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TITLE:

" An Ethnographic Study of a black
South African High School with special
reference to its Mathematics Classrooms."

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NOTE:

1. Under the Apartheid Legislation four broad ethnic groups were classified. These were whites, blacks, coloureds and asians. For the sake of clarity these terms are used in this study. Where the word Black begins with a capital letter it means all groups that were previously disenfranchised i.e blacks, coloureds and asians. The word black beginning with a small letter means specifically African.

This thesis then, focuses on an African (black) school environment.
2. The original name of the school and all those of the teachers and the students have been changed to protect identities.
3. Where reference is made to the Department of Education and Training (DET) or Department of Bantu Education, this refers to the controlling authority of black education at the time.

CHAPTER 1

INTRODUCTION:

1.1 Introductory remarks

The title of this dissertation indicates that I have undertaken an ethnographic study. Since ethnographic research requires intensive report writing on the part of the researcher, the researchers' subjectivity sometimes crosses the boundaries of the research process. There can be no doubt that whilst every effort has been made to give objective assessments in the pages which follow, the researchers own subjectivity must at times skew the process.

Bearing this in mind, Eisenhart and Rowe (1992) argue that inherent assumptions and goals must be exposed- in other words the subjectivity of the researcher, his belief system, his own assumptions about the setting and his goals in entering the setting must be explained and analysed.

Peshkin(1988) , using the Webster definition of subjectivity as a basis, has defined it as the "quality of an investigator that affects the results of a observational investigation ... these qualities have the capacity to filter, skew, shape, block, transform, construe and misconstrue what transpires from the outset of the research project to its culmination in a written statement" (p.17). He advocates the acknowledgement of such subjectivity while engaged in the fieldwork period of research. This should keep ones' pen in check since as Peshkin conjectures:

"untamed subjectivity mutes the emic voice" (p.21).

So what is my belief system and which inherent assumptions of mine about the setting at Guzany, a black high school, might cloud my judgement and colour the validity of my research?

In the context of South African society, I will classify myself as a South African who grew up in middle class surroundings. Under apartheid laws I was classified 'coloured' and I attended and at present am teaching at one of the top ten feeder schools to the University of Cape Town (national list). This school is regarded as being one of the top 'coloured' schools in the Western Cape.

At the base of my teaching philosophy is the desire to help and teach others. It is this desire which has driven me to become involved in this project. I believe that a proper understanding of the context in which black education operates will provide a framework within which to advance.

Coupled with this is my strong belief that whilst research can assist in the understanding of particular problems, it is only if those within a particular setting understand their conditions and are prepared to drag themselves out of the quagmire that real change can be effected. I believe that even with outside assistance, South Africa's problems must be solved by South Africans. This view can be extrapolated to each province, region, community and township in the land.

What is also essential is that my political belief system should be exposed. This is because, as

Hammersly (1992) cautions: ethnography may just develop into a glorified "vehicle for ideology" [p.28]. My strong commitment to obtaining fundamental human rights for all South Africans is a philosophy I have followed my entire life. Subjectively, I viewed the developments in the political arena in 1992 in South Africa as being attempts by the ruling classes of South Africa and indeed the world to hammer our nation into accepting less than their full share of fundamental, democratic, human rights. Unfortunately some of the legitimate organisations representing the large majority of South Africans at the time accepted the deals offered, although many will argue that reality dictated that there was no other choice.

Compromises concerning what is commonly known as federalism, regionalism, protection of minority rights etc. were all in my opinion cleverly hidden apartheid defence mechanisms designed to maintain the power of the ruling class minority over the lives of the majority of South Africans.

The political wheeling and dealing together with the fact that many sectors of the oppressed communities (including those involved in sport, culture, education) seemingly abandoned struggles for fundamental rights, have all contributed to my questioning of the role and intent of the organisations representing the majority of people in our country.

Whilst acknowledging the shortcomings of the political organisations and expressing my displeasure with the process through which South Africa has gone, it is nevertheless my belief that the political system in place at present (1996) is a major leap in the right direction.

Many readers will disagree with the previous paragraphs ; asking: On what basis I am able to make such claims ? and which sources have I used to support these claims ?

In answer to this , I offer no basis or support for these claims, for that is not my brief in this report, rather I have forwarded these subjective views so that :

1. those who analyse my report will, through acknowledgement, broadly understand my world view.
2. I do not overwhelm the views and belief systems of those who have participated in the research process.

Webb and Glesne (1992) in cautioning us about subjectivity, cite Barzun (1983) as stating that we need to be careful not to fall into the trap of bestowing our " own versions of reality on others and , when different versions of reality are inadvertently found, to criticise them as naive, foolish or wicked" [Barzun,1983, p.39, cited in Webb and Glesne, 1992, p.777].

In this process of exposing my own subjective views, the research will be used to understand life at Guzany in the context of the mathematics classroom, especially where reality conflicts with my own world view.

1.2 Focus of the Research Problem

The research aims to achieve an understanding of the problems faced by both teachers and students in black high schools with special reference to mathematics.

In order to gain greater insight into the difficulties experienced the research describes in detail the daily experiences of participants in one black high school in the Western Cape from January 1992 to June 1992.

There are approximately 20 black high schools in the greater Cape Town area. The researcher entered Guzany High School in the township of Guguletu for a period of 6 months and described the general conditions in the school as well as the specific conditions in the mathematics classrooms. This was done via the observation of lessons of the various mathematics teachers, informal discussions with teachers and students, attendance at various meetings, formal highly structured interviews and collection of various documents relevant to the proposed research. In order to obtain direct contact with individual students the researcher taught a mathematics class for the entire 6 month period.

The Primary objectives of the study were as follows:

1. A. to give a brief history of the school and the general community around it.

B. to give a general description of the physical conditions at the school and of the mathematics classrooms in particular.

C. to give a brief overview of the inter-personal relationships between participants as these pertain to the general running of the school.
2. to describe problems faced by both learners and teachers in the school in general and in the mathematics classrooms in particular.

CHAPTER 2

EXPLORING BANTU EDUCATION IN GENERAL AND THE TEACHING OF MATHEMATICS IN PARTICULAR.

Black education represents a key area of South Africa's political, social and economic future. Mathematics (and allied disciplines) has become more and more important in the highly technological, urban-industrial economy towards which South Africa is moving. A clear description and understanding of the problems in the mathematics classrooms of black schools will be fundamental to the advance of South African society as a whole.

While the data collection of the ensuing study was conducted in 1992 -a period prior to the historic formation of a government of national unity through the will of the people of South Africa, a cursory glance at the daily newspapers at present (1995), will reveal that the education scenario in Black High Schools has not changed significantly.

Consequently therefore, the contention is that although statistics for this study have been gleaned from publications during the period surrounding 1992, these are just as relevant today.

As later discussion will reveal, mathematics education in black high schools is in an ever increasing perilous state. Fundamentally, an intervention by both the community and the state is needed for the advance of mathematics education in black South African high schools.

However, intervention of any sort should be preceded by a thorough study of local prevailing circumstances from the point of view of the participants. Gerdes (1989) concurs with this view since he argues that the development of mathematics education must take place in the context of the local situation by involving everyone concerned.

Bearing these points in mind, the research undertaken provides the education community with a detailed description of life in an urban black South African high school in general, and of its mathematics classrooms in particular. The description and viewpoints which have emerged will hopefully be invaluable in the planning and implementation of programmes for innovative educational transformation (e.g. in-service training, reformulating the content of mathematics method teachers courses etc.)

What then, are the reported scenarios of education in high schools today ?

A perfunctory glance at the daily media depicts national education in the depths of despair.

Unimaginable disparities between white and black schools exist.

Large classes; overcrowded classrooms; shortages of: textbooks, facilities and writing materials ; poor working conditions ; unqualified teachers and high pupil- teacher ratios are all realities in black schools today (See section 2.4 for some statistics quoted by the South African Institute of Race Relations).

These physical factors combined with the " cumulative effects of the past decade of social upheaval... have left thousands of practising teachers quite unable to pursue the day to day

work of teaching, studying and backing up the work of their pupils and students in recognised enrichment activities." (T.L.S.A.,1991a,p2)

It is in this environment that black schoolchildren are expected to compete with other sectors of society as equals.

The question therefore arises: What gave rise to these reported scenarios ?

To answer this question, we need to briefly look at :

2.1 the formation of what was commonly called Bantu Education

2.2 Events leading up to the student uprisings in 1976

2.3 Education in black high schools from 1976-1992.

2.1 The formation of Bantu Education:

During the 18th, 19th and early 20th century, black education was largely conducted in mission schools. It was the philanthropic attitude of the churches which resulted in the establishment of these mission schools for the education of black South Africans at that time.

However, with the rapid industrialisation of South Africa in the early 20th century and the resultant urbanisation, the needs of South Africa's capitalist ruling class of that time altered dramatically.

Cheap labour was now needed to work the mining and other industries which had sprung up all over South Africa. This meant that it was now important for Government and Capital (Business) to provide a rudimentary education to feed a cheap labour market.

Black South Africans were seen as a cheap labour pool from which to draw.

Christie and Collins (1984) sum this idea up as follows:

"The principal... institution in which the production and reproduction of labour power takes place, is the school... with the development of Capitalism and the increase of its labour needs, schools have become the principal focus of the labour reproduction process, and have become increasingly to be the preserve of the state." (p.164)

Molteno (1984) cites an Interdepartmental Committee on Native Education (1936) :

" ... we must give the Native an education which will keep him in his place- if the Native is to receive any education he should have as his aim the idea embodied in Dickens' version of the ancient prayer:

Oh, let us love our occupations
 Bless the squire and his relations
 Live upon our daily rations
 And always know our proper stations... "

(UG 29/1936 pp86-87 para 453; cited p62).

Thus Molteno (1984) together with Christie and Collins (1984) argue that socio-economic needs rather than race determined the basis for black education in the 20th century. According to this view Apartheid and Apartheid Education from the 1950's onwards was only a mask for a system of Capitalism, designed to provide a cheap labour pool from which to procure super profits.

School segregation and its effects were already being felt before the Nationalist Party

Government came to power in 1948. The difference however, was that whereas previously

segregation was practised but not enforced, after 1948 it became law. This act separated South Africa from the majority of countries in the rest of the world.

The Eiselen Commission of 1949 suggested the control of Black Education be moved from the churches to the state. The direct result of this was the proclamation of the Bantu Education Act of 1953, and the by now infamous words of the Minister of Native Affairs, Dr.H.F.Verwoed, in 1954 (in referring to the education of black South Africans):

" There is no place for him (Bantu) in the European Community above the level of certain forms of labour..." (cited in Molteno, 1984, p.92).

According to Molteno (1984) The Bantu Education Act of 1953 advocated large syllabus revisions, obedience and loyalty to authority, ethnicity, acceptance of societal roles, piety and identification with rural culture.

" The Nationalists... knew from their own history, what potential lay in the fusion of working class consciousness and nationalist ideology-it had helped to propel their own party into power... Thus, central to their strategic objectives was the defusion of African Nationalism through a systematic attempt to retriabalise in such a way that the resultant fragmentation would obstruct further development of black nationalism..." (Molteno, 1984, p92).

Thus central to the governments' policy was the control of all aspects of the lives of Black South Africans with education being a tool of this control. According to Cameron (1985) the removal of Africans from Areas like Windemere to Guguletu must thus be seen in conjunction with this development of state control of Black education. It became necessary to create areas in which extreme control and regimentation could be enforced.

Makosana (1988) takes this argument even further when he suggests that part of the reason for enforcing state control of Black Education was that in this way, the government attempted to rest all influence from community organisations like the ANC and the PAC whose ideas had slowly begun to infiltrate the mission schools.

The 1950's and 1960's thus saw the worst kind of repression through the Apartheid policies of the state in general, and the enforced segregated and unequal education as promulgated in the Bantu Education Act of 1953 in particular.

The physical conditions of Black schools during this period was extremely bad, with no electricity, cement floors, high pupil teacher ratios and the like.

This then was the scenario in Black education which set the backdrop against which the events, later to be known as Soweto 1976, arose.

2.2 Events leading up to the student uprisings of 1976:

The uprisings in Black Education in 1976 were to shake the foundations of South Africa and its Education System to the core. The events of this period were to significantly shape the future of South Africa in general and its education system in particular.

2.2.1 What gave rise to these uprisings ?

To fully comprehend the circumstances surrounding the events of this period, one must understand the context in which persons in black South Africa were forced to live. Many black communities were deprived of fundamental political rights, had to suffer under various inhumane laws like influx control and the Group Areas Acts, and lived in conditions of poverty and squalor.

Hallet (1976) sums up conditions in this way:

" Few communities in the history of urban man have been so bereft of basic human rights as the inhabitants of the black townships of 'white' South Africa. To live in Soweto or any other black township seems to an outsider like living in a barbed wire entanglement , so many are the regulations which residents are required to observe."
(p4)

This set the background against which an education system designed to oppress, operated.

There can be no doubt that the groundswell of opposition to these hated systems was to overflow into a full scale war at some stage or another. South Africa was sitting on a time bomb waiting to explode.

The issue of Afrikaans as medium of instruction in Black schools provided the spark that was to set the scene alight. As both Hallet (1976) and Makosana (1988) contend, the explosion which later became known as Soweto '76 was a uprising against the whole system of Bantu Education rather than just an issue of the medium of instruction in Black schools. Indeed as the events of the period unfolded the entire range of black grievances came to the fore.

Some of these grievances included the following:

- * Lack of political rights
- * The pass laws and Influx Control

- * Lack of land ownership rights
- * Lack of home ownership rights
- * Forced removals
- * Restriction of trading rights
- * Compulsory homelands citizenship
- * Lack of educational and recreational facilities
- * Lack of teaching qualifications in schools
- * Lack of textbooks

(SAIRR,1978)

All of this, coupled with the fact that Black Education was seen as being used by the government as a source of cheap labour from which to draw, were causative factors in the ensuing uprising.

2.2.2 What specifically caused the uprising ?

The exact cause of the uprising, was a proclamation by the Deputy Minister of Education at the time viz. Dr. Andries Treurnicht, that in "... white areas the government should have the right to decide the medium of instruction since it supplied the buildings and subsidised the schools " (Kane-Berman,1978,p12).

The contention was that all urban black ghettos fell in the 'white areas' since black South Africans all were supposed to have had their own homelands.

The direct result of this was the Bantu Education Department instruction that 50 % of the subjects were to be taught through the medium of Afrikaans . Social Studies (History and Geography) together with Mathematics was specified as subjects that should be taught via the medium of Afrikaans (SAIRR,1978), while the rest of the subjects were to be taught through the medium of English. All non-examination subjects like Physical Education and Religious Instruction were to be taught in the local vernacular.

A further bone of contention was that not only were subjects to be taught in Afrikaans , but they were to be examined in Afrikaans as well.

African teachers were up in arms since they felt that they were not competent to teach through the medium of Afrikaans. Various schools applied for exemption from the ruling , but were not allowed to do so as it was the governments' contention that all teachers were competent to "give instruction through the medium of both Official Languages" (Hansard, 1976, No.19, Col.1185 , cited in SAIRR,1978).

Coupled with this was the fact that the trilingual approach had been rejected by educationists over a number of years.

It may therefore be concluded that the reason for the introduction of Afrikaans as medium of instruction was to ensure that black South Africans remained at 'their proper stations' in life.

2.2.3 The events of 'Soweto 1976'

The immediate reaction of the teaching fraternity was a three week strike all over Soweto which started on the 17 May 1976 (SAIRR,1978).

The students became directly involved on 16 June 1976 when a march, initiated by students of Naledi High School, moved through Soweto to Orlando West Junior Secondary. At its height this march consisted of over 10 000 people (SAIRR,1978).

It was here that the first casualty arose. A young teenager, Hector Petersen was shot dead by the South African Police. This act caused widespread rioting, school boycotts and protest which eventually spread to all the major cities of South Africa.

In the Western Cape (the location of the ensuing study) isolated incidents of solidarity especially from the Universities of the Western Cape and Cape Town occurred in the ensuing months. Secondary schools only became involved in the month of August 1976. Van Heyningen et al (1976) has cited the fact that the problems in Soweto arose as the Cape schools were closing for the mid-year vacation, as a reason for this time lag.

Trouble in Western Cape schools started on the 11 August 1976 (Van Heyningen et al,1976; SAIRR,1978; Makosana, 1988).

" The rejection of Bantu Education in Guguletu and surrounding township schools started on 11 August 1976 at Guzany High School" (Makosana,1988,p65).

Students left schools and led protest marches. They were dispersed by the police. The result of this was that widespread rioting occurred and numerous people were killed in the skirmishes. According to Van Heyningen et al (1976) all institutions that were seen to be organs of the state e.g. Post offices, government buildings and police stations were attacked. Rioting later spread to shops, liquor outlets and beer halls resulting in looting, death and destruction on a wide scale.

The SAIRR (1978) indicates that 105 people died during the unrest period from 11 August 1976-17 September 1976 in the Cape Town Area.

A significant feature of the unrest was the uncoordinated solidarity between the black and coloured schools of the Western Cape. However, black pupils were especially vehement in their protests. They demanded that Bantu education be abolished and refused to return to school. For the rest of 1976 Black schools remained unoccupied (Van Heyningen, 1976).

2.3 The effects of Soweto 1976 in the period leading up to 1992.

1976 represented a watershed year in the history of South Africa in general and its Education system in particular. For the first time the state had met violent forms of protest on such a wide scale. The state moved with all its power to crush the revolt, but in so doing disrupted any hope of a peaceful school environment. In fact these actions of the state were used by the students to justify a continued boycott of classes.

Students believed that they now had the power to change the system and they now began to reject all forms of authority.

In evidence given to the Cillie Commission by the SAIRR (1978), warning was given of :

"... the social dangers of a situation where parents do not have the supportive influences of a sound educational system and where the flagrant injustices of certain forms of authority imposed by the state are conducive to the rejection of all authority " (SAIRR,1978,p45).

In fact students began to reject the authority of their teachers and formed Student Representative Councils (SRC's) -organisations which dare not be defied by both teachers and headmasters alike. In other words, there was no meaningful relationship between students and their teachers. All of this had broken down through the events of the period known as Soweto 1976 (Makosana,1988).

It must also be understood that teachers in African Society were not used to having their authority questioned as this was in conflict with accepted norms and traditions in African culture -e.g. respect for elders etc. Coupled with this was the fact that thousands of young black students fled into exile to join the armed wings of the ANC and the PAC.

The situation in Black education over the next 15 years was pretty much the same. In almost every year, Black Education suffered some sort of disruption and for many months students did not attend school. In the 1980's the situation became so bad that not even leaders of the community could reason with the students. As a retired teacher lamented:

" The gains of 1976 in Education such as getting our schools electrified...were outweighed by losses...We lost the authority we had as teachers before 1976; the students would unilaterally take decisions which were binding on the teachers and the community." (cited in Makosana,1988,p69)

Chisholm (1991) has argued that the use of repression rather than negotiation by the authorities has "...fuelled and exacerbated the loss of a culture of learning in black schools."
(p5)

Of course a proper analysis would also argue that the liberation movements ,especially the ANC , tacitly encouraged the disruptions since they saw this as a way of attracting world attention to the plight of the majority of South Africans. In fact, the ANC's policy of 'ungovernability' -a word coined in the 1980's, must also have contributed in no small measure to the loss of a culture of learning in the black education sector of our society.

The States' response was to try to flush out the ring leaders. They blamed the older students and therefore created centres for students older than 18 years of age. In the Cape Town area an example of such a centre would be the St. Francis Centre in the township of Langa.

The direct result of this banning of older students from normal mainstream schools, was the fact that thousands of young people dropped out and became integrated into the ranks of the unemployed (Chisholm,1991).

The events of this period set the background against which the ensuing study took place.

2.4 Placing the problem in context.

As the introductory comments have revealed in urban black South Africa, large classes; overcrowded classrooms; shortages of: textbooks, facilities and writing materials ; poor working conditions ; unqualified teachers and high pupil- teacher ratios are the reported scenarios in black schools today.

To the uninformed, the above statements may seem somewhat exaggerated. A brief glance at available statistics reflects otherwise:

* 68% of black children of school-going age are innumerate and illiterate (T.L.S.A.,1990c).

* 40% of black pupils leave school before Std.5 (T.L.S.A, 1990c).

* Pupil teacher ratios:

Black: 40-1

Coloured: 23-1

Indian: 21-1

White: 18-1

(South African Institute of Race Relations, 1987 in T.L.S.A.,1990a)

* 33% of teachers in schools of the Department of Education and Training (DET) do not have a matric certificate (Integrated Market Research,1990 in T.L.S.A.,1990d).

- * 80% of teachers in black, coloured and indian schools do not have a post-matric qualification. (T.L.S.A., 1991a).

- * 56% of the candidates who wrote the 1989 senior certificate examination of the DET, failed (T.L.S.A.,1990a).

- * Only 1% of students from black, indian and coloured schools studied mathematics on the higher grade (T.L.S.A.,1990a).

- * In DET schools in the Pretoria-Witwatersrand area, only 0,9% higher grade mathematics pupils achieved 50% or better (T.L.S.A,1990a).

Indications that mathematics education in black South African high schools is in serious trouble, are reflected by the fact that in 1990, 84% of the higher grade and 83% of the standard grade pupils failed the DET mathematics examinations (Hansard in Breen,1990) and only 1% of prospective candidates from indian, black and coloured schools did mathematics on the higher grade (T.L.S.A., 1990a).

These statistics must be considered against the backdrop of physical shortages, overcrowding and large teacher-pupil ratios (Walters,1989; S.A.I.R.R.,1987) . Combined with this is the notion that mathematics in school is presented as not having any social relevance and only to be " abstractly and academically understood by a minority of clever people " (Walters, 1986,p9).

The National Education Crises Committee - NECC (1989) has added its voice to the debate by noting that: " the majority of people in South Africa have limited access to education and that mathematics education in particular contributes to the maintenance of privilege and power" (p37).

The Nationalist Party Government responded to the problems in education via its Education Renewal Strategy (ERS). The unfortunate reality about these general proposals was that while they did not purport to be racially based , they discriminated against the economically disadvantaged (T.L.S.A.,1991b). This was borne out by the fact that they proposed to make schooling compulsory and free up to standard 5 only, after which the major responsibility for the provision of funding would have to be shouldered on a private basis e.g. by the parents (T.L.S.A.,1991b).

The Reconstruction and Development (RDP) programme of the ANC - a major role player in the present Government of National Unity advocates similarly that education will only be free and compulsory up to standard 7 (9 years of free schooling).

Various political and community organisations rejected the ERS, opting instead for free and compulsory schooling, with appropriate standards up until at least matric (T.L.S.A., 1991b).

It is against this background that educationists and education researchers have asked the question : What is to be done?

Christie (1986) has argued that we should use education as an instrument of social change ,by providing both teachers and students with an awareness of their ability to transform their situation. Specifically, with respect to mathematics education , Walters (1989) suggests that we need to remove the physical problems hampering meaningful mathematics education and proposes the development of mathematics lessons which are " designed to: 1. educate 2. liberate and 3. break down existing illusions regarding mathematics and mathematics education " (p18).

Bailey and Shan (1991) argue that if we want to raise our standards and increase learning potential in mathematics education we have to focus our research on areas of content, method, attitude, expectation and evaluation.

In order for proper implementation of the proposals of any of the afore-mentioned writers to take place locally, a clearer picture of the mathematics classroom in black South African high schools from the perspectives of participants must first emerge.

There are, at present, no recent published accounts available which describe in detail the context and events shaping the daily school experiences of urban black high school students in general, and of the mathematics classrooms in these environments in particular, in South Africa.

A statistical study giving a broad overview of physical conditions in black schools in the Western Cape (Smith, L. 1977) does exist. Makhubela (1978) attempts to describe the broad policies of the then Bantu Education Department (now the DET) looking mainly at the role of

this department in black schools in the Western Cape. A brief account of life in a rural black high school in Natal, can be found in Jacobs (1991).

All of this points to a need for a project which will reflect on the nature and character of teaching and learning in an urban black High School, with particular emphasis on the mathematics learning and teaching. A thorough study of local prevailing circumstances from the point of view of the participants must precede intervention of any sort.

D'Ambrosio (1985) takes this even further when he suggests that research methods into mathematics education should develop from an anthropological base. According to D'Ambrosio (1985) this will lay the foundation on which curriculum development can take place.

Although very limited local studies have been done by researchers, the question arises : What of other contexts- third world or otherwise ?

In a study of difficulties facing mathematics teachers conducted in Nigeria in 1981 research showed that ...

" the students , the society , the teaching resources and the unavailability of teaching aids, all constitute problems and difficulties for the mathematics teachers. Many of these difficulties appear to be common phenomena in most developing countries" (Ale,1981,p.479).

Ale (1981) found that teachers were underqualified and experienced language difficulties. Students had poor mathematics backgrounds and showed negative attitudes and a lack of

interest in learning. Classrooms were overcrowded and available time was not properly utilised. Gerdes (1981) had similar findings in Mozambique.

Bishop(1988) has advanced the view that all of this must be understood against the background that the difficulties being experienced were as a direct result of the culture boundedness of the mathematics being taught. Mathematics is thus not culture-free (Bishop,1985b,1988; D'Ambrosio,1984; Fasheh,1982; Gerdes 1985). According to this view : If one is to define culture as encompassing "... patterns of meaning, reality, values , actions, and decision -making that is shared by and within social collectives" (Singleton, 1974,p28), then students (and some teachers) are unable to relate to the material being taught since it does not fall within the boundaries of their cultural experiences. According to Bishop (1985b) all of Singletons' (1974) definitions of culture are present in mathematics.

"...the thesis is therefore developing that mathematics must now be understood as a kind of cultural knowledge, which all cultures generate but which need not 'look' the same from one cultural group to another...Just as each cultural group generated its own language , religious beliefs etc., so it seems that each cultural group is capable of generating its own mathematics"
(Bishop,1988,p.180).

Gerdes (1988a) and D'Ambrosio (1983) argue that this culture boundedness of mathematics allows dominant elites to preserve the status quo. Mathematics is thus being used as a "...barrier to social access..." (D'Ambrosio,1983,p363).

Gerdes(1988b), in reporting on the use of Angolan sand drawings in the mathematics classroom , shows that the only way to open up social access is to incorporate traditional practices into the mathematics curriculum. Berry (1985) concurs with this view arguing that community members need to be actively involved in the process of curriculum development

so that practices are not seen as culturally remote. This view has direct implications for studies of urban Black high schools in South Africa.

An extension of the debate around the culture boundedness of mathematics education is the question of the medium of instruction and the terminology being used within the mathematics classrooms of the world. The crux of the debate is whether to instruct pupils in their mother-tongue or in the language of the dominant ideology prevalent in a particular society at a particular time.

Many writers have argued that the ability of learners to master the medium of instruction affects performance in mathematics (Vygotsky, 1962; Aiken, 1972; Graham, 1988; Brodie, 1989). If we accept this view, then it becomes evident that learners of mathematics will be most proficient in their mother-tongue and thus this is the desired medium of instruction.

In support of this, Zepp (1981) cites Macnamara (1967) together with Hendersen and Sharma (1974), revealing that: "... students learning mathematics in their first language were superior in problem-solving to those learning in a foreign language..." (p68).

Graham (1988), citing Newman (1981) reports that there is a direct link between children's difficulties in mathematics and their inability to master mathematical terms in a language other than the mother-tongue. Lassa (1980) concurs with this view.

While Ale (1981) points to the Malaysian experience as a successful example of mother-tongue instruction, he cites the translation of materials and mathematical terms into the mother-tongue language as problematic.

The non-availability of textbooks in the mother tongue has been cited by Lassa (1980) as another practical obstacle to instruction.

Other debates centre around the structure of the mother-tongue, with researchers arguing that this will have a direct influence on the mathematical cognitive processes currently needed in mathematics education (Zepp, 1981; Bishop, 1983; Lancy, 1983; Berry, 1985; Presmeg, 1988 ; Brodie, 1989).

Crane (1985) provides a practical example in support of this argument. A study of the Baruya language of Papua New Guinea reveals that "... there is no standard unit of measurement, other than, for distance, 'a days walk', or for time, 'the day'." (p30).

Bishop (1985a) has posited the idea that certain languages form part of a 'mathematico-technological (MT)' culture in that there is a direct relationship between the grammatical structure of these languages and mathematical constructs presently in use. The argument develops along the lines that for children who are fluent in languages falling within the range of MT languages, mathematical meanings are easily assimilated. However for children whose mother tongue falls outside the range of MT languages, it becomes difficult to construct mathematical meanings (Halliday, 1974; Bishop, 1985a; Graham, 1988 ; Brodie, 1989).

According to Graham (1988) two avenues are open to children who come from societies falling outside the MT culture: Either they learn a second language which falls within the MT range of languages, or they try to adapt their present language so that it becomes easy for mathematical meanings to be conveyed.

If one considers the first option then arguments presented previously, demonstrate that it becomes a matter of proficiency in the second language. The second option, however, does not present any easier a solution - as demonstrated by Van den Bergh (1978). In a study of the North Sotho language, attempts were made to streamline the unwieldy number structure of the language, with very little success. Brodie (1989) has slated this as not going far enough in that no community involvement was sought.

In fact, Brodie (1989) develops an approach for the use of mother-tongue instruction, arguing that the students should feel comfortable to express thought patterns and hence will only do so through their mother-tongue.

Graham (1988) supports the view of mother tongue instruction, arguing that we should teach mathematics related to the culture, real life experiences and norms of any particular society in the language over which that society has the most control. This will then enhance the mathematical meanings and constructs. Presmeg (1988) concurs, positing the idea that mathematical ideas can only develop and be enhanced from the students own frame of reference, of which their mother-tongue is a key component.

Fuller and Snyder (1991) in reporting on ethnographic work conducted by Prophet and Rowell in schools in Botswana, have noted that where students were being taught in a language other than that of the mother-tongue, often the emphasis was being placed on the use of correct technical terms rather than mathematical interrelationships and application of concepts.

This immediately put second language users at a distinct disadvantage and led directly to a situation where " the teacher in most classrooms was vocal and dominant ... [with] students rarely speak[ing]... with any queries of their own". (Fuller and Snyder,1991,p292).

Researchers in Nigeria and Thailand reported similar findings (Fuller and Snyder, 1991).

It is thus evident that black education and, more specifically, mathematics education in black South African high schools, presents huge difficulties which need to be addressed.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction:

I conducted this study over a period of six months at Guzany High school from January 1992 to June 1992. Guzany High is situated in the black township of Guguletu in the outer suburbs of Cape Town, South Africa.

The primary objective of the study was to gain greater insight into the daily experiences of black high school teachers and students. I focused particularly on the difficulties experienced by teachers and students in the context of the mathematics classroom.

At the start of the study , various methodological research options were open to me. However, before choosing a particular route I first had to attempt to identify the nature of the problem facing me as a researcher. As quoted statistics have shown in a previous chapter the position of mathematics education in black South African High Schools presents South Africa with numerous difficulties.

But when can one define a problem to be a problem ? Webb and Glesne (1992) have argued that " we see something as a problem only because it stands out against a background of habits and taken-for-granted knowledge that are themselves, for the moment at least unproblematic" [p.172]

In this context ,against a background of `normal' achievements of others in South Africa and indeed the world, quoted statistics reveal that black education and more specifically mathematics education in black South African high schools is in dire straits.

Previously it was argued that as South Africa and the world becomes more technologically advanced the issues surrounding mathematics education generally will become more and more important.

It is against this background and in an attempt to clarify, categorise, interpret and analyse the nature of the problems facing us in this particular area, that this study is offered.

If as stated one wants to clarify, categorise, interpret and analyse human behaviour, the question arises: which research option should one choose ? A particular research option cannot simply be chosen because researchers have been schooled in a particular tradition . This would be akin to asking the great mathematician Euclid to solve for x in $3x^3 - 2x + 3 = 0$ using only the postulates of circle geometry- a daunting task ! Eisner and Peshkin (1988) concur with this view: " The problem itself should be used to identify the methods appropriate to it..." [p.9]

This chapter will thus provide comment on why I chose to use qualitative research methods in general and the ethnographic approach in particular, in the course of this study. I will also comment on ethnographic research as a method, paying particular attention to its position in educational research, its validity as a research method and the ethics that it brings into the field. Against this background the rest of the chapter will involve a discussion on the

difficulties experienced in gaining entry and access to the research site, the methods of data collection used and the exit from the site.

3.2 Qualitative vs. Quantitative Research Methods:

Many tertiary education departments in the world have advanced to the point where the qualitative research paradigm is being offered side by side with the previously more preferred psychometric\ quantitative research paradigms. This juxtaposition of two seemingly opposed forces in the intellectual corridors of power has led to many, sometimes acrimonious, debates.

Supporters of quantitative research like Borman, Le Compte and Goetz (1986), writing in the *American Behavioural Scientist*, indicate that charges made against qualitative research in general and ethnography in particular, include the criticisms that : " it is too subjective , too value laden, not replicable, not generalizable, trivial in its conclusions , lacking internal validity, not empirical, neither rigorous nor systematic (i.e. unscientific and doesn't prove anything) " [cited in Johnson,1990,p.11].

In reporting on these criticisms, Eisner and Peshkin(1988) ask:

" What does one make of an approach to the study of the educational world that depends upon the unique aptitudes and proclivities of the investigator, that possesses no standardised method, that focuses upon non-randomly selected situations, and that yields questionable generalisations by conventional research criteria? "[p.10].

Committed qualitative researchers retort in much the same vein . As Eisner and Peshkin (1988) ask:" How many studies of the conventional kind actually use a random sample? How much of the significance of such research is a matter of the interpretative dispositions and abilities of the researcher? How much of the planned method is actually employed and how much of what is employed is a function of the artistry of the researcher?" [p.10].

Concurring with this view, Krenz and Sax (1986) have argued that quantitative research measures bear little resemblance to reality and as such are not very useful when considering actual educational practice. Hammersly (1992) has criticised quantitative research arguing that data collection methods are so structured that the world view of the researcher dominates a setting that is already far removed from reality in that it has been artificially set up. Quantitative research also neglects the relationship between the attitude of people and their behaviour i.e. do people really do what they say they do ? Indeed in any survey or experimental research design , the selection of the types of questions to ask, the selection of the target group, the typicality or atypicality of a particular research setting etc. are all matters in which subjective choices are made by the researcher. Quantitative research also has the problem of, at times, using statistical inference to correlate things which are not necessarily related in reality.

The recent emergence of a group of researchers who see the qualitative vs. quantitative debate as the two sides of the same coin, has served to blunt the acrimony in this debate. In fact these researchers welcome this methodological 'pluralism' and argue that in future a " bi-methodological [approach will be] the true mark of scholarly sophistication ." (Eisner and Peshkin, 1988, p.7). Other writers supporting this middle ground position include: Kirk and Miller (1986),Miles and Huberman (1984); Pinxter (1981) and Whyte (1984). In the words of

Eisner and Peshkin (1988): The debate between qualitative and quantitative research paradigms has taken on a decidedly "less encounter more interface" (p.3) tone. Hammersly (1992) indicates that criticisms of the unscientific nature of qualitative research have declined in recent years with many former critics now accepting the logic, criteria and validity of this form of inquiry.

Having indicated that I do not necessarily see these two broad research paradigms as opposed to each other, I wish to argue that it is the research question which must drive the method. The ridiculous hypothetical example I quoted earlier, with apologies to Euclid, suffices to make this point clear. As I have argued previously, the qualitative research paradigm represents the most suitable framework in which to clarify, categorise, interpret and analyse the daily experiences and difficulties of students and teachers in the context of the mathematics classrooms of a black South African high school. "Qualitative approaches to research may be better able to make the feel of the place more vivid than a precise measured description of what [research subjects] say they experience. Empathy might be every bit as important for cognition as detachment." (Eisner and Peshkin, 1988, p.12).

Although I have briefly outlined my reasons for my preferred choice of framework, I believe that I still have a responsibility to address some of the criticisms levelled in the context of the present study. As discussions in this chapter unfold, redress and remedy mechanisms in the context of the study, will emerge.

3.3 The Ethnographic Research Method In Education:

Ethnography as a research method arises out of what Eisenhart (1988) has described as the interpretivist philosophy. To best understand this position one has to imagine that it is on the opposite end of the scale to the deterministic causal models, which in the main heretofore, have shaped and dominated much educational research. According to Eisenhart (1988), interpretivists attempt to capture and record what is happening together with why it is happening in a given context from both the emic (those on whom the research is being done) and the etic (researchers') points of view. Out of this a holistic understanding of a particular setting should emerge. In the context of these interpretivist philosophical underpinnings, various definitions of ethnography as a research method have been offered by a variety of prominent social scientists.

Goetz and LeCompte (1984) have defined ethnographic research as the "holistic depiction of uncontrived group interaction over a period of time faithfully representing participant views and meanings" (p.51). Wolcott (1992) has broadened this definition to include "careful and detailed description, attention to context, and gathered in situ, and in person" (p.27) together with a "requisite commitment to cultural interpretation" (p.28).

Spindler and Spindler (1992) argue that ethnography must attempt to coherently describe human behaviour in a setting from the "emic position, the view of and knowledge of the native ...[before working its]... way to the etic, interpretive position" (p.68) of the researcher. Other ethnographers such as Agar (1980) and Maanen (1988) maintain that ethnography is a "representation of the total aspect of a society, culture or social scene" (cited in Johnson,1980,p.10). Handler and Segal (1984) conjecture that ethnography is a report "presenting not an objective account of the social system...[being studied], but the meaningful relations of a myriad [of] social realities" (p.15). They argue that all viewpoints should have

equal authority and no one viewpoint should be allowed to dominate any other. While Wilshire-Jones (1990) agrees with ethnography as being a 'multi-vocal' approach as explained by Handler and Segal (1984) he disputes the idea that all viewpoints can have equal authority arguing that this idea is "analytically barren and intrinsically impossible to achieve since it is always the ethnographer who has the final say, be it either overtly, or covertly." (p.5).

Langness and Frank (1978) argue that ethnography should be a description of a particular social scene or setting that gives the reader a feel for what the setting or social scene or the events described mean to those participating in such a setting (p.18). Wolmarans (1990) concurs with this definition of ethnography . In her analysis of the white left in South Africa she argues that by using ethnography " we [were] able to examine what it means to be white and left from the experience of those who are white and left " (p.4).

Hammersly (1979) has forwarded the idea that ethnography is an attempt to learn the culture of the participants in a particular setting . Jacob (1987) concurs with this view when arguing that ethnography is the "description and analysis of the cultural patterns of a bounded group "(p.16), where culture is taken to mean "the sum total of the knowledge, attitudes, and habitual behaviour patterns shared and transmitted by the members of a particular society " (Linton, 1940, quoted in Keesing, 1971, p.20, cited in Jacobs, 1987, p.11).

Hammersly (1992) sees ethnography as the development of a theory of seeing the world in the context of and from the viewpoint of participants in the setting. Millroy (1990) supports this view, crediting Glaser and Strauss (1967) with the introduction of 'grounded theory' - being

the development of a theory from the data obtained through research.[cited in Millroy, 1990, p.103].

If one is to consider the myriad of definitions and/or approaches to the concept of ethnography , one is cautious in placing oneself in any particular camp for fear of being labelled impure. Wolcott (1992) has alluded to this in urging researchers to be "cautious in choosing between doing ethnography ...[and]... borrowing ethnographic techniques "(p.28). Indeed , under Wolcott's (1992) definition of ethnography as description and cultural interpretation (p.27), many of the previously mentioned ethnographers could be re-classified as would-be ethnographers.

Having made this point I would thus strictly define my own position as being one in which I am what Wolcott (1992) refers to as a 'heavy borrower' (p.28) from ethnography. This is because as later discussions in this chapter will reveal, I have extensively used the ethnographic research method techniques in this case study. Thus in the strictest sense of the word I have not done an ethnography but rather used the research tools of the ethnographic method. While this distinction may seem trite at this stage, it is offered so that those who understand the parameters of pure ethnography will not have unrealistic expectations when analysing the text.

3.4 Validity in Ethnographic Research:

Critics of qualitative research in general and ethnography in particular , have attacked these research methods from a variety of angles (see earlier discussion). Most of these criticisms

question the constructs and thus the validity of the methods used. Generally critics of ethnographic research have argued that such research methods are:

1. lacking in internal validity
2. lacking in external validity
3. too subjective
4. not replicable
5. not generizable

(Eisner and Peshkin ,1988; Borman et al ,1986)

This section will attempt to counter some of these criticisms by looking at criteria for valid research and checking, whether in the context of the present study , some or all of these criteria have been met.

Eisenhart and Howe (1992) have defined validity as the " trustworthiness of inferences drawn from data" (p.644). To establish validity , Goetz and Le Compte (1984) have required that there should be procedures for determining whether or not inferences represent the real situation . They define internal validity to be the extent to which " scientific observations and measurements are authentic representations of some reality." (p.210), whereas external validity refers to the ability of the study to be applied to different groups or contexts.

What are these procedures and how do they apply in this study?

Hammersly (1992) and Goetz and LeCompte (1984), have posited the idea that we can enhance the internal validity of a study by ensuring that the fieldwork period is long enough for us to get intimately involved in the lives or setting of those being studied so that true participant meanings may be represented.

Spindler and Spindler (1992) concur with this view: " the validity of ethnographic observation is based on the observation in situ that lasts long enough to permit the ethnographer to see things happen not once but repeatedly." (p.65)

In the context of the present study let us examine if indeed these conditions were met :

As has been mentioned before , this study was conducted over a period of six months at Guzany high school in the black township of Guguletu in Cape Town South Africa. During this period I attended school every day (barring stayaways or other unforeseen circumstances).

I became integrated in the ways of 'living' (in this case learning and teaching) in the context of a black high school in South Africa. I believe that later evidence will show , that my involvement with the Guzany community was such that true participant meanings which could be conveyed in a study of this nature were carried over to me. In so doing, I heeded Rists' (1980) warning of "hit and run forays into the field- [a type of]... blitzkrieg ethnography." (p.9)- a methodological disaster when seen against a background of ethnographic research guided by the underpinnings of the interpretivist philosophy.

Indeed , throughout the course of the study even when attendance and participation seemed pointless, I remained committed to the idea of a lengthy stay in the field. I remembered the words of Deyhle et al (1992): " longevity in the field... overcomes contrived behaviour on the part of informants [and] also mitigates against deceptive behaviour by the researcher" (p.625)

Goetz and Le Compte (1984) have further argued that external validity will be enhanced if there is enough attention paid to detail in the description and context of the situation together with the identification of possible comparisons .

Generally Goetz and LeCompte (1984) have cited completeness, appropriateness of the research design, comprehensiveness, significance and credibility as all being factors which enhance the validity of the study (p.233-245). I have tried to present in the most precise and minute detail the daily experiences of teachers and students in a black high school in South Africa in the context of its mathematics classrooms.

Eisenhart and Rowe (1992) have added the view that "research questions must drive the data collection procedures" (p.658) together with clear analysis of data collection techniques. For example, how interviews were conducted, who was chosen to be interviewed? etc.

Criticisms concerning replicability and generalisability of ethnographic studies are more difficult to counter. This is because by its very nature, ethnography is time consuming and generally idiosyncratic in character. Thus to replicate any particular study would literally take years or even decades. Hammersly (1992), however has argued that we can treat the case study as typical of a larger population. This he refers to as the concept of "empirical generalisation" [p.6]. The problem with this is the ability or inability to measure the typicality or atypicality of any particular setting. In the context of this study, this would involve going into many different black high schools in South Africa, using what Atkinson (1979) has defined as the method of triangulation- being the "comparison of data from different sites..." [p.159]. Hammersly (1992) has further argued, that we can counter criticisms of replicability and generalisability by using the case study to expand and/or develop existing theory in and around this subject area. In other words we can verify existing theory by asking whether our described phenomena "exemplify universal social processes" (p.16), or expand existing theory by asking whether they add to our understanding of universal social processes?

This would be akin to looking at the "world in a grain of sand" (Hammersly, 1992, p.16).

Only once we have considered the entire research process in this particular study, can we measure, against previously discussed criteria, whether or not this case study has the necessary validity as defined earlier in this section.

3.5 The Ethics of Ethnographic Research:

Following Mays' (1980) ethical theories, Deyhle, Hess, Alfred and LeCompte (1992) have explained various categories of ethical positions open to researchers. These they define as:

1. the teleological ethical position where truth is considered an end in itself.
2. the utilitarian ethical position , where our actions as researchers are measured "by their utility in producing the greatest good for the greatest number" (May, 1980, p.360, cited in Deyhle et al , 1992, p.604).
3. critical theory ethics - " the researcher functions as adversary to the established and the powerful who already control... the levers of power" (May,1980,p.365, cited in Deyhle et al, 1992, p.604). The main concern of the researcher is how to emancipate those who are or whom they see as being oppressed in any given setting with a view to enhancing the lives of people.
4. the covenantal ethical research position - " the researchers paramount responsibility is to those he studies...This paramount obligation to the people studied derives from mutual personal exchanges" (May, 1980, p.368, cited in Deyhle et al, 1992, p.608).

As Deyhle et al (1992) point out : researchers do not have to fall into one or other category and various other categories do exist . In the study at Guzany high school I used all of these ethical positions to inform the choices that I made. However, the following aims best represent my ethical goals in this research project (in order of merit):

1. to represent the truth- (the teleological position).
2. to enhance the lives of those being studied- (the critical theoretical position).
3. to consider my obligations and responsibility to the Guzany community- (the covenantal ethical position)
4. to produce research which would be helpful to the majority of participants in and around the Guzany community (the utilitarian ethical position).

In other words if critical sensitive data (of which there are many examples in this study) needed to be analysed I weighed up the following questions in the order given when deciding whether or not the information \data was worthy of exposition:

- a. Did the data represent the truth ?
- b. What would the benefit or cost of such exposition be to the oppressed communities in and around Guzany high school?
- c. How would the exposition of data enhance or damage the relationships formed ?
- d. Could the data revealed be used directly by the surrounding community ?

These ethical considerations represent the philosophical underpinnings of the various difficult choices I made from time to time.

Thus far this chapter has been concerned with the basis of the ethnographic research method paying particular attention to its position in educational research , its validity and its ethics.

I will now turn to the actual research setting explaining: my entry to the research site; gaining access to the research site ; the methods of data collection used and my exit from the site.

3.6 Methods of Data Collection:

Eisenhart (1988) has outlined four methods of data collection when engaging in ethnographic research. These are: participant observation, interviews, collection of artefacts and researcher introspection.

In the collection of this data, Eisenhart (1988) advocates the use of what Atkinson (1979) and Denzen (1978) label triangulation - the comparison of data arising from the accounts of various participants. This she argues strengthens the research design since ,when considered simultaneously, all the viewpoints represent a more complete picture of the research setting. It was these data collection procedures as outlined by Eisenhart (1988) that largely guided the data collection methods used by me in this particular study.

3.6.1 Participant Observation:

Eisenhart (1988) has described participant observation as a method of data collection which involves entry into the field for a lengthy period to gather information by participating in school and classroom activities. The researcher works closely with and becomes integrated into the group on which the research is being carried out before stepping back to reflect and analyse. As Deyhle et al (1992) argue: " getting an insiders perspective is the basic

presupposition of ...qualitative research" [p.617]. Hammersly and Atkinson (1983, p.100) have labelled this the position of being a simultaneous insider-outsider. This is the an unenviable position since it raises many ethical considerations e.g. if you as a researcher are told or discover something, because you are being regarded as an insider, which could be damaging to certain groups being researched, what are your obligations as an outsider to report such incidents especially if they are of key significance to your study ?

I attended school on a daily basis for a period of six months. During this time I taught one class (std.9a) on a daily basis, briefly (for about a month) taught 3 std 6 mathematics classes for a teacher who was on accouchement leave and observed 3 teachers in 4 mathematics classes as far as was possible. I tried to become involved in the activities of the school by for example assisting with the inter-house athletics competition of the school. I attended all the staff meetings and tried to spend free periods and intervals with as many different groups and/or individuals as possible. After returning home in the afternoon I would attempt to document the days' events in the form of hand written field notes. At times this process was laborious and time consuming, but these notes proved invaluable as a record of the study. In the process of recording the days' events ,I was always on the lookout for anything which could assist me in the primary objective of the study which was a recording of the daily experiences of the teachers and pupils at Guzany high school in the context of its mathematics classrooms.

My status as full participant was, I believe, conferred upon me in the third month of the study and it was here that I would argue that the line between me as a participant (insider) and a researcher (outsider) began to blur. This of course has numerous advantages since one can

begin to feel and perceive the life and daily experiences of those being studied. At the same time, of course, one has to be careful not to become so involved that the line between researcher and researched disappears completely. If this were to happen the research as an academic pursuit would dissipate into nothing more than a celebration of the ideology of the group to which the study is being applied. I guarded against this by stepping back in the form of daily reflection and writing of field notes.

The necessity for this, seemingly contradictory juxtaposition of what Hammersly and Atkinson (1983) have labelled the simultaneous insider-outsider, has been clearly explained by Powdermaker (1966) when speaking of fieldwork:

" Involvement is necessary to understand the realities of a culture, that is, its meanings for the indigenous members. Detachment is necessary to construct the abstract reality, a network of social relations including the rules and how they function- not necessarily real to the people studied " [p.9, cited in Deyhle et al,1992, p.618]. Indeed I believe that I fulfilled the role of participant observer, simultaneous insider-outsider while displaying simultaneous involvement and detachment as described above. This was not always easy.

3.6.2 Interviews

Broadly speaking the kinds of interviews conducted may be broken up into two types viz. the informal and formal interview. A full discussion of these follows.

3.6.2.1 The Informal Interview:

Informal interviews in the form of conversations during free periods and intervals were conducted on a daily basis, bearing in mind that I wished to describe the setting at Guzany

high with specific reference to its mathematics classrooms in order to understand the difficulties and events experienced by participants. These conversations covered a host of topics but yielded many valid insights since none of it was contrived or artificially set up. During these informal conversations I would ask many questions in a matter of fact tone to encourage participants to speak about the problems and difficulties facing them. It was only because of the nature of the good relationships I developed and the fact that I was eventually accepted as a full participant that these informal conversations were easily conducted yielding important data as the field notes reveal. These informal interviews were recorded during my evening reflections.

3.6.2.2 The Formal Interview

The conducting of formal interviews was an entirely different matter. I held these interviews during the last two months of my stay at Guzany. The most important and obvious reason for this was the question of the validity of the data I would collect from these interviews i.e. I could not conduct interviews at an earlier stage since I was not yet fully accepted as a participant in the school community and thus the validity of the data collected at that stage using this method, would have been highly questionable. Coupled to this are the words of Deyhle et al (1992): "longevity ...in the field overcomes contrived behaviour on the part of informants" (p.625).

In doing these interviews I was looking for a way to verify my observations and formally record the views of many significant actors at Guzany high school. I was determined to keep the atmosphere at the interview as informal as possible even though technically I was working from a script, which I had memorised and used as a guide during the interview(Appendix 1)

The result of this was quite favourable since the fact that I had no script in front of me made it appear as if we were just engaged in an informal chat.

One of the problems I foresaw at the very outset of these interviews was the method of recording this data . In a community where any electronic recording equipment could lead one to be labelled a police informer or agent of the state, I was loathe to bring in a tape recorder to assist me. I could however see the huge benefits of using one to record the interviews and therefore decided to approach Anton on the matter of its use. I did this by choosing him as my first interviewee using a pen and paper to record his responses. Since I had by this time built up a significant trust relationship with Anton and I felt that he was someone who understood the way the school operated, I felt that he would be able to inform me whether the use of a tape recorder was wise or not. As it turned out, Anton (a teacher at the school -see Section 4.4.2) indicated that he thought it would be fine since " I mean everybody knows and trusts you Brent".

The fact that I hesitated to use the tape recorder was to prove important since a few days later I was taking Mr.Kola (a teacher - see section 4.4.2) to his 'sisters' place when he noticed the tape recorder on the back seat of my car. " You know Brent , two years ago that thing would have got you killed here in Guguletu. I mean I know a man whose watch went off in a meeting once and people wanted to necklace him because they thought it was a tape recorder "

Interviews were conducted in Ms.Mfabe's (a teacher -see section 4.4.2) room - a small sparsely furnished office close to the staff room. I set up the recorder in this room before

entering the room with the interviewee. The advantage of having this room available all the time was that it became known why I was using the recorder and those who saw it there knew that I was conducting research.

My next problem was to select key interviewees . This was not an easy task as there were many teachers with whom I had built solid relationships. Unfortunately the restriction of time meant that I had to make choices, particularly since I worked on the principle that I would not advance to the next interview until I had completed a transcript of the previous one.

Thus my selection of key interviewees had to be based on certain criteria. I judged whether potential candidates :were trustworthy, articulate, played important roles at Guzany or knew the culture of Guzany , its history and its people well (Tremblay, 1957; Bernard, 1988; Spradley and Mcurdy 1972). I was also forewarned by Agar (1980) to be wary of what he labelled deviants or marginals who may try to promote their cause to the absolute exclusion of other points of view.

Compounding this was the issue of jealousy surrounding who was selected . Since I had developed many different relationships many people expected to be interviewed but were rejected as probables on the basis of either their lack of experience or knowledge around the subject matter being investigated. To overcome the feeling of being left out, I devised a demographic questionnaire (see Appendix 2) - which was useful in its own right as a source of data gathering. After having applied my selection criteria I interviewed all six mathematics teachers on the staff together with two students from std.6a, one student from Ms. S's std 7 class, 1 students from std 9a whom I was teaching, 2 std 10 students and the Chairperson of the S.R.C . Other teachers interviewed included Anton, Andre, Vani and Neville.

This represented a total of 17 interviews.

Other problems concerning these interviews revolved around the question of the "...protection of information sources..." (Johnson, 1990, p.21). To circumvent this problem I would, after transcription of a particular interview, hand back the transcription to the interviewee with the brief that they could change , add or delete anything in the interview or they could indicate which information in the interview should remain classified. Generally informants did not make fundamental changes beyond a few language corrections , but a few of them added some information which they felt they had forgotten to add at the original interview. Another problem was that making appointments with people was problematic and I normally had to grab whomever I could from my basic list of interviewees on a daily basis.

In general though, the information emerging from these interviews has proved to be extremely important in the context of the study.

3.6.3 Collection of Artefacts

Eisenhart (1988) has presented the collection of documentary evidence of various sorts as a method of data assimilation in ethnographic research. In a paper jungle like a school, documentary evidence abounds and this provided a wealth of information in the present study. In this regard I managed to collect documents such as minutes of staff meetings , notices pinned to the noticeboards, letters to and from the DET, statistical information, pamphlets advertising key events in which the school participated. An important document which I managed to secure was a school magazine published in 1987. This magazine contained articles on the history of Guzany , the reasons for its formation , the various stages of its development and its present day setting in the CBD of Guguletu (See Appendix 3).

The collection of all of these types of documentary evidence enhanced the study in that it provided back up to claims being made in the research process.

3.6.4 Researcher Introspection:

Researcher introspection has been defined by Eisenhart (1988) as the practice of keeping a personal diary to record any reflections on the research taking place. Traditionally the researcher records his or her own feelings of anger, joy, frustration, sympathy, empathy, happiness, sadness, hunches etc. in a separate diary. I found this practice to be tiresome and virtually impossible since most of the two hours spent writing everyday was spent on the field notes. I thus decided to incorporate all of this introspection into my field notes - a departure from accepted procedure. This did not hinder me at all in my analysis of events and in fact the appearance of a report on a certain event together with my own reflections on the event, served to make the research process easier.

Having noted these points, I think it poignant to report that especially during the first few months I experienced much frustration in that the school setting was so fundamentally different to the one from which I had come. In fact at one stage I became physically ill - developing chest pains which were diagnosed as being stress related. After having sat back, looked at my role at the school and accepting that Rome was not built in a day, my physical well being returned and I could continue with the business of research.

3.6.5 Other Methods of Data Collection:

3.6.5.1 The Questionnaire:

As I have already stated the questionnaire had a two pronged aim. The first was to get everyone involved in the research process and the second was to gather information on the teaching staff on matters such as years of experience subjects taught , qualifications etc. Specifically for the mathematics teachers, an addendum regarding certain issues arising out of initial interviews was attached (see Appendix 4) The questionnaire and subsequent addendum provided excellent background information regarding the key actors in the Guzany research setting.

3.8.5.2 Photographs

Photographs of the research setting were only taken on the last two days of my stay at the school. This was because as in the question of the tape recorder this could have been a thorny issue. I therefore decided to limit the taking of these to the last two days in case there was any adverse reaction from participants. I am pleased to report that no such reaction was observed and in fact participants were keen to co-operate.

The questionnaire, addendum and photographs provided important secondary resource data and were considered to be useful in the context of the present study.

It should, however, be noted that photographs are not part of this final report as their inclusion would have compromised my commitment to the school that it would remain anonymous.

CHAPTER 4

THE RESEARCH SETTING

4.1 A Brief History of Guguletu.

The research setting was a high school in the black township of Guguletu - a suburb some 15 km outside of central Cape Town. Guguletu is typical of many other urban ghettos of South Africa with poverty, crime and violence being the order of the day. It is a sprawling township which in its history has seen much protest and counter-reaction from various organs of state policy e.g. the police , army , town councils and the like.

On its Western border are the 'coloured' townships of Heideveld and Manenberg, while the Eastern border is bounded by the black township of Nyanga. To the North lies the national road (N2) , while Lansdowne Road constitutes the Southern Border.

To understand the context within which to place this setting it is necessary to understand some of the history of Guguletu.

The colonisation of South Africa had caused groups of people to settle in various sections of South Africa on the basis of their racial classification. Those classified 'coloured' , for example, were settled in the area which became known as the Western Cape. Thousands of black Xhosa speaking South Africans were settled in the Transkei and Ciskei , an area just north of what became known as the Eastern Cape. According to Kinkead-Weekes (1983) the 1929 Great Depression had a detrimental effect on the subsistence farming in the Ciskei and

the Transkei. The direct result of this was a migration of people from the rural areas to the cities in search of work.

Against this background Makosana (1988) outlines the situation in Cape Town in the 1940s and 1950's:

" The City Council had serious problems [sic] about effective control of the burgeoning African population which after the war was estimated at 50 000. The only existing African township was Langa which was built in 1923 and could only accommodate 7600 legal residents in 1944. The majority of the African community in the Cape Peninsula resided in informal structures such as pondoks which were sprawled all over the peninsula." (p.5)

The City Council thus purchased land for the resettlement of those classified African. Africans (blacks) were therefore forcibly moved from areas such as Blomvlei, Windemere, Elsies River and Athlone.

Under the Group Areas Act of the National Party Government of the time these were all classified as 'coloured' areas. The rationalisation of the government at the time was that Africans were living in squalor and had to be saved from disease.

Of course nothing could be further from the truth. As Makosana (1988) notes:

" The breaking up of the African family life was done by authorities to control labour, to check the growth of Africans in the Cape Peninsula and to fulfil their ambition of creating a segregated african location in Nyanga West which was later known as Guguletu ('our pride' [sic]) " (p.13).

Molteno (1984) concurs with this view:

" The nationalists... knew that, for their own future, the working class had to be fragmented and the basis of a national consciousness broken. Thus, central to their strategic objectives was the defusion of African nationalism through a systematic attempt to retribalise in such a way that the resultant fragmentation would obstruct further development of black nationalism" (p.92).

On 23 December 1958 the government had the first 500 portable huts erected in the area which was later to be called Guguletu. The motive for this portability was noted by the government Minister for Native Affairs:

"If the natives were housed at the outset in a permanent structure this would be interpreted as a tacit admission of their right to permanent residence." (Cape Times 24.10.57 cited in Makosana,1988,p16)

Of course, history has developed differently to that seen by the government of 1957, with Guguletu developing into a massive urban township of approximately 70 000 people by 1980 (Makosana,1988).

The government's segregation policy even went so far as to divide Guguletu into various sections based on personal financial capabilities of the inhabitants. This class distinction extended even to the housing of migrant labourers in separate bachelors quarters in the township. The idea of separateness pervaded the very fabric of the society of Guguletu.

According to Makosana (1988) there were class distinctions between migrant workers, legal residents, shanty owners, backyard tenants, residents of two bedroomed homes and at the very top of the pile, residents of middle-income Malunga Park (a middle class development of the township).

The division even led to a situation where , in later years, residents of Malunga Park sent their children to 'white' and 'coloured' schools whereas other sectors of the Guguletu community sent their children to the local schools in the area.

4.2 A Brief History of Guzany High School.

Located within this township is the research setting: namely Guzany High School. The school is situated approximately 1,5 km into the heart of the township. It is very near the Central Business District of Guguletu.

Guzany High is housed in brick buildings comprising a total of 25 classrooms. In 1992 (at the time of the data collection), the school had 1 494 pupils being taught by 37 teachers. While this ratio of pupils to teachers can be calculated at 40:1 the reality in the junior standards was markedly different, with pupil teacher ratios of 65:1 and classes being housed in rooms that could only comfortably accommodate half this number.

While these conditions may appear to be harsh, according to a school magazine (1987) these premises were the culmination of years of being shifted from pillar to post.

The school was started in 1965 due to pressure from the community for a high school in Guguletu. It was housed at " NY44 in a Pondoki' " (Guzany High School Magazine,1987,p13). During that same year the school moved twice due to increased enrolment. Firstly to Lehlohonolo Combined school on NY147 and then to St.Josephs' on the southern border (a building which now houses the IKAPA town council). This remained the premises until early in 1974 when a fire destroyed part of the school. The department of education then decided to build a school in NY2 - the present premises of Guzany High. According to an article in the school magazine(1987) during the interim period , whilst there were no premises for them, Guzany shared premises with a primary school, Sonwabo on

NY49. The standards 7 and 8 pupils went to school from 7.30am to 1.00pm and the standards 9 and 10 attended from 1.30pm to 6.00pm.

By April of that year, 1974, the new premises were ready and all pupils and staff were housed in the present location.

4.3 An Overview of Conditions at Guzany High School during 1992.

As has been previously stated, in 1992 the school housed 1 494 pupils in 25 classrooms with 37 teachers.

Pupil Numbers were made up as follows:

Std 6 : 509 pupils in 8 classes : Avg-64 per class

Std 7 : 332 pupils in 5 classes : Avg-66 per class

Std 8 : 221 pupils in 5 classes : Avg-44 per class

Std 9 : 246 pupils in 4 classes : Avg-62 per class

Std 10 : 186 pupils in 3 classes : Avg-62 per class

Besides this obvious overcrowding the school lacked other basic necessities like textbooks , stationery and classroom furniture. There was no sport equipment.

The school had a large playground but most of this was sand and stone whilst the Rugby field was littered with broken glass, stones and rubble.

The staff at the school consisted of 16 males and 21 females. The principal and one of the heads of Department were males, whilst the Vice-Principal and 4 other heads of department were female.

Staff qualifications were as follows:

- * 46% were qualified with a university degree and a Teachers Diploma.
- * 35% were college graduates qualified to teach in a High School.
- * 12% were college graduates qualified to teach in a Primary School.
- * 7% of the staff were unqualified.

(Source: Biographical Questionnaire)

More than 50% of the staff were engaged in part time study towards improvement of their qualifications.

It was difficult to locate the school in terms of the results of others under the DET in the Western Cape. This is because such statistics are not readily available from the department of education. However, available statistics for 1991 revealed that 69 out of 174 candidates passed the Matric final examination. This represented a pass rate of approximately 40% (which was equivalent to the National average for that year).

In terms of mathematics at the school the following information was available:

- * All std 6 and 7 pupils took mathematics as a compulsory subject.
- * In std 8, 83 out of 221 chose mathematics as a subject (37%)
- * In std 9, 66 out of 246 chose mathematics as a subject (27%)

* In std 10, 60 out of 186 chose mathematics as a subject (35%)

From the previous discussion, it may be argued that Guzany High School was typical of an average black urban high school in South Africa, and hence a good choice for a research setting. However, the school was unique amongst all the DET schools in the black townships of the Western Cape in a fundamental way: Guzany High was the only school that offered three first languages. These were Xhosa, Tswana and Sotho with English and Afrikaans being offered as second and third languages respectively. This uniqueness had a profound effect on the daily operation of the school as will be revealed in later results.

This then represents an outline of how the school located in the broader context of schools under the DET in the Western Cape in particular, and in South Africa in general.

Who then were the people that made up what is known as Guzany High School and who form the basis of discussion in this dissertation ?

4.4.1 A list of participants at the school

Principal : Mr.B

Deputy : Ms.M

Heads of Department: Ms.Mfabi, Mr.Sim , Ms.Waya

Teachers : Anton , Winston, Zola, Mr.Kola, Temba, Andre', Vani, Tamsine ,Ms.N,

Ms.S, Neville

Students: Linda ,Jamie (SRC), Phumeza, Thembisa, Nina

While the above is by no means complete, it represents the major role players that formed part of this study.

My own role as seen by participants at the school was that of teacher.

4.4.2 Description of main participants.

The Principal -Mr B.

" Teachers have to take a large part of the blame..."

The principal Mr.B was a 42 year-old with 18 years teaching experience. Mr.B was an ex-pupil of Guzany High school who had firstly obtained a teachers diploma from College before going on to do a degree course.

The Deputy Principal - Ms.M.

" It is disturbing me that teachers are not returning to their classes after lunch."

Ms.M was a 46 year-old lady who had been teaching at Guzany for 4 years. She however had teaching experience of 20 years behind her. Ms.M was an ex-pupil of a nearby high school, who completed her tertiary university education part time.

Vani:

" We make good decisions but we are inconsistent in carrying them out "

Vani was young graduate teacher of four years experience. Whilst he obtained his formal qualifications at a city university, he grew up in a country area and schooled in that area as well.

Mr.Sim:

" Just give them a talk on grades for university entrance. Tell them a bit about your own achievements. These children need role models. They need heroes."

Mr.Sim was the guidance teacher at the school. He was 43 years of age and was an ex-pupil of a school nearby. Mr.Sim had 19 years teaching experience and obtained his formal qualifications at college and university.

Anton:

" This is not the Guzany I know... just watch these teachers, they don't go to their classes."

Anton was 39 year old teacher with 5 years teaching experience. I befriended him during the research period and benefited from his knowledge on the behavioural norms at the school.

Anton was an ex-pupil of Guzany High School who was forced, due to financial considerations of his family, to leave school after std 8. He spent 10 years working , before completing his matric (part time). He then attended college where he qualified as a teacher in 1986. At the time of this study he was busy with a part time degree course at university.

Ms.Mfabe:

" You know Brent, it is like this , time-wasting the whole year except in the last quarter. Then they really need us, then they only want to work."

Ms.Mfabe was a teacher in her thirties and the Head of Department of Mathematics. She was a university graduate and had been teaching at Guzany for 6 years. Interestingly enough she was an ex-pupil of the school , but only completed up to std 8 there when she was sent to an upcountry school to complete her matric. This was because of the student unrest in 1976.

Ms.Mfabe had a profound influence on the operation of the school. Her duties extended beyond that of the normal Head of department operation. She was integrally involved with the running of the school in nearly all aspects.

Winston:

" I never wanted to be a teacher but was persuaded to take the challenge. I've since enjoyed it...until now ! "

Winston was a 45 year-old unqualified Mathematics teacher of 20 years experience. He was engaged in studies towards a degree. Winston had been teaching at Guzany for five years. Since I had met him before we struck up a good relationship and I used many of his classes for this study.

Tamsine:

" Brent, that kind of talk is dangerous. You can get yourself killed."

Tamsine was a 31 year old teacher of 2 years experience. She was schooled at Guzany where she completed her matric. She later graduated as a teacher from university.

Tamsine was my sounding board on any controversial issue at the school. There can be no doubt that she played an important role in guiding my own decisions about what to do and not to do within the setting.

Andre':

" Discipline is a problem. These kids come and go as they please. Just look how they walk out right in front of us !"

Andre was a 29 year old teacher of 1 years' experience. He completed his primary schooling in the Western Cape but was sent up country to complete his schooling. This was as a result of problems in schools in the urban areas of Cape Town. Interestingly, he won a scholarship to study in the United States of America where he completed a Masters Degree.

Zola:

" The biggest problem is everything that is happening around the school... Bantu Education has killed the culture of learning among the oppressed of this country. "

Zola was a Mathematics teacher of 15 years experience. He was also a ex-pupil of Guzany but completed his last 2 years of schooling at a high school up country. His tertiary qualifications were obtained at College and at the time of this study he was completing a degree part time.

Temba:

" Come on Brent, let's run away to watch some cricket. "

Temba was a 30 year old teacher of 7 years experience. He schooled locally but was sent up country by his parents where he completed his matric year. Temba graduated from college and at the time of this study was engaged in studies towards a degree. There can be no doubt that he gave me another insight into the way the school operated.

Mr. Kola:

" Please take me to my sisters place..."

Mr.Kola was a mathematics teacher of 15 years experience. He was an ex- pupil of Guzany with formal teaching qualification from College.

Ms.S:

" O.K , just like in General Science we have terminology in maths. Subtrahend means that which you are subtracting, minuend means that from which you are subtracting. You must be sure which monomial is your subtrahend and which is your minuend."

Ms.S was a 39 year old mathematics teacher of 14 years experience. She schooled up country and was a college and university graduate. Ms.S was a dedicated teacher , extremely frustrated by the setting but forcing herself to shoulder all the responsibility that being a teacher in the context brought.Ms.S was from the 'old school'. She was extremely strict and did not tolerate any ill discipline.

Phumeza:

" Sorry sir, but we are scared that all this writing will fill up our books. We have no money to buy others and as you know, we already had to buy these thick ones..."

Linda:

" We did not decide sir ! COSAS students decided. We are not all COSAS."

Phumeza and Linda were two of the more outspoken students of Std 9a. They represented my route to the students especially in trying to understand the way students behaved in the setting.

Jamie (SRC):

" How can the principal instruct us on this ?... "

Jamie was a std 10 student and president of the SRC.

4.5. Gaining Entry Into The Research Site:

This case study using the ethnographic method was largely dependant on me gaining entry and ultimately access to one of the approximately 20 high schools in the black townships of Cape Town.

I felt that this would be a fairly difficult task , given that the nature of the research generally involved a stripping away of the veneer that covers all institutionalised settings.

In this regard the choice of a school , while theoretically speaking should have been a typical black South African high school, was not so much dependant on its typicality or atypicality but rather on the schools' willingness and ability to participate in a programme of this nature.

Here, I used the contacts established by my supervisor , Prof. C. Breen , in his years as a lecturer in the Education Faculty of the University of Cape Town. After two initial meetings with Prof. Breen we decided to approach Guzany high school as a probable research site. Prof. Breen set up a meeting with the Head of the department of mathematics at Guzany high school.

This meeting would prove to be the key I needed to open the gate for entry into the school, since as later chapters will show Ms.Mfabe was an extremely important cog in the machine that is Guzany High School. Atkinson(1979) has alluded to the fact that gatekeepers (in this case the Head of Mathematics) can cause the total breakdown of an envisaged project or study. This was something I was acutely aware of during this important meeting.

Prof. Breen , Ms. Mfabe and myself met on the 14 November 1991 at 13h00 in a little room behind the schools secretary's' office. After handling the initial introductions , Professor Breen

departed and I was left with the task of explaining my envisaged role at the school and the subsequent consequences arising therefrom.

I explained to Ms. Mfabe that the purpose of my study was to gain an in-depth insight into the kinds of problems being faced by teachers and students of mathematics at Guzany High School. I would want to participate and observe for a period of six months. During the ensuing hour many facts and opinions about teaching at Guzany high emerged. It was as if I had opened a floodgate from which torrents of information began to flow. Some of this information included the following:

- * The school had 1400 pupils with a teaching staff of 35
this represented a pupil : teacher ratio of 40:1.
- * In 1990, 16 out of 250 std 6 pupils passed mathematics.
- * The average size of mathematics classes was 65.
- * In 1990, 95% of those writing mathematics final examinations , failed to gain a pass.

[meeting with Ms.Mfabe 14.11.91.]

It was obvious from this meeting that Ms. Mfabe was influential at the school. She indicated that she would inform the staff that my presence at the school was as a result of a project being run by U.C.T and that I was there to assist the teachers of mathematics at the school. She also indicated that the Parent, Teacher, Student Association (P.T.S.A.) of the school would be informed.

She explained that the school was typical of DET schools in the greater Cape Town area except in one respect: This was that the school catered for first language speakers of Sesotho,

Setswana and Xhosa. Chapters 5 and 6 will show that these different languages, together with second and third languages of English and Afrikaans, were to prove to be significant elements of the problems facing participants at the school during the six months of the study.

From this initial meeting , I gained the impression that Ms. Mfabe believed discipline to be a problem: " ... this school is like a university, students come and go as they please..." (field notes p.2).

After some more discussion on the general problems facing black education our meeting was completed with Ms. Mfabe agreeing to telephone me on the 21 November 1991 to inform me of the staff and P.T.S.A's decision.

In setting up this meeting and subsequently attending it, I was struck by the friendliness displayed towards me even in these initial stages - this rapport was something which would prove to be significant in my quest to gain access to Guzany in the following year.

This important first step in the long study to follow , laid the foundation for my smooth entry into the Guzany high school community the following year.

By the 28 November 1991 (2 weeks later) I still had not heard from Ms. Mfabe. Since school was closing in a weeks' time, I frantically attempted to contact her . Unfortunately, she was away marking matric final examination mathematics scripts in Pretoria and would only be back by 20 December 1991.

On this date I again tried to contact her at home but was informed that she was away on holiday and would only be back in the new year. I managed to contact her on 10 January 1992. At first she did not seem to remember me , but after mentioning the name of Prof. Breen she recalled our meeting and informed me that although she had informed the staff of my intentions , she did not know if this was passed on to the P.T.S.A. However, I should come to the school on the 20 January 1992 as she was sure there would not be any objection to my presence.

On the 20 January 1992, feeling a little unsure about what was in store for me, I arrived at the school at 07h45. At the time of my arrival I was greeted by a long line of, by my estimation, at least 400-500 students stretching from the principals office , past the administration block , out through the main gate into the street!

Ms. Mfabe informed me that once the principal arrived she would refresh his memory regarding my presence at the school and that after this I would be in. The principal arrived at 08h00 and after Ms. Mfabe held a brief discussion with him I was informed that I was free to enter the school.

I had successfully entered the research site but gaining access was an entirely different matter!

4.6 Gaining Access To Guzany High School

From my very first day at the school it was obvious that Ms.Mfabe had prepared the ground, so to speak, in informing the staff of my presence and intentions at the school. Many teachers related easily to me and I was made to feel welcome and at home. Most of those who spoke to

me were interested in my project and wanted to know a little more about it before wishing me well during my stay at the school.

On the 2nd day I was asked to assist with the assimilation of personal family information of the std 6A class since their teacher was away. This I viewed as an important step in introducing myself to the students on my way to becoming a fully accepted member of the Guzany community. I introduced myself as a temporary teacher who would be staying at the school for a period of six months. Ms.Mfabe suggested that I do this, as the students would take longer to trust me had they been told that I was engaged in research from the start. This initial introduction to the students of myself as a teacher proved to be an excellent strategy for slowly but surely as I gained the confidence of the students, my role as a researcher at the school became more and more prominent.

It was also on the 2nd day that I met Antoni . He was to prove to be the one person who would provide the 'map' by which I would travel through the Guzany community. Indeed our initial acquaintance and subsequent friendship was to prove instrumental in smoothing my entrance and acceptance into the Guzany community.

During the first week at the school I spent most of my time assisting with the distribution of stationary and textbooks- a task which allowed all the students of the school to catch a glimpse of me. During this initial period I also attended a memorial service for the late father of one of the staff members as well as representing the school at a meeting of science and mathematics teachers hosted by the Programme for Technological Careers (PROTEC) -a

private organisation which tutors students of the black township schools on Saturday mornings.

My involvement with sport and assistance at the schools' inter-house athletics competition, was another factor which greatly enhanced my entrance and acceptance into the school community.

On an academic level I decided to teach a class so as to justify my position at the school. I was assigned to Winston's std 9a higher grade mathematics class , whom I taught on a daily basis from the start of formal lessons on Tuesday 4 February 1992 right up until my exit from the school in June 1992. With the benefit of hindsight, this proved to be a worthwhile decision. After building up a formal relationship with std 9a, important glimpses into the student community and the way it operated were provided. Of course another added benefit was the fact that by doing actual teaching I was being given the opportunity to experience first hand what it was like to be a mathematics teacher at the school.

I was formally welcomed to the Guzany staff at a meeting on Monday 3 February 1992 where Ms. Mfabe introduced me as a " teacher of five years experience at Livingstone High School and currently doing his Masters degree."

[field notes p.39].

When I was not teaching std 9a, I spent as many periods as possible observing the lessons of all the mathematics teachers (barring one), before narrowing my observations to one std 8

class and one std 6 class of Winston , one std 7 class of Ms. S and one std 10 class of Ms. Mfabe.

As the initial weeks progressed, my presence at the school began to pass unnoticed by the student body. I first detected some form of acceptance by the students when, at the inter-house sports day on the 14 February 1992 I was affectionately dubbed ' Mr. Owens'. After some initial inquiry from Anton and others I was led to believe that this was the stage name of one of the actors in a local comedy television production which was screened on a weekly basis.

As my presence at the school continued it was obvious that from about the beginning of the 3rd month I was totally accepted as a full participant by the majority of students- even those whom I did not teach. I came to this conclusion because I would often be called by various students to give advice regarding study or career choices and other related matters. On three occasions I delivered talks to the std 9's and 10's on bursaries, subject choices , tertiary education, career choices and the like. While these subject areas are strictly speaking outside my area of expertise, the fact that my opinion was sought proves the acceptance of my role as a fully accredited teacher at the school. My involvement with the students was not restricted to academic matters alone but often my opinion on various political matters was sought by individual S.R.C. as well as a few senior students.

Gaining acceptance from the staff was much easier but presented problems of its own. This was because many of the relationships I wanted to build involved me being close to people during the Lunch Break. Since broadly speaking, the male and female staff did not lunch together during intervals I was presented with a problem. It was here that Anton played a key

role in bridging the apparent gap since he normally sat alone in the staffroom at intervals talking to whomever (normally female) was available. All the other male staff members would leave the school premises to lunch at their homes nearby or purchase lunch from the various take-aways nearby. Since Anton lives approximately ten kilometres from the school, he brings his own lunch to the school and spends this time relaxing in the staff room. Anton was thus my link between the various groups at the school since invariably he and I would be the only male staff members present at lunch time and naturally we gravitated towards each other. Because Anton had many friends in all of these groups and probably because I came to be associated with him, I was given access to many different 'lunch-time groups'. The importance of this should not be underestimated; as Deyhle et al (1992) posit:

" the ability to transcend intragroup segmentation is important for the completeness of the portrayal of the studied community" [p.621].

On other occasions, especially when I did not bring my own lunch from home, I would accompany Temba, Andre, Graham, and Vani to a nearby cafe at the local community centre or to a take-away at N. Y. 3A. All of these encounters served to greatly enhance my position firstly as a teacher and finally as a researcher at the school.

On an official level I was regarded as a full teacher at the school, attended all staff meetings, and participated fully in all the decision making especially in the mathematics department. In this situation I was very careful in giving my opinion about particular situations, since I did not want to be party to the creation of the social world I was trying to interpret.

I believe that I was only accepted as a full participant during my third month at the school. The key event which led me to this conclusion occurred during the month of March on a day when I had not brought any lunch to school . As was normally the case, I loaded my car with Graham, Andre, Temba and Vani and off we went to N.Y.3A to purchase vetkoek (a deeply fried dough ball) and mince curry , something called 'bunny-chow' inside the township. Unknown to me Temba purchased some other food wrapped in a newspaper. On our return to school we went into the little kitchen to eat as we normally did. Temba unwrapped the parcel and inside was a fully cooked pigs head ! With Andre producing a pen knife , they cut off slivers of meat , put these on large slices of bread and tucked into their meal with vigour. At this stage I stuck to my 'bunny-chow'. Andre explained that it was an African custom not to waste any part of an animal, hence they would eat heads, livers, stomachs and even hearts and lungs! After a few minutes they offered me a piece of this pigs head. I could feel their eyes watching me intently and expectantly.

At first, I tried to make excuses. Reading the disappointment on their faces, I agreed to try a piece. Andre cut off a sliver from the cheek and presented it to me on the tip of his knife. After taking a huge breath , I popped it into my mouth and much to my delight it tasted just like any other piece of pork! They all began to laugh and Temba patted me on the back and said: " Brent , now you are one of us!" It was at that moment that I knew and believed that I had been accepted as a full participant by the majority of staff members.

I attended school every single day, barring the few stayaways we experienced during the six month period. On occasion however, I would leave early especially on days when I had completed all my formal lessons and had observed all the classes I intended to.

This would bring howls of indignation from some of the staff members, especially Andre and Tamsine (one of the female staff members with whom I had become quite friendly. They would pass comments like : "Don't you work here? ... Are you then a part-time teacher?... Are you just going to leave just like that ?..." Tamsine especially would get quite cross with me on certain occasions saying "are you just going to defy the authority of the principal and leave ? We are supposed to stay until 2.30pm even if our lessons are finished you know! "

These kind of reactions once again bear testimony to the fact that as time progressed, I was by and large accepted into the school community. In fact I had managed to build so many open relationships with participants in the setting, that by the time I started interviews (about two months before my exit) , I was presented with the dilemma of whom to choose as possible interviewees. This was because there were so many worthy candidates but too little time in which to justifiably interview them all.

4.7 Exit From The Research Site:

In order to facilitate as smooth an exit from the research site as possible, preparations with this in mind began in mid-May one and a half months before actually leaving. During this time I informed std 9a that I would only be teaching them up until the end of May after which their class would be taken over by Ms. Mfabe. As a farewell present to them , I had promised to provide them with an extra large hardcover book each since those we had been working in since January had long since been filled. I obtained these from my old school and handed them out on the second last day of teaching them .i.e. 30 May 1992. On leaving this class I was thanked on behalf of the class by Nina who said:

" Goodbye Mr. Brent you have taught us much and we will miss you"

I continued to conduct interviews during this period , but after 31 May 1992 I started to stagger my attendance at school. During the first week of June 1992 I attended the school for 4 days , during the second week for 3 days and during the last two weeks for two days each.

I explained my absence by indicating that I needed to attend seminars at U.C.T. While this was true in the sense that I had meetings with my supervisor Prof. C. Breen and consultant Dr. W. Millroy during this period, I did not need to be at U.C.T. on all the days I was absent . I spent the rest of this time doing transcriptions and conducting a cursory analysis of field notes in preparation for the questionnaire and addendum for mathematics teachers. During this period many teachers approached me and indicated that they were sad to see me leaving especially Anton:

" I am sad to see you go because now I will once again have to spend my intervals alone."

On my last day at Guzany I presented the staff and students with two African writer series novels as a memento of my stay at the school. The principal thanked me for my assistance during the past six months , outlining the various activities I had been involved in. He then invited the whole staff to cake and tea in the staff room as a farewell present to me . This lasted about one hour at which I said many goodbyes and took many photographs.

After school I accompanied Temba , Andre, and Graham to a local shebeen (place where liquor is sold illicitly) where we had a few beers. It was here that I discovered that Mr. Kola's ' sisters' place was a shebeen ! In fact as we were sitting talking Winston, Mr.Kola and a colleague arrived and the seven of us spent the next two hours talking, joking and reminiscing about the past six months.

We then left to take Mr. Kola home and to buy something to eat . Andre felt that Kentucky Fried Chicken was too expensive and " anyway I think you must learn to eat the township way ." We drove to the other side of Guguletu in amongst the migrant labour hostels until we came to a clearing on which all types of animal meat was being sold and braaied (barbecued) on open fires . Pig's head, sheep's head ,lungs , heart , liver and spleen were all available. I indicated that I would be comfortable with liver but that the other items were a bit too wild for my taste. Andre then purchased a large piece of liver seasoned it and braaied it before sending someone to buy some bread . We spent the next half hour hungrily munching the bread and liver which was quite delicious. As Temba said: " Brent this is how we live in the townships!"

After returning to the shebeen for a few more beers and after promising to meet sometime again in the near future , I left.

The research period was over.

CHAPTER 5

DATA

5.1 Introduction to the Episodes :

In presenting results in an ethnographic study, Goetz and LeCompte (1984) advocate the construction of units of analysis in processing the data collected. Erickson (1982) advocates representing these units in a chronologically accurate, analytic and narrative style.

The idea behind the construction of these units is that they can then be contrasted and compared, thus presenting a useful vehicle for analysis and categorisation in the next chapter.

In the context of the present study I have chosen to represent the units of analysis as chronological episodes. These episodes constitute what Millroy (1992) has labelled the primary units of analysis.

What constitutes an episode and what was the criteria used for the selection of any particular episode ?

An episode in the context of the present study would be the documentation of any event or occurrence in the field which concurred with the primary objectives of this study viz.:

* to give a general description of the physical conditions at the school and of the mathematics classrooms in particular.

- * to give a brief overview of the inter-personal relationships between participants as these pertain to the general running of the school.

- * to describe problems faced by both learners and teachers in the school in general and the mathematics classrooms in particular.

The documentation of the occurrence or event would be in the narrative style of writing as recommended by Erickson (1982).

Following Millroy (1992), I have chosen to use the word 'episode' as each of these units of analysis represent an inter-connected series of events. This will also assist in the representation of conditions as they pertained to the school at the time.

These episodes took place across a six month period from January 1992 to June 1992 during which my role was both that of researcher and participant. I have tried to quote the conversations of persons involved as far as possible so that actual participants may make themselves heard.

5.1.1 EPISODE 1 (MONDAY 3RD FEBRUARY 1992)

My first contact with the mathematics classroom at Guzany High came two weeks after the start of the year on Monday the 3rd of February. After the initial weeks of handing out books and registering students, lessons were scheduled to formally start on this day.

I arrived at school at 07h45. The bell to schedule the start of the school day sounded at 08h00. Out of a total of 1500 students, approximately 200 attended the morning prayers. After this assembly the time table for Mondays was posted on the boards and we were asked to try and follow the programme as far as was possible.

Having worked with Winston at a Saturday school run by the Programme for Technological Careers (Protec), and having struck up quite a friendly relationship with him, I decided to follow his time table and observe some of his classes. An ulterior motive of mine was that I hoped to teach one of his classes on a fulltime basis -preferably one of his standard nine classes. Most formal lessons started at round about the third period i.e. 09h04 (this was because although school was scheduled to start at 08h00, the majority of students arrived late). At this stage the playground was still packed with students chatting in small groups, walking about or arriving late. I tried to find Winston but he was not in his classes or in the staff room. I spent periods four, five and six walking around the perimeter of the school chatting to various

students about their subject choices and career opportunities. During this time I observed a few lessons taking place but on the whole the school remained unsettled and noisy with many students out in the playground and many teachers remaining in the staffroom.

As interval approached, those who had been teaching, returned to the staff room but I still could not find Winston. During interval he returned to the staff room explaining that he had had to sort out with "Ms.Mfabe which Std. 8's I would be teaching". I explained to him my intention to observe some of his lessons and he agreed to this.

After interval I accompanied Winston to std.9A. He explained that this was a class of mixed higher and standard grade students and that possibly from tomorrow I could take the higher grade group. I accepted this offer thankfully and accompanied him to the class with a sense of eager anticipation.

When we arrived he introduced me as a teacher of "five years experience who is currently doing his Masters Degree and will be helping the maths teachers. I trust that you will give him full co-operation". There were 24 out of a possible 70 students present as Winston began the lesson with a revision of solution of quadratic equations using factorisation- taught in std.8. The students were seated at narrow tables each sharing their table with another. There was no table for the teacher- indeed, there was no space! Winston occupied a space in the shape of a semi-circle of radius approximately one metre-there was no other space in which to move so his activities were confined to explanation from the front of the classroom.

As he proceeded students started arriving at five minute intervals from lunch break. A few others were not even bothering to listen to the lesson and still others had no books open in front of them. After half an hour still more students arrived. Winston admonished them and told them to sit down.

After working through some simple quadratic equations like for example: Solve for x if:

$x^2 + 4x - 21 = 0$ he eventually put the following problem on the board:

Solve for x in:

$$ax^2 + (bc-ad)x - bd = 0$$

He explained the solution as follows:

$$(ax + b)(cx - d) = 0$$

$$ax + b = 0 \text{ or } cx - d = 0$$

$$x = \frac{-b}{a} \text{ or } x = \frac{d}{c}$$

Many of the students were not listening , some were chatting and others were not showing any undue interest so Winston asked: "Hands up those who do not understand?". A few hands shot up and a student asked: "How do you know how to factorise?" Winston turned to me, handed me the chalk and said: " Brent can you help me out? "

As I started to speak the sheer enormity of the task faced by these teachers on a daily basis struck me. The students all stared intently and the noise started to subside (I assumed due to the novelty of a new teacher) as I explained that one looked at the coefficient of x^2 and in this case since it was ac the only possible factors were a and c and similarly with $-bd$. In the meanwhile more late arrivals continued to disturb the class. I used the example of 28 to illustrate that a number may be split up into many different factors for example: 4 and 7 or 2 and 14 etc. I then proceeded to finish the sum in much the same way as Winston had. There was absolute silence with many blank stares.

Winston thanked me, gave the class a homework exercise and suggested that we return to the staff room. The period had not yet ended and as we left and the noise levels rose, a few students left the classroom with their chairs, to find a place in the afternoon sun.

5.1.2 EPISODE 2 (MONDAY 3 FEBRUARY 1992)

At the end of the ninth period we were informed that departmental meetings would take place in order to plan some strategies for the forthcoming year. Since there were only six heads of department at the school with fourteen subjects to share between them, mathematics was grouped together with biology, physical science, general science and home economics. This group of subjects was collectively called the Science Department headed by Ms.Mfabe. Our departmental meeting took place in the science laboratory with all the teachers of the aforementioned subjects present. One of the purposes of the meeting was to explain to the teachers the various external projects being run by the three universities in Cape Town and some external organisations. These

programmes focused mainly on mathematics and physical science with the school being involved in all the projects via its students. Ms. Mfabe wanted teachers to identify potential candidates for the various programmes. The following programmes were being utilised by the students at Guzany high:

Institute of Mathematics and Science teaching of the University of Stellenbosch (IMSTUS), Science Education Project (SEP) - run by the University of Cape Town, the PLATO programme run by the University of the Western Cape- a computer tutorial scheme and Programme for Technological Careers (PROTEC)- a private tutorial scheme funded by business to encourage and assist students of mathematics and science. The school was required to send representatives to the various planning meetings of these organisations. Winston and I volunteered to attend the PROTEC information meeting on the 10 February 1992.

Our next item on the agenda was the question of keeping a record of work completed . Following an earlier instruction from the principal Ms. Mfabe asked us to keep a record of completed work in an "FC"- a large hardcover manuscript. The others were interested in what we at Livingstone did so Ms. Mfabe asked me to explain. I outlined the idea of work schemes in a record book. She asked me to bring a sample of this to school the next day. Since there was no further business the meeting ended one hour after it had begun.

This meeting served to formally introduce me to the teachers with whom I would be working for the next six months. An important component of this meeting, for the purposes of my role as a researcher, was that my opinion was sought after and respected.

5.1.3 EPISODE 3 (TUESDAY 4 FEBRUARY 1992)

This would be the first time that I would be teaching a class on my own since Winston was absent and Ms. Mfabe asked me to take over his Std.9a group. The lesson was scheduled for the seventh and eighth periods. At 12h00 after the interval I proceeded to the std 9a classroom to be met by only five out of a possible seventy students. I proceeded to mark the homework exercises given by Winston the day before. During this time some of the others arrived, with one or two being 40 minutes late offering excuses like: " I didn't hear the bell sir " , " No watch sir " , " I live far sir " .

Once there were about forty students in the class and I had completed marking the homework exercises , I proceeded to explain to the students what I expected of them and what they could expect from me since of course I would be teaching the higher grade group on their own from the next day: " I have three very simple rules: firstly, all homework is to be attempted . Secondly, there is to be no chewing of gum in this class and thirdly no latecomers will be allowed into class." These comments were met with outbursts indicating shock, laughter, surprise and derision. I think that those who were going to be doing standard grade mathematics were a bit relieved that they were not going to have to endure these seemingly stupid rules. After a while the class settled again and I proceeded to teach a lesson on the solution of quadratic equations involving algebraic fractions.

After having done two examples I was busy on a third one and had got to the stage : $2p = -5$ (solve for p) . " What is the value of p ? " A student replied: " $p = +2 - 5$." Some of the students

shouted no and one student proceeded to give the correct solution of $p = \frac{-5}{2}$. However the first student did not understand how this was possible so I proceeded to give an explanation using $-2 + p = -5$. She easily saw that the answer was $p = +2 - 5$ and hence her answer was incorrect since the two questions were different. This seemed to convince her but I was still getting a few blank stares from a few others, while many others did not have books open in front of them. The siren had not yet wailed and I asked someone for the time, only to realise that I had used the seventh, eighth and half of the ninth periods (each period was 32 minutes long). After giving some homework exercises I left for the staffroom to find the playground full of students. Some lessons were taking place but on the whole most students were outside talking in small groups, engaged in a game of soccer or just enjoying basking in the afternoon sun.

I returned to the staffroom where I met Ms. Mfabe. She invited me to accompany her to her little office down the hallway, where she proceeded to show me an evaluation form used by each head of department on which each teacher was supposed to be given a global percentage. These percentages were to be used for determining whether a teacher should be given a permanent appointment or not at the school. Ms. Mfabe had evaluated all of the teachers in her department at one time or another but "the only problem is that we do not allow circuit inspectors onto our premises with the result that some teachers have been on probation for years!" She then went on to explain that Ms.N had had a baby over the week-end and would not be in school for a few weeks. I expressed surprise as I had seen Ms.N on the previous Friday in school. Ms.Mfabe indicated that the department did not give paid accouchement leave and teachers who were pregnant could not afford to take unpaid leave so " here we do not let the department know. We

are a family and will cover for her otherwise she will not be paid. Number of days absent equals zero..." This birth was to prove significant for me as I would be called upon to take over some of Ms.N's classes at a later date.

I returned to the staffroom and had a discussion with Zola on the problems regarding mathematics at the school. " We have many problems as you will see . For example we have students who have failed maths doing it and see yesterday there was a student who has never done physics but wants to do it in std.10- impossible! "

With that the siren wailed to signal the end of the school day and students streamed from the playground out through the main gate.

5.1.4 EPISODE 4 (WEDNESDAY 5 FEBRUARY 1992)

After morning assembly we were asked to follow the Monday timetable in reverse starting with period eleven at 08h00 and finishing up with period one at 14h30. Winston was scheduled to be teaching std.6b at 08h32 and I accompanied him to this class.

Std.6b's classroom was situated at the back of the school in a prefabricated building designed to cater for approximately 35 students. We arrived promptly at the start of the period to be greeted by 42 out of a possible roll of 65 students. Winston did not enquire as to the whereabouts of the others and began a lesson on the distributive law , commutative law and associative law under the four basic mathematical operations of addition, multiplication, subtraction and division. The

students did not take down any notes as Winston continued to explain the mathematical intricacies of these laws.

Since this was the first lesson of the year with this class, he encountered difficulties when looking at the commutative law under the operation of subtraction. This was because the standard sixes had not yet been introduced to negative numbers.

" Standard six: What is five minus four ? " he asked.

Hands shot up as someone blurted out the answer "one sir".

" That is very good but please do not shout out the answer.

Now what is four minus five ? "

Silence.

" Four minus five standard six is...?"

A few hands darted into the air and Winston chose one of them.

" Sir the answer is one".

" No that cannot be since five minus four is one so four minus five cannot be one ".

This seemed to convince them that it could not be one until someone else volunteered:

" Sir, you cannot subtract five from four sir, it cannot be worked out."

" No it can be worked out , the answer is minus one. "

Blank stares. Silence.

Then suddenly Winston realised that the students did not have a clue as to what he was talking about . He smiled wryly and said; " But do not worry as this will be explained to you later."

Similar problems , this time related to students not understanding fractions taught in primary school, arose when Winston looked at the commutative law under the operation of division.

" Students what is eight divided by four?"

" two sir"

" Now what is four divided by eight ?"

Answers of "1" , "0" , "2" , "-2"! and "cannot be worked out sir" were given with no-one getting the answer of a half.

When Winston finally provided the correct answer of a half, the students seemed unfamiliar since this was met with absolute silence.

Twenty five minutes into the lesson approximately twenty other students came walking into the classroom with their chairs.

" Excuse us sir, but we were having Tswana lessons which went over time " one of them volunteered. Winston acknowledged this and asked them to sit down. The classroom was really full now with everyone craning their necks to see what was happening up front. Winston moved onto the distributive law under the basic mathematical operations ending off with : "these are very important rules ! " The siren wailed to indicate the end of the period and a homework exercise was set before we made our way back to the staffroom.

5.1.5 EPISODE FIVE (WEDNESDAY 5 FEBRUARY 1992)

Since Winston was present I would be taking the higher grade group of std. 9a . He agreed that I could teach this class on a daily basis for the full six months that I would be at the school. The class consisted of twenty students but according to Winston "half of them should really be doing standard grade mathematics."

The lesson was scheduled for periods four and five but unfortunately since we had now split up the class we were faced with accommodation problems as there were hardly any free rooms. At the start of the fourth period I went to std 9a's room and indicated to the higher grade group that they had to follow me to find a classroom. No-one could really tell me which rooms were free or indeed if there were any rooms free, so we spent about five minutes walking around until we found that the old library seemed to be unoccupied. This room was situated next to the staffroom and was predominantly used by teachers of the various African languages. Since there was no-one present in the room I proceeded to give a lesson there . Ten minutes later we were interrupted by Ms.M: "Excuse me but I am supposed to teach Tswana to the std.10's here now. I think the lab is unoccupied." We packed up our things and trudged off to the laboratory. Fifteen minutes passed before we were settled in the laboratory and I could finish the marking of the previous days homework exercises.

I had given three relatively easy solution of quadratic equations sums for homework- or what I considered to be easy. However only six out of the twenty students got all three correct.

I introduced more difficult examples on quadratic equations with algebraic fractions filling all the available board space. This was met with the clearing of throats and the coughing syndrome. So I turned and asked what the problem was?

" No problem sir its just that you are writing too long..."

I smiled and continued with two more examples before giving a homework exercise. Since there was still ten minutes of the double period left I decided that I must try to learn the names of these students. I asked each one to put their names on a piece of paper and then proceeded to attempt to pronounce these names. This was met with laughter since I was way off the mark with many of them.

The siren wailed and one of the students said: " Sir you must mark our books because we must show it to our parents". I indicated that I would sign books on a weekly basis which seemed to satisfy most of them. After greeting the class I made my way back to the staffroom.

The siren seemed to be wailing more regularly now and during period nine I accompanied Zola to std.7d. The time was 13h00, two periods after the end of interval. The classroom was jam packed with approximately 70 students present. Some students arrived late - one hour late to be exact ! Zola proceeded with a lesson on arranging algebraic terms in descending or ascending powers of magnitude , which was supposed to be revision from std.6. However it was obvious that some of the students did not have a clue as to what he was talking about with many confusing the plus and minus signs when re-arranging terms. Zola explained to the best of his ability, using Xhosa for

about 50% of the time, but more importantly he involved me in the lesson by asking me to mark and initial the classwork exercises of one half of the class.

The students were still taken in by the novelty of my presence and fought to have my signature in their books.

5.1.6 EPISODE 6 (THURSDAY 6 FEBRUARY 1992)

At 08h20 I accompanied Winston to std 8a. It was period one and we were twenty minutes late due to the fact that at 08h00 we had a brief staff meeting regarding the election of the Student Representative Council for 1992. When we arrived there were only 12 out of a possible 47 students present. Winston proceeded to mark the homework he had given them on the previous day. He did the first two homework problems on the board himself before going around to check the other work on an individual basis.

At 08h35 20 students arrived- they were 35 minutes late for school. Winston scolded them and asked them to be seated as he continued to mark and initial all the books. There were about 35 students present as Winston presented the title "The Distributive Law (Products)" as being the lesson for the day. He proceeded with three examples of the type:

$$\begin{aligned} (a - b)^2 &= (a-b)(a-b) \\ &= a^2 - ab - ab + b^2 \\ &= a^2 - 2ab + b^2 \end{aligned}$$

After having completed these he gave them a few problems to try on their own as a class exercise and went around trying to assist individual students. I assisted with this process. At 08h50 two

students slipped in . Winston did not see them because his back was turned towards the door. They did not notice my presence in the class and quickly made their way to their seats. I pretended that I did not notice them and continued to assist Winston in the marking and initialling of books. It was fairly clear that a large percentage of these students lacked basic arithmetic and early algebraic skills if one considered the type of errors being made by them. The following two were examples of the most common errors being made by the majority of the students:

$$1) (2a - 3b)^2 = (2a - 3b)(2a - 3b)$$

$$= 4a^2 + 6ab - 9b^2 \text{ and...}$$

$$2) \left(1 + \frac{b}{3}\right)^2 = \left(1 + \frac{b}{3}\right)\left(1 + \frac{b}{3}\right)$$

$$= 1 + \frac{b}{3} + \frac{b}{3} + \frac{b \cdot b}{3 \cdot 3}$$

$$= 1 + \frac{2b}{6} + \frac{b^2}{9}$$

Winston explained the errors made with the signs in the first example above and then took the class back to primary school with an explanation of the basic procedures involved in the addition and subtraction of fractions.

5.1.7 EPISODE 7 (THURSDAY 6 FEBRUARY 1992)

I asked Ms.Mfabe whether I would be able to sit in on her lesson she was scheduled to have with std.10a during periods five and six on this day. These two periods were directly before interval and they ran from 10h08 until 11h15.

In Episode 6 mention was made of a short staff meeting held at the beginning of the day to discuss S.R.C. elections for 1992. This was scheduled to take place during the third period i.e. 09h04 to 09h36 - which it subsequently did. However these elections had some bearing on the short episode to follow.

At the start of the fifth period i.e. at 10h08 I proceeded to std.10a's classroom only to be met by about 30 students milling around with a few chatting inside. The playground was still full of many other students from different classes. Apparently this was because the S.R.C. elections had taken longer than expected and some classes were still busy with voting. I could not find Ms. Mfabe so I decided to join the students in the bright morning sun , grabbed a chair for myself and settled down to wait for her.

After about fifteen minutes the principal came along and asked the students: "Why are you sitting here ? Go inside! " Everyone complied with this request including students from other classes who were within earshot - except for three boys who continued to enjoy their stay in the sun." And you? " he asked.

" No sir, std. 10b is still busy with S.R.C. elections. We are just waiting for them to finish . "

The principal shrugged his shoulders and continued walking down the row of classrooms, chasing students into the classrooms where ever he found them loitering outside.

Five minutes later he returned after having gone around the whole quad and proceeded back to his office. As soon as he was out of sight and 'safely ' back inside his office, the students started to trickle back into the playground . This trickle soon became a flood with many more students

outside than before. When I asked some 10a's why they did not obey the instruction they just laughed and said that they were waiting for their teacher to arrive.

Ten minutes later the siren wailed to indicate the end of the fifth period. Ms Mfabe arrived apologising profusely: " I am sorry but I had to sort out a few administrative matters. Once the time table and allocations have been sorted out then I can become a normal teacher again."

We went inside and I occupied a seat at the back of the classroom. After greeting the students and formally introducing me the lesson proceeded. Ms.Mfabe marked a homework problem on exponential equations she had given them the previous day, before putting the equation $27.3^{2x} - 28.3^x + 1 = 0$. on the board . A student gave a verbal answer which was correct . She then proceeded to give them five problems to do for classwork and walked around trying to assist those who were having difficulty. I helped as well. After some time Ms.Mfabe came over to me and said: " You know Brent, they cannot recognise the quadratic equation in these exponents, even when we use substitution".

These words rang true as I made my way around the classroom. When asked to factorise $27.3^{2x} - 28.3^x + 1$, many students did the following:

$$= 3^3.3^{2x} - 28.3^x + 1$$

$$= 3^{3+2x} - 28.3^x + 1$$

$$= 3^{3+2x+x} - 28 + 1 \text{ Stuck!}$$

Everybody in this class worked even though a lot of what they were doing was incorrect. I came to the conclusion that they were probably more serious about their work since they were in std.10. Ms Mfabe eventually explained the correct solution on the board. She then continued to mark the other classwork exercises given.

In one of the examples we came to the stage: $3^x = -4.3^{-2}$. She said to the class: " This is impossible since 4 cannot be written as base 3 so there is no solution." I queried this after the lesson, explaining that the real reason that there was no solution was because equations of the type $a^x = k$ were only solvable for $a^x > 0$. She agreed with this but said: " I know this, but do not want to confuse them ".

5.1.8 EPISODE 8 (THURSDAY 6 FEBRUARY 1992)

I was scheduled to teach the std.9a mathematics higher grade group in the two periods directly after interval (i.e. periods seven and eight- from 12h00 to 13h04).

At 12h05 there were only ten students present. The rest of them arrived in drips and drabs as I proceeded with the lesson. I admonished them and they promised that this would not occur again. We were marking the homework exercises set the previous day, dealing with the solution of quadratic equations. In order to make the problems more challenging, I included a few examples in which the solutions found algebraically would lead to division by zero when substituted back into the original equation and were thus not valid.

e.g Solve for x : $\frac{4}{x-2} = \dots$ etc. , then $x=2$ would be an invalid solution. The students seemed puzzled by this submission and indicated that they had not heard of this before. In order to examine the depth of this supposed lack of knowledge, I decided to return to the idea that division by zero was not permissible and so I put the following on the board:

$\frac{4}{0} = ?$. There was a stunned silence before a few hands shot up and answers of "0" , "4" and " undefined sir " were ventured.

The majority of the students believed that the answer was zero with only one person getting the correct answer i.e. that the solution was not defined. I then went on to explain why division by zero was not permissible, firstly using the idea of multiplication and secondly the idea of a series. The students claimed that they had not seen this before with the one student who got it correct claiming that she had seen it at the course run by PROTEC at the Saturday school.

I then marked another problem in which the solution was true for all real values of x and still another which was false for all values of x . The students claimed not to have seen any of these types of problems before. Since they had allegedly not seen any of these types of problems before, I gave them extensive notes explaining these special cases. While they were busy copying these down into their books I noticed that some of the students were scribbling the notes in short hand on the inside back covers of their note books and not directly into them. Upon inquiry I was informed by Phumeza: "Sorry sir, but we are scared that all this writing will fill up our books. We do not have money to buy others and as you know, we already had to buy these thick ones..."

After receiving assurances from me that if they filled their books I would take it upon myself to acquire others for them at no cost to themselves, they reluctantly began to copy down the notes in their proper place. After I had given them these notes and a few more examples I gave them an

exercise which had to be started in class and finished at home. While we were waiting for the siren to wail to signal the end of the period I went around and started to talk to the students. I had already established quite a good rapport with these students and they spent the rest of the period teaching me some Xhosa words.

Periods nine ten and eleven revealed that students all over the school were very restless. In fact fifteen minutes into period eleven, with the temperature rising, many teachers ended their lessons early and returned to the staffroom. There were approximately 300 students in the playground with their school bags already packed up ready to leave for home as soon as the final siren wailed. I wondered what was keeping them at school so decided to investigate. Indeed, the front gate was locked "...for latecomers and to keep tsotsies-1 out " according to Ms. Waya- a teacher at the school.

5.1.9 EPISODE 9 (FRIDAY 7 FEBRUARY 1992)

The morning assembly which served to start the day with a prayer and a hymn, continued to attract roughly one hundred out of a possible 1500 students. Many of the other students arrived late during the course of period one, while some even arrived during period two more than 45 minutes late.

Zola taught std. 7d during period 2. This was at 08h32. However, there were students continually arriving late interrupting the lesson. One of the students arrived more than 20 minutes into the period. Zola admonished him: " You have come here late and dressed in casual wear. You have

1-tsotsies - local slang for gangster

destabilised the class. Now, sit down !" A few others who were still outside but heard this outburst , did not venture into the class , preferring the safety of the space outside the door.

We were busy with a lesson on the arrangement of terms in ascending or descending powers of magnitude. Zola did an example on the board, explaining as he went along that one should look at the power of the unknown asked to determine the order of the terms. The students did not take down any notes. Some of them did not bother to take out their mathematics books. They appeared to rather prefer sitting and staring into space. Zola then gave them four problems to try on their own. He asked me to assist on the left hand side of the class while he corrected books on the right hand side of the class. The noise from outside had now reached new heights, but Zola ignored these external factors and continued to correct the work set for the students.

All the questions set were posed so that students were required to write the terms in descending powers of x . I noticed however that some of the students were writing their solutions in ascending powers of x . I asked one of the students:

" What is meant by descending?"

" I don't know sir."

" Then why don't you ask your teacher?"

He just shrugged silently. .

" Do you know what highest or lowest means ? "

" No sir."

" Do you know what biggest or smallest means ? "

" Yes sir ! " he said excitedly.

I explained in terms of the words big and small and it was as if a whole new world had opened to this student.

5.1.10 EPISODE 10 (FRIDAY 7 FEBRUARY 1992)

It was 11h55 as the siren wailed to indicate the end of the interval. Half the staff were present in the staffroom while the other half (mainly males) spent interval off the premises.

It was very hot and the teachers did not seem to be making any effort to go to their various classes. Even Ms. Mfabe did not look as if she was going to her class. At 12h15 teachers were still returning from interval while out of a possible student body of 1500 only approximately 100 were present at that time. The playground was deserted as I made my way to Std. 7d - Zola's class. He was not there but at about 12h30 he arrived and the students who were in the vicinity of the classroom took up their places inside. Our numbers seemed to have dwindled with approximately 50% of the class present. Zola ignored this fact , not bothering to enquire as to the whereabouts of the other half of the class.

We were well into period 8 but the siren had not wailed to indicate this, so Zola introduced a lesson on the concept of substitution. His use of a sport example was apt , reflecting the reality of students in an urban black environment :

" How many of you boys play soccer ?" he asked.

A few hands shot up.

" So you know the rules. So for Dr. Khumalo we substitute ..?"

" Shane Macgregor " they all shouted. (These were local soccer stars)

He used a similar example for tennis explaining (incorrectly I might add) that I played tennis.

Suddenly they all started to shout:

" 40-15 , love all , advantage , game set and match "

" O.K , O.K so you understand what substitution is..." he added before looking at a few examples in algebra. The students seemed to understand probably reflecting on the sport examples he had used previously.

" Now remember I am trying to teach you the principle of how substitution is done. You cannot learn mathematics - check all the examples we have done, they are all different."

Outside the classroom more students were returning from interval.

The playground seemed to be quite active as the noise levels rose. The siren was 20 minutes late and the lesson was beginning to drag on, so Zola gave them a homework exercise before we made our way back to the staffroom.

There were literally hundreds of students outside in the playground According to Temba it was too hot so many of the teachers had just given homework exercises and returned to the staffroom. The principal capitalised on this seemingly relaxed atmosphere by suggesting that the students spend the last two periods cleaning up their classrooms. Although this was supposed to be supervised by teachers very few ventured out across the playground, preferring the sanctuary of

the staffroom instead. By 14h15 the students had already started to amass at the front gate which had been locked. More and more arrived as the time for the final siren started to draw nearer. At precisely 14h30 the siren wailed , the gates swung open and the students streamed out.

5.1.11 EPISODE 11 (MONDAY 10 FEBRUARY 1992)

During periods 4 and 5 I accompanied Winston to the std6a class. It was very hot with 55 pupils occupying a room that would normally seat 30 comfortably. The heat was so oppressive that some of the students fell asleep. Winston was doing a lesson on the distributive law. The students took down the notes at the back of their books . Apparently this was because the notes being given were considered to be theory with statements like: " Division is not distributive over multiplication and subtraction " being an example of what was being written down.

Winston then moved onto the properties of zero. Many students were not familiar with the idea that division by zero in mathematics was undefined , but Winston introduced this idea without explanation.

During periods 9 and 10 , after the interval the heat really started to get to the students and the school settled into what can only be described as a relaxed mode. Many teachers remained in the staffroom while the majority of the students were out in the playground talking, playing games or just sitting around. I was scheduled to be teaching std.9a and moved off to the laboratory where we normally had our lessons. After 10 minutes the students had still not arrived so I sent someone to call them. They were not too impressed with my insistence on having a lesson while the rest of

the school seemed to be having interval. A few minutes later they came straggling along, begging me to give them a free period. I explained that we had an enormous amount of work to complete and that we really should be working. After some protests they agreed to the idea of work and I proceeded with a lesson on the solution of quadratic equations which involved square roots. Having observed the phenomenon of students writing theory at the back of their note books I inspected a few of the books to find that some of the students were doing the same thing. Upon enquiry Ms.N informed me: " ... we have always written our theory at the back of our books ... this was taught to us from primary school. " I explained my belief that it was better to integrate theory with practice as this would facilitate understanding. I hoped that I was not treading on any unspoken rules set by the school- of course this fear was probably a little unfounded since the students soon saw the sense in my suggestion and complied with the request.

At the end of the lesson I reminded the students:" Tomorrow we get maths in the first two periods. Please see that you are here by 08h00 ."

5.1.12 EPISODE 12 (TUESDAY 11 FEBRUARY 1992.)

More than half the staff were late on this day , with lessons only really starting at round about 08h20. By 08h00 I had already unlocked the laboratory. There were 15 out of a possible 20 students present in the std.9a mathematics higher grade group.

We marked the homework concerning the solution of quadratic equations involving square roots given the previous day.

one of the problems involved the following:

$$(x + \sqrt{x+2})^2 = x^2 + 2\sqrt{x+2} + x+2$$

Many of the students did not seem to understand this so I reminded them of :

$$(a + b)^2 = a^2 + 2ab + b^2.$$

This seemed to convince a few of them but there were still a number of blank stares. I wondered whether the language I was using was not a contributory factor in the seemingly blank stares I was getting . A reply to my question in this regard confirmed my suspicions:

" In which language did Mr. Winston teach you mathematics last year ? " I asked.

" It was mainly xhosa sir, but he also mixes the English.

But don't worry I cannot speak English well sir, but I will stop you and ask if I have difficulty with the words. " replied Nina.

During periods 3 and 4 I sat in on Winstons' std 8a class . Winston was doing a lesson on squaring the binomial. It was obvious from some of the student responses that their understanding of many basic concepts were lacking. Upon questioning some of the students the following were a few of the responses:

" - x + = + " , " 9x9=79" , " -2r x -2r = -2r² " etc.

Winston handled most of these responses admirably, patiently reminding students of some of the basic ideas developed in std 6 and 7. It was patently obvious that the students had become used to me as an observer. Directly in front of me , while Winstons back was turned two students were merrily tucking into some lunch they had brought with them , while a few others engaged in

animate conversation. I was starting to melt into the background. This would serve to enhance the unfolding picture as being a true and authentic account of life in the mathematics classrooms at Guzany high school. I was grateful for this .

After the interval the principal announced that the teachers should not return to their classes as " we will be having a meeting to discuss very important issues." The start of this meeting was delayed a further 20 minutes due to the late arrival of teachers from lunch. In the meantime the students were being left to occupy themselves. Many of them chose to play games in the playground during this extended interval. This meeting was mainly concerned with the shortfall in the budgetary expenses of the school. The principal proposed an increase in the school fee from R10 to R15 per annum. I was astounded to discover that the school operated on a budget of only R16 000 per annum (by comparison the school at which I had previously taught had an annual budget of R150 000 with an annual fee of R80). Ninety percent of this money, that is the R16 000, came in the form of school fees while the others were donations from unnamed sources. As if to bring home to me the reality of a school being run on this small amount, the principal added: " We should have at least two examinations this year, but with R16 000 we will not be able to do it. We must think of ways and means of raising more money."

The next item on the agenda was a thorny one. The National Education Crisis Committee was attempting to determine the extent of the shortages in the schools regarding student numbers textbooks and the like. This was being co-ordinated via the S.R.C's and the principal had given Guzany's information to the students to be taken to a meeting of all schools where the

information was to be processed. This forum was known as the Joint S.R.C's. Unfortunately, not all the schools furnished the proper information with the result that the decision was taken at this Joint S.R.C. forum to declare all information null and void and to do the checking themselves. This caused widespread consternation amongst the teachers with many questioning the role of the students in this regard:

Principal : " We cannot give them the go ahead until we have discussed the situation thoroughly. How are they going to conduct this checking when it has taken us nearly three weeks to get this information ? I suspect that they have nothing on their agenda so they are looking for issues- maybe they have ulterior motives ."

Ms.Mfabe: " We have done it correctly so why must they check our figures?"

Bradley: " We have already furnished them with the information. This is not child's work so why must they check us ?"

Neville: " When they arrive here they must get the information from the office."

There was general agreement on this latter suggestion and the SRC was to be informed of the staff decision at a later stage of the meeting.

The principal then discussed the results in the school as a whole from the previous year: " Teachers have to take a large part of the blame for the poor results . Teachers are absent from school and out of their classes after lunch. They leave school at random. Apparently last year not much work in the form of classwork and homework was given . In April the books were still almost empty. We must be sincere in everything we are doing. Remember the eyes of the SRC and the community are on us."

There was no response from any staff member to this comment.

The principal then invited the SRC executive members into the meeting and introduced them one by one. Many staff members implored them to be good examples to their fellow students with teacher D remarking:

" Do not think you are exempt from homework and please see that you are properly dressed and that you are always early. Remember that the other students look up to you."

This signalled the end of the meeting which lasted for the equivalent of three periods or one and a half hours. Periods ten and eleven were scheduled to follow but hardly any teaching took place in this time. In the playground it was like interval , while the classrooms were deserted. I spent this time introducing myself to the SRC members , explaining my intention at the school. They seemed happy about this.

As if to emphasise the importance of this day for the purposes of my research, I was inadvertently given some teacher stationary that was supposed to be given to Anton. I apologised to him offering to return the items. " No ! " he said, " They must give me another set. This is yours. You are a member of staff now!"

5.1.13 EPISODE 13 (WEDNESDAY 12 FEBRUARY TO FRIDAY 14 FEBRUARY 1992)

As was by now becoming a pattern , there were very few students at the morning prayers . I decided to sit in on the lesson of Ms.S which were scheduled for periods one and two. She however had not yet arrived by the time school started , so I hung about in the staffroom waiting. At 08h20 she came rushing and we moved off to her std 7b class.

There were 38 out of a possible 60 students present as we marked homework on the addition of algebraic expressions :

" Please close your books and look at the board " Ms.S said.

She put up the first problem and sent a student to the board. The student did not seem to eager and just stood there and stared .

" Faster please! ... I want to do more examples ! " she said, raising her voice as she did so. The student tried a step or two which was totally off the mark. This made Ms.S very angry.

" Do not guess ! We have done this many times before. If you do not know these basics you will not be able to go on with your mathematics! Remain standing!" she bellowed.

She then selected three more students. All of them had absolutely no clue as to what was required, so she told them to remain standing. Outside the number of students waiting to come inside was now reaching 20. No-one dared enter it seemed, since Ms.S was extremely strict. In fact there was an uneasy silence all the way through this lesson. Eventually a student gave the correct solution and we moved on to the next problem. All the while those who had given incorrect answers were made to stand . I noticed that many of the students were copying from

each others books as soon as Ms.S' back was turned. The look on the faces of the students indicated that they were hoping that she would not ask them any question. Ms.S eventually allowed the latecomers to enter with 22 entering, making the classroom jam-packed. They quickly scampered to their seats not daring to look her in the face.

The last two periods of the day were set aside for sport as was the practice every Wednesday afternoon. However these periods took on important significance on this day since the schools' inter-house athletics competition was to be held in two days time. Teachers were therefore supposed to sort out which students were going to participate- although there had been no form of training or elimination. There was absolute chaos with about 80% of the school in the playground and the rest in the rooms they were supposed to be in . There were no facilities at the school for training and the one rugby field that was there , was littered with stones and broken glass. The local stadium was used by all the schools in the area- primary and high numbered about 20. The school could thus not acquire the facility on a daily basis hence there were no eliminations. The school possessed absolutely no sporting equipment, yet we were asked to select students for javelin, shot-put and discus! I wondered what was going to happen on the day of the inter-house since by comparison, the previous school I had taught at spent a month on training and preparation before the actual event.

At 14h00 the following day I was invited to attend a meeting of the sport committee in the principals office. At this meeting it was revealed that there was no sport equipment , so I volunteered to get some from my old school. After other logistical arrangements had been made,

the discussion moved on to whether to allow the students from other schools to attend the sports meeting and what fee to charge if this was to be the case. I could not contain myself any longer:

" I am sorry, but how would we feel if our students were to bunk school to attend the sports meetings of other schools?" I asked.

" That may be so , but the reality is that they will be there!" ventured Bradley.

" But why must we condone it ? " I lamented.

Silence... then:

" I think Brent is right, we should not contribute to the chaos existing in black education" offered Vani.

After some more discussion around this point it was agreed that students from other schools would only be allowed to enter after school hours.

The inter-house sports meeting took place on the Friday of that week. It was scheduled to start at 09h00 with the school scheduled to meet at 08h30. At 10h30 we were still sitting at the school.

" You know Brent, I am not looking forward to this day. It is going to be chaotic. It gets worse every year. I am just praying for the day to be over" lamented Anton.

We eventually started at 11h10 . There was no public address system which resulted in absolute chaos , since the students did not know which event followed which. The athletes got a sense of what was about to happen by the movements of the starter. Wherever he went they followed, hoping that the event to follow would be theirs. The track was only marked out from the 200m mark to the finish and was littered with stones and other dangerous objects. No provision had

been made in the form of markings for the field events. In fact if I had not suggested that we at least start these at round about 12h30 we would not have had these I suspect. No provision was made for any first aid. Many of the events were scrapped due to the lack of participants and at about 14h00 the day was already nearing its end. The nature of the day was epitomised by an incident right at the end during the boys open relay event. Since relay batons could not be found, the students had to use rulers. One 'clever' team had the idea of hiding their own rulers on themselves so that they could move off before the baton was handed over! This resulted in a major argument at the finish which had to be sorted out by the intervention of the teachers. The students did not wait for the final points to date, preferring to stream off as soon as the last race was run.

5.1.14 EPISODE 14 (MONDAY 17 FEBRUARY 1992 TO WEDNESDAY 19 FEBRUARY 1992)

Ms.S was busy with a lesson in std.7b on the subtraction of polynomials in algebra. She started doing simple examples of subtraction of integers: e.g. $10 - (-6) = 10 + 6 = 4$ etc.

A few of the students were not comfortable with these ideas, making basic errors such as for example " $-7 - 3 = -4$ " .

Ms.S became very angry with this:

" People are giving wrong answers with respect to addition and subtraction of integers! You will be left behind if you do not understand what we have covered previously! " she shouted.

She then explained some of the basic algebraic laws concerning addition, subtraction and multiplication and division of integers- all work which was covered in std.6.

" Now let us go on to subtraction of polynomials. Watch the following on the board:

' Subtract $2x^2 - 4xy + 2y^2$ from $3x^2 - 4xy + 2y^2$.

Step 1: Arrange each term of the subtrahend below a like term of the minuend .

Step 2: Change the sign of each term of the subtrahend and add.'

" Who knows what to do?" she asked. Silence... deathly silence.

" O.K. , just like in general science we have terminology in maths. Subtrahend means that which you are subtracting, minuend means that from which you are subtracting. You must be sure which monomial is your subtrahend and which is your minuend. Like $4 - (-7)$: 4 is your minuend and -7 your subtrahend. So let us return to our example..."

On Wednesday morning I returned to Ms.S' std 7b class to see how they were coping with subtraction of polynomials. At 08h05 there were 14 students out of a possible 62 present!

" Close your books and do the homework on the board" she said.

It was 08h07 and three more students trudged in . Ms.S just glared at them and told them to sit down. She then sent around an attendance sheet to determine who was present as this was her registration class.

" Now let us look at : subtract $x^2 + x + 1$ from $2x^2 + 3x + 4$..."

She set the sum up but there was some confusion as to how to ' change signs and add' , so she explained once again.

It was now 08h20 and there were 24 students in the class.

" Close that door - no-one else can come in now, it is too late"

The latecomers were still arriving but had to stand outside. Some of them tried to get a glimpse of what was happening by peering in through the window. Ms.S ignored them and continued with the lesson:

" Let us try $(3x^2 - 4x + 5) - (9x^2 + 7x + 5)$ ".

A student offered the following solution:

$$9x^2 + 7x + 5$$

$$- 3x^2 + 4x - 5$$

$$\underline{6x^2 + 11x} \quad "$$

Ms.S first marked it correct but then realised that there was an error since the expressions had been subtracted the wrong way around.

" O.K let us look at $4 - (-9)$. The subtrahend is written first not so ? " she asked.

" Yes miss" they all chorused.

" You start by writing the number you are subtracting from and underneath you write the number you are subtracting. So what do we do with $4 - (-9)$? "

" We must write -9 first because we are subtracting +4 from -9" a student ventured.

At this stage the siren wailed and I was supposed to leave to observe Winstons' second period lesson. I decided to stay since the lesson I was observing seemed to be developing into an interesting dilemma.

" Are we doing that class ? " Ms S asked.

" No miss ! " they all shouted.

" We are subtracting -9 from +4, so which number should we write first? " Ms.S asked.

" +4 miss" someone shouted.

" Why? " Ms.S demanded.

" Because we are subtracting +4 from -9" he said.

Ms.S was starting to get fed up now and raised her voice almost willing the students to understand the point she was trying to put across. The noise outside was getting louder as more and more students arrived , but were not let in. Ms.S vainly tried to explain, using the terminology subtrahend , minuend, subtracting, subtracting from etc. It was obvious that the students could not even distinguish between the ideas of subtracting and subtracting from something. Eventually after about 15 minutes. a student got the problem correct. Ms.S then introduced students to another method of subtraction using the distributive law.

" You can use the method you prefer..." she said.

5.1.15 EPISODE 15 (THURSDAY 20 FEBRUARY 1992)

During periods three and four I decided to attend the std 10b class taught by Ms.Mfabe. The class was busy marking homework on logarithmic equations , looking at how to change an equation from logarithmic to exponential form and vice -versa.

The lesson was about 20 minutes old when all of a sudden in the distance I heard the sound of a helicopter approaching. This was probably connected to the taxi war² taking place in the suburb

2. Taxi war - reference to violent conflict between rival taxi associations in the area

of Nyanga approximately two kilometres away. As Ms. Mfabe continued to speak, the sound of the helicopter became louder and louder . Eventually the helicopter hovered directly over the school. The noise was now beginning to reach unbearable levels.

The students did not stir. I was totally astounded by this and as if she were reading my mind Ms.Mfabe said: " Don't worry we are back to '76 ³, the students are not bothered by it " ! The noise started to subside and the helicopter disappeared into the distance as I heard Ms.Mfabe say:

" ...now class ... $5\log x = 10$

$$\log x^5 = 10$$

$$x^5 = 10^{10}$$

$$x = 100 \dots "$$

5.1.16 EPISODE 16 (FRIDAY 21 FEBRUARY 1992)

During the third and fourth period I engaged a few of the teachers in a conversation on the topic of the latecoming of the students. Some of them were adamant that not enough was being done to curb the latecoming. Vani summed up their feelings:

" I do not understand this principal . He gives certain privileges to these S.R.C. boys. For example everyone is locked out right, then he opens up for an SRC boy. You know these SRC boys just do what they want to. For example yesterday in the last period the bell rang at 2.30 pm., but I just wanted to finish something so I asked them to stay for ten minutes. This SRC boy just

3. '76 - Reference to the 1976 uprising

got up, announced he had a meeting and walked out..." he said , shaking his head in disgust.

During period five, I had just started a lesson with std.9a when a student poked her head into the door: " Excuse me sir, there is a staff meeting in the staffroom now. The principal said I must call you." After giving the students some work with which to continue, I made my way to the staffroom where the principal and about 15 other staff members were waiting for the other teachers to arrive. Outside in the playground the noise levels were now starting to rise as more and more staff members made their way to the staffroom. Finally after about 15 minutes, the meeting started with members of the SRC executive present as well.

Principal: " Teachers I am sorry to interrupt your tuition time, but the SRC wants to address the students with some information from the joint SRC's regarding teacher, book and furniture shortages at the schools in the Western Cape."

Ms.Mfabe: " We need to see the value of this report before we allow them time to enter the class during tuition time."

SRC Chair: " We need to meet the students now , because after interval there will be no students - its Friday today."

Andre: " I want to question the SRC's priorities and commitment. Is the tuition not a priority over the meetings?"

SRC Chair: " We do not want to disrupt lessons, but the students will not return after interval, that is why we want to meet now."

Neville: " The SRC is supposed to assist with the government of the school . It surprises me that they have no control over their constituency and that they are now disrupting lessons"

Principal: " The staff is adamant and the SRC is adamant- nobody wants to compromise. I suggest that they have the meeting after lunch because there are only ten minutes left before interval"

SRC Chair: " We will break up the school into parts and enter classrooms one by one to inform students. Tuition can continue once we have left a particular classroom. "

The meeting had already taken up the better part of an hour and the staff was not happy about this but were forced to concede as the suggestion had already come from the principal.

Principal: " Now I hope SRC members that this is a lesson to you . The staff feels that there should be no meetings during tuition time."

The students did not like this statement and immediately, three hands shot into the air.

SRC Chair: " How can the principal instruct us on this It is his personal view this! We sometimes have to meet if the joint SRC's want a mandate and so on. So how can we agree to this? " he said angrily.

Andre: " I demand that Jamie withdraws his personal attack on the principal. The whole staff feels this way so why does he single out the principal?"

Ms.Mfabe: " We are not instructing you we are only requesting - please can you have your meetings after school ? So please apologise."

SRC Chair: " O.K. I'm sorry but we want to have meetings sometimes..."

It was obvious that the principal saw this whole discussion as a threat because very soon after this brief exchange he changed his tune somewhat:

Principal: " Maybe I did not make myself clear enough. We don't want mass meetings during tuition time. Many a time I will give you permission to hold meetings during tuition time as long as these are either executive or council meetings, but not mass meetings."

The comment was met with a stony silence. The staff was not at all pleased , but the SRC left the meeting feeling that they had achieved some sort of progress.

The meeting agreed that there would be tuition after interval, but many of the teachers did not return to their classrooms and many of the students did not return to school - as predicted by the SRC chairperson. The classes were empty and in fact I observed a teacher giving a lesson to a two students in a std 10 class which normally had 60 students.

At 13h30 the students were supposed to have a clean up period for one hour since the school did not have cleaning staff. Being Friday, however, not many of them were willing to assist. The majority of those present spent the time hanging around the school gates hoping that these would be opened before the official dismissal time of 14h30.

During this time the principal convened another staff meeting to discuss various general matters.

Principal : " I was disappointed that only six teachers attended the parents meeting on Sunday. There was only one male teacher present i.e. Mr. Neville- thank you sir. We had a report back on 1991- the failure rate, elections and increase of school fees to R15 per year. We did not inform the children of this increase. We informed the SRC and they are informing the children now."

Many teachers reacted to this statement claiming that they were not informed of the meeting . The Principal was adamant that he did mention it to the staff and for future it was agreed that a notice would be posted on the noticeboard to remind the teachers. As the meeting progressed the noise outside was now reaching new heights with a group of students engaging in what can only be described as a rendition of `drum' music using rulers , pens tables desks etc. This did not bother the staff and the meeting proceeded with a discussion on the uniform of the students.

Principal: " On the 2nd March we will send all those who do not have a uniform on home ".

Various teachers indicated that they had already started to clamp down on this aspect of student life so there was general agreement on this.

Vani: " We take good decisions but we are inconsistent in carrying them out. We must get the support of all teachers."

Although everyone agreed with Vani this last statement was to prove to be an important one in everything that happened at Guzany High during the six months of my stay there.

Principal : " This latecoming is really upsetting me. Let us close the gates at 08h30 , keep it locked until lunch , then again at 12h15 till the end of the day."

Bradley: " I think we must only close the gates at 08h45 to accommodate the teachers and students who come from far."

Evelyn: " No! for example, my child goes to a coloured school in Claremont and has to travel from Khayelitsha but her school starts at 08h00 - no mercy is shown. "

After some more discussion it was agreed that the gates would be locked at 08h30.

The principal concluded the meeting by reporting that a student in std. 10`condoned herself into std 10' by just sitting in a std10 class when she was supposed to be repeating std nine. Apparently there were three other cases of this- all of them discovered a full month after school had begun.

5.1.17 EPISODE 17 (TUESDAY 25 FEBRUARY 1992)

During period one I was sitting in the staffroom when a girl and a boy were brought in by a teacher. The teacher was fairly upset but I could not understand what the problem was as they were speaking Xhosa. Zonnie was summoned and he proceeded to give each of the students three cuts each. There were eight other teachers present in the staffroom , but not a single one of them even flinched as Zonnie proceeded to mete out the punishment. He hit them so hard in my opinion that even I was starting to get hurt Later on I discovered that the two had been fighting in the classroom and in fact had punched each other in the face.

Since Winston was absent I decided to teach all the std.9b's and a's together during period three. This numbered 70 students and represented the size of the class Winston would have taken had I not been present at Guzany High. The sheer enormity of the task facing the teachers at this school struck me as I struggled to control the class. We were busy with revision of a test on quadratic equations they had written the previous week. Many students were having problems with the material being covered and wanted me to personally correct their work. As I proceeded to do so on an individual basis, the noise in the classroom was starting to reach deafening levels. Repeatedly I tried to quieten the class with limited success. Through all this noise I discovered a student sleeping in class.

Students were still arriving even at this late juncture and eventually there were no more available desks, so some of the students were relegated to the floor. The class was absolutely jam-packed

and I taught from a small area at the front of the room. Reaching the students on a individual basis was becoming increasingly physically impossible. Towards the end of the period a student sauntered into class:

" Where do you come from ?" I asked.

" I am an athlete sir . We trained until 07h30 and then I still had to go home to change. I live in NY111 which is more than 25 minutes away."

I had no choice but to accept this seemingly flimsy excuse- the gates were not locked as agreed upon on Friday 21 February 1992 (Episode 16). I was reminded of Vani's earlier statement that the teachers took wonderful decisions but never carried them out properly.

On my way back to the staffroom I met Ms.Pomnunga:

" Do you know Brent this morning a std.8 student was a bit slow in class , so I asked her what the problem was. She replied: ` I am suffering from a babalas⁴ miss' ! Can you believe it ? "

I wondered what kind of student would have the gall to tell a teacher that she was suffering from a hangover when asked a question?

Ms. Pomnunga must have seen the absolute amazement on my face as she completed her story:

" But don't worry Brent, by the time you leave here , you will be used to all of this".

5.1.18 EPISODE 18 (WEDNESDAY 26 FEBRUARY 1992)

The principal started off the morning by informing those staff members who were present at 08h00 that there would be a mass meeting of students at a nearby high school at 12h30. This

4. Babalas - Local slang for a state of drunkenness

meeting was to discuss various grievances that the students had, although he was not sure what these were:

" We will only be having school until lunchtime. Please try to use the Guidance and Religious instruction periods for academic work if you are free before period six."

During the first two periods I accompanied Ms.S to her std 7b class. We started at 08h30 since she arrived at school late. We were busy marking the previous days' homework:

Ms.S: " ...What do we call a many term expression ?"

Class (in unison) : " monomial miss!"

Ms.S: " No! - it is a polynomial! O.K lets mark the next problem:

$$-4ab(3ab^2 - 2a^2b) = -12a^2b^3 + 8a^3b^2$$

Now class: Can these two be added?"

Class (in unison): "Yes miss"

Ms.S:" Those who say yes stand up..."

Silence.

Ms.S : " They cannot be added because they are...unlike terms. O.K. let us mark the next one:

$$3(5x - 4y) - 2(4x - 5y) = ?"$$

Student 1: " 15x + 12y - 8x - 10y miss"

Ms.S: " No ! Signs are very important in mathematics!"

Ms.S was very irritated now and raised her voice a pitch or two.

Student 2: " I know miss it equals 15x + 12y + 8x + 10y"

Ms.S had by now lost her temper. She banged her fist on the board:

" You must check your signs first before you open your mouth !" she shouted.

Student 3: " ... it equals $15x - 12y - 8x + 10y$ which equals $23x + 22y$ miss"

Ms.S: (raising her voice) " How can it be? Where did you get this from? Why do you come here for nothing? You have learnt nothing! Check back in your book ! Now we have to go back. We are wasting time when we have a lot of work to cover. This means I must go back to January work and waste time. Don't waste my time , there are children outside these gates who want to come in here and learn . Now the correct solution is :

$$= 15x - 12y - 8x + 10y$$

$$= 7x + 2y$$

Now. are there any problems?"

Silence

" Any problems class?"

" No miss" they murmured.

We moved on to the next problem: $(x - 5)(x - 3) = ?$

student 4 : " $= x^2 - 5x - 3x + 15 = x^2 + 8x + 15$ "

Ms.S: " iright class? "

" Yes miss"

" iright class?" louder now...

" Yes miss!"

" iright class?" louder still

"Yes miss! " they all shouted in unison

" iright class ? ! " Ms.S screamed.

" No miss..."

" Wake up can't you see the mistake?"

Silence...

I was free during the fourth period and was asked by Mr.Sim to take a guidance lesson for std9.:

" Just give them a talk on the grades for university entrance. Tell them a little bit about your own achievements. These children need role models. They need heroes."

I am not trained in career guidance but decided to give as broad a talk as possible covering most of the requirements of the various types of tertiary institutions. Mr.Sim explained

" I just want this teacher to speak to you on this topic. I will be getting you various other speakers during the course of the year." I gave an off-the-cuff talk highlighting the requirements for a matriculation exemption as well as the various bursaries available.

Student: " Sir, what you have told us is all very well and good, but the problem is that none of us do mathematics. When you apply for bursaries they want mathematics !"

I must admit that I felt a little helpless when searching for an answer to this statement. It was a fact that most bursaries would encourage Mathematics and Science since these represented the various technological job categories which the country needed. Consider the average students' subjects: English , Afrikaans, Xhosa, History, Geography and Biblical Studies. This subject

combination was hardly the recipe for successfully acquiring a job on the outside or indeed for further study since the opportunities were severely limited by their choice of fields.

Before the interval had begun the students were already out of their classes and Temba invited me to go with him to watch a cricket match on television at a nearby house.

" There are many days which are disrupted like this, that is why you must push to get your work done. Come lets go quickly there is nothing happening here anyway... "

5.1.19 EPISODE 19 (THURSDAY 27 FEBRUARY 1992)

Ms.Mfabe asked me to invigilate during a mathematics test which she gave to her std 10 students during the second period. As she was about to leave Jamie (SRC) came rushing in:

" Excuse me Miss, but can't I write the test later with the other std 10 class because we have an SRC meeting now."

I asked Jamie why there was a need to call a meeting during school time given the earlier discussion that the SRC had with the staff in which the staff voiced its disapproval of disrupting tuition time.

" There is a National Education Crisis Committee (NECC) march to parliament at 12h00 today. We , the SRC are not in favour of it since we were not informed early so we did not have time to

organise our students properly. But now we have to inform our students . Then they must take a vote whether to attend or not."

I then asked how the meeting of the previous day went.

" Yesterdays' meeting ended in chaos. There were no solutions. the thing is that the meeting was disrupted by certain Pan Africanist Students Organisation(PASO) elements. They did not want to hear anything except that all white teachers must be expelled from our schools. This is stupid if you think that we need teachers. This caused confusion and the meeting broke up."

After some more discussion Jamie left to attend the SRC meeting. Soon interval approached and Anton and I made our way from the staff room to the shop as we often did. As we approached the front gate we noticed that there were scuffles taking place between some students. Anton intervened:

" What is going on here ? " he asked.

" The SRC wants to inform the students that the march is off and they must return to school after interval , but the students do not want to listen." came the reply.

It was a futile exercise to try and push the students back and address them . The students just pushed against the gates until they swung open and they poured out into the street. The SRC members tried to shout that students had to return after the interval but no-one seemed to be paying any attention.

" You will see, after lunch they will not return..." said Anton as we stared at the unfolding scene in amazement.

How true the words of Anton were . After lunch about 100 students returned to the school- mainly std10's. Since there was nothing really happening at the school Mr.Sim asked me to give a career guidance talk to the std tens who were present. I covered similar ground to that covered with the std 9 group I had addressed previously in the week. However at the end of the talk and after I had fielded most of their questions I asked:

" Why is it that the students tend to come so late to school ? "

" We come late sir because the teachers are not here when we arrive early. " came the reply.

This of course was a two-sided story - teachers said that they came late because there were no students present when they did arrive early- a fact to which I could testify. When I informed the students of this they just laughed.

5.1.20 EPISODE 20 (2 MARCH 1992)

I accompanied Zola to his std 7d class during period three. There was a lot of interaction between the teacher and students in this class together with healthy doses of humour. Zola was teaching them how to add algebraic expressions.

For example.:

Add:

$$-3xy + 7yz + 4xz$$

$$+9xy + 2yz - 13xz$$

$$\underline{-12xy - 3yz + 4xz}$$

$\underline{-6xy + 6yz - 5xz}$ and a few other examples of the same type as this. It became obvious from the responses of the students that some of them were becoming a bit confused. They did not know that unlike terms could not be added and some of them were having difficulty with the signs .

Zola picked up on this:

" I think that this is too much English for you , so let me return to Xhosa . "

The rest of the explanations were conducted in the local language interspersed with English on occasion. I could not understand most of it but Zola gave the impression that he was a little bit happier with their responses. Later on he could not recall a students name: " I think you must wear name tags so that I can get to know all your names. "

School was in session for nearly two months now and still teachers were having difficulty with the names - their classes were far too large for them to be able to remember every single name.

After the interval I decided to try to observe either Ms.Mfabe's or Winstons' class but I could not find either of them. The teachers did not seem to be moving to their classes and twenty minutes later the majority of them were still relaxing in the sanctuary of the staffroom. Anton could read the mood: "...just watch these teachers, they don't go to their classes." After about half an hour Ms.M came inside, looked around and shook her head. Outside the students were still basically

having an interval. Ms.M seemed a bit angry as she started to shout out the names of those teachers who were scheduled to be in their classes during this period. One by one the teachers got up and left, reluctantly making their way out to the classes.

There did not seem to be any particular reason for the seemingly relaxed attitude of both students and staff on this day (except of course that it was unbearably hot), but one could feel the restlessness all through the afternoon. In fact during period nine I was scheduled to teach the std 9a higher grade group, but when I arrived at the classroom it was already occupied by another teacher, so there was no class to go to. I took the students back to join the standard grade half of the class and asked Winston whether he would mind supervising them while he taught as I had given them quite a bit of work to do. Winston agreed to do so, but 15 minutes later he still had not arrived . I then decided to supervise them myself and asked them to work quietly on their own. Outside the noise started to increase as the afternoon wore on. During the last period of the day it did not seem as if any work was being done as more and more students poured into the playground and crowded around the locked front gate waiting for the final siren to sound.

5.1.21 EPISODE 21 (WEDNESDAY 4 MARCH 1992)

A staff meeting was hastily convened during the interval. I did not see the notice for it but since I normally spent my intervals in the staffroom I was present when it commenced.

Principal: " I must apologise for this lunch hour meeting, but something quite urgent has come up. All teachers in our schools will meet at 12h00 today concerning the problems with the DET. One of the aspects concerns the salaries i.e. non-payment of some teachers and tax deductions. "

Zola: " This is not a party meeting . It is open to all teachers. Since we were the first school to talk about chalk downs in South Africa , we must support this meeting. The DET dehumanises us. On principle this needs our immediate attention, whoever gains or loses. We should dismiss at 12h00 to attend this meeting."

Neville: " Let us extend the time to 13h00, otherwise tomorrow the students just need a meeting and will dismiss early."

After a brief discussion it was decided to leave at 12h00. The students were to be informed after they returned from lunch.

Principal: " A crucial issue has arisen in std.10 concerning Neville. It seems that the kids are not acquainted with Neville's methods in History. They don't want to be asked questions. They always want to be given everything."

Ms.M: " They were asking for Neville to be replaced by Mr.Bradley. They kept on that they wanted Neville changed. They have a problem concerning his acceptance of many different answers so that they claim that they don't know which answer is the correct one."

Principal: " Maybe Mr.Neville can explain his approach to the staff as he did to the office."

The staff did not agree saying that it was not necessary.

Bradley: "Children cannot dictate to teachers about these matters. They will just have to accept Neville. We must not let these children fok us around."

Zola: " I agree with Mr.Bradley. Some time ago we gave them the latitude to change and we had very bad results. Last year they had teachers of their choice but they still failed."

Vani: " We as teachers should take a stronger stand. We should protect each other. For example in 9c a female teacher was sworn at for asking for silence!"

Other teachers then gave various other examples of rude behaviour amongst the students.

Principal: " We will tell them that there is to be no changing. Every time at the beginning of the year they try this. Tamsine also has a problem with the std 10's , they are rude and unruly."

Evelyn: " Let us contact the parents to solve the problem."

Principal: " Another factor is this mob spirit. Let us isolate the unruly ones and deal with them in class."

Zola: " The same boys who are unruly with Tamsine are the ones who want Mr.Neville out!"

Ms.Mfabi: " Let us address the students before the parents. We should tell them we are not prepared to tolerate any more of this."

Vani: " Let us agree : I am not going to a certain class until they apologise. We need to support each other because seemingly these kids don't know why they are at school and they won't learn until they accept authority and discipline."

Bradley: " Just hit the children who are a disturbance. We should have the liberty to use our own discretion."

After a few more comments it was eventually decided that the head staff would address the std 10's on the various issues. The meeting ended at 12h05 and I tried to find someone who was going to the teachers meeting but everyone seemed to have other obligations.

I decided to discuss the case of Neville with Andre.

This was one of the more important comments that he made:

"Brent, if you try to discipline these kids they will react and before long you will be without a job. See what happened to Neville. He is one of the hardworking ones. That is why they don't want him..."

5.1.22 EPISODE 22 (MONDAY 9 MARCH 1992)

At 08h20 I was approached by both Winston and Ms.Mfabe concerning the continued absence of Ms.N . They were not sure when she would be returning from 'accouchement leave'. They asked whether I would be prepared to teach all Ms.N's std 6 classes. While I was not too happy about this situation I believed that I probably had no choice since these classes had been sitting idly for a month and I was qualified and available. My main fear was that this teaching would cut into the time I had set aside for observation together with the fact that it would probably make me more mentally exhausted than I already was. On the other hand this was a golden opportunity to contact more students and experience first hand, different aspects of the teaching and learning environment of the mathematics classrooms at Guzany High School.

It was an opportunity I could not afford to miss. So with a certain degree of trepidation I agreed to teach four std 6 classes whenever I was available.

My first encounter with a std 6 class proved to be a real eye-opener. There were 65 students: all eager , enthusiastic and noisy. I realised that I would have to try to enforce some sort of discipline if I intended to survive in this environment:

" There will be no chewing of gum in this class. All homework is to be completed and latecoming will not be tolerated. These are the basic rules I expect you to follow... " I said.

The students seemed extremely surprised by these statements responding with gasps: " Haai....haai! "

I resolved not to be intimidated by these comments and just stood there staring at them until they settled down . They seemed terrified, but I believed that being authoritarian in this overcrowded environment was the only way to preserve ones sanity and do some effective work at the same time. I had of course seen other mathematics teachers at the school do the same with some success.

" Now class can you tell me what the last work was that Ms.N did with you? How about this student over here? " I asked pointing to a girl seated in the front row.

Silence...

" She doesn't understand English sir so she can't answer you." Eventually I managed to determine the content of the last work and decided to proceed with work on arranging terms in ascending or descending order. The students had not heard of these words before in English so I was forced to improvise by explaining the ideas of ascent and descent using drawings of a staircase. This seemed to work quite well and I was struck by the thought that teachers in this context had to be innovative and creative in this environment in order to get their message across to the students especially where their were such deficiencies in language ability. Nothing brought his point home to me more than when later on I asked a student:

" Why do you not have your book open in front of you?"

Student: " I haven't heard you sir "

So I repeated the question.

Student: " I haven't heard you sir."

I now realised that he did not understand the question I was asking and wondered how he would be able to understand the mathematics I was trying to teach.

Teaching std.6 mathematics at Guzany proved to be one of the most trying experiences in my six month stay at the school and I was genuinely relieved when Ms.N returned to the school two weeks later.

Towards the end of the day I managed to engage Andre in a conversation regarding the lack of English skills by many of the junior students . he seemed to think that this was a problem that arose from primary school in that the students were supposed to be taught in English , but of course this presented problems for the teacher, who then just resorted to mother-tongue instruction.

This explanation seemed quite plausible and it was given as a reason for poor English skills by many of the teachers at Guzany.

5.1.23 EPISODE 23 (WEDNESDAY 11 MARCH 1992)

At 14h00 the principal convened a staff meeting. There were 20 staff members present while the others were busy with sport or choir practice.

Principal: " The SRC has approached us about a programme in next week. It is a programme on the role of the COSAS and they want to use the last two periods of every day. This is the proposal:

Monday 16 March 1992: At 1.30p.m. they will explain COSAS to each class- 'door to door'

Tuesday 17 March 1992: At 12.00 p.m. - Awareness programme

Wednesday 18 March 1992: At 12.00p.m. - Panel discussion

Thursday 19 March 1992: At 1.30p.m. - Video

Friday 20 March 1992: At 12.00p.m. - Cultural programme "

Ms.M: " We cannot intervene since it seems it is all over the Western Cape , so we just have to go along."

Neville: " Remember in the last parent meeting, a parent asked if students were allowed to hold political meetings. The principal said no. Therefore we have to raise this issue, considering that we have 3 student movements. If all have their own programmes , what is our response going to be ?"

Principal: " This must go to the parents since they will hang us if we don't tell them. In response to Mr.Neville, I think that AZASM and PASO⁵ do not utilise tuition time for programmes, so I do not foresee a problem here."

Evelyn: " We should think more deeply about this. Last year we faced a problem from PASO students who demanded tuition during COSAS week. We should also make it a point that they must attend school. For example those who do not want to be forced into political things will just stay away. The kids reject the programmes because of the way it is put to them. It is a pity because these are community organisations."

Principal: " We told the SRC that they should discuss with PASO. What does the staff feel about the involvement of teachers ?"

5 - PASO /AZASM - Youth Wing of the PAC and AZAPO respectively. COSAS - youth wing of the ANC

Vani: " We have told them before:- teachers don't want to involve themselves when the issue is COSAS-PASO. We cannot allow ourselves to be divided. This programme has the potential of many problems. When PASO comes to us to ask us to involve ourselves, we will have to do so. We only concern ourselves with matters of SRC not political bodies. May I ask what the whole programme involves? They might mean if there is a march , we as teachers must march. We must know the facts.

Principal: " It is about the political situation that COSAS find themselves. Membership is lacking so they want to recruit members. The programme is not yet full blown- they will come back to give us more information."

Evelyn: " We as staff do not want to take sides so we cannot support this."

Andre: " We have no right to force these kids to listen to a certain ideological picture, so we should not become involved."

Neville " I feel that you can do your programme but do it after school. They don't have support , so they are forcing support. We are concerned about those students who are being forced."

Evelyn: " If kids are willing to learn let us just teach them."

Ms.S:" Let us follow Wednesdays and Fridays programme next week up till 1.30p.m. After wards they can do their own thing until 2.30p.m.

There was general agreement on this so the principal moved onto the next item on the agenda:

Principal: " I just want to remind the staff that the std10's will be meeting us again tomorrow re: Neville."

This was met with howls of protest which was summed up by Andre:

" This school is out of control. If these kids do not want Neville then they must have no-one. He should not return until they have apologised to him."

Ms.Waya:" See they don't want Neville because he works hard. They rather want someone like Bradley who is not even here today."

These comments were met with general agreement and the Principal ended the meeting at this juncture.

The following week we followed a timetable which had the end of the school day scheduled at 1.30 p.m. as was agreed in the staff meeting. On Monday and Tuesday of that week the students all poured into the playground at 13h30 but there was no programme arranged for them. The

majority just spent their time milling about , talking in small groups before charging for the front gate when it was opened at 14h30.

On Wednesday our lessons were interrupted by the SRC during the fourth period . The students were informed that there would be a march organised by the ANC to parliament. Free trains to transport supporters to the city centre would be laid on between 12h00 and 12h45. The school was dismissed at 12h00. On Thursday the students did not return from their break so the principal dismissed us at 12h30.

On Friday while I was busy teaching std.9a we were informed by Linda(student) that : " there will be no lessons after lunch sir. Mandela is coming to Langa High today so some students are going there. Otherwise we don't really know what is happening ."

In later conversations with the teachers, they had the following comments:

Zola: " This week has been wasted.For example, this march on Wednesday was not part of the COSAS week. In fact students were not even supposed to be there, but they just slipped in with their posters. I think next year we have to have their programme on paper."

Ms.Mfabe: " You know Brent, it is like this, time-wasting whole year except in the last quarter. Then they really need us, then they only want to work."

Temba: " We waste about one and a half days out of every five throughout the year. There is nothing we can do about it."

Since the teachers were being paid on this day the Principal came into the staff room at 13h00 and announced:

" Let me give you your cheques and let us get out of here- these kids are not coming back today."

5.1.24 EPISODE 24 (MONDAY 23 MARCH 1992 TO TUESDAY 24 MARCH 1992)

During period three I was busy with the concepts of Domain and Range in graphing with my std.9a class. The majority of the class members did not seem to have any recall of these ideas so I enquired as to whether they had ever been introduced to these.

Linda: " Mr.Winston did not do it with us last year sir, the others know it from PROTEC."

Brent: " I think you should stop blaming Mr.Winston all the time, I mean look at you students , look how much time you wasted with COSAS week. You decided on COSAS week and you wasted the time!"

There were a few gasps from the class. Linda spoke on behalf of the students:

" We did not decide sir! COSAS students decided. We are not all COSAS."

Later on I reported to Tamsine the conversation I had with the std.9a class.

Tamsine: " Brent, you must be careful. In this community you cannot just say what you want, it can get you killed. be careful of some of these people. You will see some of them just want to force their political views on you. The political organisations just want to control everything. You say something today against it and you are marked. When something else happens they come find you and take it out on you."

Brent: " But surely someone has to start somewhere and resist."

Vani : " I agree and I think that last week was an ideal opportunity with COSAS week. When we saw that the first day was not working we should just have put our foot down."

Tamsine: " That kind of talk is dangerous. You can get yourself killed."...

Later I had a conversation with Ms.Mfabe:

" I think I will let my std.10's come in for extra lessons. I must finish by 31 August 1992. Just think, we have missed so many days. Five days for sport, three weeks for registration plus all the disruptions like for example COSAS week. I have worked out that we have only covered four weeks work in this term. I suppose we could have started work earlier by finalising the time-table, but the principal did not finalise allocations by the end of last year. You see he took democracy to its illogical conclusion by letting teachers choose where they wanted to teach and then he still changed this. He creates too many gaps for people. For example look at what is

happening with Neville- the principal should just have put his foot down with the students by telling them that there is nothing he can do."

5.1.25 EPISODE 25 (WEDNESDAY 8 APRIL 1992 TO THURSDAY 9 APRIL 1992)

The second quarter began extremely controversially with calls for a chalkdown (a teacher strike) from the very first day.

At the morning assembly I spoke to Yandi:

Yandi: " Did you hear about the chalkdown ? I wonder if we will be following it ? I think we should since it affects everyone this pay thing. I only got paid for two months and they underpaid me as well !"

Ms.Mfabe: " It seems as if this chalkdown decision was taken at parliamentary⁶ level. They always think that Guzany is the venue for these disruptions, but we will adopt a wait and see attitude."

The rumours concerning the proposed chalkdown had by now spread around the school like wildfire and one could detect the marked effect it was having on learning and teaching at the

6- Parliamentary Level - reference to a decision taken at Executive committee level

school. There were more students than before out in the playground and a minority of teachers were attempting to conduct lessons.

To make matters worse , during periods five and six (before the interval) I was busy teaching the graph of the parabola to my std.9 class when a student rushed in and announced:

" Sir, there is fighting in the street..."

The class erupted and ran out of the door towards the fence. Virtually the whole school was at the fence as two gangs of youths hurled rocks and other missiles at each other.

After the interval hardly any of the students returned for lessons. In fact some of the teachers stayed away as well. The principal hastily convened a staff meeting at which he informed us that the school would be dismissed at 13h00 to enable teachers to attend a meeting of all schools on the chalkdown. The surprising thing was that I could not find anyone who was going to the meeting.

The next day we were informed that the chalkdown had been suspended since the department was making arrangements to settle all outstanding pay of teachers.

The effect on the school , however could still be felt with numerous students arriving late for classes and many classes being left unattended.

By about period five the school settled down nicely into a work mode.

Anton: " This silence like a school is the Guzany I know..."

5.1.26 EPISODE 26 (THURSDAY 9 APRIL 1992)

Since the school was still unsettled (because of the aborted chalkdown) , many of the students did not return after the interval. I spent the free time available, talking to Andre.

Brent : " What do you think is the single most important problem facing you as a teacher here ?"

Andre: " I would say discipline . These kids come and go as they please. Just look how they are walking out right in front of us ! They come late and they leave early.

As we spoke two students with bags on their shoulders actually greeted us and marched out of the front gate.

Brent : " But don't you think there is anything that can be done?"

Andre : " I don't think so. You see Brent this discipline problem gets right back to their home environment . The parents cannot control them so how can we control them ? You see this gangsterism is on the increase again. look at all this fighting in the streets. Some of our kids are involved in the gangs. This is the most dangerous township of all the black townships in the Western cape. There are many guns floating around here. This place is a jungle. For example if you knock anyone over here, do not stop , ride straight to the police station. Otherwise these people will kill you. This is the environment that our kids are forced to live in, so how can we

even try to discipline them. And believe it or not this is one of the better schools in the Western Cape. "

Brent: " But how did you cope as a student in Guguletu ? "

Andre : " Many of us were sent to boarding schools to escape the urban areas. At least there we had school without disruptions. For example Temba and I went to the Ciskei. Milos went to Transkei and Zonnie went to school somewhere in the Orange Free State. That was how we survived, but these kids have no such choice..."

Later I asked Anton and Zola the same question : i.e. what they thought was the biggest problem facing them here at the school ?

Anton : " Brent, to me the biggest problem is still the teachers. Just look how they are not going to their classes. If we as teachers are more disciplined I am sure students will follow. I wonder if our kids were here if we would have the same attitude. We as teachers here all send our kids to white or coloured schools and we are sacrificing innocent children from our community by not going to our classes. "

Zola: " To me the biggest problem is everything that is happening around the school. For example: our students see all these ex-students driving smart cars, not working and getting rich by smuggling. Yet we tell them to study hard to get a good job , but there are no jobs and if you

do find work, you still struggle. So the students are receiving mixed signals . How can I tell them that education is the key when deep down I know for most of them it is going to be meaningless ?"

5.1.27 EPISODE 27 (FRIDAY 10 APRIL 1992 TO WEDNESDAY 29 APRIL 1992)

After the lunch interval on Friday 10 April 1992, very few students returned to their classes. The majority of the staff members remained in the staff room believing that it was pointless to attend lessons since there were very few or no students present. The deputy principal came in after half an hour and urged the teachers to go to their classes even if there were only a few students present. A few staff members listened to her, but the majority remained and the rest were soon back chatting in the staff room - many complaining that there were too few students for them to do any meaningful work. By 13h00 there were no students in the school. The principal convened a staff meeting for 13h30.

Principal : " Ms.M would just like to raise an issue with you concerning today."

Ms.M : " It is disturbing me that teachers are not returning to their classes after lunch. Whenever we go back after lunch even if there are two or three students, we should attend. I fear that at the end of the day we will have disaster. How can we motivate non-attendance after lunch ? "

Anton: " I agree, I think we should attend all our periods I wonder how we would have acted if our children went to these schools ?. All our kids go to coloured or white schools - we cannot sacrifice innocent children.

Andre: " The chalkdown did have an effect on the attitudes of students - it unsettles them a bit and teachers are not attending classes. What has been done is done. From Monday we should have a test week and attend classes.

Vani: " I hope we carry out our decision. For example with this latecoming, we did not carry out our decision. These things make children not respect us and contributes to the ill-discipline in the school. This ill-discipline has turned into gangsterism and these gangsters fight outside the school. We were isolated there when this happened- other teachers were not in their classes when this happened, so we should all attend to protect that side of the school as well."

After a lengthy discussion it was decided that the following week would be a test week with everyone attending all classes on time.

On Monday all the teachers had reported to the school by 08h00. The gates were locked at 08h30 and students were not let in till the interval. Tuesday saw pretty much the same commitment from the teachers, but by Wednesday some of the teachers were beginning to slide back into their old habits. A meeting was convened at 13h30 to discuss the situation.

Principal : " There is minimal attendance at the assembly in the morning. Most of the children stream in after 08h00. It is quite inopportune for us to tell students to go to their classes if there is no-one to teach there. What do teachers feel about a winter timetable ? "

Bradley: " I agree. There are problems with the transport, resulting in teachers coming late so I am thankful for the suggestion."

Zola: " I am against since if you are late you won't even make 08H30 for that day.

Anton: " I am against later times since the principal should just come down on teachers who are late."

Principal: " In the morning very few teachers are attending on time, so that is why I am suggesting a later starting time and then we move everything back and finish later i.e. at 15H00."

Vani: " I can only say that we as teachers are to blame. We have failed. For example this was supposed to be a test week, but still teachers are not going to their classes."

Principal: " It is true what is being said, so I think we will stick to 08H00."

Ms.M: " The fault here lies with the teachers. They do not go to their classes. The back block is always empty but luckily the caretaker informs the Principal and chases students to class even if the teacher is not there. We must continue with our project to try and find solutions."

Ms.M then proceeded to read out the names of the classes and the names of teachers who left classes unoccupied during the period after interval over the previous three days. These numbered about 12 per day .

Principal: " I hope teachers will take this issue seriously. Another final point is that some teachers are teaching lessons in Xhosa to up country pupils⁷. Remember that they do not understand, so please teach in English."

On Wednesday 22 April 1992, approximately 200 students were locked out of the school after 08h30 - as agreed in the staff meeting of the previous week. Some students attempted to jump the fence but were chased back outside by the principal. At about 10h30 a group of tsotsies came walking by and started to interfere with the students. This resulted in many of them running away to walk around at the nearby shopping centre.

7 - Up country pupils : reference to pupils coming from other parts of South Africa

At 13H30 the principal convened a staff meeting.

Principal : " I must thank everyone on the staff for their co- operation on this gate issue. We will keep this up until things change. I have had some negative views expressed by some outsiders, but I just turned a deaf ear to these. "

On the following Monday 27 April 1992, the gate was still being locked in the morning even though it was raining quite hard on this day. The numbers of students late in the mornings had definitely decreased and teachers were attempting to report to their classes on time. The unfortunate thing was that many of them only did so when they noticed Ms.M doing her 'research' in a small black notebook.

By Wednesday 29 April 1992, the SRC approached the principal to complain that the gates should not be locked when the weather was bad and to question the decision of the staff with respect to the safety of students who were being molested by gangsters outside the school as they waited to be let in. Students were also complaining that they could not afford to miss a whole day of school. The principal arranged a meeting between the staff and the SRC to discuss these issues . The feelings of the staff were summed up by Andre and Zola.

Andre: " Don't try and shift the blame for your latecoming by making all types of excuses. You should be here at 08h00."

Zola: " The numbers of students coming late are decreasing. So you should accept this locking of the gate since it is working. Don't try to say that apartheid is doing damage to us when you are doing damage to yourselves by coming late in the mornings."

Principal: " Parents have been phoning to thank me for closing the gate. If you are really leaders try to lead your followers positively. Take a hint from leaders of the political organisations, they go down to the grassroots and lead properly- you should do the same."

The SRC accepted the comments of teachers and for the first time at the school it appeared as if the participants in the setting had won a small battle in the quest for a 'normal' education.

5.1.28 EPISODE 28 (THURSDAY 30 APRIL 1992 TO FRIDAY 8 MAY 1992)

Upon arrival at the school on Thursday, the teachers were informed that there were many problems with the salaries of teachers and so a chalkdown had been called.

Principal: " I don't know all the details but in the meantime, I leave it to your discretion to follow the decision or not."

Many teachers were extremely angry with this comment saying that the principal should have given more direction by saying what the teachers had to do. The indecision that arose from the meeting meant that there was virtually no school for this day. By 11h00 the school was deserted

with students milling about in the nearby central business district. By the afternoon we were informed by the principal that the chalkdown would continue until the question of salaries had been sorted out by the department.

This pattern continued for all of Friday and by the following Monday virtually none of the students turned up for school. Tuesday and Wednesday were much the same with nearly all the schools empty and teachers being dismissed early. On Wednesday 6 May 1992 the chalkdown was called off (the salary shortages had been sorted out), but the next problem was getting the students back into the classrooms.

This point was borne out when on Thursday 7 May 1992 the school experienced a high absentee rate. In fact the number of students returning to school after the lunch interval declined dramatically.

By Friday lethargy had set in and it seemed as if the previous experiment i.e. test week had all been in vain. A staff meeting to discuss the ' fact that teachers were still not attending class on time' was convened. After a lengthy discussion covering the same points as had been discussed in previous meetings the teachers agreed that from 'Monday we will make a fresh start.'

5.1.29 EPISODE 29 (JUNE 1992)

Examinations were scheduled for early June but due to all the disruptions of the quarter, the commemoration of June 16 and 17 at all schools in the townships and the fact that the majority of teachers were engaged in their own examinations at the tertiary institutions nearby, all resulted in the decision to move the examinations back to the period 18 June 1992 to 25 June 1992.

In fact during the period leading up to the 18 June 1992, not much teaching took place as the majority of staff members were busy with their own examinations at the nearby universities.

The initial first papers were examinations involving compositions and letters in the various languages. Since there was a shortage of paper in the school, the topics for the examination had to be written on the chalkboard in each individual class.

The examination proved to be an eye-opener with students writing in an atmosphere of noise and uncertainty. The procedure for the examination was as follows: All the papers for the day were laid out on a table in the staffroom. Each class teacher had to invigilate for his or her class every day. There was no invigilation timetable for teachers. The starting time for each individual class depended on the time of arrival of the class teacher but was generally in the first hour of the day. The fact that all the classes were starting and finishing at different times meant that those who finished early poured into the playground after they had handed in their papers and, since on most

occasions it was not yet interval, some of the students would start a soccer game. The resulting noise did not seem to distract those that were still writing.

Inside the classrooms accommodation was at a premium with students sitting virtually on top of each other. This set of circumstances resulted in many instances of copying. In fact on the one occasion when I caught students copying they were angry that I had had the audacity to stop them from doing so.

On another occasion I was sent to a std 10 class to invigilate, since their class teacher had not arrived. When the time came for the examination to end I instructed the students to stop writing and hand in their papers. The majority were still busy and refused to do as I asked. I called the principal , who after some discussion with the students, agreed to give them an extra half an hour to complete their examination.

The last disconcerting thing about the examinations was that many of the question papers had no time limits on them and often teachers who had set these were absent, resulting in a scenario where students wrote for as long as they saw fit. It was obvious that the examinations were not without their problems but the words of Winston that this was ' the first June examination in three years', reminded me that the fact that examinations were being written was probably more important than the way in which they were being written.

In the context of the setting this represented a major breakthrough for learning and teaching at Guzany High School.

5.2 THE INTERVIEWS:

5.2.1 INTERVIEW LIST.

A total of sixteen interviews were conducted.

The transcriptions of these interviews have been included in an Audit Trail which is available from Prof.Chris Breen of the Education Faculty of UCT.

Following is a list of the interviews conducted and the interview with Winston which has been included as an example:

Interview #1 : Anton (Tuesday 28 April 1992)

Interview #2 : Andre (Thursday 30 April 1992)

Interview #3 : Ms.Mfabe (Tuesday 5 May 1992)

Interview #4 : Winston (Thursday 7 May 1994)

Interview #5 : Zola (Monday 11 May 1992)

Interview #6 : Ms.S (Thursday 14 May 1992)

Interview #7 : Mr.Kola (Tuesday 19 May 1992)

Interview #8 : Ms.N (Thursday 21 May 1992)

Interview #9 : Tsobo (Monday 25 May 1992)

Interview #10: Palesa (Wednesday 27 May 1992)

Interview #11: Nicholas and James (Thursday 28 May 1992)

Interview #12: Cecilia (Friday 29 May 1992)

Interview #13: Std 10. Student (Thursday 4 June 1992)

Interview #14: Jamie (Monday 8 June 1992)

Interview #15: Thembisa (Monday 15 June 1992)

Interview #16: Neville (Thursday 18 June 1992)

Interview #17: Vani (Monday 22 June 1992)

5.2.1.1 INTERVIEW WITH WINSTON (THURSDAY 7 MAY 1992)-INTERVIEW #4

B- Basically what I want to ask you is, what are the problems facing you as a teacher at the school?

W- Concerning maths ?

B- Concerning maths. We can talk about maths first and then maybe we can talk about general problems afterwards.

W-Firstly, as you might have seen, the numbers, the numbers are almost too much you know... and secondly that leads to overcrowding, hardly you can move around in most classes especially the junior classes like std 6, in some cases even std 9. For example in 9a you have seen the numbers. Secondly, the material... sometimes the school runs out of stationary, things like that... overhead projectors, lack of funds... you know those things which you need to ease this overcrowding the numbers.

B- O.K. you spoke about the numbers...Now how do you cope with the numbers in your class ?
How do you cope with that ? What do you do ?

W- I normally just go on... you know... I'm...not sure really how effective the teaching is because I just normally go on... even with corrections I just normally take a few. You know as a result the rest are lagging behind.

B- Are you saying that that's just what you basically do ?

W- Ja.

B- O.K...um... do you feel there is anything that can be done about the numbers ?

W - Well, that depends on the D.E.T of course. They could build more schools ,employ more teachers... and another problem... our children have inherited some ill discipline over the years... broadly through these political activities... that ...um... teacher - pupil relation is very lax... they've inherited ... you know... even the family ties are broken down, the children are much more, what could I say... arrogant-they like to do what they like. The general lack of discipline - going from the home situation which is transported to the schools and society in general.

B- Are there any examples in your classroom teaching ?

W- There are...some examples...

B- Like for example ?

W- Like boys just bursting out of tune... you know normally in the past that never used to happen.

B- So how long ago would you say it never used to happen ?

W- From 1976.

B- So are you saying that things changed in 1976 ?

W- Definitely.

B- Why ?

W- Well, the kids after ... those uprisings they felt they had some power... over their parents, over society, over the teachers. So there was that...uh...what would I say ? ... communication breakdown. It went from bad to worse over the years. you know. For instance if you look at std 6 pupils, when they first came here, they are well disciplined, they are eager to learn and very responsive, but give them 2 or 3 months... they inherit this general laxity...

B- O.K., concerning the ill-discipline as something you have raised, what do you think can be done about this problem ?

W- ...That is a question which...should I say its a 100 million dollar question, because its a problem right through the country, in our uh ...black schools. Church ministers, politicians have been trying to solve that problem.

B- O.K. What do you think ?... You don't have to say what is happening but what do you think can be done ?

W- Firstly, Brent I think that the department should address inadequacies in our education- imbalances. I don't know if creating one education department would solve everything, but I think there should come some money in our education - starting from our teachers, training our teachers properly you know...and that's from where I think that should filter to the society.

B- With Money ?

W- Ja, look for instance there has been a shortage of text books. - they have only now they have arrived. This is already April the fourth month there is a general shortage of textbooks. The department takes a long time to respond to simple things that could be addressed. For instance building schools is such a major task- its a long term thing but at least textbooks - they can bring books stationers should be available and equipment school equipment- like if i want to make

worksheets, at least that would ease the numbers if you give them worksheets to work on. I find that the school is out of equipment and stationery...

B- What about other problems that face you as a teacher here maybe not as a maths teacher just as a teacher.

W- Ja, well I don't think I have any in particular.

B- You don't feel you have any other problems?

W- No, not really. I wouldn't think of any.

B- O.K. let me ask you then about... lets say the disruptions which some people have raised as a problem ?

W- Ja... like chalkdowns and things. They do affect our teaching adversely and uh I also think that coming from the past, any little thing the students will grasp onto just in order to stay away from school.

B- Now why do they want to be away from school ?

W- ... That resistance they have against say authority or whatever... they'll take the slightest opportunity to have boycotts stayaways and so on you know.

B- O.K now lets go back to when you were at school, was it like this ?

W- No, never !

B- How was it ?

W- (Silence)

B- Which school were you at ?

W- I attended Langa High and then from there I went to boarding school in...Durban.

B- O.K. but how was it ?

W- Discipline was well established... and there was none of this overcrowding although I wouldn't say we had everything but...you know parents...students used to pay huge amounts of fees that has since been phased out- students boycotted classes because of fees, right. They are no longer called fees now, they are called contributions - almost voluntary. So we used to pay for our equipment those days - for everything. Well even during school I would say we had almost

everything that was adequate for our daily needs ja ! There was no cause for boycotts and things like that...

B- So are you saying that things changed since the boycott ?

W- They changed, they changed radically...

B- So how do you think we are going to turn it around ?

W- That's a tough one (laughter) that's a tough one...

B- No just give your own ideas...O.K.let me ask you : do you think we need to turn it around ?

W- We need to because this is an unhealthy state of affairs definitely... we do need ... but as I said these inadequacies should be addressed. I wonder what would the students feel like if they had everything ? small numbers, teachers being helping, well equipped labs,libraries and... you know... the works....

B- A good environment in other words ?

W- Ja.

B- You think that will help ?

W- It will go along way...and then having workshops to educate the parents about the school, schoolwork, discipline... and more and above... punctuality... punctuality...

B- Do you think we as a school are doing anything about punctuality ?

W- Ja, the attempts to close the gate...ja it is effective...it is.

B- O.K let me ask you then: do you feel motivated to teach here ?

W- I was before.

B- When ?

W - When I first came here in 1980 what ? I came here in 1987. There was still a semblance of some order...and the results were not as bad as at present , not very good but fairly average given the circumstances, you know...there was some semblance of discipline and the atmosphere was conducive to teaching ... (long pause)

B- So would you say that ...um... at the moment you don't feel so motivated as such ?

W- Not as much as before.

B- What's the reason for that ?

W- I think that as I have mentioned : if you go to a class of 65 you've got to do a test... there's corrections you know... it's a daunting task.

B- So what do you do ?

W- I do give them , but I take longer than normal to mark... you know it's a strain. You know with mathematics you need quite a regular testing or evaluating system, but with those numbers, sometimes you are scared of giving a test...

B- O.K. are there any other obstacles that face you or face the school, anything else you can think of ?

W- Well to be blunt with you , I'll go back to the department ... the salary imbalances between blacks and whites are still have to be ... you know that's another incentive , you know that you're being adequately paid then you have an interest in your work. It's a motivating factor...you know.

B- O.K. are you saying that the department must sort out any problem they have ?

W- Ja, you know Brent, its not always the department that is always at fault, sometimes even these... these local guys, starting from the principal upwards and HOD's , they can make life really hard by not say... administrating properly. I'm sure you know what I am saying.

B- O.K anything else that you may want to add or that you see as a problem in the school ?

W- And of course going back to sports equipment ... they say a sound mind in a sound body... there should be some sporting activity, more than we have now ...you know... the Rugby Field has been neglected, that we cannot really blame totally on DET.

B- Why ?

W- The school could raise some money and have this field operating ... we could have tennis clubs... you know anything that is going to keep the children away from trouble.

B- When you first came here, was that field used ?

W- Hardly, it was new but the grass was growing wild, ever since it has not been operating.

B- All that has to be pulled out and re-planted and whatever.

W- Re-surfaced, Ja.

B- O.K.

W- Soccer fields you know.

B- Any other problems ?

W - I don't think so - let me think about it and then I can tell you again.

B- O.K. we'll stop thanks very much... whatever you've said here, I'll get back to you , so if you want to delete anything or add anything ... we can do that.

W- Right.

B- Thanks.

Postscript (Handed in by Winston after the interview)

After handing back the interview to Winston for perusal he added the following in writing:

1. All sporting codes should be vigorously encouraged.
2. Debating societies should be formed and other schools across the colour line invited.
3. Student should be encouraged to involve themselves in community project.
4. Environmental awareness also encouraged.
5. Cultural activities, inside and outside the school, should also be encouraged.
6. All teachers, especially the guidance teachers, should motivate students on all of the above aspects.

CHAPTER 6

ANALYSIS OF DATA:

6.1 Introduction

Goetz and LeCompte (1984) and Eisenhart (1988) have posited the idea that units of analysis (episodes) should be grouped together according to similar characteristics.

Broadly the episodes in this case study with similar characteristics were grouped into categories with interviews serving as another source of information.

Following are the categories

Category A : This group includes episodes which reflect on the general atmosphere and ethos of the school and playground. Included in this group are the following episodes : 1,6,7,8,9,10,11,12,15,16,17,19,20,23,24, 25,26,27,28.

Category B : This group includes episodes reflecting the atmosphere and ethos of the mathematics classroom. Included in this group are the following episodes: 1,3,4,5,6,7,8,9,10,11,12,13,14,16,17,18,20,22,24,27.

Category C: This group includes episodes which reflect upon the decision-making power in the school setting. Included in this group are the following episodes : 12,16,17,21,23,24,27,28.

These categories can be broken up into various sub-categories:

The following sub-categories arise from Category A:

Sub-Category A1 : Punctuality in the school setting. Included here are episodes:
1,6,9,16,17,19,20,26,27

Sub-Category A2: Disruption within the school setting. Episodes which represent this sub-category include: 1,6,9,16,19,21,23,24,25,28.

Sub-Categories which arise from Category B:

Sub-Category B1 : Overcrowding and the lack of individual attention in the mathematics classroom.

(Episodes 1,5,9,11,13,17,20,22)

Sub-Category B2: The use of language and terminology in the mathematics classroom.

(Episodes 3,5,9,12,14,20,22,27)

Sub-Category B3: Material shortages in the setting.

(Episodes 1,8,12,16)

Sub-Category B4: Mathematics results and their bearing on the school.

(Episode 12)

Sub-Category B5: Background deficiencies in mathematics and their effect on learning and teaching in the setting.

(Episodes 3,4,5,6,8,12,20,24)

Sub-Category B6: The 'culture of silence' in the mathematics classroom.

(Episodes 4,13,14,18)

Sub-Category B7: Teacher methodology

(Episodes 1,4,6,7,10,13,14,18)

Sub-Categories arising from Category C are:

Sub-Category C1: The difficulties experienced with the execution of tasks arising from various decisions.

(Episodes 16,17,27)

Sub-Category C2: Power Relations within the school setting.

(Episodes 12,16,21,23,24,28)

6.2 Discussion And Analysis Of The Sub-Categories Arising From Category A: The General Atmosphere Of The School And Playground.

The general atmosphere of the school differed from the conventional view of an urban South African high school in a number of respects. Indeed, the education was Christian and National in character, but various other aspects made the school fundamentally different to what other (especially white) South African school were like. I have chosen to discuss two of the most fundamental differences to give a picture of what life at Guzany as a learner and a teacher was really like. Questions of punctuality and disruption dominate the episodes and thus these were chosen as themes worthy of some form of analysis. Further evidence of the themes of disruption and punctuality came from the interviews conducted with the participants in the setting and hence qualified the decision to isolate these as worthy of analysis.

Indeed all of this took place within the context of an overcrowded black urban high school in a township of South Africa and should be viewed as such. The reasons for the disruptions and the apparent lack of respect for time should be viewed against this backdrop. It was observed that this behaviour on the part of the participants was so regular that it had already formed a part of the culture of the school setting.

Following is a discussion of the more salient features of the themes mentioned.

6.2.1. Punctuality in the school setting (Sub-category A1)

Punctuality did not seem to be a high priority amongst both teachers and students at Guzany high school. While the first two weeks of school were spent organising and planning for the forthcoming year, punctuality did not become an issue as no formal lessons were on taking place. However from the very first day of formal lessons , as described in episode one, the punctuality of both the students and the staff presented problems within the setting. A familiar scenario was the fact that students tended to arrive anywhere between the hours of 08h00 and 10h00. i.e. up to two hours late for school. Teachers on the other hand were also late on a number of occasions with most arriving by 08h30 - half an hour after the school day had already begun. This resulted in various problems for both the teachers and the students . For the teachers who were on time , the dilemma of starting a lesson during period one with up to 75% of the class absent proved to be a source of frustration. Students who were punctual always complained that teachers were not at their posts at the stipulated times and that those teachers who were present, refused to start lessons as many of the students who were late would miss out on work taught. Examples of these problems are revealed in Episodes 6 and 9. Arising out of this dilemma was the fact that the teachers blamed the students and the students blamed the teachers for the lack of punctuality on both sides- a conclusion in Episode 19.

Further evidence of this problem was revealed by the interviews conducted with participants in the setting. Students in the setting all blamed the teachers for not being on time (Interview with

Cecilia -p6 ; interview with Thembisa - p7 and p8 ; interview with Nicholas and James - p14, p15 and p16)

As Jamie lamented in his interview:

" Teachers are starting attending in the 2nd period, so I'll come in the 2nd period ja..." (p23)

The following quote from the interview with Andre reveals the position of teachers on this matter:

" I tell myself that I have to be at school at 7.50am but then I think...what the hell, the kids will not be there anyway so I might as well come in late." (p5)

Andre also revealed another view of the teachers when he argued that " we as teachers do not go to our classes on time...I mean how can we give 100% in this situation ?...The conditions here don't warrant that." (p7)

Jamie summed the situation up as follows:

" Teachers say that there are no students in class the first period and the students say there is no teacher in the class. So it lies in both sides the problem." (p23)

Of course the lack of punctuality did not only affect the start of the school day, but was particularly evident during the period after interval which invariably became a period in which no

formal lessons took place. Episode 19 demonstrates how the students conducted themselves in the situation while episode 20 shows the punctuality, or lack thereof, of the teachers in the setting. The disruptive effect that this had on the school was lamented by Anton who complained that even those teachers who were punctual could not work in the environment since the whole school became noisy when the classes were left unattended by his colleagues (Interview with Anton).

The staff at the school recognised this problem area and proposed that the school gates be locked at 08h30 in order to force both teachers and students to be on time for the morning session.

The problem with this was that although the decision to lock the gates was taken, on many occasions this was not followed through- as demonstrated in episode 17. The inability of the staff to follow through with decisions was a cause for concern and represents a separate area of analysis in this study. In the words of one teacher: ...we take good decisions but we are inconsistent in carrying them out... " (Episode 16)

The teachers did not stop there at trying to sort out this problem. In fact episode 27 demonstrates how teachers decided on what they labelled a "test week" during which all teachers gave their word that they would try to attend classes punctually and regularly. This met with limited success but at the end of the week a full report on the classes left unoccupied by teachers or classes where teachers were late was delivered.

In fact these two actions of the teachers i.e. locking the gate and test week were quite successful in bringing some semblance of order to the setting. As explained in episode 27 parents were pleased that teachers at the school were attempting to address the problem of punctuality.

It had taken four months of schooling for those in the setting to formulate and carry out a solution to the problem of punctuality.

Unfortunately other forces were at work and the teachers strike at the end of April 1992 served to undo and dislocate all the attempts to bring order to the school setting just when it seemed as if the instituted measures were revealing some success. Individual efforts to 'normalise' the setting on for example the question of punctuality, were overshadowed by the dislocation of the greater education system of Bantu education under the auspices of the DET. In this regard one may conclude that the dislocation of education could be blamed on the system and the DET as much as the individual. Nevertheless the attempts of teachers to work around these problems were noted and demonstrated that despite the physical shortages, overcrowding etc. It was possible to bring some order (in this case in the form of punctuality) to the school.

Those in the setting blamed the general lack of respect for time on a general breakdown of discipline in urban black environments in South Africa (See Episode 26). In fact some of the participants in the setting blamed the breakdown of family traditions, mores and values as the root cause of all the lack of discipline and thus the lack of punctuality in the setting. Ultimately,

they argued that the root cause of this in turn was the system of apartheid (Interview with Winston, Interview with Zola).

Given these broad general root causes the attempts by participants in the setting to solve the problem of punctuality must be saluted. Against all odds they persevered. Even though in the end they were not successful their efforts demonstrated that given half a chance, it was possible to bring a semblance of order to the school setting no matter the physical conditions and difficulties.

6.2.2 Disruption within the school setting

(Sub -Category A2).

Disruption of activities at the school was observed to be a normal part of the functioning of the school. From the outset it was obvious that teachers within the setting accepted the excuses of students, the various political disruptions and the general lack of respect for uninterrupted lessons , as part and parcel of the normal daily routine.

Episode one described the behaviour of students directly after a lunch break at Guzany High. The teacher attempted to start a lesson but was continually interrupted by students who returned to class late. Added to this was the general carnival atmosphere outside the classroom with many classes unattended by teachers and many students just not bothering to attend class- preferring rather to enjoy playing or talking in the playground.

As a std 10 student remarked, when referring to the pupils and their lack of respect, in an interview:

" Some of them they come to school with the thought they can disrupt school..." (Interview with std 10 student ,p21).

The result of all of this was that the teacher eventually decided to call it a day and returned to the staffroom before the end of the period - the motivation for this being that everyone was outside not attending lessons and teachers were in the staffroom not teaching the students.

Episodes six and nine expanded on the theme of interruption, demonstrating the conditions during the first and second periods of the school day. Latecomers interrupted lessons for up to an hour after the start of school! The noise outside the classroom reached unbearable levels, yet teachers in the setting soldiered on, admonishing students for interrupting and destabilising the classes, while still attempting to conduct lessons even though the general atmosphere of the school at the time was not conducive to meaningful learning and teaching in the setting.

Episode 16 revealed that the question of disruption was not one that was forced onto the setting by the students alone . Indeed, the convening of a staff meeting in the middle of the school day to discuss the SRC using tuition time to address students, showed that at times the staff contributed to the atmosphere. In fact, while this particular staff meeting was being conducted, students roamed the playground aimlessly as discussed in the episode.

The disruption of these lessons on this particular day (episode 16) also revealed a theme which was to crop up time and time again: i.e. who held the power in the school ? This theme is so interwoven into the various episodes , that a special sub-category (C2) has been devoted to its analysis.

Episode 19 demonstrated the general attitude of students towards the idea of disruption. Students were informed of a march to parliament early in the day - which would result in early dismissal from school. When word came through to the SRC that the march was to be called off an attempt to cancel the protest was mounted by the SRC. Students would not listen to their leaders, preferring instead to fight their way through the school gates and not return to school. It was as if disruption of the school day was such a normal phenomenon that anything less was unacceptable to them. As Winston remarked:

"...that resistance they have against authority or whatever... they'll take the slightest opportunity to have boycotts, stayaways and so on you know." (Interview with Winston, p6)

In episodes 23 and 24 the question of "COSAS WEEK" was discussed.

This activity spanned a period of five school days during which students were supposed to follow a programme arranged by the SRC at 13h30 every day. The reality of the situation revealed that nothing was properly organised, resulting in students aimlessly roaming around in the playground with nothing to do after 13h30 each day. This relaxed atmosphere resulted in two days of that week being disrupted almost entirely. This was in the guise of: a march to parliament and Mr.

Nelson Mandela's visit to the townships. On both occasions the school was dismissed early to allow students to attend these events, but a closer analysis revealed that very few chose to do so. The majority of the student body spent this free time roaming the township or hanging around at the nearby shopping centre. As Vani lamented:

"...disturbances have become a culture in the schools that its very rare to have one year without having a major disturbance." (Interview with Vani, p11)

In searching for a reason for the students' behaviour, Andre summed it up in this way:

"I think one thing the 1976 riots brought in, okay, maybe it was needed...it was...a breakdown in discipline. Maybe too much politicisation of these kids made them go overboard too much...the trouble is they tend to mix politics with discipline." (Interview with Andre, p2)

The wastage of time due to this type of disruption did incalculable harm to the ideal of meaningful learning and teaching of academic work in the setting. The effect of this could be witnessed in the examination that the students wrote and, indeed, is reflected in the results of the DET right up to the present (i.e.1994). "These disturbances ... are ... contributing towards the failure rate of Maths students" (Interview with Ms.Mfabe,p15).

Interestingly, though, many of the students at the school refused to accept responsibility for COSAS week and the general chaos surrounding this event, preferring to place blame on the

SRC. When students were challenged about their behaviour during this week (episode 24) they angrily reacted that they were not all COSAS students and they did not decide to have COSAS week. On the other hand, they did not challenge the decision to host COSAS week in any way. It appeared, instead, as if they relished the idea of early dismissal and the general disruptive nature of the week with hoards of students rushing out of the school gates whenever an opportunity arose.

The teachers strike was another issue which gave rise to disruptions on a regular basis as episodes 23, 25 and 28 reveal. Of course the issues at stake were extremely complex, demonstrating the sheer debasement of black education in modern South Africa. A cursory analysis reveals that the reason for the strike was the non-payment of teachers salaries at various schools. The reasons for such non-payment seemed spurious and could probably (according to those in the setting) be blamed on the incompetence of the DET.

The salary issue gave rise to a series of meetings which eventually culminated in two short strikes as described in episodes 25 and 28. The effect of the strike on the learning and teaching at the school was widespread. The first strike was aborted after only one day. Promises that the DET would sort out the salary problems were accepted by the teacher union SADTU and the strike was called off. The point that is worth making though, is the marked effect this one day had on the attitudes of both the teachers and the students in the setting. It took the school nearly four days to settle into a semblance of order once again. After rumours of the strike had spread many students

just simply stayed away from school and many of the teachers did not bother to attend their classes.

The second strike came three weeks later. Apparently the DET had not sorted out the issue of salaries and SADTU called for a strike. This strike lasted a week, but its effects were still visible for two weeks afterwards. For teachers at Guzany this was a frustrating time, especially since the school had painfully worked on getting lessons punctually started and properly conducted. The teachers had labelled the preceding period test week, but the strike served to undo all the work they had put into getting the school to function as normally as possible under difficult circumstances. It took another two weeks before the school could once again settle down. One of the positive spin-offs of the strike was that the question of underpayment of salaries was sorted out with the DET flying two officials to the Cape from the Transvaal to issue payment.

In the end it was a question of weighing up the right of the teachers to be paid for work done against their responsibility to the students in their care and the broader community around them. It was a difficult question and not one which could be resolved without a measure of conflict. In the final analysis though teachers and students seemed to accept the situation as part of the package of "Bantu Education" , weathering the storm and eventually returning to learning and teaching at the school.

The strike also revealed other aspects of the modus operandi of teachers in black high schools in South Africa. Three aspects deserve some analysis.

The first of these was the question of the series of meetings leading up to the decision to strike. Although the strike was called by SADTU to which fifty percent of the staff belonged, I could not find a single member going to any of these meetings where the decision to strike was made. The irony was that the school would dismiss early to allow teachers to attend these meetings but no-one attended. Upon enquiring as to why this should be the case it appeared as if teachers believed that their presence would not make a difference to any decision and that strikes and disruptions of this nature were but part and parcel of the territory of being a teacher in an urban black high school in South Africa.

The second aspect which arises directly out of the first was the way the decision to actually strike was communicated to the staff. Since no-one had attended the meetings where the decisions were made, the principal would telephone neighbouring schools to determine what the position was. Once he had determined that the decision to strike had been taken he would convene a meeting to inform the staff. There was never any discussion, just information on this question. The staff did not for example discuss whether they would be supporting the strike or not. It was a 'fait accomplis' that the decision had been taken and everyone would just follow irrespective of their views. This question was raised in the interviews with the teachers and the majority of them indicated that the reason for this apparent lethargy was the fear of intimidation. Teachers were afraid to come out against something which the "whole community" supported.

Recent examples of persons who had defied "community decisions" were cited. Some of these persons had their lives threatened and their possessions burnt ! This came out strongly in the interview with Ms.S.

From this one could conclude that it was not a case of teachers being disinterested in factors affecting their daily work, but rather for many of them a matter of life or death !

The third aspect of the strike that was revealed was the conflict between the two teachers unions operating at the school. These unions were PENATA a more conservative union comprising mainly older teachers and SADTU a union aligned to the basic tenets of the ANC. The decision to strike on the first occasion was taken by SADTU. Members of PENATA were opposed to this strike and in fact these members were instructed per telephone not to support the strike but to continue with lessons. The principal of the school found himself in the middle of all of this and on this particular occasion instructed the teachers to do whatever they felt they should do. It was his way of attempting to resolve a situation which could have turned into a major explosion at the school.

Of course this conflict did not disappear but it appeared as if teachers at the school accepted conflict as part of their "daily diet" and weathered the storms that came their way.

Disruption of the school day was not confined to the political events inside the school alone. Episode 25 discussed the question of the disruption of lessons due to gang fights outside the school premises. The effect of this fighting in the street was that students merely rushed out of classes were lessons were taking place to view the "entertainment" on show. Gang fights appeared to be a normal part of everyday life in the township of Guguletu as students and staff testified during the interviews.

In fact during the six month research period there was one period of four weeks during which gangs from different sections of Guguletu were attacking each other with students of Guzany High caught in the middle. During this period absenteeism and the lack of punctuality was high, contributing further to the general mayhem that surrounded the school day at the time.

Episode 29 discussed the question of examinations at Guzany High. The conduct of these examinations epitomised the general atmosphere at the school. As pointed out in the episode, the examinations seemed to start and end at almost random times decided upon by the teacher present in the class at the time.

The first hour of the exam was invariably and continuously disrupted by the interruption of students arriving late. Further chaos prevailed once the junior classes completed their examinations. As explained in the episode soccer games and the like right outside matric examination venues were the order of the day. The noise and uncertainty created by the atmosphere was certainly not conducive to reasonable examination conditions.

Yet, despite all of these factors ,some students at the school still tackled their examinations with vigour, choosing to ignore the disruptions , the general atmosphere of the playground and the unsuitable conditions under which they wrote.

In trying to establish a root cause as to why disruption was such a 'normal' feature of school life, many participants indicated that 1976 was the turning point in the behaviour and attitude of

students. The argument posited was that students felt a new sense of power which they abused - hence leading to the generally disruptive atmosphere.

Ms.Mfabe summed up the feelings of the majority of staff members:

" I am saying that '76 was the one year which brought a very great percentage to what frustrations we are experiencing now... adolescents really played their role of being managers everywhere- be it at home, be it at work." (Interview with Ms.Mfabe,p21)

In analysing disruption as a sub-category of the general atmosphere of the school we must try to place it in the context of conditions which did not seem to be conducive to meaningful learning or teaching. Yet, students were learning and teachers were teaching.

This factor showed that despite tremendous odds those who were willing to succeed were indeed on the right track. For this the participants in the setting at Guzany High need to be saluted.

6.3 Discussion And Analysis Of Sub-Categories Arising From

Category B: The Atmosphere And Ethos Of The Mathematics Classroom.

In the previous discussion mention was made of the fact that the general atmosphere of the school should be placed within the context of the setting of the school in a black urban township of

South Africa. It is against this background and within this context that the study will now focus on activity within the mathematics classroom.

In general mathematics did not seem to be a high priority of students and teachers at the school. While the subject was compulsory in standards six and seven, subject choice in standard eight revealed a 90% drop-off rate. The reasons for this are complex and will emerge in the discussion that follows.

Various problem areas surrounding the learning and teaching of mathematics in the setting arose as the study unfolded. Arising directly from the episodes the following sub-categories are worthy of some discussion.

6.3.1. Overcrowding and the lack of individual attention in the mathematics classroom:

(Sub-category B1)

Overcrowding of the school classrooms in general , and the mathematics classrooms in particular, presented the learners and teachers in the setting with tremendous obstacles.

From the outset it was obvious that those outside of the setting had no conception of the magnitude and depth of the problem of overcrowding within the school. As explained in episode one , the sheer enormity of teaching a class of 70 students in a space designed to accommodate 30 was overwhelming in itself. The teacher hardly had any space in which to move and was

restricted to the area directly in front of the blackboard. This had dire consequences for the learning and teaching of mathematics, as often the lack of physical space prevented the teacher from exercising any individual attention. Coupled with this was the fact that the close proximity of the students to each other resulted in them becoming quite restless soon after the lessons had begun. Overcrowding was listed as a problem by nearly all the participants interviewed. From the side of the students interviews with Jamie, Thembisa and a std 10 student all revealed this to be a major problem facing the school as the teacher would lose control over the class and there would be a lack of individual attention .

All the teachers interviewed intimated that this was an area which needed urgent attention. As Vani indicated:

" ...overcrowding is making it very difficult for instance to have a person to person relationship with the students...[it] is one of the major problems." (p1)

The mathematics teachers in the setting coped with this situation by just continuing to teach from the tiny space in front of the classroom, but the effects of overcrowding were plainly detrimental to the progress of the students in a subject that required much individual attention. As Mr.Kola complained, that overcrowding meant that he could not mark all the students work as he could not reach everyone, so instead he would just do the problems himself on the board and write the homework on the board (Interview with Mr.Kola , p2 and p3).

Testing also presented a problem to teachers in the setting:

" You know with mathematics you need quite a regular testing or evaluating system , but with those numbers, sometimes you are scared of giving a test..." (Interview with Winston, p9)

The result of this was that many of the students did not assimilate the material adequately. The teacher had difficulty in checking whether or not a particular child's work was done and understood or whether a child had copied all the work in order to dodge the teacher. No coherent system of testing could be implemented since the sheer load of marking scripts made many teachers back off. For many teachers each test set would have meant marking approximately 300 scripts at a time !

During examinations the situation was worse as the amount of material to be marked was more - specifically in mathematics, the average teacher taught 300 pupils which translates to marking 600 scripts per examination!

Teachers were engaged in a battle to survive. Survival meant having to dispense with the luxury of individual attention. Space constraints and overcrowded conditions prevented more effective control of work and as many of the teachers showed, the only way to prevent chaos in the classroom was to give the lesson from the front of the room and hope that enough questions were asked by the students, so that those who did not understand what was happening would begin to get some idea.

Episode 5 revealed another aspect of overcrowding in the setting. The mathematics department , in an attempt to alleviate the problem of overcrowding , decided to split the std. nine group up into higher and standard grade. This was possible because of my presence and seemed to be a useful idea at the time. However, the school was so full that the creation of this extra class could not easily be accommodated in the physical buildings of the school and time was wasted on a daily basis trying to find a venue for effective teaching and learning.

Episode 5, 9, 11 and 13 also demonstrated that overcrowding occurred in nearly all the mathematics classes at the school, from std 6 to std 10 with resultant consequences. As revealed in these episodes, overcrowding resulted in minimal control by the teacher over the work of the students. It was impossible for him to check all the books to see whether for example all the homework had been completed. This resulted in many students not doing their work and some not even bothering to open their books to take down what was written on the board. Copying of work from other students was something that also flourished under these overcrowded conditions. While this activity probably occurred in all classes it was particularly disastrous for mathematics where the learning of material had to be understood and mastered by each individual student alone.

As explained in episode 11 , on days when the heat was unbearable, the overcrowded classes made learning and teaching virtually impossible and very little learning or teaching took place.

Episode 17 reflected on the reality which would have been faced by the std 9 mathematics teachers had I not been present at the school and in fact what the teachers had to prepare themselves for once I left the setting. My attempts at individual attention amidst all the overcrowding revealed that this often resulted in a complete breakdown of discipline in the class. Noise levels rose as I moved around the class to try to assist individual students. In fact it could be argued that the overcrowding gave students the free rein to do as they pleased as evidenced by the fact that I discovered a student sleeping in this class only after I had tried to move around to give individual attention to the weaker ones.

Episode 20 demonstrated that the overcrowding of classes resulted in teachers not even knowing the names of students two months after school had started. This impersonal approach, while forced on the teachers by circumstances, had disastrous consequences for the learning and teaching of mathematics in the setting. No proper control or indeed awareness and evaluation of individual students' problems could take place effectively. The result of this of course, was that the learning and teaching of mathematics suffered. While this was probably applicable to all the subjects it held particular significance for mathematics where individual attention should have played a crucial role.

In conclusion, episodes 13 and 22 revealed that teachers in the setting (myself as participant included) resorted to an authoritarian approach as a matter of course. This was in order to survive and hence bring a semblance of discipline to the setting. No effective mathematics teaching could

take place in an atmosphere of chaos. Strict discipline was the only means of survival and it was used by most of the mathematics teachers in the setting.

Overcrowding was one of the major obstacles to effective learning and teaching of mathematics as evidenced by the responses of mathematics teachers in the questionnaire and interviews. It was amazing that the school still managed to produce some students of effective mathematical expertise given the problems of overcrowding in the setting. Indeed teachers were faced with a daily battle to survive and overcrowding represented only a small part of that fight.

6.3.2 The use of language and terminology in the mathematics classroom (Sub-category B2)

Language has the power to unite and to empower whole communities, but it also has the power to divide and disempower members of a particular community. This was none the more evident than in the setting of this study.

The language of Xhosa is the mother tongue of the majority of blacks living in the south western part of South Africa- more commonly called the Western Province or Western Cape. English is a second language for most blacks living in the region , with Afrikaans being a third language.

The medium of instruction in black high schools in the Western Cape in 1992 was officially English although, as this analysis will show, this was not always the case within the setting.

From the outset it soon became evident that English as a medium of instruction would present problems. As described in Episode 3, I was busy explaining a std.6 algebraic technique to a std.9 class and was met with blank stares. Some may argue that the difficulty of the mathematics being considered at the time could have presented a problem but when one considers what was covered then it becomes obvious that my use of English and lack of knowledge of Xhosa was indeed the problem. As explained in the episode I was trying to correct the work of some students who had written the following on the board:

$$2p = 5$$

$$p = 5 - 2$$

I corrected this to read (explaining as I went along):

$$2p = 5$$

$$\frac{2p}{2} = \frac{5}{2}$$

$$p = \frac{5}{2}$$

There were many blank stares and the only way I could justify these was that I suspected that the language I was using must have presented a problem - since I was teaching a higher grade class and basic algebraic techniques of this nature should not have presented problems.

My suspicions were confirmed at a later stage whilst observing a std.7 lesson on the arrangement of algebraic terms in order of magnitude (Episode 5).

Zola took the students through all the steps painstakingly showing the students how to arrange terms in descending or ascending order of magnitude. After a while it became clear that the problem was that the students did not know what the terms ascending or descending meant never mind the difference between the two ! Zola then switched to Xhosa and conducted most of the remainder of the lesson in this local language all the while switching, between Xhosa and English. As the lesson progressed more students realised what he was driving at. Here the power of mother tongue instruction was ably demonstrated.

Episode 9 re-inforced the idea that students had problems with the teaching of mathematics through the medium of English. Only after careful explanation of the concepts of ascending and descending were they able to have some sort of understanding on the mathematics involved. In fact episode nine indicated that the teacher had to reduce all the ideas to the simplest form possible- in this case the concepts of ascending and descending were reduced to highest and lowest or biggest and smallest. These ideas are not strictly mathematical in form , demonstrating that the obstacle to mathematical development of the students in the setting was due to a lack of knowledge of, the language in which they were being taught.

Episode 12 demonstrated the barrier that English as a medium of instruction presented for the students. I was busy with solution of quadratic equations involving square roots and one of the problems had the following step:

$$(x + \sqrt{x+2})^2 = x^2 + 2\sqrt{x+2} + x + 2$$

Since the students had difficulty with these ideas I reminded them that :

$$(a + b)^2 = a^2 + 2ab + b^2$$

This was met with blank stares which I suspected was due to the fact that they did not understand the language of English. My suspicions were confirmed for upon questioning the students it appeared that their previous teacher had used Xhosa mixed with English to enhance their understanding. This mixture was used by most of the teachers in general and the mathematics teachers in particular as a means of survival. Teachers felt that on the one hand they had an obligation to teach in English since all the examinations are conducted in English, but on the other hand they had an obligation to help their students understand the concepts being taught- hence the switch to mother tongue.

In the context of the setting, this switch to mother tongue instruction presented peculiar problems for teachers. This was because , as described in episodes 9 and 27, Xhosa was not the only black first language being taught at the school. In fact Guzany High School was the only one in the area which catered for two other black first languages viz. Tswana and Sotho. This meant that many up country students were enrolled at the school . Many of these students could not understand any Xhosa at all ! Thus a switch to mother tongue instruction was disadvantageous to them. These students would insist on English as the medium of instruction. The interview with Cecilia revealed this problem: "...I'm doing Sotho and most of the schools here don't have Sotho...the English subjects- they [the teachers] translate them in Xhosa..." (p7)

In episode 27 the principal reminded teachers of this dilemma since he had been receiving complaints from students whose mother tongue was a language other than Xhosa. In fact, most of those who did not have Xhosa as their mother tongue could not understand this language spoken by the majority of participants in the setting. This was just one more problem for those in the setting.

As was remarked in episode 9, not only did one have to be an adequate mathematician, but also a versatile linguist.

The implications of all of this are enormous for the uncertain future into which education in general and mathematics education in particular is moving. Within the setting mother tongue instruction, whilst desirable was not practical since all the students did not have the same mother tongue, and all the teachers were not able to teach in all the first languages being spoken.

English represented the only uniform language, supposedly understood by all students, albeit a second language. Reality showed differently. For example in episode 22 I related my own experiences in trying to teach a std 6 class a mathematics lesson. It became patently obvious that many of the students did not have a clue as to what I was talking about and eventually I resorted to the use of pictures to bring my point across to them.

There appeared to be a direct link between those who managed with a rudimentary knowledge of English and those who were taking mathematics to a higher level.

In trying to establish what the cause was of the obvious lack of knowledge of English, the most popular reason put forward was the fact that teachers in the primary school, whilst supposed to teach through the medium of English did not do so because students did not understand. This resulted in a scenario where students came to high school not able to communicate in the language of instruction.

The implications for the teaching and learning of mathematics are considerable. If one considers that students who enjoy mother tongue instruction struggle with mathematics, what of students who do not have a basic understanding of English but have to be taught in this language ?

Another aspect which requires further investigation is whether the structure of the various black languages are able to accommodate the intricacies of a subject like mathematics.

The fact that English presented a problem for some of the students seemed to escape the notice of some of the mathematics teachers at the school. This was best illustrated in episode 14 part of which is reprinted here. Ms S was conducting a lesson on subtraction of polynomial expressions. The following is an extract from the lesson:

" Now let us go on to subtraction of polynomials. Watch the following on the board:"

' Subtract $2x^2 - 4xy + 2y^2$ from $3x^2 - 4xy + 2y^2$.

Step 1: Arrange each term of the subtrahend below a like term of the minuend .

Step 2: Change the sign of each term of the subtrahend and add.'

" Who knows what to do?" she asked. Silence... deathly silence.

" O.K. , just like in general science we have terminology in maths. Subtrahend means that which you are subtracting, minuend means that from which you are subtracting. You must be sure which monomial is your subtrahend and which is your minuend. Like $4 - (-7) : 4$ is your minuend and -7 your subtrahend. So let us return to our example..."

Terminology like that described above was being used in nearly all the mathematics lessons I had the privilege to observe. Certainly the language of instruction and the way in which that language was being used, together with all the complicated terminology, presented a problem for the effective learning and teaching of mathematics at Guzany High School.

6.3.3 Material shortages in the setting (Sub-Category B3)

Material shortages presented problems for all the learners and teachers at Guzany high school. This issue was not without emotion as it was these shortages that had caused many student uprisings in the past.

The shortage of space together with desks was something which struck me from the very first lesson I observed (Episode 1). Winston was busy teaching a mathematics lesson to a std 9 class. The students were seated at narrow tables. There were so many tables jam packed into the classroom that there was hardly space for Winston to move. Individual attention was out of the

question. In a subject like mathematics this spelt disaster and presented another obstacle to meaningful mathematics learning and teaching at Guzany High school. The students themselves were very much aware of these shortages, for they would always carry their chairs with them during unofficial breaks between lessons. Indeed those who did not have chairs were often relegated to the floor!

The shortage of stationary had a direct influence over the approach of students towards the learning and teaching of mathematics in the setting. As described in Episode 8, I was busy with a lesson on the special solutions to quadratic equations. For example, cases where after simplification one landed up with $0=0$ or with $0 = 5$ etc. Upon questioning I realised that the students had not been introduced to these concepts previously, so decided to give them short notes on these topics. To my dismay I discovered that the students were refusing to write these notes in their books, preferring instead to copy them down shorthand in the inside cover of the back of their note books. When I asked the reason for this the response was:

"... sorry sir, but we are scared that all this writing will fill up our books. We do not have money to buy others and as you know , we already had to buy these thick ones..."

The implications of this statement for mathematics teaching and learning were of course grave. Students would only write down what THEY considered to be necessary, based on how much SPACE the writing took up - so as not to fill their books! The learning and teaching of mathematics was being sorely compromised by something that many of us took so much for granted.

Of course, I assured them that if they managed to fill their books, I would personally see to it that they received others at no cost, since I was able to procure a full set from Livingstone High School where I was employed. I kept this promise and handed each one a new large hard cover book before my departure.

Episode 12 revealed that the school fees for the year were R10 per annum. Many students could not afford to pay this resulting in serious problems for the school. The school fees and other donations brought in an amount of R16 000 which was the BUDGET OF THE SCHOOL FOR THE YEAR! The reality of the shortage of money and resources was brought home in episode 12 when in a staff-meeting, the principal remarked: " We should have at least two exams this year, but with R16 000 we will not be able to do it. We must find ways of raising more money." Eventually it was decided to increase the school fee to R15 per annum to accommodate more than one examination.

The fact that the school could even consider writing just a final examination had bad consequences for teaching and learning in general and for mathematics as a subject in particular. Teachers could not regularly ascertain via testing and examinations whether or not their charges understood the material being covered. Material shortages prevented this !

The community at large was not unaware of the dire need of students and teachers in urban black high schools in South Africa. Indeed, as mentioned in Episode 16, a committee of students from surrounding schools , including Guzany High School, wished to ascertain the actual material

shortages at the school. This group was called the Joint S.R.C.'s. Although the staff would not allow them access to conduct a survey, the fact that groups attached to outside organisations wanted to come onto school premises to assess problems, meant that the community at large was aware of conditions pertaining to the setting. One hoped that the authorities in control of education would accede to the requests for shortages to be made up.

Throughout the interviews with participants many indicated a need for material shortages to be eliminated so as to ease conditions. (Interviews with : Winston, p1 ; Ms.S, p9 ; Neville, p17 ; Ms.N, p4 ; Thembisa, p10)

Failure to do so could mean the collapse of schooling in the region.

6.3.4 Mathematics results and their bearing on the school: (Sub-Category B4)

The collection of any results in the setting proved to be highly problematic throughout the study. This was the one area in which I failed to make a breakthrough in getting the official examination results of the previous year. The reasons for this had little to do with trust, but probably rather with the knowledge that these would be used in a report on the mathematics setting at the school. I believe that participants stonewalled on this aspect of the study. Atkinson (1979) has referred to gatekeepers who can deny or confirm access to any given site of study. In this instance, regarding this particular aspect , it appeared as if there were many gatekeepers and despite repeated promises to furnish me with some results these never materialised. Many reasons were offered,

the main one being that they were not properly organised for any meaningful analysis of them to be done. Despite my reassurances that even raw data would help I was unable to obtain official results.

In analysing this response, it must be remembered that by this time the reality of the fact that a report (even though I guaranteed anonymity for the school) was being prepared was considered to be a value judgement by some of the participants and it appeared as if some did not want this aspect of the study to emerge.

Nevertheless, during the preliminary interview before my entry into the setting, Ms Mfabe revealed the following about the mathematics records of the school (Interview conducted on 14 November 1991). In referring to June 1991 std 6 results, Ms.Mfabe indicated that only 16 out of a possible 250 passed mathematics. In std10 the final mathematics results of 1990 revealed a FAILURE RATE OF 95% , whilst Ms.Mfabe predicted a failure rate of 90% for 1992. During this preliminary interview Ms.Mfabe indicated that she doubted whether the mathematics results in the school would improve by any significant amount in the year ahead.

It is obvious from the above discussion that the mathematics results of students within the setting were not very good at all. In the few tests that were given to the students by me this was confirmed. The result of this was that large numbers of students did not elect to do mathematics after std 7.

As Ms.Mfabe explained:

" They simply decide at std 7 level: I'm not taking Maths. I'm sure of that, I've had enough of this subject. I'm continuously failing it." (Interview with Ms.Mfabe,p8)

In fact the following statistics were gleaned from the notice board for 1992:

	<u>Total No.of Students</u>		<u>Total No. of Math. students</u>	
Std 6	509		509	students
Std 7	332		332	students
Std 8	221		83	students
Std 9	246		66	students
Std 10	186		60	students

(Field notes, p183)

From the table we notice the marked drop off from std 7, where mathematics is compulsory, to std 8 where it is an optional subject. The reason for this drop off has been due to the high failure rate in the subject at a junior level - as borne out by the comments of Ms. Mfabe above.

The only reference made to the poor results of the school as a whole, was made by the principal (Episode 12) when he admonished the staff in a discussion of the poor performances by the students the previous year.

There was no response from any staff member to his comments. I was puzzled by the silence since it appeared as if the principal had made a direct attack on the professional responsibilities and duties of the teachers. However as has been revealed throughout the episodes there was a measure of truth in what the principal was saying. Teachers of course felt justified in their actions. In private they blamed the students- they always came late to class, they did not attend all the lessons etc., together with the conditions under which they worked and the disruptions which had to be endured in the setting- all valid considerations in my experience there.

The participants in the setting were thus caught in a spiral of accusation and counter-accusation as far as the results of students in the setting were concerned. Perhaps the only conclusion a participant researcher could reach was that the question of blame could proportionately be laid in many different directions within and out of the setting. The challenge to a new beginning was to rise above these accusations and chart a course towards a successful future.

6.3.5 Background deficiencies in Mathematics and their effect on learning and teaching in the setting. (Sub-Category B5)

Deficiencies in basic mathematical skills were evident amongst the students in nearly all the lessons I observed or taught. While it is no doubt true that anywhere in the world the likelihood of finding students who do not understand previous concepts exists, the problem in the setting was so widespread that it deserves a separate discussion.

Numerous examples abound with following being some of the more marked cases:

In Episode 3, I first recognised the possibility of the problem when in a std 9 class, students were not able to correctly solve the equation $2p = -5$. The correct solution should have read:

$$2p = -5$$

$$p = \frac{-5}{2}$$

but instead quite a number of the students believed the answer to be $p = -2 -5$.

These basic gaps in mathematical skills cropped up again and again as described in Episodes 4, 5 and 6.

In Episodes 4 and 6, Winston experienced a problem with the students lack of knowledge in the area of subtraction and addition of fractions with both a **STD 6 AND STD 8 CLASS!**

Episode 5 described how Zola's std 7 class struggled with the concept of arranging algebraic terms in order of magnitude, something which had supposedly been covered the previous year in std 6.

In Episode 7 Ms.Mfabe gave an incorrect reason for justifying a particular result. When I queried this, she indicated that it was more important not to confuse them. This was significant since it conveyed the reality faced by the teachers although it could also be argued that perhaps, at times, teachers in the setting lacked a deeper understanding of concepts. This, however, was difficult to gauge since teachers always had plausible explanations for their actions.

Episodes 8 , 12 and 24 related my own experiences with the std 9 higher grade grouping I taught for the duration of my stay at the school. Concepts which students claimed they were not taught, but which formed part of their syllabi, included the lack of knowledge concerning solution of equations- especially concepts concerning division by zero, equations which were true for all Real values of a given variable and equations which were false for all Real values of a given variable. Students also had difficulty with the ideas of Domain and Range in graphs and some of them could not complete the question: $(a + b)^2 = ?$; something which was covered in std 7 two years previously.

More basic deficiencies were revealed by Zola's std 7 class (Episode 20) who did not know that unlike terms in algebra could not be added or subtracted. In similar vein , Winstons std 8 class (Episode 12) were committing basic errors such as:

$-x + = +$; $9 \times 9 = 79$ and $-2r \times -2r = -2r^2$ etc.

Hence it was obvious that the problem of deficiencies abounded and were negatively influencing the learning and teaching of mathematics in the setting.

But what was the root cause of the problem?

Teachers in the setting blamed the poor background knowledge of students on the fact that work supposedly covered in primary school was not adequately done. As Ms.S indicated:

"... the children come with that problem ...of not understanding mathematics from the lower standards..." (Interview with Ms.S, p3)

Ms.Mfabe indicated that this led to the source of frustration in teaching a subject like mathematics. (Interview with Ms.Mfabe, p4). Teachers also indicated that "... we have students who have failed Mathematics doing it..." (Episode 3).

If we work on the only available statistic revealed by Ms.Mfabe i.e. in 1991 16 out 250 passed mathematics in std 6 then it should be clear that in std 7 the majority of the students taking mathematics had failed it in the previous year. Extrapolating this statistic to higher standards also reveals that quite a few students taking the subject had previously failed it. However, it is worth noting that this conclusion must be viewed in the light of me being unable to obtain formal pass-fail statistics.

Many teachers also felt that the teaching of Mathematics through the medium of English presented inherent difficulties (Episode 20).

Students on the other hand blamed their teachers for not covering work that was supposed to be covered in the previous year(s). Students further claimed that the reason that some of them seemed as if they had covered work, while others seemed as if they had not, was due to the work of outside organisations which ran extra tutorial lessons for pupils (Episodes 8 and 24).

The principal of the school blamed the situation on the fact that teachers often absented themselves, they left school at random and that not much classwork or homework exercises were given to the students in the previous year (Episode 12).

From what has been said previously it again became clear that the school was caught in a vicious cycle of blame and counter-blame. This was a theme of nearly all the problems experienced in the setting.

As a participant observer, on the question of background deficiencies in mathematics, it became clear that the reasons were complex and that all parties concerned had expressed valid areas of concern. Indeed the challenge to participants in the setting was to meet each other halfway and progress to the point where obstacles to the learning and teaching of mathematics could be removed.

6.3.6 The 'culture of silence' in the mathematics classroom (Sub-Category B6)

In considering all the problems facing both the learner and teacher in the setting, we need to look at the actual atmosphere of the mathematics lessons. All the teachers in the setting had their own style and generated their own classroom atmosphere with this style. However a common theme in all the lessons was what can only be described as a 'culture of silence'.

Episode 4 demonstrated the silent response of students when confronted with material with which they were not familiar. It appeared as if students were hardly willing or indeed able to challenge

the material presented by the teacher. This lack of confidence stemmed from their deficiency in background knowledge (already referred to in sub-category B5). Indeed in this particular case even when the teacher presented the idea that 4 minus 5 is equal to -1 (something with which they were not familiar and had not been taught previously) they did not challenge this. Zola picked up on this in his interview:

"...there seems to be that culture of silence- non -participation or... call it some withdrawal syndrome if you wish...that one notices in most... maths classes." (Interview with Zola ,p3)

Zola blamed political apathy as the root cause of this inability to challenge or question with resultant reduced self-concept.

In the interview with the student Tsobo an indication of this problem of reduced self-concept emerged:

"...there are times when the teacher says something and you don't understand it, but you are shy ... to talk to the teacher...ay, you don't want to be humiliated by the...to humiliate yourself ...Well, in the class they love to laugh...I don't know..." (p2)

Episodes 13 and 18 showed that this 'culture of silence' was enhanced by the teaching styles evident in the mathematics setting of the school. In the episodes in question, students were subjected to strict discipline. The form of this terrified them to the extent of not even venturing an answer to the questions posed. The students were caught in a vicious circle. If they answered and the answer was incorrect they ran the risk of being scolded in a dehumanising way for "guessing".

If they did not give an answer the teacher became angry at their silence. The survival strategy of individual students was to remain silent and bear the brunt of the teachers remarks as a group rather than be singled out .

Episode 14 indicated that the question of language and terminology was intertwined with the question of silence in the mathematics classrooms of the school. The terms which were stressed as being important by the teacher were so confusing that even first language speakers of English would be at a loss. If one combines this with the strict discipline prevalent in the episode being discussed, it becomes obvious that students were using silence as a survival strategy in the classroom.

The implications for the future of mathematics learning and teaching in the setting are ominous. Unless students are taught to challenge invalid statements, to critically question the teacher and to develop self-confidence in the context of the mathematics classroom, the 'culture of silence' will remain a stumbling block in the quest for adequate learning and teaching in the setting.

6.3.7 Teacher Methodology (Sub-Category B7)

Mathematics teachers in the setting were all fairly well qualified. Of the six teachers two were University graduates, three were college graduates and one was unqualified - although he had successfully completed a first course in mathematics at university and was completing his studies part-time.

The teacher methodology in the setting was similar across all the mathematics teachers. The conditions at the school forced all the mathematics teachers to resort to the 'chalk and talk' method of teaching.

Right from the start in Episode 1 it was patently clear that overcrowding presented huge problems and thus forced teachers to be restricted to the limited space in the front of the classroom and thus use the 'chalk and talk method' of delivery. Combined with this was the fact that all classrooms lacked basic facilities to use any audio visual aids and that text books were in short supply. These phenomena were also observed in Episodes 4 , 6 ,13 and 14. Coupled with this was that teachers were fairly strict in that they did not allow much interaction from the students, preferring rather to be strict and thereby able to control the overcrowded nature of their classes. This climate was one of the causes of the development of a 'culture of silence ' as discussed in Sub-Category B5 of this analysis.

Episode 4 also revealed that teachers were often unaware of the background deficiencies of their charges. Indeed, episode 4 demonstrated the fact that teachers were not certain of the material which had or had not been covered in previous standards. The case in point here was the introduction of negative numbers where the teacher had assumed that students were familiar with the subject matter when clearly they were not. An interpretation of this could be that teachers were used to teaching classes with deficiencies hence just assumed that students were so unfamiliar with previous material that it was impossible to go back hence they decided to just forge ahead. This was the view expressed by both Winston and Ms.S during the interviews.

This view tied in with Episode 7 where Ms.Mfabe opted to teach students material that they should know in order to pass, rather than actually emphasising the true position and hence the proper understanding of concepts.

The overcrowding overwhelmed everything and was the source of frustration of many of the teachers as expressed by all of them in the interviews and specifically demonstrated by Episodes 13 and 14.

What was surprising was that seemingly the teachers were not aware of the language difficulties of students as was demonstrated at its worst by the use of terminology in Episode 14. The school was however acutely aware of the problem but, as discussed in sub-Category B2 , teachers felt that the use of proper terminology was better as not all the students at the school could speak and understand the local language of Xhosa.

Episode 10 demonstrated that despite the difficulties teachers in the setting still turned the situation to their advantage where specifically in this case Zola tried to use real life examples with which students were familiar (in this case the game of soccer).

Overall one could conclude that teacher methodology in the setting was overwhelmed by the material conditions like overcrowding and lack of facilities and teaching aids.

6.4 Discussion And Analysis Of Sub-Categories Arising From Category C: Decision-Making Power In The School Setting.

Decision making in the school setting presented a problem for many of the participants. As the following two sub-categories will reveal, the normal school hierarchical relationships were often challenged. The problem was that the power as to who took decisions and the execution of such decisions were often inconsistent. The result was indecisiveness and stagnation. To adequately analyse this category I will first look at the difficulty experienced with the execution of decisions taken and then look at the power relationships arising and resulting from the various decisions taken.

6.4.1 The difficulties with the execution of tasks arising from various decisions.

(Sub-Category C1)

Episodes 16, 17 and 27 all adequately demonstrated the problem of taking a decision but having difficulty in executing the decision taken.

According to Zola, the non-execution of decisions taken was as a result of a lack of follow up on the part of the authorities at the school i.e. the management and staff at the school (Interview with Zola).

In Episode 16 teachers agreed to clamp down on students who were not dressed in school uniform. Various teachers indicated that they had already clamped down on this aspect of student

life at the school. However the inconsistency with some teachers applying the uniform rule strictly while others had not caused the students to sometime dress in any manner they pleased. Vani summed up the situation: " ...we take good decisions but we are inconsistent in carrying them out. We must get the support of all the teachers..."

Episode 17 revealed that Vani's words rung true in the setting. Previously the decision to lock the school gates at 8H30 had been taken. All latecomers were to be locked out. However, as revealed in this episode this was not done on a regular basis. This type of inconsistency allowed students (and some teachers) to arrive up to one hour after the official start of the school day.

Episode 27 showed this theme once again. Teachers had decided on a 'test week' in which they would report to school and to their classes on time, thereby giving no room for counter-accusations by the students as to their non-attendance or otherwise.

The staff only managed to follow their decision for two days before they were summoned to a meeting which indicated that they were slipping back into previous bad habits. The average number of classes left unattended per day was in the region of 12. This was while the teachers were in 'test week'. After close examination the staff then agreed that they would do everything in their power to ensure the normal functioning of the school. The SRC was summoned and they agreed to do likewise. For two weeks the school operated fairly efficiently relative to the previous months. However, as indicated in Episode 27, outside events interrupted the programme and strikes and disruption were the order of the day.

It had taken four months to get a semblance of normality within the setting. Yet within two days with calls for a teacher strike all this hard work was undone.

Another area of concern was the lack of co-operation of parents in the schooling of their children. This led to numerous difficulties on an academic level. Teachers for example had identified problems with pupils and wished to give parents advice on these problems. This could then have resulted in a better working relationship with the students and thus a possible improvement of their academic work. All the 10 parents were invited to a meeting which was held on a Sunday afternoon so that all could attend. Only 8 parents out of a possible 168 attended the meeting. (See: Interview with Vani, p8 ; Interview with Ms.Mfabe ,p33)

Thus a decision by teachers to execute the task of assisting their pupils by meeting the parents, was undermined by the fact that parents did not attend the meeting.

The participants therefore faced an uphill battle to ensure the smooth functioning of their school. While it may be argued that participants in the setting were often responsible for the indecisiveness and generally unstable teaching and learning atmosphere, often, outside calls and disruptions caused more harm.

6.4.2 Power relations within the school setting (Sub-Category C2)

It was apparent from the very first interview with Ms.Mfabe in the previous year (1991) that the normal hierarchical relationships were being challenged in the school setting. From the outset she made it clear that my attendance at the school as a participant observer was dependent on not only the decision of the staff and principal, but also on that of the student body (SRC) and the outside link to the community - the Parent teacher Student Association (PTSA).

Episode 16 clearly demonstrated this hierarchical anomaly. the Principal had indicated to the students , in a meeting of staff and students that , the staff felt that no meetings should take place during tuition time. The students then attacked him questioning his authority to speak on behalf of the staff. Even though they (the students) were admonished by other teachers for their attitude, the principal backed down saying that he only meant that general meetings of the student body should not take place but that executive meetings would be allowed.

It was clear from this exchange and though the observation of the setting throughout the research period, that the students wielded more power, both as individuals and as group organisations, than they would in other school settings.

This was reiterated by the students who were interviewed:

"...here...I can say what I want to him/her [i.e. the teachers]." (Interview with Thembisa , p8)

" ... they are so disrespectful, disrespectful ja, that's the one problem... these students...approach teachers in a bad way, disrespect them...take them for granted ja. They don't see a teacher as nothing [sic]..." (Interview with Std 10 Student,p20 and p21)

" [Students believe that] Now I'm doing std 10 ... so I can do whatever I want...that's why people [are] taking advantage in std 10. " (Interview with Jamie , p10)

Various teachers in the setting concurred that the power relations had shifted in favour of the students. Neville lamented that:" students...are thinking that democracy is whatever they want to be done ... they want to dictate how you should teach them." (Interview with Neville, p1 and p3).

Ms.S summed up the situation as follows:

" ...some time there were parents and teachers responsible for running the education of our children but as time went on , there was this inclusion of the students...where they had certain power ...to use the students and so on...The children ...I think they became sort of loose, they lost control of themselves." (Interview with Ms.S, p6 and p9)

In analysing the reasons for this , many teachers in the interviews blamed 1976, 1985 and its aftermath. These were periods of intense political activity in the black schools of South Africa. The teachers reasoned that students had learnt from previous generations that they wielded extraordinary power. They believed that they could challenge virtually anyone or anything.

School boycotts served to reinforce these ideas and in the context of the research period one could see this culture being reinforced by periods like 'COSAS Week'.

Winston described the situation as one in which

" our children have inherited some ill-discipline over the years...basically through these political activities ... even the family ties are broken down , the children are much more, what could I say ?...arrogant-they do what they like." (Interview with Winston, p2)

Even students agreed with this view as demonstrated in the interview with the std 10 student (p21).

Episode 12 demonstrated the influence of community organisations on the school. Here again the hierarchy one normally expects was challenged. The NECC was to come onto the school premises to conduct checks on shortages. This was an outside extra-parliamentary pressure group concerned with issues in education. Although the staff was not pleased with this they eventually allowed this group to conduct the survey. In analysing this aspect it became clear that the community wielded power which had a direct influence on the school. It was their way of making sense of their reality and of keeping a measure of control in a seemingly chaotic environment.

Participants in the setting reinforced the idea of the power of the community when they related the manner in which gangsters were dealt with in the township. According to participants if a

certain gangster had overstepped the mark in any way his parents would be visited and warned .In a few days this gangster would probably leave the location until things cooled down.

The power that was wielded by organisations outside the school was demonstrated again in episode 21 and 28 where the call for a teachers strike was made. Even though those in the setting were not part of the decision, the principal proceeded to inform them of the decision to strike and everyone just followed without question. Throughout the six month research period, not once did the principal, staff or students go against any outside call by community organisations. In fact often they were not part of the decision but merely complied with it.

Episode 21 also demonstrated the power of the students with respect to the staff in demanding another history teacher. While teachers were angry with this episode 23 demonstrated the fact that the principal entertained their suggestion even allowing a situation where students refused to go to class for a period of nearly two months. The anger of the staff was clear but they were in fact powerless to do anything.

Episode 23 also dealt with the issue of 'COSAS Week' in some detail. Although teachers expressed their reservations :

"... we have no right to force these kids to listen to a certain ideological picture..."

" ... we are concerned about students who are forced..." ,

they were powerless to challenge this disruption in any way. Eventually they succumbed, reasoning that :

" ... we cannot intervene since it seems it is all over the Western Cape . So we just have to go along..."

I challenged the conception that they could not counter the decisions taken and was supported by one or two teachers, but we were warned that such dangerous talk "... can get you killed here... " !

(Episode 24)

In summing up this sub-category the following general order of the hierarchy at the school was observed:

1. Community Organisations such as NECC ,the PTSA, COSAS and the Teacher Trade Unions.
2. The SRC.
3. The Principal
4. The Students
5. The staff

In conclusion, it became clear that the hierarchy essentially tolerated by both the staff and the principal was merely a survival strategy in a difficult set of circumstances. Indeed it could be argued that this kind of hierarchy was probably necessary in order to assist the social and political transformation of south Africa. The difficulty was that since social and political transformation

had begun (1991- unbanning of political organisations, the freeing of political prisoners, CODESA etc.) students still wished to maintain the hierarchical order and influence of power which they enjoyed in the period 1976-1991.

These were the challenges facing those in the setting.

CHAPTER 7

CONCLUSION

" Education has lost it's essence in our community. "

(Interview with Ms.N, p8)

7.1 Introduction

In concluding this study, I wish to start with the view as expressed by Ms.N in an interview with her. In analysing various problems, what has emerged is that, in general, in the teacher parent and student community, education has lost its meaning. Is this indeed so ?

To answer this question, we need to return to the beginning and look once again at the following questions:

- 7.1.1 What the were the objectives of this study ?
- 7.1.2 Were these objectives achieved ?
- 7.1.3 What were the difficulties which emerged for participants in the setting ?
- 7.1.4 Visions for the future ?

7.1.1 What were the objectives of this study ?

Broadly there were two primary objectives in this study

1. a. to give a brief history of the school and the general community around it.

b . to give a general description of the physical conditions at the school and of the mathematics classrooms in particular.

c. to give a brief overview of the inter-personal relationships between participants as these pertain to the general running of the school.

2. to describe problems faced by both learners and teachers in the school in general and the mathematics classrooms in particular.

7.1.2 Were these objectives achieved ?

To adequately answer this question one needs to view all the afore-mentioned chapters in this study against the stated objectives.

A brief history of the setting within the a broad history of Black Education in South Africa has been attempted in this study. A description of the physical conditions in the school and particularly in the mathematics classrooms has unfolded.

Emerging out of this has been an exposition of the difficulties faced by both learners and teachers in the setting.

I have attempted to take the emergence of the difficulties faced a step further, by attempting to provide a cursory analysis of these with a view to understanding the causes thereof.

The intention of this is to provide a platform from which other educationists may launch interventionist programmes to ensure the upliftment of education for all South Africans.

7.1.3 What were the difficulties which emerged for participants in the setting ?

The physical conditions of the setting did not enhance the learning and teaching potential of the participants. A lack of facilities , shortages of basic materials and overcrowding of classes were all factors which mitigated against participants in the setting.

In a South African context, this finding concurs with Smith L. (1977) ; SAIRR (1987) ; Walters (1989) ; TLSA (1990a) and TLSA (1991a). In other contexts similar findings were recorded by Ale (1981) in Nigeria and Gerdes (1981) in Mozambique.

The reasons for these poor conditions have been adequately dealt with throughout this study, but it suffices to indicate that schools in the black townships under the Apartheid era were never designed to produce thinkers, intellectuals and leaders of our communities. As Molteno (1984) cites the Interdepartmental Committee on Native Education (1936):

" ...we must give the native an education which will keep him in his place..." (UG 29/1936, pp86-87 , para 453 , cited p62).

Hence there was minimal spending on this facet of urban black life in South Africa. In fact, the conclusion could be reached that there was a direct link between the Education system and the socio-economic conditions of the setting as evidenced by this study.

Another problem to emerge was the difficulty of language as used in the setting. English was supposed to be the language of instruction, but since it was not the mother-tongue of any of the participants in the setting, more often than not it was abandoned in favour of mother-tongue instruction. This in itself presented learners with problems as not all of them understood Xhosa -the language spoken by the majority of participants in the setting. Coupled to this was the fact that the teachers for whom English was a second language, often used the most complicated forms of words and sentence construction to convey their meanings. This concurs with findings of Prophet and Rowell in Botswana and research conducted in Nigeria and Thailand all of which is cited in Fuller and Snyder (1981).

The language problem put the pupils at an even greater disadvantage as demonstrated in Episode 14 and discussed in Sub-Category B2 of the Analysis. In this regard I was not able to determine whether the structure of Xhosa could accommodate the intricacies of a subject like mathematics - a concept which has been labelled a Mathematic-Technic or MT culture by Bishop (1985a).

A study of the structure of the Xhosa language and its ability to accommodate the MT culture would be worthwhile, given the problems experienced by Papua New Guineans utilising the local Baruya language (Crane, 1985). If indeed it is found that Xhosa falls outside the MT culture then

we would need to consider the difficulties of constructing mathematical meaning as detailed by Halliday (1974) , Bishop (1985a), Graham (1988) and Brodie (1989). Hence consideration will have to be given as to whether mother tongue instruction was worthwhile.

In essence, what was observed was that teachers tended to explain the concepts in Xhosa whilst still using English terminology for the actual concepts themselves. Participant views in the setting on this debate concurred with the findings of Vygotsky (1962) ; Aiken (1972) ; Zepp (1981) ; Graham (1988) and Brodie (1989) that mother tongue instruction enhances performance in mathematics. This view supports Ale (1981) who points to the Malaysian experience as an example of successful mother tongue instruction.

The difficulty with this approach was that all examinations were conducted in English, hence putting the students at a distinct disadvantage.

English was also seen as a power language by participants. in fact those who were best able to communicate in English were the ones who progressed to the higher standards and were thus more likely to find better jobs.

Of course, the issue of language was also directly political for participants. As has been extensively dealt with, the issue of the language of instruction was the spark which ignited what later became known as Soweto '76 (Kane-Berman ,1978 ; SAIRR,1978 ; and Makosana, 1988).

Language will thus have to be an area which is sensitively handled by the authorities in the future.

Arising out of all of this was the general attitude and ethos of learners and teachers within the setting. The episodes and consequent analysis (Chapters 5 and 6) have dealt extensively with the problems of punctuality, disruption to the school day and schooling, the general lack of self-concept amongst students or what has been labelled by participants as a 'culture of silence', the limited types of teacher methodology, the difficulties associated with the execution of any task in the setting and the unusual power relations between participants in the setting.

All of these problem areas have their general root causes in the system of Bantu Education, but specifically participants blamed the uprising of 1976 as the turning point in attitudes of especially students in the setting. This finding concurs with research done by Makosana (1988). As Chisholm (1991) has argued - the combination of repression and a loss of culture of learning has resulted in problems for black education.

Having sketched the general findings, it now becomes necessary to locate mathematics as a subject in all of this. Against the background of problems indicated above, students and teachers attempted to learn and teach mathematics. Mathematics is a subject in which, internationally, students experience difficulty under the best conditions. Needless to say, under the poor general conditions described previously, it was impossible for the majority of students to engage in meaningful mathematical learning as cited by Breen (1990) and TLSA (1990a).

Their mathematical backgrounds were sparse and at times non-existent. This resulted in teachers having an uphill battle to teach mathematics and to ensure that they were successful in tests and examinations. Indeed in the senior classes very few pupils took mathematics with the general mathematics results being extremely poor (e.g. A pass rate of 10% for the std 10 class of 1991 was quoted at a pre-research interview with Ms.Mfabe). This finding is in line with Hansard cited in Breen (1990) and TLSA (1990a).

If we accept the view that mathematics is a barrier to social access (D'Ambrosio,1983 ; Gerdes,1988a and NECC,1989) , then it may be argued that black South Africans through a lack of access to meaningful mathematics learning and teaching , are being denied entry to a number of fields which could ensure economic development.

This study has given a broad overview of the state and conditions in one urban black high school in general and its mathematics classrooms in particular. It has highlighted the problems facing the participants in this particular setting. If we are to extrapolate these findings to other similar settings we need to ask the question :

What then of the way forward?

7.1.4 Visions for the future ?

In order to look at the way forward we have to extract two broad areas of concern which have emerged from this study.

The first of these is the arena of problems with the physical conditions. The second is the arena of participant attitudes.

To deal with the first area is patently easier than that of the second. It was the widespread view of participants that all physical conditions should be improved and all material shortages should be attended to. The present Government of National Unity has now implemented the Reconstruction and Development Programme (RDP) and this is supposed to eliminate the differences in the various schools in South Africa. Of course, reality dictates differently and there can be no doubt that schools in urban black areas will remain poor and inadequate for some time to come. Physically then, it is unlikely that urban black schools will enjoy a significant improvement in the allocation of space. Short of building more schools, government and communities should look to the platoon system in their areas to alleviate overcrowding. This means that the school will be occupied by one set of learners and teachers from 07h30 - 13h30 and a different set of learners and teachers from 13h30 - 19h30. Critics of this system indicate that it interferes with the community of youth in an area in that even families are split by going to school at different times. Perhaps communities could look at running e.g. std 6 and 7 in the morning slots and stds.8, 9 and 10 in the afternoon slots. Who will teach these afternoon classes ? Thousands of presently unemployed qualified teachers need jobs. There are enough students in South Africa to warrant the employment of all of these. The alternative would be to lengthen the working day of presently employed teachers - but this must be linked to adequate remuneration (a source of frustration of teachers in this study).

Other areas which may be looked at by communities is the idea that Education should be broad enough to secure entry into a variety of fields. This could mean the reduction of the number of different streams presently being offered by schools, thus resulting in better pupil - teacher ratios. Another possibility would be to cluster schools in groups so that staff may be shared and thus pupils teacher ratios need not be adversely affected.

South Africa is at a crossroads. Communities have to realise that no one but themselves have the responsibility to lift their environments and secure better lives for all. Sacrifices like the one mentioned above should be the order of the day.

Coupled with this has to be the introduction of method courses for teacher training which are sensitive to the lack of physical resources and the inherent problems that overcrowding brings. Teacher trainees have to be taught to survive despite these set of circumstances. Whilst present teacher trainers have little experience of these conditions, it becomes incumbent on institutions training teachers for the future, that they deal with the challenge that overcrowding presents. In this regard participative workshops with teachers in such settings need to be conducted to develop strategies around the problem of overcrowding.

However, all of the above will be meaningless unless it is accompanied by a drastic change in the attitude and behaviour of all stakeholders in the South African Education System today.

Participants have to own their future. They have to accept that it is their responsibility to change their attitude towards the system.

Whilst comments by the participants adequately sum up the present situation:

"...you cannot separate education from the socio-economic conditions around us...the whole DET and system of education must be dismantled... we need to start over." (Interview with Andre, p6 and p8), what has to be acknowledged is that the present government (1996) is largely working within the old system in many facets of South African life. Thus reform rather than radical change is the order of the day. Current initiatives by the Department of Education under the leadership of Minister Sibusisu Bhengu, to reduce pupil teacher ratios in black schools within a limited budget, reflects the dilemma facing South Africans as we follow the route of reform.

If we accept the view that the Education system is but a mirror of the Political and Economic systems of any society, then it becomes clear that education will be gradually reformed rather than radically transformed.

Having argued in this way it means that participants will have to work within the boundaries which have already been laid down.

We need to change our attitudes within the framework of the present system. The implications of this for learners and teachers is that in terms of the problems which have emerged from this study the following changes need to be effected:

As has been argued by Makosana (1988) , we need to build a learning and teaching culture in the schools. Students and teachers need to understand that being on time is the start of this building

process. Reporting to classes when required to do so is another aspect of this culture. Disruption to the daily programme of learning and teaching should not be tolerated. Rather we should build the culture that all possible disruptions to lessons must take place outside of school hours.

We need to give our communities ownership of their children's education. We must force them to become involved in the process of managing and building our schools. Parents need to be forced to take an active interest in the schooling of their children, with attendance at meetings being made compulsory. Berry (1985) takes this idea even further by advocating the involvement of all communities in actual curriculum development.

We need to create critical thinking skills in the minds of our students. We need to teach them to analyse, interpret and challenge - this is the only way to build and enhance self-concept.

We need to teach mutual respect for both learners and teachers. Students have to understand that democracy does not mean doing whatever one pleases whenever it suits one. Teachers have to understand that students have been debased in a system for as number of years and have felt a sense of power over authority for the past 20 years. They will thus not readily embrace a new order of power relations as is normally the case in most schools of the world today.

" We need to produce thinkers, and we need to teach them , not what to think. Now Bantu education teaches them what to think and in reverse you [must] teach them how to think. This is where the struggle is actually." (Interview with Neville, p4)

Students ,teachers and parents need to draw up a code by which they will behave in any given setting. Parents teachers and students must be made to sign and abide by this code.

In the words of Neville:

"...the students, the teachers, the parents should come up and table their roles." (Interview with Neville, p5)

Coupled to all of this should be the idea of hope for the future. Students ,parents and teachers must begin to believe that they have the power to change and to effect change.

"... they must begin to see something...in their eyes there must be viewed to be some change."
(Interview with Zola, p9)

As South Africans on the dawn of a new era, the challenge awaits us all.

May we succeed.

B.C.Walters

(January 1996)

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APPENDIX 1: GENERAL FORMAT OF FORMAL INTERVIEW:

1. What would you say are the main problems facing you as a teacher\student here ?

2. Can you give an example of the problem you have just mentioned ?

3. How does this problem affect you as a teacher or student here ?

4. How do you cope ?

5. Was this problem always present at Guzany High ?
 - a) If the answer to question #5 was Yes, then:
 - i) What do you think can be done about the problem ?

 - ii) Can you give some ideas on how your objectives can be achieved ?

 - b) If the answer to question #5 was No, then:
 - i) When did it change ?

ii) Why did it change ?

iii) What do you think can be done about the problem ?

iv) Can you give some ideas on how your objectives can be achieved ?

APPENDIX 2: BIOGRAPHICAL QUESTIONNAIRE**BIOGRAPHICAL QUESTIONNAIRE:**

Kindly Note: All information received will be treated as

STRICTLY CONFIDENTIAL and has only been

requested as a basis for obtaining a holistic

picture of the teaching core at the school.

1. NAME: (OPTIONAL)

2. SEX (M/F):_

3. AGE:_(OPTIONAL)

4. SUBJECTS AND STANDARDS TAUGHT:(e.g Maths std.6 : 3 units or
Xhosa std.10 : 2 units etc.)

5. NO. OF YEARS OF TEACHING EXPERIENCE: _

6. NO. OF YEARS SPENT TEACHING AT FEZEKA: _

7. PRIMARY SCHOOL EDUCATION:

SCHOOLNAME(S); AREA AND DATES ATTENDED: (e.g. Marion Primary, Bekkersdal,
1965-1968 etc.)

8. HIGH SCHOOL EDUCATION:

SCHOOL NAME(S); AREA AND DATES ATTENDED:

9. a) ACADEMIC AND PROFESSIONAL QUALIFICATIONS HELD AT PRESENT:(e.g.

B.Sc-H.D.E. etc.)

b) WHERE OBTAINED ?_

c) WHICH YEARS ?

d) MAJOR SUBJECTS ?_

10.a) ARE YOU STUDYING FURTHER AT PRESENT ?_

b) IF YES : aa) TOWARDS WHICH QUALIFICATION ?_

bb) AT WHICH INSTITUTION ?_

cc) SUBJECTS ?_

dd) WHY HAVE YOU CHOSEN THESE SUBJECTS ?

ee) WHAT DO YOU HOPE TO GAIN FROM YOUR
STUDIES ?

11. a) ARE YOU AN EX-PUPIL OF GUZANY ?

b) IF YES, IN WHICH YEARS DID YOU ATTEND SCHOOL HERE ?

THANK YOU ANSWERING THIS QUESTIONNAIRE !!

APPENDIX 3: EXTRACTS FROM SCHOOL MAGAZINE:

“Where are our Roots?”

Due to the pressure from the Guguletu community [redacted] High School was opened in 1965 originally being temporarily housed at NY44 in a Pondoki. Parents had felt that they could not afford to carry the expenses of the children who had to commute daily between Langa and Guguletu. The first principal was Mr [redacted]. He was assisted by Mr and Mrs [redacted] who were from [redacted] Higher Primary school. For two years whilst the struggle for accommodation was on the school used these temporary measures.

In 1965 the enrolment increased tremendously hence we were forced to move out to (NY147) [redacted] for more accommo-

dation. But again within the same year the school had to move to [redacted] next to [redacted] road. The school was beginning to gather its roots here, when unfortunately it was gutted down by fire and thus the students had to be grouped and then accommodated at various places around the township.

In 1968 this was the school with the best Junior Certificate results in the Western Cape Region. In 1972 again the school broke a record by having the best Junior Certificate results in the whole region.

In 1973 the school won the National Eisteddfod music competition. This choir was conducted by Mr [redacted] who is at present the vice principal in the school.

In 1974 the school finally settled in NY2 to date. For the first time it has proper school buildings. The principal was Mr [redacted] until 1976. From this time i.e. 1976 the school has had a shaky ground where no one made roots that is there has been a string of principals as follows: Mr [redacted], followed by Mr [redacted], but they were both promoted to be inspector of schools, Mr [redacted], Mr [redacted] and in 1985 Mr [redacted] was promoted to be the principal to date.

The teachers too have been on the move. To date only one teacher [redacted] is left from the old staff members which started in 1972. We hope the new young staff will come with much zeal and gather roots in this school.

APPENDIX 4: ADDENDUM FOR MATHEMATICS TEACHERS:

1. During the course of interviews many of you expressed the desire for smaller numbers in your mathematics classes.

a) How small should the ideal maths class be ?

b) Why do you need these small numbers ?

c) What (if anything) would change in your teaching method if you could teach a smaller mathematics class ?

2. Why is there such a big drop off in numbers of mathematics students after std 7.?

3. A few teachers have said that they think that the problem with mathematics as a subject is that it is too abstract.

a) Do you agree ?

b) Why ?

c) If your answer to 3a) above was YES , what do you mean by saying that mathematics is too abstract ? What would you change to make it less abstract ?

4. What do you do if students give incorrect answers to questions posed in your mathematics classes ?

5. When you give a maths test what do you normally set as a pass mark ?

What do you do if students fail to reach this pass mark ?

THANK YOU FOR ANSWERING THESE QUESTIONS !

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