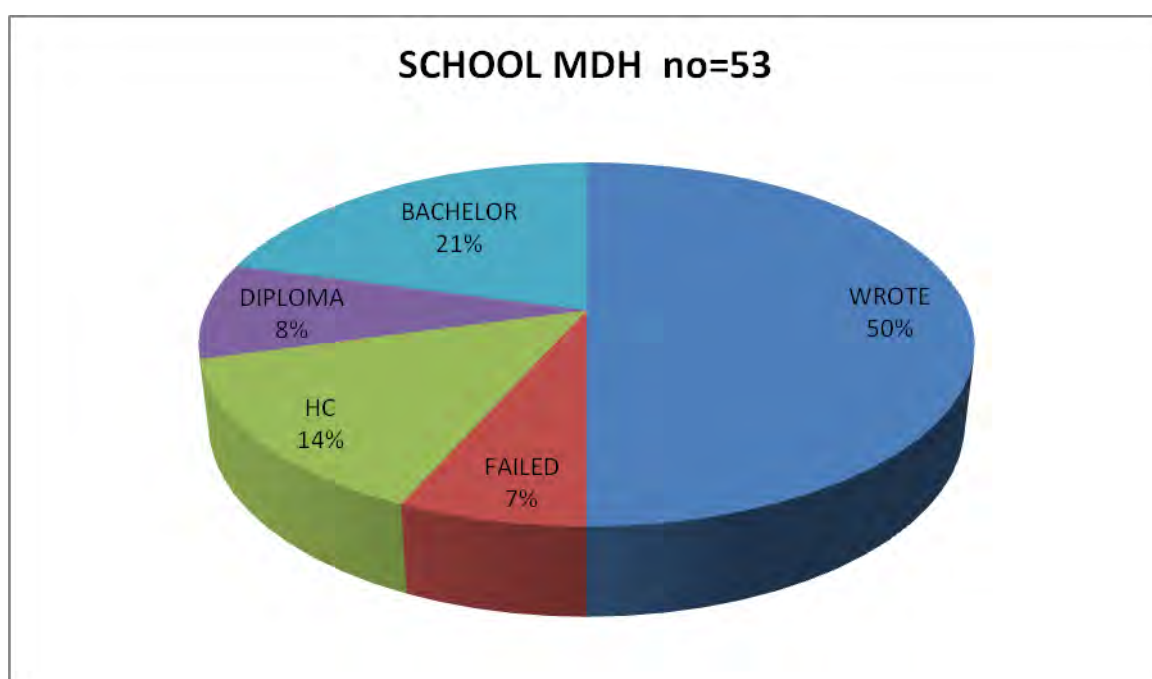


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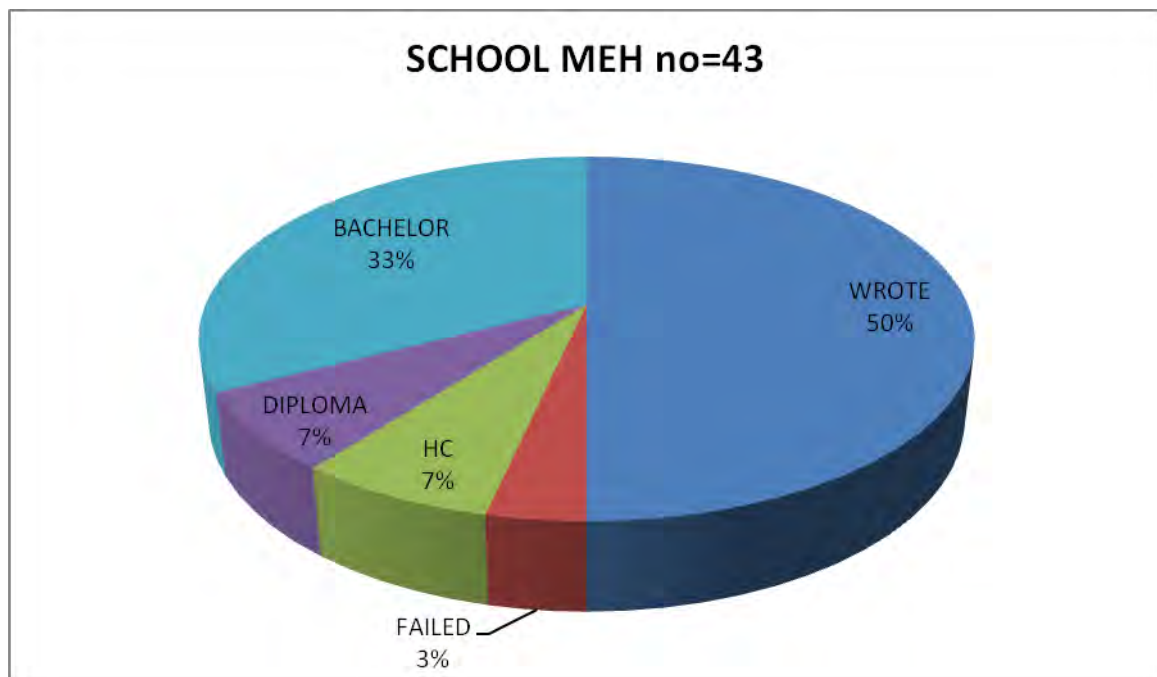


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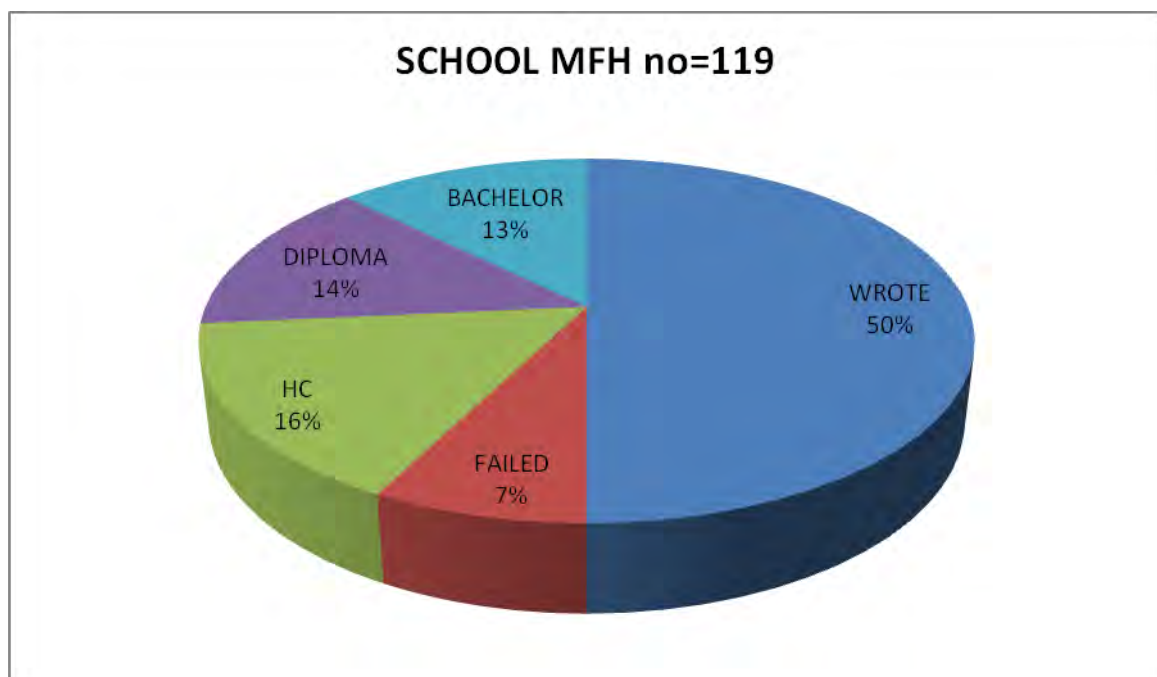


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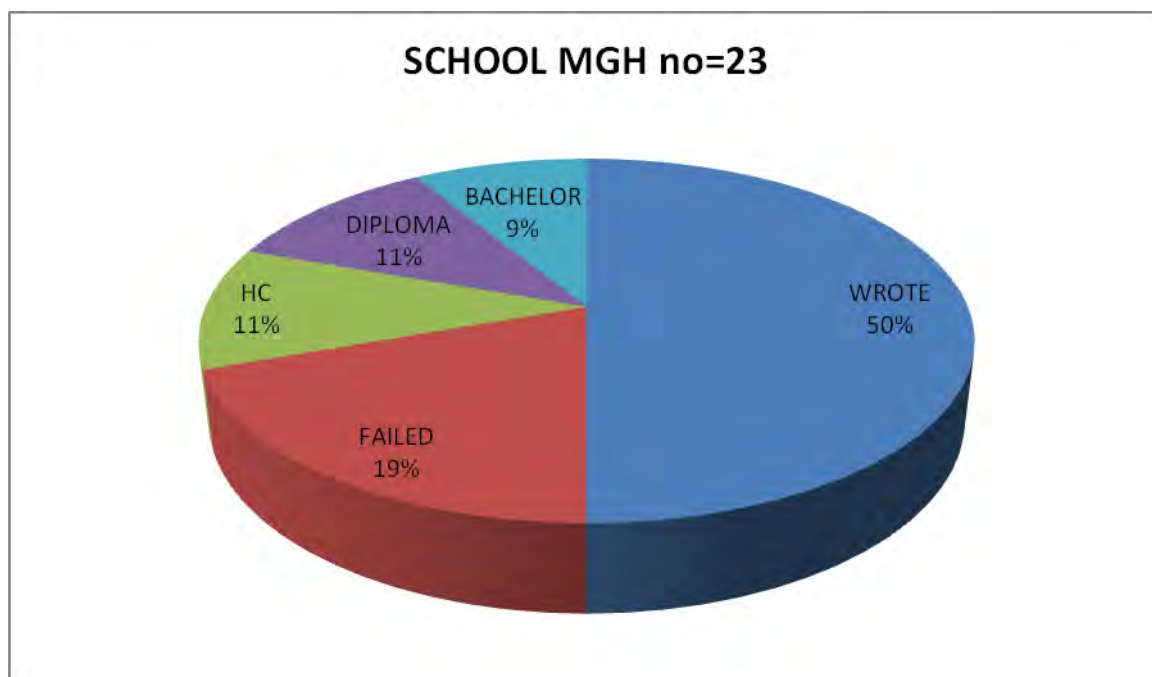


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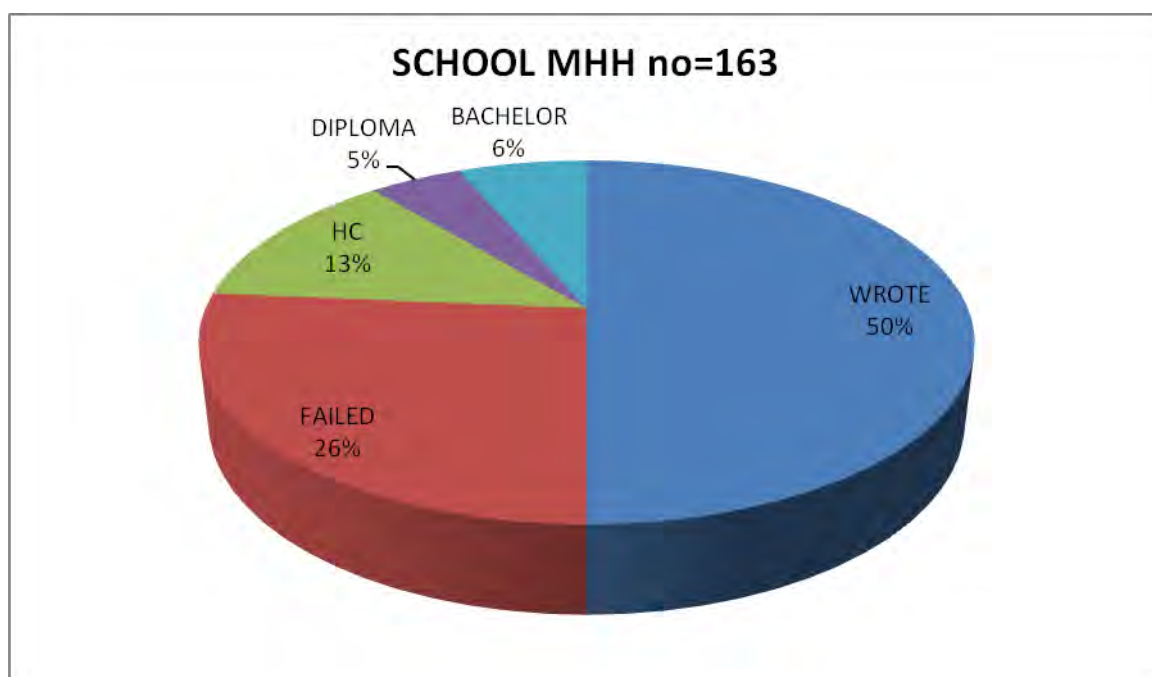


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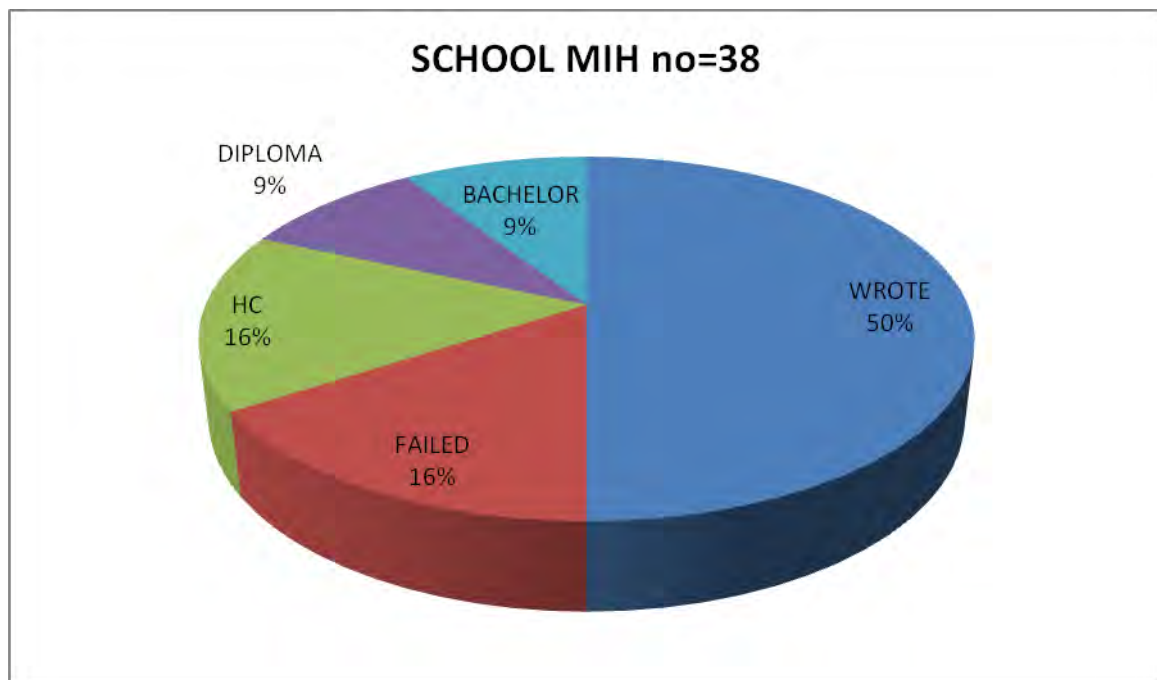


Figure App D 9

APPENDIX E: SUMMARY INTERVIEW RESPONSES

Question:

In your opinion; which factors are associated with high or low achievement in Grade 12 particularly in Mathematics and Language in the school?

A. TEACHER PERSPECTIVE: 3 MOST COMMON ACROSS SAMPLE

POSITIVE

1. Dedication of the staff to their work and being on class in time teaching.
2. Sacrifice/ going out of the way to maintain the positive image about the school in terms of good results
- Parents who appreciate teachers and are willing to help learners.

NEGATIVE

- Student numbers are on the increase therefore causing a concern about individual attention.
- Parents not participating in the education of their children with learners easily adopting a negative attitude to their work
- Lack of support from the District office has a direct impact on results.

B. LEARNER PERSPECTIVE: 3 MOST COMMON

POSITIVE

1. Teachers being in class and completing the syllabus
2. Learner support materials that is adequate for all learners
3. Extra classes although they are draining and take up most of spare time

NEGATIVE

1. Teachers are too strict even on petty issues straining learner-teacher relations and Black students feel strongly about racism and how it makes them feel less of people. White students on the other hand feel a lot of time is wasted re-explaining things to Black students who always just don't seem to get it.

2. Difficulty with the language of learning and teaching (English) and the fact that they must attend classes the whole year to make up for time lost.
3. LTSM shortages and having to share basic necessities. Learners felt that a good pass in Grade 12 is impossible without individual textbooks and teachers who do not know enough Mathematics are a frustration.

PARENTAL PERSPECTIVE AS TO RESULTS: 3 MOST COMMON

POSITIVE

1. Dedicated teachers who respect learners despite their racial or cultural orientation.
2. A good principal who sets an example by providing everything for Grade 12s including organizing extra classes.
3. Learners who are committed to learning and studying.

NEGATIVE

1. Pettiness of teachers who demand too much from parents and students that is not related to schoolwork including; demands for fundraising and money that they are never satisfied with.
2. Absent parents whose charges are loose and easily distract teaching and learning and negatively influence others to behave badly. Insufficient support from the District office and Head Office.
3. Learners who do not want to learn and engage in adult activities and drugs.