"SYLLABUS DIFFERENTIATION IN MATHEMATICS IN CISKEI

- THE REALITY AS AGAINST INTENTION"

A HALF THESIS

by

MAWONGA CHRISTOPHER COLUMBUS DELIWE

Submitted in partial fulfilment of the requirements for the degree

MASTER OF EDUCATION (MATHEMATICS IN EDUCATION)

in the Faculty of

EDUCATION

at

RHODES UNIVERSITY

DECEMBER 1988

ABSTRACT

The topic of this half-thesis was conceived after the author had noted with interest, that an alarmingly high number of pupils in the Mdantsane Central District of the Ciskei were registering for Higher Grade (HG) mathematics for their final (Standard 10) year. What mattered most was that the failure rate was abnormally high. As a teacher of the subject for 14 years as at the end of 1988, the author had seen very weak pupils passing through his hands who had nevertheless insisted on registering for the examination in HG mathematics.

A look through the Human Sciences Research Council (HSRC) Report of 1971 which recommended the syllabus differentiation, revealed that the intention of the relevant HSRC Committee was to offer a subject at a level in accordance with a pupil's interest, aptitude and ability.

In a survey undertaken by the author, samples of teachers, pupils and parents indeed confirmed the existence of a very high number of HG candidates, as suspected. The survey also revealed an aversion to the standard grade (SG) course by some pupils, teachers and even principals. A desire for university education was shown to be in the minds of most pupil respondents.

Well sourced registration statistics clearly showed that the Department of Education and Training (DET) in the Republic of South Africa and the Department of Education in the Ciskei had by far the greatest proportion of pupils on the HG in mathematics in comparison with the other race groups.

Standard 10 (Std 10) results for two years taken separately confirmed the author's suspicion that aptitude and/or ability were not taken into consideration by most pupils, in the choice of grade. The results were not good at all. In most cases the uninformed pupil was acting alone in taking the important decision, perhaps with only peer group pressure to contend with.

Three independent opinions suggested that there was probably a general feeling that Black education was already inferior, even without the syllabus differentiation - hence the reluctance to register for the SG option. Furthermore, the investigation indicated that there was no adequate provision for technical education for Blacks in either the RSA or Ciskei which would provide the alternative to a university career for a pupil.

Amongst other things, a mild form of pupil screening and a well structured careers guidance programme are suggested in the concluding chapters.

ACKNOWLEDGEMENTS

My sense of responsibility and also my consience compel me to express my indebtedness, my sincere gratitude to the following people:

(i) To Mr B Nel, the Examinations Officer for the Department of Education and Training in Pretoria for the detailed statistics he gave me, as well as the valuable opinions he willingly shared with me.

(ii) To Mrs M Kruger of the Department of Statistics in Pretoria for having supplied me with the registration statistics for so-called Whites, Coloureds and Asians.

(iii) To Mr Gubuza and Mr Tshabe of the Examinations Section of the Department of Education in Ciskei for allowing me access to some of their examination statistics.

(iv) To Mr M Mokhoabane, the Mathematics Advisor in the Ciskei for his assistance with the distribution and completion of teachers' questionnaires.

(v) To Mr Marala of the Political Science Department at Fort Hare for his considered opinions on the HG/SG options.

(vi) Most importantly, to my supervisor, Prof T A Marsh for his dedication to his work, his eye for detail and his humility in his dealings with novices like me.

(vi) To Nola Johannsen and her team (at Computer Training and Personnel) for the expert typing they have done with their word processor.

(vii) Lastly, to my family for having encouraged me throughout my studies, having never complained about the associated discomforts. This reminds me of the old saying that behind every successful man there is a woman.

The Author

CONTENTS PAGE

ABBREVIATIONS

Hereunder follows a key for the abbreviations as used in the text.

HG	:	Higher Grade
SG	:	Standard Grade
DET	:	Department of Education and Training (for Blacks)
TBVC	:	Transkei, Bophutatswana, Venda and Ciskei
HSRC	:	Human Sciences Research Council
RSA	:	Republic of South Africa
Std	:	Standard, as in Std 10

LIST OF TABLES

CHAPTER 1

STATEMENT OF THE PROBLEM AND A REVIEW OF LITERATURE

1.1 Introduction

The subject mathematics is, for one reason or another, regarded as a necessary prerequisite for various career directions by many countries. Schools in Southern Africa, and even parents, picked up this trend quickly and in due course wished to have as many of their charges as possible in the mathematics classes. The Ciskei is no exception as in that country all children do a mathematical subject up to Standard 8 (Std 8) - after which they can choose to drop it.

Perhaps for the reasons mentioned above, or for other reasons, a somewhat high proportion of mathematically weak pupils continue with mathematics up to Standard 10 (Std 10) level. The result is that the teaching corps find themselves in a situation where they have pupils doing mathematics, not necessarily because they love it, or have an aptitude for it, but because they feel they have to do it to open the way to post school careers to which they aspire.

1.2 The Problem

The topic of this study arose as a consequence of different points of view as to the advisability or otherwise of taking Higher Grade (HG) or Standard Grade (SG) syllabusses at senior secondary level, in mathematics in particular - and even most importantly, uncertainty regarding the original purpose of the differentiated approach itself.

One view is represented in an extract from an article by the University of Cape Town's Department of Mathematics Student Advisor, titled: "SG Mathematics is sub-standard":

> "The SG course is not designed or intended to prepare you for further study in mathematics. Neither does it do so; some years ago we accepted a SG pass more readily than we do now as an entrance qualification for one of our courses, and the results suggested that a B symbol at SG was less of a recommendation than an E at the HG ..."
>
> "... every now and again we encounter students who have taken SG Maths 'because I was told I would get a better symbol that way'. If you want the symbol, the reason is excellent; but if you want to study further, please don't make that mistake." - (Mathematical Digest No. 69, October 1987, p.2)

That is but one view. In response to the above quotation an experienced teacher of mathematics viewed the matter from another angle. She felt that many pupils in standards 9 and 10 are doing HG mathematics when they would be better advised to do SG mathematics. They persist with the HG course because of university requirements, but "they do not hear the message that it is mathematical ability universities are looking for, not just a 'scrape' through on the HG!" (Mathematical Digest No. 71, April 1988, p.8.) If they cannot get a good understanding of HG work and therefore a good pass, they should set themselves career goals which do not require mathematics at a university, she said.

A variety of opinions on this topic abounds. On being questioned about her views on the SG/HG options, another highly qualified and

experienced teacher of the subject in Ciskei responded thus:

> "I prefer to teach the majority of students at standard grade (SG) as I feel that most are not capable of passing higher grade (HG), not even at a standard pass. Hence it is better that most should take the SG and have a good chance of passing than fail HG completely. This is particularly relevant at the present time when schooling has been so disrupted for the last few years and much of earlier work has been forgotten."

A pilot survey of a sample of Ciskeian high schools conducted in March 1987 pointed to the existence of a divergence of views as depicted by the extracts above. Out of a sample of 20 teachers consisting of 10 principals and 10 mathematics teachers the following points emerged:

(a) It turned out that 6 of the principals and 7 of the teachers preferred the HG paper for one or more of the following reasons:

  (i) The chances to obtain university exemption are thus left open.

  (ii) A failure in the HG is "automatically" converted to a pass in the SG, or so it was thought.

  (iii) HG test items are thought-provoking and therefore desirable.

  (iv) HG opens the way to a diversity of careers with a mathematics prerequisite.

(b) The remaining 4 principals and 3 teachers felt that the demands of the HG paper are too much for the weak child and that they would therefore advise such pupils to consider SG level for subjects like mathematics.

One other reason for the preference for the HG syllabus in mathematics, submitted in confidence by some teachers (and not in writing), was that the powers that be in the RSA are intent on advancing the cause of the exponents of the inferior so-called "Bantu Education" of the Verwoerdian era. To quote one respondent, "They introduced an inferior type of syllabus (the SG) for our children in order to perpetuate their stay at the servile level".

In another pilot survey conducted at the same time amongst members of a std 10 class, a 100% preference for HG was recorded. The reasons cited were more or less the same as those given by the sample of teachers and principals. In fact the whole class went on to register for HG in mathematics, for the 1987 final exams. There is in the author's opinion, nothing peculiar about this, until one is told that in fact only two out of the 31 candidates passed at the HG level - one with a D symbol and the other with an E symbol.

Amongst other things, one can hypothesise out of the abovementioned samples (which need not be representative) that there is probably little room for SG, at least in mathematics, in Ciskei - or so thinks the school population (teachers and pupils).

This investigation seeks to bring into perspective a variety of opinions and trends on the subject of SG and HG mathematics, with a view to highlighting the reality as against intention in the Ciskei - an essentially historical-descriptive piece of research. A brief review of the significance of mathematics in our curriculum is the theme of the next section.

1.3 Mathematics in the Curriculum

Mathematics has been studied over the centuries firstly for its own intrinsic value and secondly because of its ever expanding applicability.

Griffiths and Howson (1974) wrote that:

> "whereas the Egyptians studied Mathematics because of its usefulness, the Greeks were attracted by the aesthetic aspect and by the power of mathematical argument".

Through the influence of the Greeks, the subject was gradually removed from its practical origins and it progressed to the present position where its abstractions are awesome to many. The subject was gradually absorbed into the classical curricula of the grammar and the public schools in England, whereas in ancient Greece it had been the prerogative of the educated, the wealthy. It was the mark of a gentleman. In due course it came to be regarded as a language - a means of communication and description increasingly used by economists, geographers, businessmen and others. Its applicability was expanding especially after the Industrial Revolution.

In Kotze's (1976) words:

> "Sciences and pseudo-sciences, where mathematics has not been vigorously applied, have remained the poorer, in fact some are, from a philosophical point of view, down right naive and shallow in so far as they consist merely of empirical observations".

The advent of the computer and economic development of nations of the world greatly enhanced the status of mathematics in their curricula. Industry and commerce were finding the subject indispensible.

As resources became scarcer with the increase in demand and the population, methods of production and distribution had to be optimised.

It is in this light that we should view the position in the Ciskei. The demands made by the professions, commerce and industry dictated the type of curricula that would best serve the interests of that country in general and her man-power needs in particular. Furthermore, an increasing number of university faculties are demanding a Std 10 pass in mlthematics to gain admission into them.

1.4 The Position in the RSA Before 1971

Going back to the history of education in the RSA we discover that differentiation in curricula or syllabi or both has been investigated in some provinces as far back as 1937. Hereunder follows a brief account of developments in two provinces. The other provinces did not show much that could interest the investigator.

The Transvaal

As was to be expected in the light of the Transvaal's pioneering position in the RSA's industrial developments, educational authorities in the province were the first to appoint a commission, viz. the Nicol Commission of 1937. Its terms of reference were:

> "to investigate the education system of the Transvaal in order to make recommendations which might lead to an improvement in the efficacy of the system, to cause it to be adapted to the most modern developments in the field of education and to enable it to comply satisfactorily with the requirements of all classes of the population".

It submitted, in its report, that the solution to the problems in the education system had to be sought "in a comprehensive differentiation for the secondary school course" (Chap. 1, p.83) or (Chap. 7, p.51, HSRC Report, 1971). It further recommended a shorter more practical course of three years and a longer more academic course of five years, each course housed in a separate school.

The desire by teachers, pupils and parents alike to have their charges aspire to nothing less than the matriculation certificate was singled out as the most important misguiding force in secondary education.

A major breakthrough, however, was achieved after another commission report, viz. the Lynch Report of 1950, was tabled. Apart from recommending the creation of comprehensive schools with all possible curriculum combinations under one roof, as opposed to the Nicol Commission's separated schools, the sending of a commission "composed of experienced and capable educationalists" to some Western countries was suggested. This line of thought was (as was the case in all the progressive provinces) the source of inspiration for major changes which were to be effected later on. Advances in education systems in some overseas countries were studied with interest, and noted.

A major aspect of these early movements in education in the Transvaal is embodied in the Van Wyk Report of 1955, drawing largely from its overseas findings. An extract from the report reads thus:

> "....(that) the educable school population of high school age be classified, on the strength of level of intelligence, achievement and aptitude, into four ability groups and that provision be made for the transfer of individual pupils from one ability group to another".

It also reiterated the Lynch Report's desire for the establishment of comprehensive schools.

All in all it was noted that there was differentiation in both curriculum and syllabusses in the Transvaal at the time of the HSRC report of 1971 on differentiation and guidance in the RSA. Pupils could be channelled into three courses, viz. Std 8, Std 10 and university entrance courses. That is, Std 8 or 10 were terminal courses for some pupils. Also the province had twelve subjects with differentiated syllabusses at secondary level. The rest of the subjects were not differentiated, i.e. there was one syllabus per subject for each standard.

Natal

It was as late as 1961 that the Natal Education Department began to participate in the differentiation debate. As in the Transvaal, it was after an overseas visit by the Director, Mr L Biebuych, that major changes came about. Needless to say, they also had to consult the Transvaal Education system, as it was years ahead of them in this regard. The Director, on the question of differentiation, announced in 1961 that "a two-stream system of education would be introduced in White high and secondary schools in Natal in 1962" (Chap. 7 HSRC Report, p. 57). The two streams were to be called the Advanced and the Ordinary Streams. According to the HSRC Report (1971) the Advanced

Stream would lead to the Senior Certificate, with or without Matriculation exemption, and the Ordinary Stream to the Senior Certificate (Ordinary): "Only the Senior Certificate (Advanced) secures admission to a university, training college or to any post matriculation course". (Chap. 7 HSRC Report p. 57)

In so far as syllabus differentiation was concerned, there were subjects which could be taken only by one or the other of the two streams, as well as common subjects. The general complaint was, however, that the majority of the subjects were meant for the Advanced Stream, leaving a limited choice for the Ordinary Stream. There was differentiation in syllabusses in some subjects where it was thought possible, like for instance science and mathematics.

In 1964 an HSRC committee (hereafter referred to as the HSRC Committee) was constituted, its brief being to evolve a system of differentiation and guidance. Prior to 1964 there was no national educational policy regarding differentiation and guidance up to the time of the HSRC Committee of 1964. The result was that while some provinces were advanced in such educational matters, others were just starting to think about them.

One might wonder whether it was possible for the Ciskei Education Department to remain unaffected by these developments around her. In the following section we look at the small country's position relative to the HSRC Report of 1971.

1.5 The HSRC Report and Ciskei Differentiation in General

The Ciskei Education Act No. 7 of 1980 made provision for the Minister of Education to continue (if he so desired) for an indefinite period after independence, with the education system of the Department of Education and Training (DET), of the mother country, viz. the RSA. Thus at independence in 1981, the DET education system was adopted.

However, limited changes from the system were noted in due course. For instance the retention of external examinations at Std 5 and 8 levels. The intention in maintaining the status quo was probably partly to effect a smooth transition from a South African education system to a well structured and unique Ciskeian one; and partly technical, in the sense that the then existing educational machinery, including manpower, was necessarily South African in design and approach.

Syllabus differentiation in South Africa was part of the recommendations of the HSRC Report presented in 1971. In order to present, without bias, the intentions of the committee referred to in the report as the Reconnaissance Committee, a brief account of its terms of reference, its possible aims in recommending, amongst other things, syllabus differentiation as it did, will be recounted.

The brief was that the

> "... Committee should as a matter of urgency make an immediate start to evolve a system of differentiated education and a system of guidance for the Republic which

would be acceptable to all education departments and to the National Advisory Education Council", (Part 1, p. (4)).

The brief was interpreted by the Committee as implying amongst other things, that "... consideration must be given to an educational system:

(a) which will promote the aims of education as such;

(b) in which the abilities, aptitudes and interests of the individual will be developed as far as possible and which will satisfy the needs of the domestic economy, ..." (Part 1, p.(4)).

A study of differentiation in certain overseas countries revealed that cross grouping as a technique of differentiation was practised by some countries, amongst them England, Germany and the USA. In this differentiation the same subject is offered at different levels for the same standard. The members of the Committee, however, had their doubts as to the extent to which the contents of a subject can be divided into easy, more difficult and most difficult work - while at the same time preserving a certain standard (Part 1, p. 29).

In effect this amounted to providing syllabuses at different levels according (in the Report's words) "... to the pupil's aptitude and achievement in the subject" (Part 1, p. 185). In overseas countries like England and the USA, one technique of differentiation was to group pupils according to IQ or achievement and make them take <u>all</u> subjects at lower or higher levels. In today's language a pupil would according to this technique, take all his/her subjects either at the HG or at

the SG level. American educationalists, however, felt that this method was "... didactically and psychologically unjustifiable ... a 'label' is attached to each pupil, especially the less intelligent" (Part 1, p. 29). It was subsequently done away with in favour of cross grouping whereby a pupil could take some (however few) subjects at higher level and others at lower level. Throughout the relevant sections on syllabus differentiation in the report there is reference to the provision of a subject at a level in accordance with the pupil's "aptitude, ability and interest". It is therefore suggested in this account that this was the chief intention behind the syllabus differentiation as we know it today.

In 1974, A Noble in his reflections on the then to be introduced differentiation, suggested that:

> "at least two alternative SG syllabusses will be required, the first for those schools which, because of size or other factors, can only offer a watered-down version of the HG syllabus, and the second syllabus which could differ quite widely from the HG syllabus for those schools able to offer it" (Spectrum, March 1974, p. 56).

However it is contended here that the requirement that a common core of subject matter should be offered for the two levels (Part 1, p. 185) limits the extent to which a SG syllabus could differ from a HG one. Another extract from the same report is a further indication that the author's view regarding the original intentions of the report is probably true, for the Committee asserts that:

"By allowing a pupil to take certain subjects at the standard level and others at an advanced level, on the strength of his aptitude and capacities, he is given every opportunity of competing with other pupils on an equal footing and to achieve success and self-competition". (Part 1, p. 188).

Having outlined the background to, and suggested a possible intention of, the HSRC Report it is now proposed that we review some aspects of the HSRC Report.

1.6 Some Comments on the HSRC Report

It is worth noting that the then Department of Bantu Education was not represented in the deliberations preceding the Committee's work. By excluding this Department the authorities ran the risk of being accused of adopting a paternalistic attitude. Nonetheless the Report's recommendations were immediately (after approval), implemented by the above-mentioned Department as well. One gathers from the early remarks in the report that the man-power needs of the country (RSA) constituted the prime motivator behind the National Advisory Education Council's decision to investigate differentiated education and guidance in the RSA. In their own words:

"Education (up to then) did provide for the forming of pupils as responsible citizens and recognised certain vocational requirements, for which provision was made. It was especially directed towards preparation for the university and was not adjusted to the preparation of pupils for other post-school specialised training".

One wonders whether the Bantu Education Department had by then (or even presently) done enough in the provision of "post-school specialised training" other than university education. Malherbe (1977) submits that by 1970 there were only two technical colleges for Blacks - one at Pietersburg and another one at Pietermaritzburg - and this provision for a total Black school population of 2 741 000 (1970). Consequent upon this a total of only 3 622 (0,13%) of Black pupils was receiving training of a vocational and technical nature. Compare this with 83 000 (out of a total of 954 023 pupils (1970)), i.e. 8,7% of the White school population receiving the same type of training (Malherbe, pp. 49-100). There is therefore probably a point in the contention that the diversification introduced by the recommendations was rather inopportune in the case of Black education, taking into consideration amongst other things, the dominant influence of the Joint Matriculation Board in secondary education in the RSA. Tunmer (1981, pp. 1-25) probably felt the same way for he suggested, referring to the HSRC Report: "Above all, assessments need to be made about their (the recommendations) general applicability to all the people of South Africa, and not only to whites".

In the light of the above-mentioned views one may then be led to ask: When the Report's recommendations were implemented, how did the Black population in general and the Ciskei people in particular, respond to these "winds of change"?

As part of an answer to this question, one aspect of the Report, viz. the differentiated syllabus in mathematics, will feature in the rest of this dissertation.

In the next chapter we shall look briefly into the methodology and possible limitations of the study.

CHAPTER 2

RESEARCH DESIGN

2.1 Introduction

The research design consists in doing small scale opinion surveys on pupils, teachers and parents. There will also be the presentation in figures, of Std. 10 registration statistics for the various Departments of Education in Southern Africa over the years 1976-1985. Some statistics on examination results will also be presented. Lastly, graphs will be drawn to illustrate these statistics.

In an academic investigation the samples and the instruments used determine to a great extent the reliability of the results. No reader will attach much importance to such results until he knows the modus operandi. This chapter will therefore briefly explain how samples were drawn up. It will also describe the instruments of investigation as well as source documents, since the probe is historical/descriptive in nature. The last section in this chapter will deal with the inevitable limitations of the study.

2.2 Subjects

The target population of this investigation constituted all parents with children in Std 9 or 10, pupils in Std 10 and teachers of

senior secondary mathematics in the Ciskei. The researcher however had to consider, in the case of parents and pupils, the population in the Mdantsane magisterial district of Ciskei, mainly because of accessibility.

The choice of population for parents was motivated by the fact that the Department of Education in Ciskei does not offer a differentiated syllabus for mathematics at the Std 8 level. In the case of pupils, the Std 10 pupils were preferred because they had most probably already made their choice of grades and were therefore better able to respond to questions on differentiation.

About 60 pupils were chosen at random from a group of $\pm$ 160 Std. 10 pupils from 10 high schools in Mdantsane. Their parents were taken as the sample of the population of parents referred to above. As it happened, the pupils were at the time assembled at one point in order to receive extra tuition in mathematics and physical science. The group of 160 pupils thus assembled constituted the study's sample of pupils. The assistance of the Subject Advisor for mathematics in Ciskei was enlisted to assemble the sample of teachers from all 9 education circuits in the country.

2.3 Instruments

Three questionnaires, one for pupils, one for teachers and one for parents were constructed. With a view to establishing what factors would constitute the theme of the questionnaires, a pilot survey of

school teachers and principals in the neighbourhood of the investigator was done (refer to the preceding chapter).

The pilot survey revealed that the respondents were split down the middle on the question of what grade was suitable for their charges, and principals were no exception. A mild aversion for SG was not hard to detect from 13 of the 20 teachers and principals.

It was therefore thought that the questionnaires should revolve around three aspects of syllabus differentiation, viz:

(a) the intention of the Department of Education in introducing the grades

(b) the criteria used to fit pupils to grades

(c) who had the greatest influence in the choice of the grades.

All three questionnaires appear as appendices at the back of this report for the perusal of the reader.

For the samples of pupils and teachers, the questionnaires were explained and then given to each person with the express request that no discussion of the contents and the responses should be done for the duration of each response session.

As the investigation was not meant to be far-reaching, a return of 156, 23, and 50 for pupils, teachers and parents respectively, was considered adequate for our purposes. In fact this piece of research is only intended to be a pointer, to show some opinions and trends in some aspects of syllabus differentiation.

2.4 Sources of Data

Statistical information on mathematics registration for the so-called Whites, Coloureds and Asians was obtained from the Central Statistical Services section of the Department of Statistics in Pretoria. Data for the years 1976 to 1984 was supplied with the kind permission of the head of this Department.

For statistics for Blacks, the Department of Education and Training in Pretoria was consulted. The Examinations Section was especially instrumental in the compilation and supply of the valuable data. A personal opinion was also sought from a senior official of the examination section and was willingly supplied.

The Ciskei Education Department was consulted for that country's own statistics for mathematics registration. They were however only able to furnish information for the years 1980 onwards, probably because the country became independent from the Republic of South Africa as from the 4th December 1981. The Examinations Section also kindly permitted the investigator to extract some matriculation results from their files so that graphs could be drawn to highlight contrasts with registration numbers, especially for the HG.

Finally, syllabusses for Std 10 mathematics from three education departments, namely the Department of Education and Training, the Cape Education Department and the Natal Education Department, were acquired.

All the relevant source documents are also contained as appendices to this write-up. This is done to allow for the verification of the

author's concluding remarks, and also for other possible interpretations.

2.5 HG and SG Examination Questions - What are the Differences?

Originally, the author intended to investigate what differences, if any, existed between the HG and the SG mathematics final examination papers. In fact there was mixed reaction to the question as to whether such differences exist, amongst many of the author's colleagues.

In such an analysis Bloom's taxonomy of instructional objectives (the cognitive domain) is an obvious possible starting point. As the reader probably knows, modifications of the original taxonomy were formulated to suit the various subjects in our curriculum - including mathematics. A review of relevant literature briefly summarised in the next paragraph, however, revealed that such an attempt (the original proposal referred to above) would not produce worthwhile results. It would have all the ingredients of a highly subjective exposition.

D.A. Norton (1983) and J.E. Johnston (1986) conducted some analyses of past Std 10 examination papers, using derivatives of Bloom's taxonomy. Even though the analyses were done independently, the authors seemed to agree on the following aspects:-

(a) The allocation of questions to the hierarchical levels of the taxonomies used is highly subjective. For instance while some person may think that a question belongs to the routine/recall category, another may see it as non-routine.

(b) The differences in candidates' mathematical instructional background further complicate the process. For example, some teachers would drill their pupils in examination type questions as part of their revision exercises; other teachers could offer some enrichments of the syllabus, thereby familiarising their charges with what would otherwise be new and requiring innovation to most pupils.

Furthermore, Norton (1983) submitted that there was no blue-print in existence in South Africa which suggested, in approximate terms, what percentages of marks should be allocated to each taxonomic level for HG examination questions. This suggested the absence of standards to strive for. An extract from Norton (1983, p. 26) reads thus:

> "In the case of a HG paper in South Africa the author is not aware of any such criteria ... This means that teachers virtually work towards their own ideas as to what constitutes a satisfactory assessment of learning on the higher grade".

The same applies in the Ciskei. Therefore the good probability that another investigation could come up with a different result discouraged the author from undertaking an analysis of the examination papers.

2.6 Limitations of the Study

(a) Subjects

The limitations imposed by the choice of sample were, in the case of parents and pupils, mainly caused by regional differences within

the Ciskei. For instance, a difference of an economic, educational/ cultural nature immediately becomes a factor influencing the representativeness of the sample.

The Mdantsane region is the greatest urban concentration in the Ciskei. The township started off as a dormitory town for Blacks working in East London but later on developed into an industrial and commercial growth point with very attractive tax benefits to industrialists from outside Ciskei. In view of the fact that Ciskei is for the moment predominantly rural, the area from which the sample for pupils and parents was drawn is for the reasons mentioned above (amongst others) regarded as an enlightened region, one of the forerunners in economic and educational developments. The regional differences have also had an effect on the distribution of teachers. There seems to be arguably, a greater concentration of better qualified teachers in the Mdantsane region than elsewhere.

(b) Samples

The sizes of the samples are also delimiting. The figures 156, 23, and 50 for pupils, teachers and parents respectively are definitely far less than 10% of each target population. However, as has been alluded to before, this is but a small-scale 'path finder'. It is treading on ground which has never been touched in Ciskei since 1976, when differentiation first reached Std 10.

(c) School disturbances

The author had to look reluctantly, at examination results in the Ciskei for the years 1980 to 1987 - reluctantly because school disturbances have been the order of the day for the greater part of the period under scrutiny. For instance, schools were disrupted in 1980, 1983, 1985 and 1986. In those years no normal tuition was given and hence results could not be expected to be normal either. Nonetheless it was felt that the report cannot be complete without some reference to results. Also, it is interesting to note that in spite of the disruptions, the majority of Std 10 pupils continued to register for HG (as is reflected in the graphs of chapter 4).

One is therefore free to assume that the report presents only one of many possible opinions on the problem investigated, perhaps a well-informed opinion. Hence it is hoped that a large-scale probe into some aspects of the report will be undertaken by interested people in future, to refute or confirm some, if not all, the findings in this minor research.

A sample of opinions of some sections of the Ciskei population of parents, pupils and teachers will be presented in the next chapter.

CHAPTER 3

QUESTIONNAIRE RESPONSE AND SYLLABUS ANALYSES

The samples of parents, pupils and teachers consisted of 50, 156 and 23 respondents respectively. Even though they were not sufficiently large they were thought to be enough to at least help one to establish an informed opinion on which future investigations could be based. A description of how the subjects responded to the questionnaires (attached as appendices) follows in the next section.

3.1 Parents' Responses

3.1.1 Question 1

In response to the question which sought to establish whether they were aware of the existence of the HG and SG syllabusses for senior secondary mathematics, the parents responded as shown in Table 1 below.

TABLE 1: PARENTS' AWARENESS OF EXISTENCE OF HG AND SG SYLLABUSSES

OPTION	FREQUENCY	% FREQUENCY
(i) Yes	20	40%
(ii) No	11	22%
(iii) Responsibility of teachers and principal	19	38%
TOTAL	50	100%

The investigator found that out of the sample of 50 parents, 20 (40%) were aware of the existence of differentiated syllabusses in mathematics and 11 (22%) were not. The rest (38%) did not know and did not mind not knowing because they thought this information was the preserve of teachers and that they themselves did not need to be concerned with such matters.

3.1.2 Question 2

On being asked whether they helped their children to choose the grades the parents responded thus:-

TABLE 2: PARENTAL HELP WITH GRADE CHOICE

OPTION		FREQUENCY	% FREQUENCY
(i)	Yes	17	34%
(ii)	No	9	18%
(iii)	Left to pupil and teachers	24	48%
	TOTAL	50	100%

Out of the 50 parents, 17 (34%) helped their children and 9 (18%) did not. A high percentage, viz. 48%, believed that teachers should help the children without their intervention as parents.

3.1.3 Question 3

Question 3 sought their opinion on differentiated syllabusses in mathematics or in general. Table 3 below analyses the responses to the question. The options provided were as follows:

(i) I do not know enough about it.

(ii) I am suspicious of the motives behind the system of differentiation.

(iii) It is good if its intention is to offer a more suitable mathematics syllabus for pupils who lack ability.

(iv) A combination of (numbers only) ....

(v) Other (specify) ....

TABLE 3: PARENTS' OPINIONS ON DIFFERENTIATED SYLLABUSSES

OPTION	FREQUENCY	% FREQUENCY
(i)	14	28%
(ii)	2	4%
(iii)	32	64%
(iv)	-	-
(v)	-	-
Abstain	2	4%
TOTAL	50	100%

Of these 50 parents, 14 (28%) did not know enough to be able to form an opinion and 32 (64%) felt that the differentiation was good if its intention was to cater for pupils who lacked ability.
Only 2 respondents (4%) were suspicious of the motive behind differentiation for unspecified reasons.

All in all, of the sample of 50 parents, 30 (60%) did not know, or felt that they did not need to know, about differentiation in school mathematics. Part of this group felt that it was the teacher's duty to attend to such matters. The remaining 20 (40%) were aware but only 17 of the 20 (85%) actually helped their children to choose the grades. A very high percentage (66%) did not help, or did not see the need to help, because they expected the teachers to help the children. A total of 14 parents (28%) did not have an opinion on differentiation because they felt they did not know enough about it.

The summary above immediately serves as one instance in support of the suspicion that ignorance on the part of the parents has had a part to play in the disproportionately high registration at the HG level in mathematics. One would probably not be far wrong if one submitted that the majority of parents in the black communities of Ciskei do not scrutinize the school progress of their children, let alone the curricula the children follow in the various standards.

3.2 Pupils' Responses

The sample here was made up of 156 pupils in Std 10 drawn from ten high schools out of a total of 248 pupils registered for Std 10 in the 10 schools.

3.2.1 Question 1

This question was directed at HG candidates and was worded thus: If you registered for HG in mathematics, which of the statements below explain your choice?

(i) SG would reduce my chances of getting university exemption.

(ii) SG is an inferior syllabus.

(iii) I do not know enough about SG, e.g. whether it will not disadvantage me later in life.

(iv) I did not get sufficient advice from my teachers.

(v) I want to follow a university career which requires a HG mathematics pass.

(vi) I love mathematics.

(vii) I do well in mathematics.

(viii) My parents wish me to follow a mathematical sciences/physical sciences/medical career, at post school level.

(ix) A combination of (numbers only - listed in order of importance) e.g. v, vii, vi.

.....

(x) Other (specify)

.....

A total of 144 (out of 156 pupils in the sample) i.e. 92,3%, were registered for HG mathematics. Because of the presence of option (ix) only 15 pupils (out of the 144) chose just one option as their answer to the question. The rest had more than one reason for choosing HG in mathematics. Consequently the author decided to record the first three reasons given in order of importance as was requested by option (ix) above. Table 4 below illustrates clearly how the options were rated by the pupils.

TABLE 4: PUPILS' REASONS FOR CHOOSING HG

OPTIONS	FREQUENCIES				% FREQUENCIES
	1ST CHOICE	2ND CHOICE	3RD CHOICE	TOTAL	(OUT OF 144)
(i)	49	23	11	83	57,6%
(ii)	6	4	3	13	9,0%
(iii)	6	16	12	34	23,6%
(iv)	8	7	3	18	12,5%
(v)	34	43	16	93	64,6%
(vi)	31	19	18	68	47,2%
(vii)	5	10	6	21	14,6%
(viii)	5	5	20	30	20,8%
(ix)	refer to the above mentioned options				
(x)	-	-	-	-	-

From the table we note that 93 pupils (64,6%) placed option (v) in the first three chosen. Another 83 pupils (57,6%) placed (i) in the first three positions, while 68 pupils (47,2%) put option (vi) in the top three.

Therefore the most popular reasons cited by the sample of pupils in order of importance, considering the first three choices, are options (v), (i) and (vi). However if we consider only the first choice of each pupil, the order of the three most important options changes to (in order of importance again) (i), (v) and (vi).

It appears from the above analysis that a university career and getting entrance to a university is uppermost in the minds of the majority of the pupils. However, lack of information on such aspects as, for instance, which university faculties do not accept a certain pass at SG level, is widespread. Generally, ignorance about several aspects of the differentiation concept is discernible.

3.2.2 Question 2

Question 2 was meant for SG candidates. It sought their reasons for choosing SG in mathematics. The question had the following choices:

(i) I am not very good in mathematics.

(ii) I have no intention of furthering my studies in mathematics beyond Std 10.

(iii) I qualify for mature age university exemption.

(iv) I want to ensure a pass in mathematics.

(v) My teacher or headmaster advised me to take SG

(vi) My parents advised me to take SG

(vii) I was forced against my wishes to take SG mathematics by .....

(viii) I had sufficient and reliable information about the SG and the HG options.

(ix) A combination of (numbers only - listed in order of importance, e.g. (v), (vi) and (iv)).

(xi) Other.

Out of a total of 12 pupils who registered for SG in mathematics in the sample, 4 pupils had only one reason for opting for the SG, whereas the other 8 had more than one reason. As has been done for the HG group, the first three choices by the pupils are summarised in Table 5 below.

TABLE 5: PUPILS' REASONS FOR CHOOSING SG

OPTIONS	FREQUENCIES			
	1ST CHOICE	2ND CHOICE	3RD CHOICE	TOTAL (OUT OF 12)
(i)	7	2	1	10
(ii)	1	-	-	1
(iii)	1	-	-	1
(iv)	1	3	1	5
(v)	-	3	1	4
(vi)	-	-	-	-
(vii)	3	-	-	3
(viii)	-	-	1	1
(ix)	refer to above figures			
(x)	-	-	-	-

The first three choices in order of importance are (reading from the table) (i), (iv) and (v).

It would appear from the above analysis that the majority of the SG mathematics pupils were aware of their lack of ability in mathematics, hence their choice of SG It is interesting to note from the responses that 3 pupils were forced against their wishes by their respective principals to take the SG course. The author wondered whether this could not be an indication, however slight, of an aversion for the SG option. In such situations one can only hope that such decisions are based on valid educational reasons and that in the end the principals are proved right.

3.3 TEACHERS' RESPONSES

3.3.1 PARTICULARS OF RESPONDENTS

The sample consisted of 23 teachers from various circuits in the Ciskei, broken down according to rank and teaching experience as shown in Tables 6 and 7.

TABLE 6: RANKS OF TEACHERS IN SAMPLE

RANK	FREQUENCY	% FREQUENCY (out of 23)
Assistant teacher	13	56,5%
Head of Department	4	17,4%
Deputy Principal	2	8,7%
Principal	2	8,7%
Not Known	2	8,7%
TOTAL	23	100 %

TABLE 7: TEACHING EXPERIENCE

EXPERIENCE IN TEACHING MATHEMATICS	FREQUENCY	% FREQUENCY (out of 23)
0 - 3 Years	4	17,4%
4 - 6 Years	7	30,4%
7 - 9 Years	3	13,0%
10 - 12 Years	4	17,4%
13 - 15 Years	2	8,7%
16 - 18 Years	-	-
19+ Years	1	4,4%
Not Known	2	8,7%
TOTAL	23	100 %

A total of 18 teachers each had more than 3 years of teaching mathematics and 4 out of 23 had not more than 3 years.

3.4 Teachers' Response Analysis

3.4.1 Question 1

Question 1 sought to establish whether pupils were made aware of the existence of the two syllabusses. All but one of the respondents answered in the affirmative.

3.4.2 Question 2

In order to gauge the approximate point in time, when information on HG/SG syllabusses is disseminated, several options were suggested by question 2.

Table 8 below analyses the responses.

TABLE 8: WHEN ARE PUPILS INFORMED ABOUT DIFFERENTIATION?

OPTIONS		FREQUENCY	% FREQUENCY (out of 23)
(i)	Beginning of Std 9 year	15	65,3%
(ii)	Mid - Std 9 year	-	-
(iii)	End of Std 9 year	1	4,3%
(iv)	Beginning of Std 10 year	6	26,1%
(v)	Close to final Std 10 exam reg.	-	-
(vi)	At final Std 10 registration	-	-
(vii)	Other (specify)	-	-
	Abstain	1	4,3%
	TOTAL	23	100,0%

The majority of the pupils are apparently informed about the two syllabusses at the beginning of the Std 9 year. It is necessary to point out that this is unavoidable as the Std 8 syllabus of the DET and hence of the Ciskei is not differentiated up to the end of the Std 8 level.

3.4.3 Question 3

Who makes the final choice as to what grade to opt for? This is what respondents were asked in question 3.

TABLE 9: WHO MAKES THE FINAL CHOICE OF GRADE?

OPTIONS		FREQUENCY	% FREQUENCY
(i)	Maths teacher	5	21,8%
(ii)	Headmaster	1	4,3%
(iii)	the pupil	10	43,5%
(iv)	the parent	-	-
(v)	(i) and (iii)	4	17,4%
(vi)	all the above	2	8,7%
	(ii) and (iii)	1	4,3%
	TOTAL	23	100%

The pupil and the teacher appear to have a decisive role to play in the choice. The pupil acts alone according to 43,5% of the respondents. However it would seem that if this sample is anything to go by, the mathematics teacher has a fairly good opportunity to lead or mislead in this matter.

3.4.4 Questions 4 & 5

In question 4 several factors were listed (given below) which could have an influence on the choice of the grades. The respondents were asked in question 5 to list the factors in order of importance, starting with the most important. The results are summarised in Table 10 below.

TABLE 10: FACTORS AFFECTING CHOICE OF GRADE

		FREQUENCY				% FREQUENCY
	OPTIONS	1st Choice	2nd Choice	3rd Choice	Total	(Out of 23)
(i)	Entry to University	-	1	2	3	13,0%
(ii)	Past performance in maths	6	9	7	22	95,6%
(iii)	General ability	4	5	12	21	91,3%
(iv)	Aspirations of parents	-	-	-	-	-
(v)	Aptitude for maths	11	9	2	22	95,6%
(vi)	Other (specify)	-	-	-	-	-

The sample of teachers rated the pupil's past performance as well as his aptitude for mathematics highly.

Also of great importance was the pupil's general ability. If only the first choice is considered, then an aptitude for mathematics is cited by 11 teachers (47,8%) as the most important factor.

At this point the author feels that a brief explanation is necessary, regarding his own view of what constitutes the difference between aptitude and past performance in the subject. Aptitude refers to the innate (potential) ability of the pupil to do well in a subject, usually as measured by psychological tests, whereas past performance is considered to be mainly a function of the pupil's aptitude and motivation and also the quality of tuition in preceding standards.

3.4.5 Question 6

In order to establish whether text books can be used as resource materials for grade selection purposes, the respondents were asked whether their text books helped. A total of 14 respondents felt that the books helped while the other 9 did not see it that way. However, the author has not, in his experience, come across a book which advises on the grades selection. After further consultation with a few of the 14 respondents it became clear that they were actually referring to nothing more than the division of the textbooks into HG and SG sections where applicable. Other than this division, the textbooks used in the respondents' schools therefore offered no guidance as to who should take either of the grades.

3.4.6 Question 7

The respondents attached to schools which had registered the majority (60%+) of their pupils at the HG level in mathematics in Std 10 (1987) were asked for their opinions on the pupils' possible reasons for their decision not to choose the SG course. In fact there were 12 such respondents. Of these, 5 thought that the pupils might have felt that SG would reduce their chances of getting university exemption, while another 4 gave the "loss of status" feeling as a possible reason. The remaining 3 chose one or the other of the given options and were thus few enough to be negligible.

3.4.7 Question 8

A total of 9 teachers were attached to schools with 51+% of the pupils in the Std 10 mathematics classes registered for SG. These schools did not belong to the schools from which the study's sample of pupils was drawn. The reader will remember that the sample of teachers was drawn from all over the country. Their opinions on the possible reasons for the choice (by the pupils) of SG mathematics were sought in question 8. It turned out that 4 of these teachers were of the opinion that the pupils possibly thought that the SG syllabus was short and hence left enough time for revision.

Another 4 thought that the answer might be found in the pupils' bad past performance in mathematics.

3.4.8 Question 9

Question 9 sought the teachers' opinions on the possible reason for the introduction of the SG. The options given were:

(i) to disadvantage black pupils

(ii) to cater for pupils who are not so good in mathematics

(iii) to enable as many pupils as is possible to do mathematics up to Std 10

(iv) to cater for university faculties other than the mathematical sciences, physical sciences, engineering sciences and medical faculties.

(v) other (specify)

Table 11 shows how they responded.

TABLE 11: TEACHERS' OPINIONS ON INTRODUCTION OF SG

OPTION	FREQUENCY	% FREQUENCY
(i)	-	-
(ii)	13	56,5%
(iii)	2	8,7%
(iv)	8	34,8%
(v)	-	-
TOTAL	23	100 %

A significant 13 (56,5%) of the sample of teachers thought that the grades were introduced in order to cater for the mathematically weak pupils, while another 8 (34,8%) chose option (iv). This is consistent with the responses to question 5 already discussed above.

3.4.9 Question 10

In this question the respondents were asked whether the differences in content of the SG and the HG syllabusses were great enough. Of the sample, 12 respondents answered in the affirmative while 9 disagreed. They felt that the two syllabusses were not significantly different in content. The remaining 2 respondents did not know.

3.4.10 Question 11A

This question asked whether the respondents would like to see more subject matter taken out of the SG course. In response to the question, 16 teachers did not want to see any deletion from the

syllabus. The majority submitted that the omission would amount to the lowering of standards to below the minimum university requirements. Another 6 teachers wanted to see some subject matter taken out while 1 teacher abstained.

3.4.11 Question 11B

Would the addition of some subject matter to the SG syllabus make it a more attractive option? Of the 23 respondents, 13 did not agree that it would, whereas 9 thought that it would.

3.4.12 Question 12

Question 12 wanted to know from the respondents whether they agreed with some people who felt that the final Std 10 SG mathematics papers were not easy enough. A total of 16 (69,6%) respondents agreed with this opinion, whereas 6 (26,1%) thought that the two sets of papers (SG and HG) were not significantly different.

Of the 23 teachers, 21 (91,3%) confided that they did not think that teachers/educationists in the Ciskei were sufficiently informed about the original aims of the HSRC Report on differentiation.

What effect do the relevant syllabusses have on the grade selections? In the next section we look into this aspect.

3.5 Syllabusses

There has been a feeling amongst the teaching fraternity that it does not matter whether the pupil registers for SG or HG.

Perhaps they feel that obtaining 100/400 (25%) or even 120/400 (30%) at HG level is easier than obtaining 100/300 (33 1/3%) or 120/300 (40%) at SG level, especially if they believe that there is no significant difference in the standards of the two sets of papers. Is there a significant difference? How do the various syllabusses advise us on the setting of the two sets of papers or even on teaching for the papers? Hereunder follows a brief review of three mathematics syllabusses from three different education departments, viz. DET, Cape and Natal.

(a) General aims:

Under general aims the only difference between the two grades is to be found in section 2.5 in the syllabusses of all three departments.

The SG section reads thus:

> "To give pupils a clear insight into and a thorough knowledge and understanding of those basic mathematical principles which will prepare and equip them for daily life and further study".

The HG section follows exactly the same wording as above but adds the following qualification of "further study":

> "in mathematics, the pure sciences and certain applied sciences".

(b) General remarks:

In all three departments the only difference under the above heading is embodied in section 1.2 where it is stated under SG that:

"In tests and examinations more stress should be laid on insight and understanding than on mechanical reproduction of formal knowledge: nevertheless the subject must be made accessible to as many pupils as possible, by avoiding unrealistic demands in the examination".

Again the HG section 1.2 uses the same wording but excludes the part starting with "nevertheless".

Except in the quantity of work prescribed for each grade there is no other notable difference in the aims or suggestions for examining in the HG and SG syllabusses.

The sections under (a) and (b) above are clear on at least one thing, viz. that the HG syllabus should prepare pupils for further study in mathematics and other related subjects. Therefore one can only conclude that in this grade, each pupil has to rise to the standards demanded and not that the standards should be allowed to depend on the pupils' ability (but, of course, what standards?). However the same cannot be concluded about the SG course, for it has to be made accessible to as many pupils as is possible. It therefore has to reach, we conclude, as far down as regulations will allow.

The question could then be: what is the SG mathematics candidate prepared for? The answer is, in the opinion of the author, not easily ascertained because even though the pupil is not especially prepared for further study in mathematics and related subjects, he is prepared for further study - refer to (a) above. The impression is being created that the SG syllabus should be broad based. How can it be otherwise if its intention is to prepare a pupil for

further study in any conceivable direction (not necessarily excluding mathematics et al)? Therefore the requirements that the SG course has:

> "to be made accessible to as many pupils as possible" and to prepare them for "further study" may to some extent be irreconcilable".

One is left wondering whether it would not have been advisable for the syllabus constructors to have entrusted to a select committee the responsibility of drawing up a more detailed blue print for the structure of examination papers in the two grades. After all, Bloom's taxonomy (in the cognitive domain) and its derivatives were already talked about when the differentiation was first mooted. The investigator submits therefore that the broad guidelines as given by the syllabusses are not sufficient in helping teachers in either the differentiated presentation of the subject matter or the construction of the SG and the HG papers.

What do statistics say? Do they throw any light on what the future holds regarding the popularity of the one or the other of the grades? Chapter 4 will be devoted to this aspect.

CHAPTER 4

MATHEMATICS REGISTRATION STATISTICS AND RESULTS - STD 10

In this chapter, for the sake of convenience and for no other reason, the people in the RSA have been divided into so-called Whites, Asians, Coloureds and Blacks, since the arrangement will facilitate easy analysis of the registrations in question. Hereunder follow analyses of mathematics registration statistics for the Asian, Coloured and White population groups for the years 1976 to 1984 and also for the Blacks from 1976 to 1985 - all RSA inhabitants. The corresponding statistics for the Ciskei were only available for the years 1980 to 1987. A table follows each descriptive paragraph to facilitate understanding.

4.1 Whites:

At the inception of differentiation in 1976, registration for mathematics HG (Std 10) for Whites had a surprising start. A relatively low percentage registered for HG, viz. 57,8%. What is more, a gradual downward trend (see page 50 for graphs) became apparent as the years progressed. Actual figures for HG enrolment have increased steadily over the 9 years, from 16091 in 1976 to 20850 in 1984, but percentages per capita have decreased. It is interesting to note how gradual the approach to the 50% line has been. In the absence of any change of policy or review of the status quo by White education authorites, it appears that the line might even be crossed and the downward trend continued in due course.

TABLE 12: MATHEMATICS REGISTRATION STATISTICS FOR WHITE PUPILS IN THE RSA FOR THE YEARS 1976 - 1984

YEAR	HG	SG	TOTAL	HG%
1976	16091	11749	27840	57,8
1977	16569	12348	28917	57,3
1978	16359	12621	28980	56,4
1979	18257	13041	31298	58,3
1980	18546	14022	32568	56,9
1981	19566	15593	35159	55,6
1982	19734	15966	35700	55,3
1983	19323	17329	36652	52,7
1984	20850	18834	39684	52,5

4.2 Asians:

This group started at 56,8% HG enrolment in 1976. Their initial mathematics HG registration is the closest to that of the Whites. In this case actual figures rose from 1831 in 1976 to 2179 in 1984. However, the graph (see page 50) showing percentage per capita, after commencement of the differentiation system, dipped very soon thereafter to break through the 50% line, and its downward trend seems to be destined for levels even lower than 30%.

TABLE 13: MATHEMATICS REGISTRATION STATISTICS FOR ASIAN PUPILS IN THE RSA FOR THE YEARS 1976 - 1984

YEAR	HG	SG	TOTAL	HG%
1976	1831	1390	3221	56,8
1977		No statistics available		
1978	1875	1622	3497	53,6
1979	1694	2113	3807	44,5
1980	1816	2779	4595	39,5
1981	1742	3400	5142	33,9
1982	1857	3533	5390	34,5
1983	2084	4133	6217	33,5
1984	2179	4804	6983	31,2

4.3 Coloureds:

An interesting trend is discernible in the graph for this group. From an initial level of 68,6% in 1976, the proportion of mathematics HG registrations dropped sharply to reach a low of 26,6% in 1980. However, the author wishes to inform at this point that figures for 1978 and 1979 were not available from the Department of Statistics in Pretoria as no survey was done for the group in these years. The continuity of the graph was consequently artificially maintained by interpolation. A very low level of 16,9% was reached in 1984 and there is no reason to believe that the lowest level has already been attained.

TABLE 14: MATHEMATICS REGISTRATION STATISTICS FOR COLOURED PUPILS IN THE RSA FOR THE YEARS 1976 - 1984

YEAR	HG	SG	TOTAL	HG%
1976	1192	549	1746	68,6
1977	1849	863	2712	68,2
1978				
		No statistics available		
1979				
1980	1189	3272	4461	26,6
1981	1479	3414	4893	30,2
1982	1440	3782	5222	27,6
1983	1271	4402	5673	22,4
1984	1186	5827	7013	16,9

4.4 Blacks:

The rapid acceleration in matriculation enrolment figures as a whole is noticeable in the actual figures for this group. From a very low figure of 2752 in 1976, the mathematics HG registrations reached a high figure of 16903 in 1983, then dropped to a lower 14333 in 1985. A very big jump indeed in relative terms. The graph is towering above the graphs for Whites, Asians and Coloureds and appears destined to maintain this position for the forseeable future.

Also whereas the three other graphs (Whites, Indians and Coloureds) show fluctuations which are towards the lower levels, the graph for Blacks remains at a high level from the initial to the terminal points.

TABLE 15: MATHEMATICS REGISTRATION STATISTICS FOR BLACK PUPILS UNDER THE DET FOR THE YEARS 1976 - 1985

YEAR	HG	SG	TOTAL	HG%
1976	2752	1040	3792	72,6
1977	3115	450	3565	87,4
1978	4217	1057	5274	79,9
1979	6975	1072	8047	86,7
1980	12230	1443	13673	89,4
1981	15638	1695	17333	90,2
1982	15508	4813	20321	75,3
1983	16903	8830	25733	65,7
1984	16269	8975	25244	64,4
1985	14333	7908	22241	64,4

4.5 Ciskei

As an offshoot of the DET system (refer to Chapter 1), the Ciskei registration statistics for mathematics HG share some characteristics with the DET graph. Only figures from 1980 onwards were available, probably because that country obtained independence only in 1981. The graph however, has a tendency to reach very high levels for the greater part of the period under scrutiny. Since the DET figures include Ciskei figures, for all the years under study, viz. 1976 to 1985, Ciskei figures form part of the great upward pull on the DET graph. The Ciskei registrations in fact reached a remarkably high percentage of 91,5% in 1981.

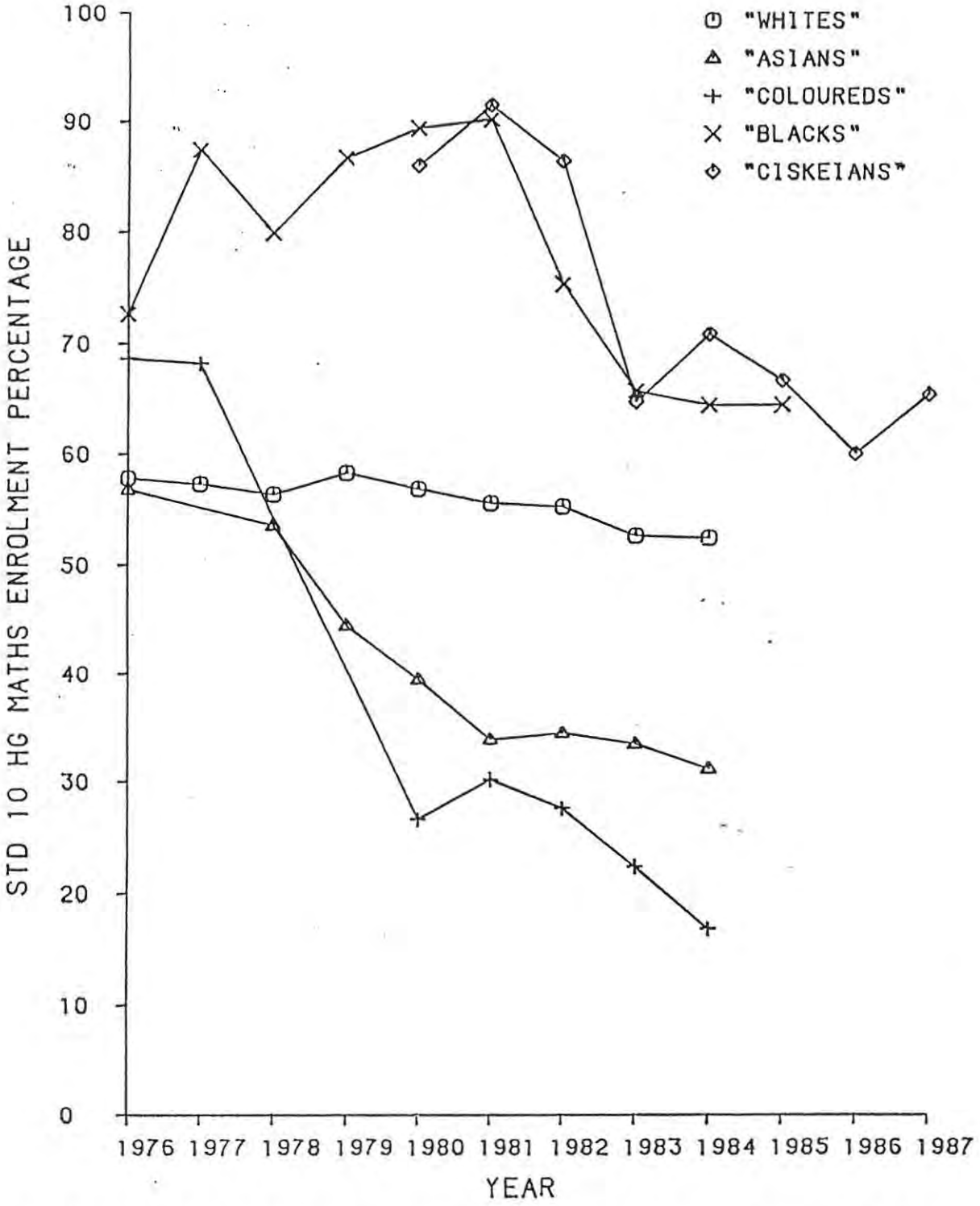
TABLE 16: CISKEI MATHEMATICS REGISTRATION STATISTICS FOR THE YEARS 1980 - 1987

YEAR	HG	SG	TOTAL	HG%
1980	709	115	824	86,0
1981	702	55	767	91,5
1982	624	98	722	86,4
1983	793	432	1225	64,7
1984	975	402	1377	70,8
1985	1055	528	1583	66,6
1986	604	402	1006	60,0
1987	903	479	1382	65,3

The graphs referred to in the preceding discussion are shown on the following page. They reflect Std 10 mathematics HG enrolment percentages for the Asian, Coloured and White population groups for the years 1976 to 1984 and also for the Blacks from 1976 to 1985 - all RSA inhabitants. The corresponding statistics for the Ciskei were only available for the years 1980 to 1987.

It should be noted that the data for Blacks includes Ciskei registrations.

The HG enrolment percentages are HG enrolments as percentages of total mathematics enrolments.



Percentage of Std 10 Mathematics Pupils Enrolled at the HG Level for Various Education Departments in Southern Africa (RSA and "Black" States, Excluding Transkei) for the Years 1976 - 1985.

(Data Supplied by Department of Statistics, Pretoria).

One may wonder whether examination results could throw any light on the reasons for the high registrations at the HG level in the Ciskei. The next section will therefore look at some of the Std 10 results.

4.6 Some Std 10 Results

4.6.1 In this section the author will briefly analyse Std 10 results for the years 1984 and 1987 for each education circuit in the Ciskei. The two years 1984 and 1987 were, relatively speaking, riot-free in the Ciskei.

The following abbreviations will be used for the nine circuits in the country.

1. Z.S. - Zwelitsha South
2. MAT - Mathole
3. HEW - Hewu
4. AL - Alice
5. MDASE - Mdantsane S.E.
6. MDACE - Mdantsane Central
7. Z.N. - Zwelitsha North
8. PED - Peddie
9. MID - Middledrift

Registration statistics will be contrasted with results for each circuit.

TABLE 17: MATHEMATICS REGISTRATION STATISTICS FOR EACH CIRCUIT IN CISKEI FOR 1984

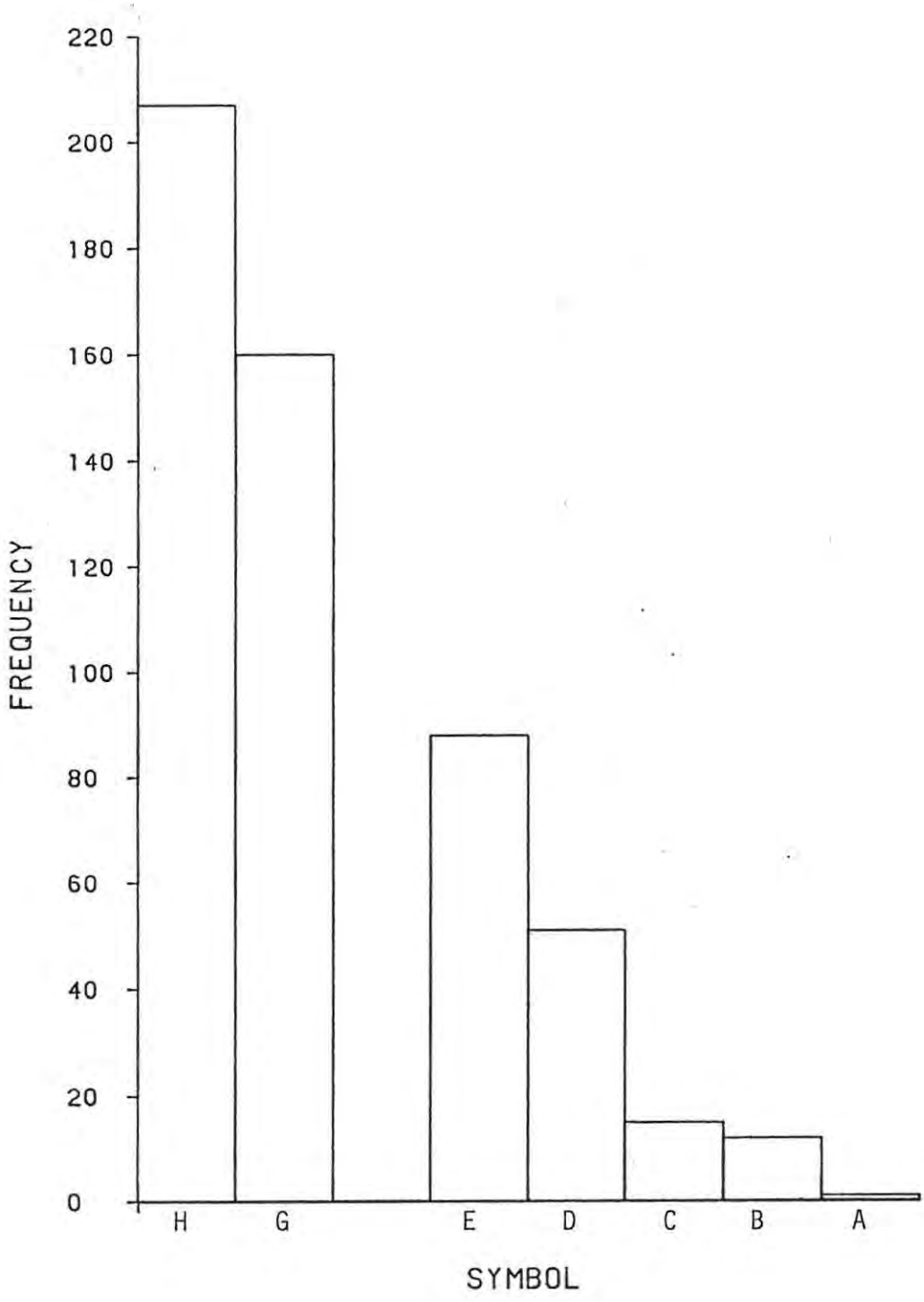
YEAR	HG	SG	TOTAL	HG%
1. Z.S.	37	11	48	77,1
2. MAT	67	70	137	48,9
3. HEW	196	0	196	100,0
4. A.L.	98	126	224	43,7
5. MDASE	27	34	61	44,3
6. MDACE	310	21	331	93,7
7. Z.N.	169	119	288	58,7
8. PED	51	17	68	75,0
9. MID	20	4	24	83,3
TOTAL	975	402	1377	70,8

TABLE 18: HG MATHEMATICS RESULTS PER CIRCUIT IN CISKEI FOR 1984

CIRCUIT	NUMBERS PER SYMBOL										
	A	B	C	D	E	TOTAL	% PASS	G	H	TOTAL	%FAIL
1. Z.S.	-	-	-	-	-	-	0%	12	12	24	64,7
2. MAT	-	-	2	-	16	18	26,9	13	25	38	56,7
3. HEW	-	2	1	10	4	17	8,7	41	45	86	43,9
4. AL	-	2	5	10	12	29	29,6	23	20	43	43,9
5. MDASE	-	-	-	1	1	2	7,4	6	19	25	92,6
6. MDACE	-	6	6	19	34	65	21,0	29	20	49	15,8
7. Z.N.	1	-	1	10	15	27	16,0	26	44	70	41,4
8. PED		2	-	1	5	8	15,7	9	7	16	31,4
9. MID	-	-	-	-	1	1	5,0	1	15	16	80,0
TOTAL	1	12	15	51	88	167	17,1%	160	207	367	37,6%

The reader should note that the percentages of Table 18 are based on the totals in Table 17. Also it should be noted that the percentages for failures as well as passes do not add up to 100% for the simple reason that the rest of the candidates have had their failures converted to passes on the SG, using the formula as explained under 4.6.3.

Hereunder follows a histogram for the HG mathematics results for 1984.



Histogram of the Mathematics HG Results for the whole of Ciskei for 1984.

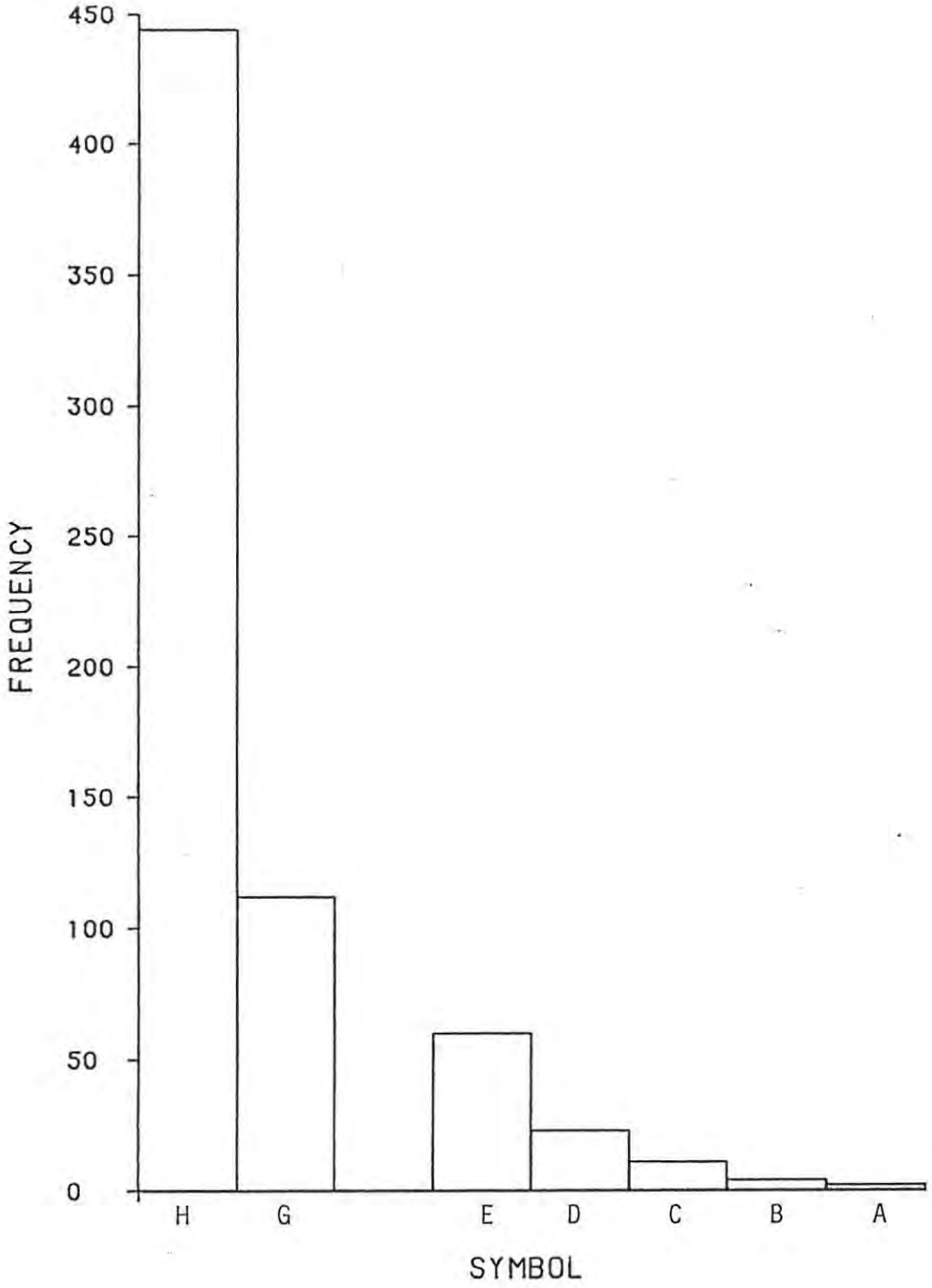
The analysis of the 1987 Std 10 HG mathematics entries and results is presented below.

TABLE 19: MATHEMATICS REGISTRATION STATISTICS FOR EACH CIRCUIT IN CISKEI FOR 1987

YEAR	H.G.	S.G.	TOTAL	H.G.%
1. Z.S.	37	61	98	37,5
2. MAT	94	32	126	74,6
3. HEW	90	76	166	54,2
4. A.L.	116	122	238	48,7
5. MDASE	45	29	74	60,8
6. MDACE	239	9	248	96,4
7. Z.N.	222	26	248	89,5
8. PED	42	77	119	35,3
9. MID	18	47	65	27,7
TOTAL	903	479	1382	65,3%

TABLE 20 HIGHER GRADE MATHEMATICS RESULTS PER CIRCUIT IN CISKEI FOR 1987

CIRCUIT	NUMBERS PER SYMBOL										
	A	B	C	D	E	TOTAL	% PASS	G	H	TOTAL	%FAIL
1. Z.S.	-	-	-	-	-	0	0%	3	28	31	83,8
2. MAT	-	-	2	2	5	9	9,6	20	45	65	69,1
3. HEW	-	-	1	-	6	7	7,8	6	61	67	74,4
4. AL	1	2	1	9	10	23	19,8	13	47	60	51,7
5. MDASE	-	-	-	-	2	2	4,4	5	34	39	86,7
6. MDACE	1	1	2	10	18	32	13,4	26	95	121	50,6
7. Z.N.	-	1	4	2	11	18	8,1	32	110	142	64,0
8. PED	-	-	-	-	6	6	14,3	6	15	21	50,0
9. MID	-	-	1	-	2	3	16,7	1	9	10	55,5
TOTAL	2	4	11	23	60	100	11,1%	112	444	556	61,6%



Histogram of the Mathematics HG Results for the whole of Ciskei for 1987.

4.6.2 Validity of Selection Procedures

Reading from the statistics, one would conclude that the results were not very good for the year 1984. However, two circuits, viz. the Alice and the Mdantsane Central circuits, seem to have had relatively valid selection criteria for the grades. For instance, the Alice circuit had the lowest HG registration proportion and also the highest pass rate. On the other hand Mdantsane Central circuit had the second highest proportion of pupils on the HG and also obtained the third highest point in the HG mathematics results ratings for the year 1984. For the rest of the circuits there appears not to be much that one can extract from the data in support of the hypothesis that their selection procedures were valid.

Validity in this context refers to the extent to which the selection procedures adopted succeed in selecting the pupils for the grade. The underlying assumption is that the higher the number of passes from those registered for HG, the more valid is the selection procedure and hence the more successful it is regarded as being.

The tables for 1987 suggest that the Alice circuit had once more fairly valid selection procedures on average, in that it again had a low (third lowest) HG mathematics registration proportion of pupils as well as the highest pass rate at the HG level. Two more circuits seem to have handled their selections relatively well. They are the Peddie and the Middledrift circuits. The

Mdantsane Central situation has worsened to some extent. While the HG proportion has increased from 93,7% to 96,4% to give it the largest registration, the pass rate has decreased from 21% to 13,4%. The failure rate for this circuit has also increased from 15,8% to 50,6%. All in all the pass rate for the country in the subject has dropped from 17,1% in 1984 to 11,1% in 1987. Consequently the failure rate has increased from 37,6% in 1984 to 61,6% in 1987.

4.6.3 The Conversion of HG Fails to SG Passes

At the inception of differentiation in 1976 (at Std 10 level) education authorities made provision for those candidates who fail to make the 40% minimum required for a pass per subject at the HG level. According to the provision, a 40% was the minimum pass for a HG subject. A pupil who obtained between 25% and 39.9% for a HG subject would have the failure on the HG converted to a pass on the SG. A mark falling between 25% and 33,3% earned a conversion to an F on the SG, while a mark which fell between 33,3% and 39,9% was converted to an E on the SG. The regulation however was amended as from 1984. The amendment amounted to narrowing the conversion region from 25% - 39,9% to 30% - 39,9%, thereby cutting out would-be passes as was possible before. Thus the cut-off point for both years under consideration, viz. 1984 and 1987, was 30% for a HG subject. Therefore anything below this was regarded as an outright failure on the HG, not convertible to a SG pass.

Worth noting in the results statistics given above, is that the proportion of conversions had decreased significantly from 45,2% in 1984 to 27,3% in 1987. Could this perhaps be an indication that standards are dropping? In the absence of data for 1985 and 1986, one cannot say.

But then what do these statistics prove? That the pupils are failing badly because the majority registered for HG? The answer is, of course, no. There could be other reasons why they are failing, for instance a disadvantaged educational background. The only point the author wishes to drive home to the reader is that it is NOT because of a good pass rate that the schools in the Ciskei maintain on average a high proportion of registrations at the HG level in mathematics. The analysis therefore suggests that the reason for this situation should rather be sought elsewhere. It also becomes clear from the data that the schools' selection procedures leave much to be desired.

4.6.4 Some Local White Schools' Statistics

Assuming for a moment (and not without reason) that the White situation constitutes the ideal, Std 10 mathematics results for 7 White schools in East London over the years 1980 - 1982 and also their histograms will be given. They have been extracted and compiled from R.A. Viljoen (1983, pp 50 - 52).

TABLE 21: MATHEMATICS HG REGISTRATION STATISTICS FOR 7 WHITE HIGH SCHOOLS IN EAST LONDON FOR THE YEARS 1980 - 1982

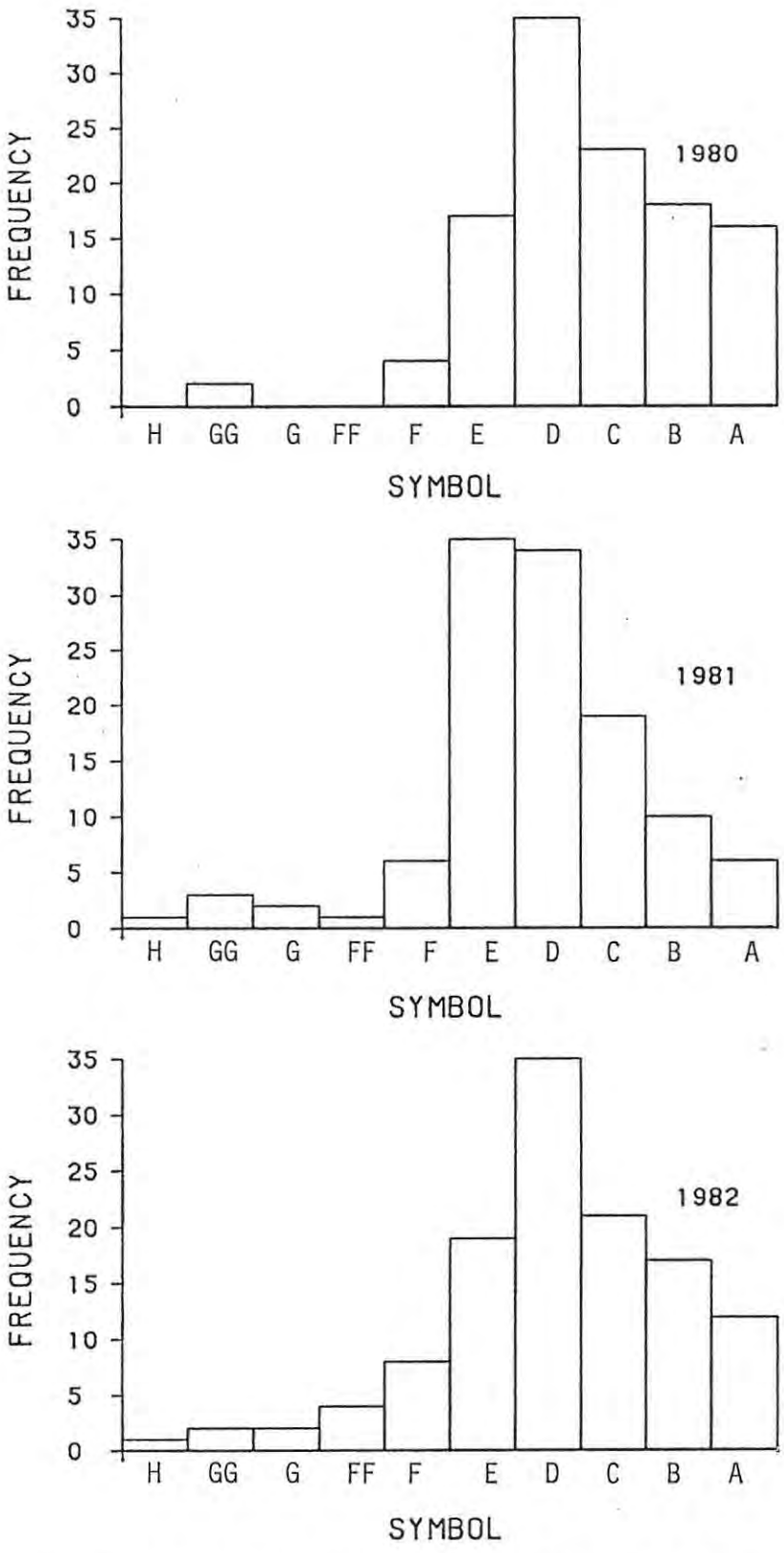
YEAR	H.G.	S.G.	TOTAL	% H.G.
1980	115	183	298	38,6%
1981	117	155	272	43,0%
1982	121	202	323	37,5%
TOTAL	353	540	893	39,5%

TABLE 22: MATHEMATICS HG RESULTS FOR 7 WHITE HIGH SCHOOLS IN EAST LONDON FOR THE YEARS 1980 - 1982

YEARS	NUMBERS PER SYMBOL										
	A	B	C	D	E	F	FF	G	GG	H	TOTAL
1980	16	18	23	35	17	4	-	-	2	-	115
1981	6	10	19	34	35	6	1	2	3	1	117
1982	12	17	21	35	19	8	4	2	2	1	121
TOTAL	34	45	63	104	71	18	5	4	7	2	353

The pass rates for 1980, 1981, 1982 (at HG level) were respectively 94,8%, 88,9% and 85,9%.

On the following page histograms for the above statistics have been drawn.



Histograms of the Mathematics HG Results for 7 White High Schools in East London for the years 1980 - 1982.

The proportion of HG registrations for Whites in the East London region stood at 39,5% - well below the national average of 55,9% for the years under consideration. Viljoen also submits that:

> "It is clear that the schools counsel and select their HG mathematics candidates rigorously. With the exception of one school which had a total of eight outright failures in mathematics HG over the three years under review, no other school had any outright failures at all." (Viljoen 1983, pp 41-42).

It is worth noting that only 27 candidates (7,6%) obtained a converted pass at the old 25% cut off point for conversion.

As one can see, the histograms are more like the normal bell-shaped curve that is expected in such performance-related frequency graphs. But then can the so-called ideal situation be attained by simply applying the rigorous selection criteria (referred to above) to the Ciskei situation? Are the two situations comparable, i.e. the White education system in South Africa and the Ciskei education system? In the author's opinion they are not exactly comparable. There are other factors which come into play to bring about the inequalities in the two systems and these will be briefly discussed in the next chapter. However there is hopefully no harm in showing how the ideal could be approximated or which population group could be the closest to this ideal situation.

If the results are not a factor in the determination of a suitable grade, what could then be behind the trends as depicted by the registration graphs for the DET and Ciskei? Of particular

importance to the investigator is the apparent situation that the arguably most disadvantaged group educationally, viz. the Blacks, consistently has the greatest percentage enrolment on average, at the HG level in mathematics. Also arousing curiosity is the gradual drop in this percentage in the last few years under consideration. Possibly as part of an answer to the above, it is proposed that some personal opinions of two well placed officials, one in the Department of Education and Training (DET) and the other in the Department of Education in Ciskei, as well as one opinion from a student of political science, be briefly presented. The reader should therefore see these for what they are: a few opinions.

4.7 Possible Explanations

When asked for his opinion on the two points raised above, i.e. the high registration percentage at the HG level and the gradual drop in later years, the Examinations Officer in the Department of Education and Training in Pretoria responded thus:

> "Abnormally high percentage DET candidates offering Mathematics HG: In my opinion black candidates regard SC subjects as inferior to their HG equivalents (subjects). This is a misconception largely due to the fact that they have been receiving poor guidance. They consequently also mistakenly believe a certificate on which SG subjects appear to be inferior to one carrying only HG subjects. Their attitude has thus always been to go for Higher Grade. Candidates are also of the opinion that it is better to present a subject on the HG in the examination as a 30% (since 1984) mark achieved therein means that the level of the subject will be converted from HG to a pass on the SG."

Downward trend:

"Since 1981 the Vocational Guidance Section of the Department has been positively assisting candidates to choose correctly between subjects offered on both the HG and the SG. They are encouraged to only take a subject on the HG if it is needed for further study or a future career. The decrease in the number of HG candidates on the one hand and the increase in the number of SG candidates on the other hand is a fair indication of the degree of success which has thus far been achieved with said guidance."

The Subject Advisor for mathematics in the Ciskei on the other hand saw it thus:

Abnormally high HG registrations:

"The standard of Black education is generally considered lower than that of the other racial groups. The parents, teachers and pupils would not accept anything lower (SG) than what they already have. The aspirations of the majority of pupils is to study at a university. Many study mathematics so that they may become, (for example) engineers and medical doctors and these disciplines require very good HG passes in mathematics.

The downward trend in the later years may be caused by awareness on (sic) the conditions to obtain a University entrance certificate (exemption). People realised that one need not take mathematics HG in order to obtain an exemption.

The drive towards Technical Education which does not require a very good pass in mathematics may also be the cause."

The opinion of a Fort Hare University (Ciskei) lecturer in political science was also sought. Valid points were raised by the lecturer, amongst which the following are quoted:

Abnormally high HG registrations:

"Black peoples/students who are aware of the fact that they are receiving an inferior type of education, i.e. Bantu Education, try to compensate by doing the highest of the grades of options available. It is ridiculous to do a standard grade of an inferior education. It amounts to doing an inferior grade of an inferior education. There are peer group pressures against such "misguided" choices.

... That students show a high rate of failure in HG is irrelevant to the newcomers to the subject. They do not know that. Pupils do not consult records of passes or failures before they register for subjects. Black students register or enrol more with sentiment rather than ability for the said grades. They continue with this attitude to university level. At university level they choose their majors out of "love" rather than as a result of rational choice".

"... The possibility of having one's results converted to SG should one not make it in HG persuades pupils to register in HG, whereas in SG a fail is a fail."

Whether these opinions are representative of the general opinion one cannot say. They are nevertheless independent opinions. The reader should however note some similarities in the views expressed in spite of the independence. For example the feeling that pupils regard SG as inferior, as well as the view that they are not properly guided in their choice of grade - a view which is implicitly expressed by the three respondents.

In the next chapter some points raised in the four previous chapters will be briefly recounted and put into perspective, with a view to drawing some conclusions and hence putting forward suggestions where possible.

CHAPTER 5

A DISCUSSION OF SOME OF THE FINDINGS OF THE STUDY

5.1 A Summary of the Findings

Chapter 1 had as its aim the explanation of the rationale for the syllabus differentiation in the RSA as we know it today. Providing for the pupil who lacks ability was in the minds of some education authorities in the RSA as far back as 1937. Limited opportunities were created for these pupils, like for instance an Advanced Stream and an Ordinary Stream for secondary pupils in Natal from 1962.

However, two obstacles seem to have retarded good progress in this provision. Firstly, the influence of the Joint Matriculation Board as an examining body. Its function has been and still is to prepare school children for entry to universities. The board serves as a watchdog on standards of the final examinations that the pupils write. Furthermore, members of the board are predominantly university personalities. Hence one can safely conclude that it serves universities.

From this, the impression is created that any educational institution other than a university is sub-standard and therefore not what Southern Africa needs most. The De Lange report of 1981 reflected on this observation. It recommended an alternative body - a South African Certificate Council to be established to control certification at schools and technical colleges, and another similar body for Technikons. These bodies were intended to ultimately replace the Joint Matriculation Board.

A second obstacle to the earlier efforts to make education accessible to as many pupils as possible by broadening its base, was the attitude of Black parents. They wanted their children to be prepared for university education. This was understandable since they themselves knew very little about possible non-university educational institutions other than teacher training colleges. There simply were not many such institutions in their younger days and the few that existed were often looked down upon and regarded as suitable only for the children of the lower class citizens - to prepare them for the menial tasks that awaited them on attaining maturity.

Peter Randall (1982) saw it differently. He felt that the influence of the British educational system and its class consciousness had a major role to play in the pre-occupation with university education by South African parents. Social class mobility which is facilitated by education in such renowned institutions as the so called grammar schools, public schools (private schools in the RSA) and well established universities, was the ultimate wish of all classes of parents for their children.

We quote Randall (p.8):

> "Education has long been an avenue of social mobility. In England in the thirteenth and fourteenth centuries there were numerous examples of villeins being fined for sending their sons to school without the permission of their lords. They willingly paid these fines, not so much to see their children educated as to secure their freedom from bondage, as a way of helping them escape from their class background.

> By the end of the fourteenth century some children of the peasant class were managing to enter grammar schools so that they could rise in the social scale."

The HSRC Committee of 1964 on differentiation and guidance has been shown to have had as its main concern, the provision of education in accordance with a pupil's interest, ability and aptitude.

Chapter 2 enumerates some of the limitations of the study. The study should, in fact, not be seen as anything more than a small-scale probe whose findings can only be generalisable with due caution.

In Chapter 3 it was noted that the majority of the parents of the sample do not see it as their duty to check on the grades of the subjects their children are doing. In fact, 33 (66%) of the parents fell in this class. They left it to the teachers to take decisions on such matters. On the other hand, it is interesting to note that only 6 teachers out of the sample of 23 had the final say in the choice of the grades. Who then has the final word on this very important decision? From the data gathered it seems to be the pupil in most of the 23 schools the reacher-respondents are attached to. What factor has had the greatest influence in these pupils' choice of grade (HG for the majority of the pupils of the sample)? Without doubt, gaining entry to a university of the pupil's choice overrides all other factors. Only 21 (14,6%) pupils (out of 144) rated achievement in the subject highly. This group chose mathematics HG because they did well in the subject.

Ability is thus not a major factor in the determination of the grade for most of the respondents of the sample.

In spite of the fact that 22 (out of 23) teachers realised that aptitude and performance are the most important attributes to look for (taking the HSRC report into consideration), the majority of them decided not to force their will on the pupils for unspecified reasons. Hence it was concluded that there are reasons other than ability which influenced the choice of grade.

If aptitude and ability are not important factors then examination results cannot be expected to be either. This was established in chapter 4. The results were shown not to have been good at all and yet the disproportionately high registrations at HG level persisted.

Some reasons are suggested by three independent opinions presented in chapter 4. One opinion suggested that since the so called 'Bantu Education' (a term given to the administration of Black Education before it was later changed to the DET) is already inferior, no pupil could be expected to want to do a lower grade of an inferior education system. The other two opinions also suggested similarly, in that the respondents felt that either it was generally assumed that Black Education is inferior, or the SG syllabusses are despised. Status is associated with registering for HG by some pupils. It must be noted that the author is not in any way contending that these opinions are representative of those for the whole Ciskei.

Be that as it may, it is assumed that the presentation of these independent opinions cannot fail to register a line of thought in the mind of the reader.

From the information in the paragraphs above, it appears that the majority of Ciskei parents do not wish to interfere in the grade selections. This can be interpreted as an admission of ignorance on their part, on academic matters, and this is not unexpected since, on average, their educational standards are low.

Nonetheless what is disappointing, is the failure by the majority of teachers to advise on the choice of grades. Why should such an important decision be left to the pupils? Is this negligence on the part of the teachers and educationists in any way associated with the views expressed in the three independent opinions of section 4.7, namely that education for Blacks is generally looked down upon as already inferior even without the syllabus differentiation? Unfortunately the present study does not offer any answers to the question. It is suggested as an area needing further probing by a follow-up researcher.

The investigation has however established, barring the limitations of the study, that a <u>disproportionately high</u> percentage of Std 10 pupils in the Ciskei are registering for mathematics HG - <u>not</u> because of a consistent record of high pass rates at the HG level. It has also established that the intentions of the exponents of the differentiation system were, amongst others, to endeavour to offer a subject at a level which is in line with a pupil's ability, aptitude and interest. Do we in the Ciskei have

any pupils who lack ability, who have neither aptitudes for nor interest in their subjects? The next section will look into this aspect.

5.2 Ability of Pupils

It is assumed in this section that "ability and aptitude" as used in the HSRC Report refer to a pupil's general ability and aptitude respectively, as measured by psychological tests.

Atkinson et al (1983) assert that genes impose a top and a bottom limit on intelligence. They also say, however, that "environmental influences - what happens to the individual during the course of development - will determine where the person's IQ will fall within the range." (p.374).

It is hereby submitted that environmental factors such as socio-economic, cultural and educational backgrounds have cumulatively affected the black child's ability to such an extent that it may not be fair for one to judge that such a child is of low ability.

Hereunder follows an enumeration of some of the educational factors which could have contributed to underachievement by black pupils.

Education for Whites in the R.S.A. was well established as early as the 18th century. At the beginning of the 20th century school attendance was made compulsory for all White pupils up to age 16

or Std 8, whichever came first, according to Malherbe (1977). The financing of White education has therefore been in the hands of the state ever since. Not so with Blacks. As late as 1977, Black pupils were buying their own text books, exercise books and language set works for example. In fact the 1984/85 per capita expenditure for the various races was (in rands): 1926, 1182, 708 and 294 for Whites, Indians, Coloureds and Blacks respectively, the Transkei, Bophutatswana, Venda and Ciskei countries included.

Because facilities and equipment can only come about with the availability of finance, black schools had thus never had enough of these. Lack of facilities and equipment deprives the black child of the opportunity to experience an enriched environment which would enhance his ability.

The qualifications of Black teachers leave much to be desired also. According to the DET Annual Report for 1985, only 883 (± 2%) out of 44 619 teachers under the DET had a degree and professional certificate. It was slightly higher at 1 285 (2.3%) out of 55 858 for self-governing states (excluding the TBVC countries) like for example Zululand. The same pamphlet reports that 19 534 teachers (43,8%) out of 44 619 under the DET and 18 637 (33.4%) out of 55 858 in self-governing states (excluding the TBVC countries) had Std 8 as highest standard passed. The quality of the teachers in Black schools is thus poor indeed. There is no reason to believe that Ciskei is any different as it is still largely being funded by the RSA in most developmental matters.

Another important aspect of Black Education is the pupil - teacher ratio. A Rhodes University pamphlet titled: S.A. Education:- A Picture in Diagrams and Numbers (1986,p6), provides the following table:

TABLE 23: A SUMMARY OF EDUCATIONAL PROVISION: 1984

	Schools	Teachers	Pupils
Whites	2 379	52 403	978 063
Coloureds	2 060	30 410	780 677
Indians	441	9 421	230 536
Africans (DET)	7 269	43 238	1 724 219
Self-governing States	4 785	52 301	2 292 026
TBVC	5 567	41 983	1 779 466

From this table the table below was constructed.

TABLE 24: PUPIL - TEACHER RATIOS: 1984

	Ratio
Whites	19 : 1
Coloureds	26 : 1
Indians	25 : 1
Africans (DET)	40 : 1
Self-governing States	44 : 1
TBVC	43 : 1

The facts revealed by the last table should be expected, in view of the per capita expenditures given earlier in this section. What emerges is that the Black pupil is once more at a disadvantage.

Furthermore because of socio-economic and cultural differences an aptitude test which is applied to a Black child even before the first year at school, is not likely to produce valid results either. The Black child will most probably be found to be starting at a much lower point than the White child. It is for these reasons, quite understandable that a Black child or parent will at times not entertain the view that the Black pupil lacks ability and will therefore tend to ignore this important trait when deciding on a career. In fact, Atkinson et al (1983, p.) sum it up by stating that:

> "The environmental conditions that determine how an individual's intellectual potential will develop include nutrition, health, quality of stimulation, emotional climate of the home, and type of feedback elicited by behavior."

It is therefore submitted that, because of the existence of the above-mentioned inequalities (amongst others) in the RSA's education system, which were unfortunately inherited by the Ciskei Government when it opted for independence in 1981, it is not possible for anyone to say with certainty, on the basis of standard tests of ability, that a given Black child lacks ability.

5.3 TECHNICAL EDUCATION

The traditional British education system has had a considerable impact on the provision (or lack thereof) of technical education in the RSA. An extract from Randall (1982, p.) who in turn is quoting Bottomore, a sociologist, reads thus:

> "In Britain ... children of the upper-class are educated in the major public schools and at the universities of Oxford and Cambridge, whence they proceed into business, politics, the administrative class of the civil service, and the older professions; working-class children are educated in state schools ... from which they go ... into manual jobs in industry or into minor clerical jobs."

The 'manual jobs' in this context refer to the application in industry of the technical skills learnt in Technical and Vocational schools. As alluded to before, such schools will afford no upward social mobility for the working-class children. Consequent upon such traditional views as quoted above, provision for technical education for all race groups in the RSA had a doubtful start.

It is interesting to note that the first industrial and vocational training in the RSA was provided for non-whites by Sir George Grey in the early 1850s, according to Malherbe (1977). Once more reference is made (Malherbe p. 164) to the unpopularity of this type of education, because of its association with the destitute, the defective and the delinquent - the type of person for whom the training was originally intended. Sir George Grey may have created such schools in good faith, having in mind perhaps the upliftment of the poor classes of the South African society of the day, to prepare them for industrial and commercial developments which he foresaw, but nonetheless he reinforced the belief from the colonial era referred to earlier, namely that that type of education was meant for the lower classes of a country's citizens.

Other than these schools, the author is not aware of any technical colleges for Blacks which were established in the early years. Malherbe suggests that the first two technical colleges for Blacks were established in the late sixties, one in Pietermaritzburg and the other in Pietersburg.

What was the position with Whites? The first technical institutions for Whites were established soon after the discovery of diamonds in Kimberley in 1871. The Railways and the mining industry pioneered the founding of these institutions.

A table of Technikons (post school technical institutions) for the various race groups in the RSA, has been extracted from the Rhodes University pamphlet (p.20) referred to earlier and is presented below.

TABLE 25: NUMBER OF TECHNIKON STUDENTS IN THE RSA - 1984

Group	No. of Technikons	No of Students
Whites	8	30 560
Coloureds	1	2 134
Indians	1	3 942
Blacks	3	1 657

In the light of the above-mentioned facts, it would seem that the alternative to university education, viz. technical education provision for Blacks, was and still is completely inadequate.

This, coupled with the fact that a university is traditionally a prestigious institution, had a major role to play in the desire on the part of the majority of the Black students, to receive university education.

CHAPTER 6

RECOMMENDATIONS AND CONCLUSION

6.1 Recommendations

6.1.1 What do parents want?

What is the position with the so-called enlightened parent in general, that is, the parent who appreciates the value of education? The most important question we as enlightened parents should be asking ourselves whenever we consider the HG/SG options is: what do we want for our children? Dale Carnegie (1953) has an interesting answer to this question. It is expressed more or less in these words:

> "Human nature dictates that we should dream about the welfare of our children, that they are intelligent and successful in life - a situation which makes us feel great and capable as parents. In their achievement we see one opportunity in which we hope to feed the 'craving for importance' which is the ultimate wish of almost every human."

Note that Carnegie is in no way suggesting that these dreams are desirable or appreciated. He is simply describing human nature as he sees it.

It is the same 'craving for importance' which causes some people to build houses much bigger than their needs, to boast about their children's intelligence, to wear the latest styles in clothing, to drive the latest car models, says Carnegie. The same feeling has been the driving force behind many inventions over the centuries, according to Carnegie.

If that be the case, then it is only fair to expect some enlightened parents to want their children to go to university, the most prestigious educational institution in a country, and it is equally fair to expect such parents to think that the children have the ability to do so until proved otherwise.

There is no way we can deny that the more HG subjects a pupil takes, the more chances there are of his/her obtaining matriculation exemption, provided of course, that the pupil has the ability to handle the subjects, the ability the parents assume to be there, as we have said above.

Another question is, what do we as teachers want for our charges? As a teacher himself, the author suggests that we want to be as close as we can be, to a 100% pass rate. Again since most of us have been to universities and teacher training colleges, we tend to talk highly of such institutions, thereby giving the impression that they are <u>the</u> places to aim for - and this is understandable.

Even though a 100% pass rate is within reasonably easy reach of every school, a qualification for university for everybody is not likely because past records reveal that there will always be those students who will not make it, and they need not be a minority. What advice do we as teachers have for them? Should we push them for an exemption or a Std 10 certificate?

From the above exposition it seems that we have in one camp people who think that any argument that the black child lacks ability is not convincing. In the same camp we have parents who are ignorant about educational matters, and also ambitious parents whose wishes are discussed above. This group will consequently say very little or nothing in favour of differentiation. In the other camp we have people who contend that the performance in class of a high proportion of the black school population is poor, to them this being an indication that many black children seem to lack ability and/or aptitude. The statistics on matriculation results in chapter 4 serve as partial evidence in support of this view. In the light of the discourse presented above, is it not wise to find a solution somewhere between the two camps, to strike some sort of a compromise? The author suggests that it is.

6.1.2 Guidance counsellors

There are indications that there are no well defined or properly executed career guidance programmes in the Ciskei.

There is admittedly a subject called Guidance in the Ciskei Secondary curriculum, but it is doubtful whether it receives the attention it deserves. In fact like all non-examination subjects there is a strong likelihood that it suffers in this respect.

In view of this, would not the creation of posts of Guidance Counsellors in each high school help alleviate this problem? It can be done piece-meal, say one directorate (education circuit) taken at a time. The project could then be continuously evaluated. It is hoped that such counsellors would solve (amongst others) the problem we have in our schools, namely that of having too many pupils with no proven aptitude for mathematics, who nevertheless aspire to university education with a mathematics HG pass as a prerequisite. In fact, in this way, pupils would be made aware of their strengths and weaknesses as early in their secondary education as is possible and some individual counselling would simultaneously be made possible. There is information that the Department of Education in Bophutatswana has done something similar to what is suggested here, as from 1988. According to a Guidance Counsellor there, they have started with one circuit already and intend to extend the programme to all the other education circuits, as and when funds become available.

6.1.3 Mathematics or no mathematics?

The subject mathematics is fast becoming indispensible in many fields of study, a point we have referred to in section 1.3. Hence it is recommended that no child should be denied the opportunity to do mathematics even if there is only a very slight

indication that he/she is capable of performing acceptably. Pupils should in fact be encouraged to take mathematics because of its increasing applicability, if for no other reason. It is suggested here that, as a sort of a compromise and at the same time to allow for as many pupils as possible to continue with mathematics, a low cut-off point (pass mark) of say 34% at the end of the Std 7 year be considered.

It is assumed that the other factors such as consistency of past achievement scores, and a poor educational background will have been investigated prior to the application of the 34% border line. This is a low point indeed, for Viljoen (1983,p 78) suggested implicitly that 50% is the ideal point of separation at the Std 7 level. At no point should a pupil be forced against his/her will or the parents' will to drop the subject. Only persuasion supported by convincing evidence should be used in each case. The author is aware that quite a number of schools in the Ciskei will still allow all the pupils from Std 7 to continue with mathematics up to Std 8. This is appreciated as some uncertainties about a pupil's aptitude for the subject could in this way be cleared. Furthermore many vocational careers demand Std 8 mathematics as a minimum requirement, to ensure numeracy on the part of the candidate. In other words Std 8 is suggested as the ultimate exit for the very weak - in mathematics.

6.1.4 Standard Grade or Higher Grade?

In the light of what was contended earlier, namely that some Black pupils with ability could have been so disadvantaged previously, that they are presently classed under the weak, it is

hereby recommended that the weak still be given a chance, that is they be allowed to do mathematics HG in Std 9. The reader is reminded that the weak here refers to some pupils amongst the Std 7 pupils who scored 34% plus at the end of the Std 7 year. These pupils will do Std 8 mathematics and are in fact expected to continue with mathematics up to Std 10.

It is hoped that any pupil's latent ability or aptitude will in this way be afforded an opportunity to manifest itself. However, strict separation into SG or HG is recommended at the end of the Std 9 year, and a cut-off point of say 40% (unadjusted scores) is suggested. Implicit in the cut-off points referred to up to now, is the assumption that the end of year papers written at the Std 7 and Std 9 levels are somehow standardised, like for instance the so-called common papers the Ciskei Department of Education sets for Stds 6,7, & 9 presently.

6.1.5 Remedial programmes

If the inequities of the past in the field of education as related above are real, then one may want to know what steps Departments of Education such as the DET, the departments in the self-governing homelands and in the National States have taken to redress the imbalances. To aggrevate the situation, further set-backs were brought about by the school disturbances of the past decade.

It seems that either we in the Ciskei should institute acceleration/remedial programmes at some stage in the school

years of a pupil or we should set different entrance and exit requirements for Blacks and Whites at universities, technikons, etc. But the second alternative is not feasible. Post school institutions would be reluctant to set different criteria since their products have to be seen to be universally acceptable, that is to be of good quality. The world outside does not compromise. It demands quality above all else. Without being aware of it, the institutions will thus have thrust upon them the burden of instituting remedial programmes. The only conclusion one can draw from this, is that programmes such as this are simply unavoidable if standards are to be maintained.

Surely standards have to be maintained - no one can be so naive as not to agree with this view. If that be the case, who will bear the burden? The schools or the post-school institutions? In the author's opinion, the responsibility should be shared by both. A start has to be made somewhere. It could be at the Std 10 level initially. At the risk of being labelled an idealist the author suggests that extra classes be instituted for the whole Std 10 year for key subjects. This should be compulsory for all pupils. As if the writer is not aware that the financial constraint is ever present, he further suggests that the services of expert tutors be sought. Such teachers surely do not come at no price. Taking everything into consideration, the recommendation boils down to one thing, and that is, a financial budget for the redress.

How much will such an operation cost? The Johnson & Johnson Co management in East London should have an idea. For the years

1987 and 1988 they have been conducting and financing such an upgrading operation in the Mdantsane Central Circuit. Another private organisation called ITEC (Independent Teacher Enrichment Centre) has since 1988 joined forces with the Johnson & Johnson project. They have actually pooled together their financial and human resources to make the project a success. Admittedly some loose ends here and there still need to be tied up, but that it is a step in the right direction should not go unstated.

What role should the subject teachers play, particularly in view of the absence of efficient Guidance Counsellors? The next section will look into this aspect.

6.1.6 The role of subject teachers

It is very disappointing to note that in the triangle formed by the teachers, the pupils and the parents, the teachers are reluctant to assert themselves on matters of an academic nature. There is definitely a vacuum which the teachers should help fill. A situation where ability and/or aptitude is irrelevant in the choice of grade or subject is sufficient cause for concern.

It is suggested that teachers take up their expected role of leadership and give out or seek out information and advice on matters educational. The unfortunate situation which is prevalent in the Ciskei is that parents are probably ignorant about these things. Perhaps they believe that teachers will take full responsibility for the situation at school and then inform the parents, mainly in an advisory capacity. However, can there

be a point in advising pupils to consider non-university or non-teaching careers when there are no educational institutions to offer training in such courses? Do we have enough technical schools in the Ciskei? The next paragraph is devoted to this matter.

6.1.7 Technical education

It is clear that there are not enough technical colleges in the Ciskei and the few that exist are not sufficiently attractive to the parents or pupils for various reasons, some of which have been given earlier. This should not be interpreted to imply that the Ciskei Department of Education is either not aware of this or is not doing anything to improve on this. There are indications that it sees the need for this type of education. For instance a technical centre in Mdantsane has been upgraded in 1988 to enable it to provide facilities for technical courses from Std 4 to Std 10 in the course of its first full cycle, viz. 1988-1992. Two secondary schools are also involved in the project. The schools send their Std 6 pupils (in 1988) to the centre for two days a week to receive tuition and do practical work relevant to the courses they do. Also a technikon is presently under construction and promises to be of a high standard. There is also one fully fledged technical high school located in the Mdantsane Central Circuit. There is therefore reason to believe that this weak point in our educational system is receiving attention.

Nonetheless there is a dire need of further facilities. An existing technical college in East London could offer such facilities. It is an old established institution whose contribution to commerce and industry in the Border region is unquestionable. Would not the College consider opening some N1 - N6 courses to Ciskei applicants - especially if the courses are unavailable in the Ciskei?

In so far as apprenticeships are concerned, the standards demanded by the industries in the region are rather high, to such an extent that Blacks are effectively excluded - one consequence of the educational imbalances referred to earlier. A solution to the problem could be found in involving the industries which operate within the Ciskei. They could be persuaded to lower the standards of admission into their apprenticeship programmes and then be asked to undertake to effect in-service enrichment programmes for the intakes. After all, taking everything into consideration, the Ciskei is indeed a tax haven. A blanket flat tax rate of 15% for the individual and company alike is encouraging. Asking the companies to involve themselves in such developmental programmes is thus not unfounded.

6.2 Conclusion

The author set out to investigate a burning question, something which troubled his mind, namely: why a very high proportion of the total of Black pupils should continue to register for HG in mathematics, when their indicated ability or aptitude in class left much to be desired. One conclusion he draws out of the

investigation is that there is possibly some aversion to the SG syllabus in the Black population in Ciskei. There are also indications of ignorance on the part of parents, pupils, and even educationists on some aspects of the differentiated structure, including its original purpose, if the opinions of the subjects in the sample of teachers are anything to go by.

However there is a noticeable gradual drop in the proportion of candidates who opt for HG in mathematics and this augurs well for the future. It is disturbing to note that Whites, who have had all the privileges Blacks were denied over the previous centuries, have a national average of 55,9% enrolment on the HG over the period 1976-1984 as against DET's (Blacks) 79,1% for the same period.

The investigator is well aware that he has not done a thorough investigation of the topic, as the scope of the thesis does not allow for that. He has only scratched the surface. It is therefore his wish that another researcher will find some aspect of the syllabus differentiation to probe, like for instance the differences in content and standard of the HG and the SG papers in mathematics.

Also worth looking into are the criteria that schools use to select those pupils who will benefit from mathematics tuition after Std 7. But of even more importance is the investigation of the place of Careers Guidance as a subject in Ciskei schools. The significance which educationists in the Ciskei attach to

the subject will inevitably draw mathematics education to the centre of all ensuing discussions.

In concluding, the author wishes to state once more, that anyone who reads this half-thesis should see it for what it is: a limited exposition of what is and has been. Even though he cannot guarantee that it reveals a specific trend, he nevertheless is convinced that the general trend and/or opinion is more likely to be as suggested here than otherwise.

REFERENCES

Allison D (1987) 'Mathematics at UCT - Admission Requirements', Mathematical Digest No 69.

Ary D et al (1985) Introduction to Research in Education 3rd Edition; Holt.

Atkinson R L et al (1983) Introduction to Psychology 8th Edition; Harcourt Brace Jovansvich Inc, U.S.A.

Best J W (1977) Research in Education 3rd Edition; Prentice Hall

Christie P (1985) The Right to Learn; Ravan Press, Johannesburg.

Dale W L (1971) 'Why Not Mathematics', The Mathematics Teacher; National Council of Teachers of Mathematics, U.S.A.

Davies R P (1975) Mixed Ability Grouping; Temple Smith, London.

Fraser W G et al (1972) The Principles of Objective Testing in Mathematics.

Gay L R (1987) Educational Research-Competencies for Analysis Application 3rd Edition; Merril.

Griffiths & Howson (1974) Mathematics: Society and Curriculum; Cambridge University Press, U.K.

Harrison D (1983) The White Tribe of Africa; Macmillan South Africa, Johannesburg.

H.S.R.C. (1971) Differentiated Education Report, Part 1, Pretoria.

Johnston J E (1986) An Experiment in the Prediction of Achievement in Senior Certificate Higher Grade Mathematics. Unpublished M Ed Thesis, U.C.T.

Kallaway P (ed) (1984) Apartheid and Education; Ravan Press, Johannesburg.

Krech D et al (1982) Elements of Psychology 4th Edition; Alfred A Knopf, Inc., U.S.A.

Malherbe E G (1975) History of Education Vol 1; Juta & Co, Cape Town.

Malherbe E G (1977) History of Education Vol 2; Juta & Co, Cape Town.

Mathonsi E N (1988) — Black Matriculation Results; Skotaville, Johannesburg.

Noble A (1974) — 'Some Thoughts on Recent Changes in Educational Policy in South Africa', Spectrum.

Norton D A (1983) — Some Perspectives on High School Mathematics Evaluation. Unpublished M Ed Thesis, U.C.T.

Phillip J D et al (1981) — The Mathematical Experience; Houghton Mifflin Co, Boston.

Randal P (1982) — Little England on the Veld; Ravan Press, Johannesburg.

Rhodes Paper (1986) — 'South African Education - A Picture in Diagrams and Numbers'; Rhodes.

Travas R M W (1969) — An Introduction to Educational Research 3rd Edition; Macmillan, London.

Trevor K et al (1982) — Mixed Ability Teaching; Macmillan Education, London.

Tunmer R (1981) — The Curriculum in the Decade of the 'Eighties', Rhodes, Grahamstown.

U.O.F.S. Publication (1986) — Education and Manpower Production (Blacks) No 7, U.O.F.S.

Viljoen R A (1983) — An Investigation into the Reliability of the Standard Seven Year-End Mathematics Results as a Predictor of the Mark Obtained in the Final Cape Senior Certificate Examination. Unpublished M Ed Thesis, Rhodes.

Webb T W (1988) — 'Higher Grade or Standard Grade?', Mathematical Digest No 71; U.C.T.

Yates A (1972) — The Organisation of Schooling; Routledge & Kegan Paul, London.

APPENDIX A

THREE PERSONAL OPINIONS ON HG/SG REGISTRATIONS

P O Box 257
MDANTSANE
5219 (Ciskei)

8.4.88

Further to our telephone conversation of the 8/4/88, I (as agreed between us) hereby wish to formally appeal to you, as a matter of extreme urgency, to share with me your considered opinion as regards the questions given below which are based on the graphs hereto attached. We would further want to know whether we can quote you.

The questions are:

How do you account for,

(a) the great fluctuations in the D.E.T. graph?

(b) the downward trend in the last few years under consideration?

(c) the apparent situation that the most disadvantaged group is towering over the rest in H.G. Math. percentage registration?

A speedy reply would be greatly appreciated as the mini-dissertation is due for submission by the end of April 1988.

Yours faithfully

DELIWE M.C.C.

G.P.-S. 008-0319

REPUBLIEK VAN SUID-AFRIKA
Telegramadres / Telegraphic address } "IMFUNDO"
Teleks No. / Telex No. } 282531 X 248 MR B. NEL
Telefoon / Telephone } [illegible] Bylyn / Ext. }
Adresseer alle briewe aan Direkteur-generaal
All communications to be addressed to Director-General

REPUBLIC OF SOUTH AFRICA

OO/ET 230

By beantwoording meld / In reply please quote
No. 16/1/2

DEPARTEMENT VAN ONDERWYS EN OPLEIDING
DEPARTMENT OF EDUCATION AND TRAINING

Privaatsak / Private Bag } [illegible] X184
PRETORIA
0001

21 April 1988

Mr M.C.C. Deliwe
P.O. Box 257
MDANTSANE
CISKEI
5219

Dear Mr Deliwe

Thank you for your letter of 8 April 1988.

The answers to the questions raised in your letter express my personal opinion and is not official.

(a) Fluctuation in DET Graph:

It is very difficult to give a ready explanation for the fluctuation in the graph reflecting the number of candidates who take Mathematics on the Higher Grade.

However, it is encouraging to note the rising tendency in numbers as far as the candidates that take Mathematics on either the HG or the SG is concerned. The number of candidates taking Mathematics HG as subject is determined by the

1. quality of the candidates taking Mathematics during the year in question;

2. intended future careers that the candidates wish to follow.

3. guidance given to the candidates concerning the choice between taking subjects on either the HG or the SG.

/2 .....

(b) Downward trend

Since 1981 the Vocational Guidance Section of the Department has been positively assisting candidates to choose correctly between subjects offered on both the HG and the SG. They are encouraged to only take a subject on the HG if it is needed for further study or a future career. The decrease in the number of HG candidates on the one hand and the increase in the number of SG candidates on the other hand is a fair indication of the degree of success which has thus far been achieved with said guidance.

(c) Abnormal high percentage DET candidates offering Mathematics HG. In my opinion black candidates regards SG subjects as inferior to their HG equivalents (subjects). This is misconception largely due to the fact that they have been receiving poor guidance. They consequently also mistakenly believe a certificate on which SG subjects appear to be inferior to one carrying only HG subjects. Their attitude has thus always been to go for Higher Grade. Candidates are also of the opinion that it is better to present a subject on the HG in the examination as a 30% (since 1984) mark achieved therein means that the level of the subject will be converted from HG to a pass on the SG.

I hope the above information could be assistance to you.

Yours faithfully

DEPUTY-DIRECTOR : EXAMINATIONS

DEPARTMENT OF EDUCATION AND TRAINING

MR MOKHOABANE: MATHEMATICS ADVISOR: CISKEI

The standard of Black Education is generally considered lower than that of the other racial groups. The parents, teachers and pupils would not accept anything lower (S.G) than what they already have.

The aspirations of the majority of pupils is to study in a university. Many study mathematics so that they become engineers and medical doctors and these disciplines require very good H.G passes in mathematics.

The above may be reasons why 80% of Ciskei pupils registered H.G in 1980-1982.

The downward trend in the later years may be caused by awareness on the conditions to obtain a university entrance certificate (exemption). People realised that one need not take mathematics H.G in order to obtain an exemption. The drive towards technical education which does not require very good passes in mathematics may also be the cause.

12/7/88

MR MARALA: SENIOR LECTURER: FORT HARE

(a) This can be attributed to several factors amongst which I can mention the following:-

(i) Black peoples/students are aware of the fact that they are receiving an inferior type of education i.e. Bantu Education try to compensate by doing the highest of the grades of options available. It is ridiculous to do a standard grade of an inferior education. (It amounts to doing an inferior grade of an inferior education.) There are peer group pressures against such "misguided" choices.

(ii) Doing/Passing a H.G. helps restore self confidence in the mind of candidates. I have known cases of students who have told me that it is an honour to fail a H.G. than to pass a S.G. of Maths, English or History.

(iii) There is in the Black community in general a sort of a status attached to the grade of the subject. One would recall that in our days we used to boast that we have obtained 1st class exemption pass in J.M.B. instead of National Certificate. There are parallels between this and the way the present student chooses his grades. To the present student/pupil who is not exposed to J.M.B. and S.N.C. differentiation pride is taken of having registered for a higher grade and not a standard grade. This is so regardless of the ability of the student or pupil. To register for a S.G. would be to lower his status in the eyes of fellow students.

(iv) Students register for H.G. in order to get an exemption. This ensures entry into universities. Subject grouping plays a role.

(v) That students show a high rate of failure in H.G. is irrelevant to the new comers to the subject. They do not know that pupils do not consult records of passes or failures before they register for subjects. Black students register or enroll more with sentiment rather than ability for the said grades. They continue with this attitude to university level. At university level they choose their majors out of "love" rather than as a result of rational choice.

(vi) The possibility of having one's results converted to S.G. should one not make it in H.G. persuade pupils to register in H.G., whereas in S.G. a fail is a fail.

(b) There are many factors which come to produce this downward trend in this proportion. Amongst others these are:

(i) Whilst we do not rule the possibility of deliberate manipulation by the authorities note should be taken of the fact that this down trend has coincided with the rise in popularity of subjects such as Biblical Studies. This decrease the proportion of those doing subjects like Maths.

(ii) The newly introduced subjects syllabi is of such a nature that many teachers in the field are not able to cope with the content they have to impart to the pupils. To accommodate this less qualified teachers, who unfortunately are in the majority, pupils are encouraged to register for S.G.

(iii) Teachers are pre-occupied with upgrading their academic qualifications. It is a fact that due to this they neglect their responsibilities to their pupils. The general trend is the "volume" of work given and not the "quality" of work. Thus H.G., which demands an insight of the subject is not catered for by most of the teachers, especially those doing private studies.

(iv) The Black students' ascertiveness is presently at its ebb. When it was high NB 1969 - Black Conscienceness, the graph is very high.

Temba Marala

14/7/88

APPENDIX B

SOME REGISTRATION STATISTICS

OO/ET 230

REPUBLIEK VAN SUID-AFRIKA
REPUBLIC OF SOUTH AFRICA

Telegramadres / Telegraphic address: "IMFUNDO"
Teleks No. / Telex No.:
Telefoon / Telephone: 323-9931 Bylyn / Ext.: X741

By beantwoording meld / In reply please quote
No. 6/16/2

ENQUIRIES : DR G.J. ROOS

DEPARTEMENT VAN ONDERWYS EN OPLEIDING
DEPARTMENT OF EDUCATION AND TRAINING

Adresseer alle briewe aan Direkteur-generaal
All communications to be addressed to Director-General

Privaatsak / Private Bag X212
PRETORIA
0001

Mr M.C.C. Deliwe
P.O. Box 257
MDANTSANE
5219
CISKEI

1988 -02- 12

Dear Mr Deliwe

REQUEST FOR STATISTICS ON MATHEMATICS HG AND SG

With reference to your letter of 25 November 1987, I herewith enclose the required statistics.

Unfortunately it is not possible for the Department to supply separate statistics for the Ciskei as requested.

The statistics is made available on condition that a draft copy of your dissertation is handed to the Department for scrutiny and control, before submitting it to your supervisor.

Yours faithfully

DIRECTOR-GENERAL : EDUCATION AND TRAINING

DEPARTEMENT VAN ONDERWYS EN OPLEIDING

EKSAMENSTATISTIEK:

WISKUNDE HG:

JAAR	GETAL KANDIDATE	SLAAG HG	SLAAG SG
1976	2 752	902 (32,8%)	330 (12,0%)
1977	3 115	828 (26,6%)	321 (10,5%)
1978	4 217	1 636 (38,8%)	607 (14,4%)
1979	6 975	1 353 (19,4%)	348 (5,0%)
1980	12 230	1 907 (15,6%)	1 100 (9,0%)
1981	15 638	2 126 (13,6%)	1 360 (8,7%)
1982	15 508	2 140 (13,8%	1 132 (7,3%)
1983	16 903	2 721 (16,1%)	1 453 (8,6%)
1984	16 269	2 359 (14,5%)	1 561 (9,6%)
1985	14 333	2 106 (14,7%)	1 447 (10,10%)

WISKUNDE SG

JAAR	GETAL KANDIDATE	SLAAG
1976	1 040	478 (46,0%)
1977	450	181 (40,4%)
1978	1 057	393 (37,2%)
1979	1 072	433 (40,4%)
1980	1 443	570 (40,1%)
1981	1 695	561 (33,1%)
1982	4 813	1 236 (25,7%)
1983	8 830	2 143 (24,27%)
1984	8 975	2 136 (23,80%)
1985	7 908	2 087 (26,40%)

21/1/87

REPUBLIEK VAN SUID-AFRIKA

REPUBLIC OF SOUTH AFRICA

SENTRALE STATISTIEKDIENS
CENTRAL STATISTICAL SERVICE

VERSLAG No. 21-03-16

ONDERWYS— KLEURLINGE

1982

REPORT No. 21-03-16

EDUCATION— COLOUREDS

1982

D1, D7

Verkoopprys • Selling price
(AVB uitgesluit/GST excluded)
Plaaslik **R2,10** Local
Buitelands **R2,50** Other countries
Posvry • Post free

ISBN 0 621 10666 6

Gedruk deur en verkrygbaar by die Staatsdrukker, Bosmanstraat, Privaatsak X85, Pretoria, 0001. Tel. 323-9731 x 267
Printed by and obtainable from the Government Printer, Bosman Street, Private Bag X85, Pretoria, 0001. Tel. 323-9731 x 267

2.1.3.3 - Standerds 8 tot 10 van die gewone kursus: Frekwensieverdeling volgens vakke geneem en die medium van onderrig

2.1.3.3 - Standards 8 to 10 of the ordinary course: Frequency distribution by subjects taken and the medium of instruction

Vakke HG = Hoër Graad SG = Standaardgraad	St. - Std. 8				St. - Std. 9				St. - Std. 10				Subjects HG = Higher Grade SG = Standard Grade
	Seuns Boys		Meisies Girls		Seuns Boys		Meisies Girls		Seuns Boys		Meisies Girls		
	Afr.	Eng.	Afr.	Eng.	Afr.	Eng.	Afr.	Eng.	Afr.	Eng.	Afr.	Eng.	
Alle skole - All schools													
GROEP A													GROUP A
Afrikaans Eerste Taal HG	11 006	20	11 588	29	6 356	22	6 045	13	4 052	5	3 714	5	Afrikaans First Language HG
Afrikaans Eerste Taal SG	-	-	-	-	-	-	-	-	-	-	-	-	Afrikaans First Language SG
Afrikaans Tweede Taal HG	-	3 146	-	3 402	-	1 989	-	2 043	-	1 398	-	1 526	Afrikaans Second Language HG
Afrikaans Tweede Taal SG	-	-	-	-	-	-	-	-	-	-	-	-	Afrikaans Second Language SG
Engels Eerste Taal HG	14	3 159	12	3 423	25	2 011	27	2 056	5	1 403	6	1 531	English First Language HG
Engels Eerste Taal SG	-	-	-	-	-	-	-	-	-	-	-	-	English First Language SG
Engels Tweede Taal HG	10 992	9	11 576	8	6 331	-	6 018	-	4 047	-	3 709	-	English Second Language HG
Engels Tweede Taal SG	-	-	-	-	-	-	-	-	-	-	-	-	English Second Language SG
Duits Moedertaal (SWA) HG	-	-	-	-	-	-	-	-	-	-	-	-	German Home Language (SWA) HG
Ander taal/tale	-	-	-	-	-	-	-	-	-	-	-	-	Other language(s)
GROEP B													GROUP B
[illegible] HG	1 672	1 131	851	926	760	690	308	547	441	464	212	323	Mathematics HG
Wiskunde SG	[illegible]	[illegible]	2 151	[illegible]	2 526	890	1 275	722	[illegible]	654	662	627	Mathematics SG
Funksionele Wiskunde SG	51	31	-	-	2	36	-	-	9	17	-	-	Functional Mathematics SG
GROEP C													GROUP C
Natuur- en Skeikunde HG	1 233	916	575	630	767	713	339	488	441	580	212	383	Physical Science HG
Natuur- en Skeikunde SG	710	209	285	149	673	162	285	83	453	112	248	79	Physical Science SG
Biologie HG	5 875	2 479	5 546	2 596	3 191	1 615	2 588	1 682	2 349	1 092	1 847	1 150	Biology HG
Biologie SG	3 544	396	4 452	475	2 338	123	2 657	270	1 208	132	1 526	201	Biology SG
Funksionele Natuur- en Skeikunde SG	21	31	-	-	6	36	-	-	9	17	-	-	Functional Physical Science SG
GROEP D													GROUP D
Latyn HG	4	22	6	46	-	29	-	32	-	15	-	29	Latin HG
Duits HG	55	12	81	27	41	11	31	33	21	12	26	26	German HG
Xhosa SG	5	3	12	4	2	5	2	3	4	6	3	5	Xhosa SG
GROEP E													GROUP E
Geskiedenis HG	2 307	981	1 774	893	1 473	630	1 004	571	1 160	451	804	431	History HG
Geskiedenis SG	3 368	420	3 288	354	1 745	148	1 629	185	888	106	970	168	History SG
Aardrykskunde HG	2 742	1 177	1 805	982	1 784	808	992	650	1 362	638	727	533	Geography HG
Aardrykskunde SG	3 148	362	2 487	284	1 579	141	1 239	139	832	114	729	151	Geography SG
Ekonomie HG	898	153	818	198	407	113	308	146	273	92	212	123	Economics HG
Ekonomie SG	446	32	488	86	240	21	322	16	119	8	101	6	Economics SG
Bybelkunde HG	241	18	275	41	108	16	150	9	94	16	72	21	Biblical Studies HG
Bybelkunde SG	288	5	491	6	101	5	192	15	25	2	72	5	Biblical Studies SG

LEERLINGE
2.1.3.3 - Standerds 8 tot 10 van die gewone kursus:
ORDINARY SCHOOLS
PUPILS
2.1.3.3 - Standards 8 to 10 of the ordinary course:

Mr Lewis 545

104

REPUBLIEK VAN SUID-AFRIKA REPUBLIC OF SOUTH AFRICA

SENTRALE STATISTIEKDIENS
CENTRAL STATISTICAL SERVICE

VERSLAG No. 21-04-16

ONDERWYS INDIËRS 1982

REPORT No. 21-04-16

EDUCATION INDIANS 1982

D1, D7

Verkoopprys • Selling price
(AVB uitgesluit/GST excluded)
Plaaslik R2,10 Local
Buitelands R2,50 Other countries
Posvry • Post free

ISBN 0 621 10731 X

Gedruk deur en verkrygbaar by die Staatsdrukker, Bosmanstraat, Privaatsak X85, Pretoria, 0001. Tel. 323-9731 × 267
Printed by and obtainable from the Government Printer, Bosman Street, Private Bag X85, Pretoria, 0001. Tel. 323-9731 × 267

GEWONE SKOLE
LEERLINGE
2.1.3.5 - Standerds 8 tot 10 van die gewone kursus:
Frekuensieverdeling volgens vakke geneem -
medium van onderrig slegs Engels

ORDINARY SCHOOLS
PUPILS
2.1.3.5 - Standards 8 to 10 of the ordinary course:
Frequency distribution by subjects taken -
medium of instruction English only

Vakke HG = Hoër Graad SG = Standaardgraad	St. - Std. 8		St. - Std. 9		St. - Std. 10		Subjects HG = Higher Grade SG = Standard Grade
	Seuns Boys	Meisies Girls	Seuns Boys	Meisies Girls	Seuns Boys	Meisies Girls	
Alle skole - All schools							
GROEP A							GROUP A
Afrikaans Eerste Taal HG	-	-	-	-	-	-	Afrikaans First Language HG
Afrikaans Eerste Taal SG	-	-	-	-	-	-	Afrikaans First Language SG
Afrikaans Tweede Taal HG	6 592	5 753	4 738	4 372	2 996	2 634	Afrikaans Second Language HG
Afrikaans Tweede Taal SG	16	9	376	168	659	431	Afrikaans Second Language SG
Engels Eerste Taal HG	6 578	5 739	4 707	4 333	2 847	2 564	English First Language HG
Engels Eerste Taal SG	30	23	407	207	808	501	English First Language SG
Engels Tweede Taal HG	-	-	-	-	-	-	English Second Language HG
Engels Tweede Taal SG	-	-	-	-	-	-	English Second Language SG
Duits Moedertaal (SUA) HG	-	-	-	-	-	-	German Home Language (SUA) HG
Ander taal/tale	-	-	-	-	-	-	Other language (s)
GROEP B							GROUP B
Wiskunde HG	5 724	3 469	2 750	2 001	1 195	662	Mathematics HG
Wiskunde SG	59	119	1 831	1 212	2 067	1 466	Mathematics SG
GROEP C							GROUP C
Natuur- en Skeikunde HG	2 738	1 223	1 663	1 099	1 036	584	Physical Science HG
Natuur- en Skeikunde SG	-	-	384	106	529	248	Physical Science SG
Biologie HG	4 902	5 065	3 165	3 161	1 818	1 784	Biology HG
Biologie SG	35	27	769	670	1 114	837	Biology SG
GROEP D							GROUP D
Arabies SG	22	23	17	24	20	21	Arabic SG
GROEP E							GROUP E
Geskiedenis HG	1 318	1 492	945	1 083	603	672	History HG
Geskiedenis SG	12	24	134	156	223	241	History SG
Aardrykskunde HG	2 440	2 119	1 458	1 254	841	723	Geography HG
Aardrykskunde SG	13	27	228	257	325	300	Geography SG
Ekonomie HG	609	478	455	459	222	202	Economics HG
Ekonomie SG	1	6	38	38	80	59	Economics SG

REPUBLIEK VAN SUID-AFRIKA

REPUBLIC OF SOUTH AFRICA

SENTRALE STATISTIEKDIENS
CENTRAL STATISTICAL SERVICE

VERSLAG NO. 21-02-17

ONDERWYS — BLANKES, 1982

REPORT NO. 21-02-17

EDUCATION — WHITES, 1982

D1, D7

Prys/Price

Plaaslik/Local R2,10
(AVB uitgesluit. GST excluded)
Buitelands/Other countries R2,50
Posvry/Post free

ISBN 0 621 10665 8

Gedruk vir die Staatsdrukker, Pretoria deur Aurora Drukpers, Mitchellstraat 161, Pretoria-Wes
Printed for the Government Printer, Pretoria by Aurora Printers, 161 Mitchell Street, Pretoria West

PRIMÊRE ONDERWYS
PRIMARY EDUCATION

2.1.3.8 Standerds 8 tot 10 van die gewone kursus: Frekwensieverdeling volgens vakke geneem en die medium van onderrig

2.1.3.8 – Standards 8 to 10 of the ordinary course: Frequency distribution by subjects taken and the medium of instruction

	Std. 8				Std. 9 – Std. 9				Std. 9 – Std. 10				
	Seuns / Boys		Meisies / Girls		Seuns / Boys		Meisies / Girls		Seuns / Boys		Meisies / Girls		
HG = Hoër graad SG = Standaardgraad	Afr.	Eng.	Afr.	Eng.	Afr.	Eng.	Afr.	Eng.	Afr.	Eng.	Afr.	Eng.	Subjects HG = Higher Grade SG = Standard Grade
	Alle skole – All schools												
GROEP A													GROUP A
Afrikaans Eerste Taal HG	18 090	282	18 781	294	16 648	869	15 712	249	13 104	191	14 248	187	Afrikaans First Language HG
Afrikaans Eerste Taal SG	1 161	–	236	21	1 048	–	267	15	1 102	–	322	15	Afrikaans First Language SG
Afrikaans Tweede Taal HG	19	13 777	2	13 636	11	12 894	–	12 210	15	10 869	1	10 677	Afrikaans Second Language HG
Afrikaans Tweede Taal SG	7	818	–	416	5	866	–	386	·	771	–	677	Afrikaans Second Language SG
Engels Eerste Taal HG	320	14 330	422	14 134	248	12 994	338	12 703	229	10 725	311	11 011	English First Language HG
Engels Eerste Taal SG	–	293	–	162	5	485	–	177	–	863	–	456	English First Language SG
Engels Tweede Taal HG	17 560	18	18 088	18	14 988	15	15 115	11	12 346	13	13 260	25	English Second Language HG
Engels Tweede Taal SG	1 397	–	508	–	1 368	–	526	–	1 646	–	1 000	5	English Second Language SG
Duits Huistaal (SWA) HG	–	–	–	–	–	–	–	–	–	–	–	–	German Home Language (SWA) HG
Ander taal/Tale	–	64	–	45	–	66	–	61	–	80	–	41	Other language(s)
GROEP B													GROUP B
Wiskunde HG	11 863	10 891	8 441	8 168	7 989	7 770	6 390	6 175	5 477	5 652	4 404	4 201	Mathematics HG
Wiskunde SG	3 442	2 673	871	1 244	4 533	4 503	1 626	2 366	5 020	4 806	2 801	3 339	Mathematics SG
Funksionele Wiskunde SG	1 049	121	7	2	1 001	213	5	7	1 060	278	9	22	Functional Mathematics SG
GROEP C													GROUP C
Natuur- en Skeikunde HG	10 494	10 362	5 212	4 294	7 771	8 008	4 063	3 522	5 393	5 880	3 114	2 677	Physical Science HG
Natuur- en Skeikunde SG	2 060	1 110	196	231	2 303	2 428	399	469	2 948	2 930	841	709	Physical Science SG
Biologie HG	7 795	5 726	11 250	9 903	6 690	5 039	9 063	8 442	5 471	4 126	7 767	6 718	Biology HG
Biologie SG	1 042	654	1 051	876	1 753	1 187	1 785	1 530	2 111	1 280	2 497	2 103	Biology SG
Fisiologie HG	5	22	3	15	3	21	–	18	29	98	4	75	Physiology HG
Fisiologie/Fisiologie en Gesondheidsleer SG	–	8	–	10	–	18	–	17	–	5	–	10	Physiology/Physiology and Hygiene SG
Funksionele Natuur- en Skeikunde SG	878	80	7	–	867	116	3	–	828	119	–	–	Functional Physical Science SG
GROEP D													GROUP D
Latyn HG	112	389	104	272	100	319	63	265	105	395	72	247	Latin HG
Frans HG	14	270	98	1 500	18	270	106	1 241	18	237	106	1 164	French HG
Duits HG	637	284	1 708	597	572	290	1 523	501	598	277	1 644	535	German HG
Grieks SG	–	–	–	1	–	1	–	–	–	1	–	2	Greek SG
Hebreeus HG	–	268	–	263	–	231	–	269	–	191	–	241	Hebrew HG
Italiaans SG	–	1	–	3	–	6	–	2	–	3	–	11	Italian SG
Nederlands SG	–	–	–	–	–	–	–	–	–	–	–	–	Nederlands SG
Portugees SG	–	2	–	–	–	5	–	5	–	6	–	8	Portuguese SG
Spaans SG	–	–	–	3	–	–	–	1	–	1	–	6	Spanish SG
Noord-Sotho HG	107	4	141	2	112	6	126	15	26	–	13	–	Northern Sotho HG
Noord-Sotho SG	114	–	122	–	188	–	95	–	130	1	222	4	Northern Sotho SG
Tswana HG	23	–	15	–	11	–	6	–	–	–	–	–	Tswana HG

APPENDIX C

SOME EXTRACTS FROM THE PILOT SURVEY SAMPLE OF CHAPTER I

David Mama High School

I prefer Higher Grade to S.G. becuase (1) most universities, technikons and colleges give higher grade subjects first preference.

(2) High Grade is thought provoking - demanding insight and understanding unlike S.G. which covers a very narrow scope that needs memory - no thought provoking questions.

(3) Higher Grade includes the work done in S.G. while in S.G. no Higher Grade work.

Mr Ningi

Buchule T.H.S.

(1) We prefer S.G. for Physical Science as most of the students at a Technical school are of very average capabilities. H.G. is only recommended for students who have proved their ability and diligence.

(2) We only have one Std 10 class in this subject which does not make it easy to mix the two grades in one class.

H. v.d. Merwe
Acting Principal

Philemon Ngcelwane High

I prefer H.G. to S.G. because should the candidates enrol for S.G. they won't be admitted in Universities; in other words it would mean that we are just encouraging students to go as far as Std 10.

Secondly if students enrol for H.G. and unfortunately fail to qualify for H.G. they might qualify for S.G. in any case if they get 33.1/3% in each paper.

Lastly if the school has qualified teachers in Std 10, I see no need for students to enrol for S.G. as if they are part time students.

J Sohabo

I prefer H.G. to S.G. because, should the candidates fail in H.G. it would be easy to convert their symbols to a pass symbol in S.G. Moreover they cannot enrol for Science at the university if enrolled for S.G.

(initial illegible)

David Mama High School

I prefer to teach the majority of students at Standard grade as I feel that most are not capable of passing Higher grade, not even at a Standard pass. Hence it is better that most should take the S.G. and have a good chance of passing than fail H.G. completely. This is particularly relevant at the present time when schooling has been so disrupted for the last few years and much of the earlier work has been forgotten.

S Williams

Buchule Technical High School

I feel my pupils are not good enough to do H.G. because of their poor background in Mathematics especially the lower standards and lack of enough motivation in the subject.

Subject Teacher Std 10: T.S. Ngumbela

APPENDIX D : PUPILS', TEACHERS' AND PARENTS' QUESTIONNAIRES

QUESTIONNAIRE ON DIFFERENTIATED MATHEMATICS

FOR TEACHERS

A. PARTICULARS OF RESPONDENT

i Rank ...

ii Experience in teaching/ed. ...

iii Experience in teaching Maths in the classroom ...

B. QUESTIONNAIRE

Respond by putting a cross ~~at~~ the relevant square e.g [x] yes if yes is your response to Q1.

QUESTION 1

Are pupils made aware of the option of taking S G or H G examinations in all subjects at Senior Secondary level in your school?

i [ ] Yes

ii [ ] No

iii [ ] Other comment ...

QUESTION 2

If the response is yes, at what point in the last two years at school are they made aware?

i [ ] At the beginning of the Std 9 year.

ii [ ] At mid year exam time of the Std 9 year.

iii [ ] At the end of the Std 9 year.

iv [ ] At the beginning of the Std 10 year.

v [ ] When registration time for the Std 10 final examination approaches.

vi [ ] At registration time for the Std 10 final.

vii [ ] Other (specify).

QUESTION 3

In the case of Mathematics, who makes the final choice as to what grade to opt for?

i [ ] the Maths teacher

2/...

ii ☐ the headmaster

iii ☐ the pupil

iv ☐ the parent
v ☐ OTHER (MENTION) - - - - - -
vi ☐ all the above

QUESTION 4

Which one of the factors (mentioned below) do you consider to be the most important in choosing either S G or H G in Mathematics?

i ☐ Getting entry to university to study for a degree.

ii ☐ The pupil's past perfomance in Maths.

iii ☐ The general ability of the pupil.

iv ☐ Aspirations of the parents i.e the profession/vocation the parent's wish the child to take at post school level.

v ☐ The pupil's aptitude for Maths

vi ☐ Other (specify) ...

QUESTION 5

Arrange the above factors in order of importance.
Use the numbers (i) to (v) only. Start with the most important.

.....

QUESTION 6

Does the Std 9 and 10 Maths text book that you use help in advising pupils and teachers in deciding on H G or S G?

i ☐ Yes

ii ☐ No

RESPOND TO QUESTION 7 BELOW ONLY IF THE MAJORITY (60%) OF PUPILS IN YOUR SCHOOL REGISTERED FOR H G MATHEMATICS IN 1987.

QUESTION 7

Most pupils did not opt for S G, because (in your opinion)

i ☐ S G would reduce their chances of getting university exemptions.

ii ☐ S G is seen as the introduction of yet another inferior syllabus.

3/...

iii ☐ Sufficient information in support of S G is either not available or not valid i.e not good enough to convince the pupils/teachers/parents etc.

iv ☐ There is a "loss of status" feeling amongst pupils at the suggestion of S G for them.

v ☐ Nobody in the staff knows enough about the S G/H G set up.

vi ☐ After all if a pupil fails H G his/her marks would be converted to a pass in the S G.

vii ☐ A combination of several factors above. Use the nos above to list such a combination in order of importance.

viii ☐ Other (specify).

ANSWER QUESTION 8 BELOW ONLY IF THE MAJORITY (51%+) OF PUPILS IN YOUR SCHOOL REGISTERED FOR S G MATHS IN 1987.

QUESTION 8

The majority of pupils opted for S G because (in your opinion).

i ☐ the syllabus is short and hence leaves enough time for revision.

ii ☐ the questions in the Std 10 final paper are easy or at least not difficult.

iii ☐ the pupil's perfomance in Maths is bad.

iv ☐ the Maths teacher forced them to take S G (some against their wishes) because after all, he/she knows they cannot cope with H G.

v ☐ Most of the pupils have no ability for university education.

vi ☐ Other (specify).

vii ☐ A combination of (mention nos above only) ...

QUESTION 9

What do you think were the reasons for the introduction of the S G option?

i ☐ to push black pupils (in a nice manner) to a lower grade Maths syllabus with all the attendant consequences.

ii ☐ to cater for pupils who are not so good in Mathematics.

4/...

iii ☐ to enable as many pupils as is possible to do Maths up to Std 10.

iv ☐ to cater for university faculties other than the mathematical sciences, physical sciences, engineering sciences and medical faculties.

v ☐ Other (specify) ...

QUESTION 10

Are the differences in content of the S G and H G syllabusses great enough?

i ☐ Yes

ii ☐ No

iii ☐ I do not know

QUESTION 11

A. Would you like to see more subject matter being taken out of the S G Course?

i ☐ Yes

ii ☐ No - Motivate ...

B. Would the addition of some subject matter make the S G course desirable?

i ☐ Yes

ii ☐ No - Motivate ...

QUESTION 12

Do you agree with some people that the final Std 10 S G Maths papers are not easy enough?

i ☐ Yes

ii ☐ No - Motivate ...

QUESTION 13

Do you agree with the statement that many teachers/educationists in the Ciskei do not know enough about the original aims of the committee (however bad or good the aims may be) which recommended the S G/H G differentiation?

i ☐ Yes

ii ☐ No

5/...

QUESTION 14

If the response to 13 is no, please motivate your answer:

_____

_____

_____

_____

_____

QUESTIONNAIRE ON DIFFERENTIATED MATHEMATICS

FOR PARENTS

N.B. Respond by putting a cross in the relevant square e.g. ☒ yes if "yes" is your response to Q1.

QUESTION 1

Are you aware of the existence of a S G and a H G syllabus for senior secondary mathematics?

i ☐ Yes

ii ☐ No

iii ☐ I do not worry about such things - the principal and teachers are better qualified to study these things.

QUESTION 2

If the answer is yes to Question 1 above, did you help your child to choose either S G or H G ?

i ☐ Yes

ii ☐ No

iii ☐ I left it to him/her and his/her teachers.

QUESTION 3

What is your opinion on the differentiated syllabus in Maths (or in general)?

i ☐ I do not know enough about it.

ii ☐ I am suspicious of the motives behind the system of differentiation.

iii ☐ It is good if its intention is to offer a more suitable Maths syllabus for pupils who lack ability.

iv ☐ A combination of (numbers only) .....

v ☐ Other (specify) .....
.....
.....

QUESTIONNAIRE ON DIFFERENTIATED MATHEMATICS FOR STANDARD 9 & 10 PUPILS

N.B. Respond by putting a cross at the relevant square e.g.
ii [x] if ii is your response to Q1.

QUESTION 1

If you registered for H G in Mathematics which of the statements below explain your opting for H G?

i ☐ S G would reduce your chances of getting university exemption.

ii ☐ S G is an inferior syllabus.

iii ☐ You do not know enough about S G e.g. for whom it was meant, or whether it will not disadvantage you later in life.

iv ☐ You did not get sufficient advice from your teachers.

v ☐ You want to follow a university career which requires a H G Maths pass.

vi ☐ You love Maths.

vii ☐ You do well in Maths.

viii ☐ Your parents wish that you follow a Mathematical Science/ Physical Science/Medical career at post school level.

ix ☐ A combination of (Nos only) ... (List in order of importance)

QUESTION 2

If you registered for S G in Maths which statement/s below explain your choice?

i ☐ You are not very good in Maths.

ii ☐ You have no intention of furthering your studies beyond Std 10.

iii ☐ You qualify for mature age exemption.

iv ☐ You want to score high marks in Maths.

v ☐ Your teacher/headmaster advised you to take S G.

vi ☐ Your parents advised you to consider S G.

vii ☐ You were forced against your wishes to take S G Maths by ...

viii ☐ Your guidance teacher/Maths teacher told you everything there is to know about S G/H G.

ix ☐ A combination of Nos only) ..... List in order of importance)

(x) ☐ OTHER - - - - - - - - - - -

APPENDIX E

SYLLABUSES FOR THREE DEPARTMENTS OF EDUCATION

NATAL EDUCATION DEPARTMENT

SYLLABUS FOR MATHEMATICS (STANDARD GRADE)

FOR THE SENIOR SECONDARY SCHOOL

(STANDARDS 9, 10)

1. General remarks

1.1 The syllabus content which is prescribed for std. VIII, is here taken as pre-knowledge to the syllabus for stds. IX and X. This knowledge is again used either directly or indirectly in the syllabus for the last two school years and thus also in the Matriculation examination, but during these years the emphasis will fall on the actual syllabus for stds. IX and X.

1.2 In tests and examinations more stress should be laid on insight and understanding than on mechanical reproduction of formal knowledge. Nevertheless the subject must be made available to as many pupils as possible by guarding against unrealistic demands in the examination.

1.3 Where applicable, the slide rule may be used.

2. General aims

2.1 To acquaint the pupils with the part played by mathematics in the modern world in which man is constantly required to handle quantitative and spatial aspects of situations.

2.2 To contribute to the general education of the pupils with special emphasis on the development of logical thought and of systematic accurate and neat methods of working.

2.3 To cultivate appreciation for the structure and the continuous theme of each section of the syllabus as well as for the underlying relation between certain sections.

2.4 To acquaint pupils with and train them in mathematical methods of thought and work.

2.5 To give pupils a clear insight into, and a thorough knowledge and understanding of those basic mathematical principles which will prepare and equip them for daily life and further study.

3. Remarks

3.1 In all sections of the subject pupils must be guided to tackle and solve each problem or theorem systematically by:

3.1.1 giving close attention to the data and what is required;

3.1.2 taking account of all facts and theorems that can possibly serve as a key to the solution, irrespective of the section of mathematics in which they appear;

3.1.3 giving close attention to necessary and sufficient requirements with respect of formulation and reasoning when writing down the solution.

3.2 Pupils must be trained in the correct use of notation and terminology, the exact formulation of statements and the making of valid deductions.

4. Examination papers and allocation of marks

4.1 Standard VIII - To be decided on by each department.

4.2 Standards IX and X.

4.2.1 The examination at the end of std. X will consist of two papers, each of three hours duration. Both papers will be set on the syllabus for stds. IX and X.

4.2.2 The total marks for each paper will be 150.

4.2.3 The distribution of marks among the various sections of the syllabus will be as follows:

4.2.3.1 Paper 1

Algebra, and one question of a miscellaneous nature which may cover all the sections of the mathematics syllabus and for which at most 15 marks may be allocated. 150 marks.

4.2.3.2 Paper 2

Synthetic Geometry	50 marks
Vector algebra	40 marks
Trigonometry	60 marks
Total	150 marks

N.B. The marks for each section of the second paper may be increased or decreased by a maximum of 5 marks.

NATAL EDUCATION DEPARTMENT

SYLLABUS FOR MATHEMATICS (HIGHER GRADE)

FOR THE SENIOR SECONDARY SCHOOL (STANDARDS 9, 10)

1. General Remarks

1.1 The syllabus content which is prescribed for Std.VIII, is here taken as pre-knowledge to the syllabus for Stds. IX and X. This knowledge is again used either directly or indirectly, in the syllabus for the last two school years and thus also in the Matriculation examination, but during these years the emphasis will fall on the actual syllabus for Stds. IX and X.

1.2 In tests and examinations more stress should be laid on insight and understanding than on mechanical reproduction of formal knowledge.

1.3 Where applicable, the slide rule may be used.

2. General aims

2.1 To acquaint the pupils with the part played by mathematics in the modern world in which man is constantly required to handle the quantitative and spacial aspects of situations.

2.2 To contribute to the general education of the pupils with special emphasis on the development of logical thought and of habits of systematic accurate and neat methods of working.

2.3 To cultivate appreciation for the structure and the continuous theme of each section of the syllabus as well as for the underlying relation between certain sections.

2.4 To acquaint pupils with and train them in mathematical methods of thought and work.

2.5 To give pupils a clear insight into, and a thorough knowledge and understanding of those basic mathematical principles which will prepare and equip them for daily life and for further study in mathematics, the pure sciences and certain of the applied sciences.

3. Remarks

3.1 In all sections of the subject pupils must be guided to tackle and solve each problem or theorem systematically by:

3.1.1 giving close attention to the data and what is required;

3.1.2 taking account of all facts and theorems that can possibly serve as key to the solution, irrespective of the section of mathematics in which they appear;

3.1.3 starting with the most obvious method and then considering other possibilities;

3.1.4 comparing the different methods of solution and making a choice;

3.1.5 giving close attention to necessary and sufficient requirements with respect to formulation and reasoning when writing down the solution.

3.2 Pupils must be trained in the correct use of notation and terminology, the exact formulation of statements and the making of valid deductions.

4. Examination papers and allocation of marks

4.1 Standard VIII - To be decided on by each department.

4.2 Standards IX and X.

4.2.1 The examination at the end of Std. X will consist of two papers, each of three hours duration. Both papers will be set on the syllabus for stds. IX and X.

4.2.2 The total marks for each paper will be 150.

4.2.3 The distribution of marks among the various sections of the syllabus will be as follows:

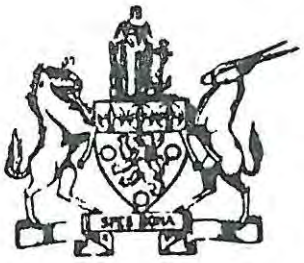
4.2.3.1 Paper 1.

Algebra, and one question of a miscellaneous nature which may cover all the sections of the Mathematics syllabus and for which at most 15 marks may be allocated : 150 marks.

4.2.3.2 Paper 2

Synthetic Geometry	65	~~50~~ marks
Vector algebra	55	~~40~~ marks
Trigonometry	80	~~60~~ marks
Total	200	~~150~~ marks

N.B. The marks for each section of the second paper may be increased or decreased by a maximum of 5 marks.



PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE

DEPARTMENT OF EDUCATION

SENIOR SECONDARY COURSE

SYLLABUS

FOR

MATHEMATICS

STANDARD GRADE

1985

SENIOR SECONDARY COURSE: SYLLABUS FOR MATHEMATICS STANDARD GRADE

The following syllabus for Mathematics Standard Grade for the Senior Secondary Course will be introduced as from 1 January 1985.

The syllabus will be introduced in Standard 8 in 1985 and the first Senior Certificate Examination in this subject will be held in November/December 1987.

SENIOR SECONDARY COURSE: SYLLABUS FOR MATHEMATICS STANDARD GRADE

1 REMARKS

1.1 The arrangement of the content of the syllabus and its subdivision is not necessarily an indication of the sequence in which the work must be handled.

1.2 Non-programmable pocket calculators may be used where necessary and applicable to develop mathematical concepts and for calculation. Basic instruction in the practical use of pocket calculators must be given.

1.3 The breakdown for Standards 9 an 10 is suggested but is not prescriptive.

2. AIMS

2.1 To develop a love for, an interest in and a positive attitude towards Mathematics, by presenting the subject meaningfully

2.2 To enable pupils to gain mathematical knowledge and proficiency

2.3 To develop clarity of thought, so that mathematical techniques may be well understood

2.4 To develop accuracy

2.5 To instil in pupils the habit of estimating answers where applicable and, where possible, of verifying answers

2.6 To develop the ability of the pupils to use mathematical knowledge and methods in other subjects and in their daily life

2.7 To provide basic training for future study and careers

3. EXAMINATION

3.1 Standards 8 and 9 are examined internally.

3.2 Standard 10

3.2.1 The external Senior Certificate papers will be set on the syllabus for Standard 9 and Standard 10.

3.2.2 There will be two three-hour papers of equivalent value with the allocation of marks as follows:

3.2.2.1 First paper

- Algebra : 75% (± 5%)
- Differential Calculus : 25% (± 5%)

3.2.2.2 Second paper

- Questions of a miscellaneous nature covering two or more sections of the whole syllabus may be asked : ± 5%
- Euclidean Geometry : 30% (± 5%)
- Analytical Geometry : 25% (± 5%)
- Trigonometry : 40% (± 5%)

4. STANDARD 8

4.1 Products

The following types by inspection:

4.1.1 $(a \pm b)(c \pm d)$

4.1.2 $(ax \pm b)(cx \pm d)$ and $(ax \pm by)(cx \pm dy)$

4.1.3 $(ax \pm b)^2$ en $(ax \pm by)^2$

4.1.4 $(ax + b)(ax - b)$ and $(ax + by)(ax - by)$

4.2 Factors

Factorization of the following types:

4.2.1 Quadrinomials by grouping in pairs

4.2.2 Quadratic trinomials

4.2.3 Difference of squares

SENIOR SECONDARY COURSE: SYLLABUS FOR MATHEMATICS HIGHER GRADE

The following syllabus for Mathematics Higher Grade for the Senior Secondary Course will be introduced as from 1 January 1985.

The syllabus will be introduced in Standard 8 in 1985 and the first Senior Certificate Examination in this subject will be held in November/December 1987.

SENIOR SECONDARY COURSE: SYLLABUS FOR MATHEMATICS HIGHER GRADE

1. REMARKS

1.1 The arrangement of the content of the syllabus and its subdivision is not necessarily an indication of the sequence in which the work must be handled.

1.2 Non-programmable pocket calculators may be used where necessary and applicable to develop mathematical concepts and for calculation. Basic instruction in the practical use of pocket calculators must be given.

1.3 The breakdown for standards 9 an 10 is suggested but is not prescriptive.

2. AIMS

2.1 To develop a love for, an interest in and a positive attitude towards Mathematics, by presenting the subject meaningfully

2.2 To enable pupils to gain mathematical knowledge and proficiency.

2.3 To develop clarity of thought and the ability to make logical deductions.

2.4 To develop accuracy and mathematical insight.

2.5 To instil in pupils the habit of estimating answers where applicable and, where possible, of verifying answers

2.6 To develop the ability of the pupils to use mathematical knowledge and methods in other subjects and in their daily life.

2.7 To provide basic training for future study and careers.

3. EXAMINATION

3.1 Standards 8 and 9 are examined internally.

3.2 Standard 10

3.2.1 The external Senior Certificate papers will be set on the syllabus for Standard 9 and Standard 10.

3.2.2 There will be two three-hour papers of equivalent value with the allocation of marks as follows:

3.2.2.1 First paper

- Algebra : 75% (± 5%)
- Differential Calculus : 25% (± 5%)

3.2.2.2 Second paper

- Questions of a miscellaneous nature covering two or more sections of the whole syllabus may be asked : ± 5%
- Euclidean Geometry : 30% (± 5%)
- Analytical Geometry : 25% (± 5%)
- Trigonometry : 40% (± 5%)

4. STANDARD 8

4.1 **Products**

The following types by inspection:

4.1.1 $(a \pm b)(c \pm d)$

4.1.2 $(ax \pm b)(cx \pm d)$ and $(ax \pm by)(cx \pm dy)$

4.1.3 $(ax \pm b)^2$ and $(ax \pm by)^2$

4.1.4 $(ax + b)(ax - b)$ and $(ax + by)(ax - by)$

4.1.5 $(ax + b)(a^2x^2 - abx + b^2)$ and $(ax + by)(a^2x^2 - abxy + b^2y^2)$

4.1.6 $(ax - b)(a^2x^2 + abx + b^2)$ and $(ax - by)(a^2x^2 + abxy + b^2y^2)$

4.2 **Factors**

Factorization of the following types:

4.2.1 Quadrinomials by grouping

DEPARTMENT OF BANTU EDUCATION
(DEPARTMENT OF EDUCATION AND TRAINING)

NATIONAL SENIOR CERTIFICATE

MATHEMATICS

HIGHER AND STANDARD GRADES

STANDARDS 9 AND 10 (FORMS IV AND V)

AS FROM THE EXAMINATION OF NOV/DEC. 1976

-1-

THE AIMS, TUITION AND EXAMINATION OF THE ACCOMPANYING SYLLABUSES

1. Introduction

A syllabus naturally specifies the prescribed subject-matter in broad outline, but inevitably also comprises the standard to be maintained as well as the structure of each section round its central theme. In compiling a syllabus both the general and the special needs of the pupils for whom it is intended must be taken into account very thoroughly, as well as the acquired knowledge and intellectual maturity of the pupils concerned.

Besides the content and the arrangement of the subject-matter the teaching methods are also of the greatest importance. This determines the success or failure of the teaching. Through the teaching the understanding and insight of the pupils are promoted, and in this way their interest in and love of the subject are developed.

The examination technique is just as important as are the subject-matter and the teaching methods. Stereotyped questions and examination papers encourage stereotyped techniques in the teaching. Such examinations promote memory work on the part of the pupils and excessive drilling by the teacher. Then it pays the teacher and the pupil to concentrate on formulae and mechanical techniques, at the expense of understanding and insight.

2. General Aims

(a) Choice of subject-matter

(1) The syllabuses link up with the existing syllabuses, with essential changes.

(2) With the content and choice of items due regard was paid to the general mathematical needs of an educated person who has to deal with aspects of quantity and space in all fields.

(3) The syllabuses lend themselves particularly to preparing and selecting prospective university students. Candidates who take Mathematics on the higher grade should not only be better equipped for any intended course of study, but are specially prepared for further study in Mathematics, Physical Science and other courses of study for which mathematical

methods and techniques are essential. The standard grade is meant to make mathematics accessible to as many pupils as possible.

(4) With effective tuition and examination both syllabuses should also lend themselves to preparing students and to the selection of prospective university students by the Joint Matriculation Board.

(b) Examination practice

(1) Mechanical reproduction in examinations of memorised definitions, formulae and techniques should be avoided as far as possible.

(2) Examination questions should call for solutions based on understanding and insight. A candidate should be able to apply his knowledge and to make deductions.

(3) Seeing that final examination papers have such a great influence on the tuition, papers should be set in such a manner that they promote correct teaching methods. It should pay the teacher to concentrate on understanding and insight rather than on excessive drill. Stereotyped papers should be be avoided.

(STANDARD GRADE) FOR THE SENIOR SECONDARY SCHOOL

1. General remarks

1.1 The syllabus content which is prescribed for std. VIII, is here taken as pre-knowledge to the syllabus for stds. IX and X. This knowledge is again used either directly or indirectly in the syllabus for the last two school years and thus also in the Matriculation examination, but during these years the emphasis will fall on the actual syllabus for stds. IX and X.

1.2 In tests and examinations more stress should be laid on insight and understanding than on mechanical reproduction of formal knowledge, nevertheless the subject must be made accessible to as many pupils as possible by avoiding unrealistic requirements in the examination.

1.3 Where applicable, the slide rule may be used.

2. General aims

2.1 To acquaint the pupils with the part played by mathematics in the modern world in which man is constantly required to handle quantitative and spatial aspects of situations.

2.2 To contribute to the general education of the pupils with special emphasis on the development of logical thought and of systematic accurate and neat methods of working.

2.3 To cultivate appreciation for the structure and the central theme of each section of the syllabus as well as for the underlying relation between certain sections.

2.4 To acquaint pupils with and train them in mathematical methods of thought and work.

2.5 To give pupils a clear insight into, and a thorough knowledge and understanding of those basic mathematical principles which will prepare and equip them for daily life and further study.

3. Remarks

3.1 In all sections of the subject pupils must be guided to tackle and solve each problem or theorem systematically by:

3.1.1 giving close attention to the data and what is required;

3.1.2 taking account of all facts and theorems that can possibly serve as a key to the solution, irrespective of the section of mathematics in which they appear;

3.1.3 giving close attention to necessary and sufficient requirements with respect to formulation and reasoning when writing down the solution.

3.2 Pupils must be trained in the correct use of notation and terminology, the exact formulation of statements and the making of valid deductions.

4. Examination papers and allocation of marks

4.1 Standard VIII - To be decided on by each department.

4.2 Standards IX and X.

4.2.1 The examination at the end of std. X will consist of two papers, each of three hours duration. Both papers will be set on the syllabus for stds. IX and X.

4.2.2 The total marks for each paper will be 150.

4.2.3 The distribution of marks among the various sections of the syllabus will be as follows:

4.2.3.1 Paper 1

Algebra, and one question of a miscellaneous nature, which may cover all the sections of the syllabus and for which at most 15 marks may be allocated. : 150 marks.

4.2.3.2 Paper 2

Synthetic Geometry	50 marks
Vector Algebra	40 marks
Trigonometry	60 marks
Total	150 marks

N.B. The marks for each section of the second paper may be increased or decreased by a maximum of 10 marks.

COMMON BASIC SYLLABUS FOR MATHEMATICS

(HIGHER GRADE) FOR THE SENIOR SECONDARY SCHOOL

General Remarks

1.1 The syllabus content which is prescribed for Std. VIII, is here taken as pre-knowledge to the syllabus for Stds. IX and X. This knowledge is again used either directly or indirectly, in the syllabus for the last two school years and thus also in the Matriculation examination, but during these years the emphasis will fall on the actual syllabus for Stds. IX and X.

1.2 In tests and examinations more stress should be laid on insight and understanding than on mechanical reproduction of formal knowledge.

1.3 Where applicable, the slide rule may be used.

2. General aims

2.1 To acquaint the pupils with the part played by mathematics in the modern world in which man is constantly required to handle the quantitative and spacial aspects of situations.

2.2 To contribute to the general education of the pupils with special emphasis on the development of logical thought and of habits of systematic accurate and neat methods of working.

2.3 To cultivate appreciation for the structure and the central theme of each section of the syllabus as well as for the underlying relation between certain sections.

2.4 To acquaint pupils with and train them in mathematical methods of thought and work.

2.5 To give pupils a clear insight into, and a thorough knowledge and understanding of those basic mathematical principles which will prepare and equip them for daily life and for furhter study in mathematics, the pure sciences and certain of the applied sciences.

3. Remarks

3.1

In all sections of the subject pupils must be guided to tackle and solve each problem or theorem systematically by:

3.1.1 giving close attention to the data and what is required;

3.1.2 taking account of all facts and theorems that can possibly serve as key to the solution, irrespective of the section of mathematics in which they appear;

3.1.3 starting with the most obvious method and then considering other possibilities;

3.1.4 comparing the different methods of solution and making a choice;

3.1.5 giving close attention to necessary and sufficient requirements with respect to formulation and reasoning when writing down the solution.

3.2 Pupils must be trained in the correct use of notation and terminology, the exact formulation of statements and the making of valid deductions.

4 Examination papers and allocation of marks

4.1 Standard VIII - To be decided on by each department.

4.2 Standards IX and X.

4.2.1 The examination at the end of Std. X will consist of two papers, each of three hours duration. Both papers will be set on the syllabus for stds. IX and X.

4.2.2 The total marks for each paper will be 150.

4.2.3 The distribution of marks among the various sections of the syllabus will be as follows:

4.2.3.1 Paper 1

Algebra, and one question of a miscellaneous nature which may cover all the sections of the syllabus and for which at most 15 marks may be allocated : 150 marks.