

A CRITICAL STUDY OF THE SENIOR CERTIFICATE EXAMINATION
OF THE DIVISION OF INDIAN EDUCATION SINCE THE
INTRODUCTION OF THE SYSTEM OF DIFFERENTIATED EDUCATION

By

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DECLARATION OF ORIGINALITY

I hereby declare that the whole of this thesis, unless specifically indicated to the contrary in the text, is my own original work and that it has not been submitted for any degree in any other University.

M. NAIDOO

OCTOBER 1984

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INTRODUCTION

Examinations are of concern to many people. To the pupil success or failure is generally measured by performance in an examination. To the teacher his pupils' performance in examinations indicate whether his teaching has been effective. It is also important for employers, particularly those who must look at performance in certain subjects of those they employ. Examinations are also a matter of considerable interest to education departments since performance in them reflects the effectiveness of the school system, and it is also essential for the development of educational policy and the allocation of financial resources.

Malherbe (1977) states that as measuring instruments examinations perform two main functions: "(a) to regulate the selection of candidates for certain special privileges and duties, and (b) to assess the amount of knowledge and skill these candidates have attained at each stage in the preparation for those duties". This involves the establishment of recognised standards.

Modern society is essentially a measuring society. To measure one must have standards. For such standards to have value there must be social recognition and acceptance. In South Africa there are nine examining bodies that conduct the Senior Certificate Examination. Many of these examining bodies cater for a particular ethnic group and the examinations conducted by some have not gained total acceptance by some communities. The question of standards among the different examining bodies also arises.

In the current climate of growing public interest in equal standards of education in South Africa it is considered necessary that some attention be focused on the comparability of standards and performance levels of candidates taking the examination of the different examining bodies. While there may be some basis for the assumption that each examining body should have an equivalent cross-section of candidates' potential and attainment and that the performance levels

should therefore be similar. This assumption does not apply in the South African context since there are wide socio-economic differences among the different ethnic groups which have an influence on performance. Environmental conditions do play a significant role in performance and therefore the high pass rate in one examining body and the low pass rate in another does not imply that the one is necessarily lenient and the other necessarily severe. Therefore, any conclusions drawn on performance in examinations is viewed in the light of the situations candidates find themselves in this country.

The Joint Matriculation Board has a set procedure by which it tries to ensure that equivalent standards among the different examining bodies are maintained. These procedures are examined in the course of this research. Further in South Africa some of the examining bodies have been established as early as the 1950's and these have had the time to develop a tradition with regard to standards in examinations. There are, however, others for example the Division of Indian Education which became an independent examining body in 1975. Research into the performance levels of candidates in this body should yield valuable information with regard to the standards achieved.

Research into examinations is a very sensitive area and it has been difficult to obtain certain confidential information from some examining bodies. In other instances information was provided on the understanding that it be used for research purposes only. In this study therefore access was gained to several areas of confidential information. In the use of this information only general conclusions were drawn and at all times the identity of examining bodies where necessary was respected.

It is hoped that this research provides some information with regard to performance of candidates in the senior certificate examinations, particularly in the examination conducted by the Division of Indian Education, an area in which very little information is currently available. Further this research

into the examining process in Indian Education has been undertaken at a time when changes in the education system in South Africa makes reviews of both curriculum development and assessment procedures imperative.

CHAPTER ONEMEASUREMENT, EVALUATION AND TESTING IN EDUCATION WITH PARTICULAR REFERENCE TO INDIAN EDUCATION1.1 THE RELATIONSHIP BETWEEN MEASUREMENT, EVALUATION AND TESTING

A clear distinction between evaluation, measurement, assessment and testing needs to be drawn.

Dizney (1971) makes the following differentiations between measurement, evaluation and testing. According to him testing deals with the use of tests as measuring instruments. Measurement on the other hand is a process which results in a set of symbols representing selected characteristics of aspects in which we are interested. Compared to measurement, the process of evaluation is even more complex. Evaluation deals with value and quality. Therefore evaluation incorporates quantitative statements (measurement) as well as value judgements.⁽¹⁾ He does, however, indicate that testing, measurement and evaluation represent an "interdependent trilogy" and summarises their definitions and interrelationships in a scheme presented in Table 1.1.

TABLE 1.1

INTERRELATIONSHIPS AND DEFINITIONS FOR EVALUATION,
MEASUREMENT AND TESTING⁽²⁾

Term	Definition	Key Synonym or Synonymous Concept	Reference Point
Evaluation	A process of determining worth or for interpreting information from	Judgement of merit	Educational goals, purposes, objectives
Measurement	A process for gaining a symbolic system to represent characteristics	Symbolic representation	Traits, characteristics, behaviour
Testing	Procedure for systematizing observations	Instruments	Tests, rating scales, observation, interviews

The following points emerge from the table. Evaluation and measurement are processes. Testing on the other hand is the allocation of a symbol to predetermined traits or characteristics. Evaluation is a consideration of these traits or characteristics and the arrival of a judgement.

Lien (1971) agrees that the terms measurement and evaluation do not mean the same thing. He maintains that measurement and evaluation involves a three-step process and that each of these phases can be seen by defining three key terms in the following order:

Measurement : Collection of data, by both objective and subjective means, to provide evidence for analysis and interpretation. This is referred to as collection phase.

- Statistical methods : Presentation and analysis of data which has been collected through measurement, preparing it for interpretation. This is referred to as the analysis phase.
- Evaluation : Evaluation is the consideration of the first two phases and the interpretation of the results to determine how well the learners have achieved their goals. This is referred to as the interpretation phase.⁽³⁾

In the context of this work measurement, evaluation and testing are seen as distinct terms that show a definite interrelationship, and are integral components in the teaching-learning situation. Measurement is a prerequisite to evaluation. Testing, on the other hand, is the application of a measuring instrument, e.g. tests to any information gathering situation. Evaluation is the interpretation given to information gathered during measurement.

In recent years another term "assessment" has become widely used in educational circles. The relationship between evaluation and assessment needs to be clarified.

1.2 THE RELATIONSHIP BETWEEN EVALUATION AND ASSESSMENT

Ebel (1974) contends that evaluation follows upon measurement and the consideration of other sources of information of a pupil.⁽⁴⁾ Huberman (1973)⁽⁵⁾, Schofield (1974)⁽⁶⁾, Montgomery (1965)⁽⁷⁾ and Davis (1966)⁽⁸⁾ confirm the view of Ebel that measurement is a prerequisite to evaluation.

Richmond (1975) holds a view different from that of Ebel. For him measurement (as for example, awarding a pupil 9 out of 10 marks for an essay) is quantitative appraisal;

evaluation on the other hand (as for example, designating the pupil's essay as "very good") is qualitative appraisal. Both are highly subjective. He, therefore, prefers the concept assessment which represents a combination of both measurement and evaluation.⁽⁹⁾

A perusal of the views of several other authorities i.e. van der Walt (1974)⁽¹⁰⁾, Niven (1977)⁽¹¹⁾, Behr (1971)⁽¹²⁾, Craig (1973)⁽¹³⁾, Jooste (1974)⁽¹⁴⁾ and Loret (1975)⁽¹⁵⁾ confirms the view of Richmond.

The view that assessment and measurement are closely linked is supported. Measurement lies at the root of both these terms. In the context of this work both terms assessment and evaluation will be used and will imply one and the same thing.

Since measurement and evaluation are integral components of the instructional process, some attention is given to the relationship between measurement, evaluation and instruction.

1.3 THE RELATIONSHIP BETWEEN MEASUREMENT, EVALUATION AND INSTRUCTION

The relationship between instruction and measurement-evaluation has been outlined by Dressel (1954)⁽¹⁶⁾. His listing, reproduced in Table 2.2 illustrates the common objectives of these two processes.

TABLE 1.2THE RELATIONSHIP BETWEEN INSTRUCTION, MEASUREMENT AND EVALUATION ⁽¹⁷⁾

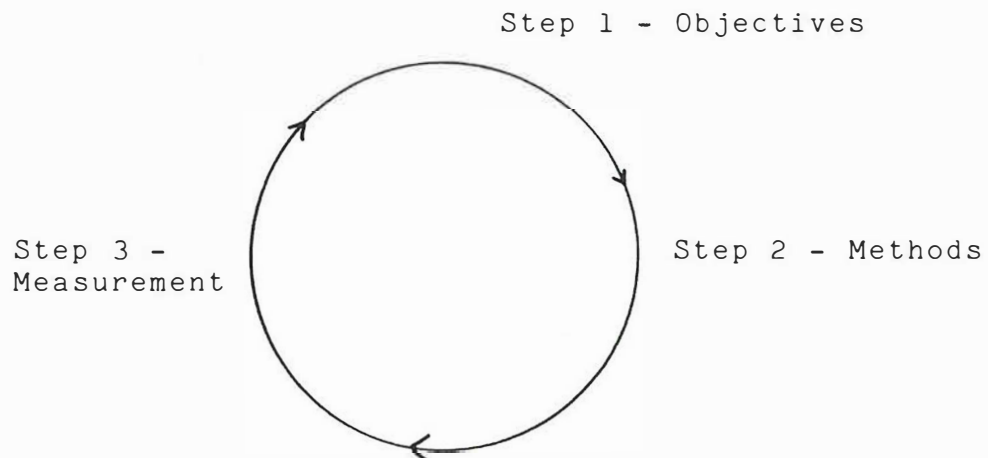
Instruction	Measurement-Evaluation
1. Instruction is effective as it leads to desired changes in students	Evaluation is effective as it provides evidence of the extent of the changes in students.
2. New behaviour patterns are best learned by students when the inadequacy of present behaviour is understood and the significance of the new behaviour patterns thereby made clear.	Evaluation is conducive to learning when it provides for and encourages self-evaluation.
3. New behaviour patterns can be more efficiently developed by teachers who know the existing behaviour patterns of individual students and the reasons for them	Evaluation is conducive to good instruction when it reveals major types of inadequate behaviour and the contributory causes.
4. Learning is encouraged by problems and activities which require thought and/or action by each individual student	Evaluation is most significant in learning when it permits and encourages the exercise of individual initiative.
5. Activities which provide the basis for the teaching and learning of specified behaviour are also the most suitable activities for evoking and evaluating the adequacy of that behaviour	Activities or exercises developed for the purposes of evaluating specified behaviour are also useful for the teaching and learning of that behaviour.

It is evident that instruction is concerned with the development of new behaviour patterns or the modification of existing patterns. Evaluation yields valuable information on the effectiveness of instruction.

Lien (1971)⁽¹⁸⁾ also discusses the relationship between measurement and evaluation. He suggests that the teaching process is a cycle, that is continuous, and that it involves a three-step process. These steps are outlined below:

1. What is worth teaching? What is worth learning?
This refers to the objectives, aims, outcomes or goals of education.
2. How can it best be taught? How can it best be learned?
This refers to the methods, techniques, procedures, and experiences to be used in the teaching situation.
3. How well has it been taught? How well has it been learned?
This is the measurement and evaluation phase of the teaching process. It determines by measuring and evaluating how well the pupil has grown towards the goals of instruction.

A diagrammatic representation of Lien's view is given below:



THE TEACHING PROCESS

The model indicates that the teaching-learning process should be considered a cycle and should therefore be regarded as continuous in nature. From the model the following can be deduced:

- Step 1. The objectives of the course give direction to what is to be learnt and how it should be best taught.
- Step 2. The methods to be employed in teaching and the most appropriate means of attaining the objectives are decided.
- Step 3. The measurement and evaluation stage will reflect on whether the teaching-learning activity has been successful or not. Further, measurement should reflect on Step 1 and Step 2. Whether the objectives and method were within the range or maturational level of the pupils concerned should come to light through the process of measurement.

The model also indicates that the teaching-learning process is never complete rather, it is changed as new goals, new methods and measurement-evaluation techniques modify the process. The model is, however, an oversimplification of the teaching-learning-evaluation situation. There are several factors such as potential of pupils, teacher variables, socio-economic conditions and certain political considerations which make the situation very complex. Nevertheless the model does help in clarifying the relationship between measurement-assessment and instruction.

1.4 THE NEED FOR MEASUREMENT AND ASSESSMENT IN EDUCATION

The importance of measurement and assessment in education cannot be doubted. According to Lindeman (1967) the measurement-assessment process can help answer such questions as : what are the characteristics of pupils at each standard or phase in the school system? Considering the general ability and aptitudes of the pupils in a given school system, how does their achievement in the various subject matter compare with that of pupils of similar ability and aptitude in other school systems?

To what extent are the instructional objectives of the school and the individual classroom teacher being achieved through the various instructional processes and methods employed? Which pupils require specialised instruction in order to take the fullest advantage of their exceptional ability or to deal effectively with special learning problems? What special instructional processes and methods and what special programmes must be developed for achieving maximum individualization of instruction?⁽¹⁹⁾

Lindeman's thoughts make it clear that the measurement-assessment process forms an essential part of the teaching-learning situation. Biehler (1971) provides a list of the advantages of the measurement-assessment process. Some of the more important ones are given below:

1. Assessment provides feedback, which often functions as reinforcement, which in turn is an essential part of learning.
2. Tests and examinations help guarantee that pupils will master basic facts and skills en route to mastery of concepts.
3. Studying for examinations can result in students over-learning. Such overlearning may ensure that materials will be remembered for a longer period.
4. Test performance provide a detailed analysis of the strengths and weaknesses of pupils. This information can be used in a variety of ways by teachers, counsellors and students themselves.⁽²⁰⁾

While agreeing with the above points, measurement and assessment in the school situation must also be seen as a means by which valuable information to parents, employers and tertiary education institutions on general standards of achievement of pupils are provided. Further, measurement and assessment are by far the best objective means by which pupils could be selected for further education or vocational training.

1.5 ASSESSMENT AND THE CURRICULUM

A curriculum is "the offering of socially valued knowledge, skills and attitudes made available to students through a variety of arrangements during the time they are at school, college or university".⁽²¹⁾

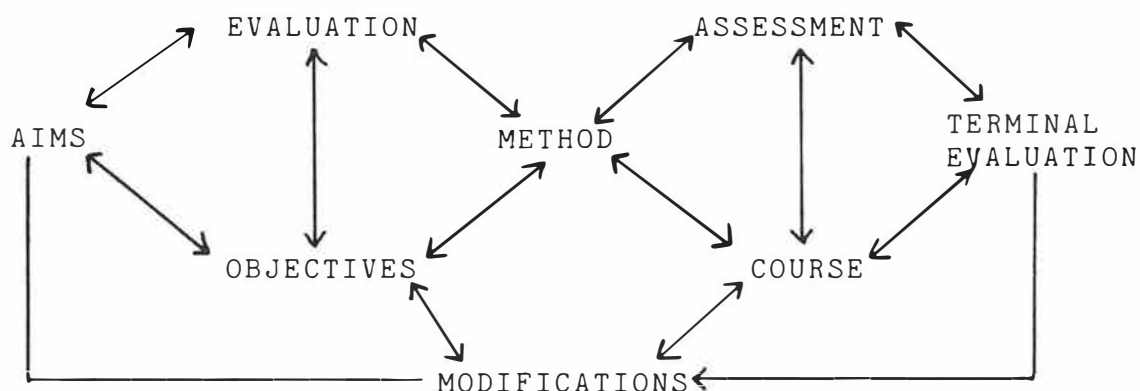
In the context of this work "curriculum" is taken to mean "all the learning experiences provided by the school".⁽²²⁾

The importance of assessment in education has been mentioned already. While assessment may be important in the teaching-learning situation it must be seen in its proper perspective. Deale (1975) states the following:

"it would be unwise to get so carried away by enthusiasm for testing that no teaching (or learning) ever got done".⁽²³⁾

Tests and examinations need to be considered in relation to the whole context of the teaching programme.

The diagram below illustrates the relationship between assessment and the teaching programme by showing a model of curriculum design.⁽²⁴⁾



RELATIONSHIP BETWEEN ASSESSMENT AND THE CURRICULUM

Starting with aims, a teacher planning his syllabus would ask himself "why am I teaching this course? What is it going to do for the pupils?" Then moving on to the more detailed objectives, he would try to establish exactly what the children should know at the end of the course and what they should be able to do then that they could not do before it started. Having decided this he would choose the most effective method of achieving these aims and objectives.

All through this preliminary planning stage, a more or less continuous process of evaluation will be going on, the teacher considers whether the aims and objectives are in accord with the general philosophy of education, whether the chosen method is practicable in terms of time, age of pupils, accommodation and equipment.

Having worked out solutions to these problems, the course can be designed taking into account the learning experiences to be offered to the pupils, books to be used, aids and practical sessions. With these should also be planned the assessment procedures that will be needed and the most appropriate technique chosen to match the particular teaching situation.

When the whole course has been worked through in practice there must be a terminal evaluation, when the whole scheme is looked at. End of year school examinations could provide valuable data for the process of terminal evaluation. As a result of this evaluation, there should certainly be modifications to be made to some or all of the preceding elements, so the process becomes one of continuous revision and improvements. (25) (26) (27) (28) (29)

From the foregoing it is quite clear that assessment does have an important function in the whole teaching-learning situation. This function must be seen as one that complements the educational process, without which the process will be incomplete.

1.6 PLACEMENT, FORMATIVE, DIAGNOSTIC AND SUMMATIVE EVALUATION

The way evaluation techniques are used in classroom instruction also provides a convenient framework for describing evaluation procedures. One such classification system by Airasian and Madaus (1972) follows the sequence in which evaluation procedures are likely to be used in classroom instruction.⁽³⁰⁾ These categories are related to their role in teaching in the following manner:

1. Evaluation of pupil entry behaviour in a sequence of instruction (placement evaluation).
2. Evaluation of pupil learning progress during instruction (formative evaluation).
3. Evaluation of pupil learning difficulties during instruction (diagnostic evaluation).
4. Evaluation of pupil achievement at the end of instruction (summative evaluation).

The functions of each of these types of classroom evaluation are different, enough to require instruments specifically designed for the intended use.

1.6.1 Placement Evaluation

Placement evaluation according to Gronlund (1976) is concerned with the pupil's entry behaviour and typically focuses on questions such as : Does the pupil possess the knowledge and skills needed to begin the planned instruction? To what extent has the pupil already mastered the objectives of the planned instruction? To what extent do the pupil's interests, work habits and personality characteristics indicate that one mode of instruction might be better than another?⁽³¹⁾ Answers to questions like these require the use of a variety of techniques such as pre-tests, school examinations, aptitude tests and reports from previous teachers.

The goal of placement evaluation is, therefore, to determine "the position in the instructional sequence and the mode of instruction that are most likely to provide optimum achievement for each pupil".⁽³²⁾

1.6.2 Formative Evaluation

Formative evaluation is used to monitor learning progress during instruction. Gronlund (1976) states that its purpose is to provide continuous feedback to both pupil and teacher concerning learning successes and failures.⁽³³⁾ Feedback to students provides reinforcement of successful learning and identifies the specific learning errors that need correction. Feedback to the teacher provides information for modifying instruction and for prescribing group or individual remedial work. Formative evaluation depends heavily on especially prepared tests for each segment of the syllabus. These tests are generally teacher-made. Since formative evaluation is directed towards improving learning and instruction, the results from such evaluation should not be used for promoting pupils from one standard to the next, nor should they be used for allocating symbols to pupils.

1.6.3 Diagnostic Evaluation

If a pupil continues to experience failure in a subject despite the use of alternative methods of instruction, then a more detailed diagnosis is necessary. Such diagnosis may be provided by diagnostic evaluation. Davis (1966) states that diagnostic evaluation searches for the underlying causes of those problems that do not respond initially to the different types of instruction.⁽³⁴⁾ Thus diagnostic evaluation is much more comprehensive and detailed. It involves the use of specially prepared diagnostic tests as well as various observational techniques.

Serious learning problems are also likely to require the service of remedial, psychological and medical specialists. The primary aim of diagnostic evaluation is to determine the causes of learning problems and to formulate a plan for remedial action.

1.6.4 Summative Evaluation

Summative evaluation typically comes at the end of a course of study. It is designed to determine the extent to which the objectives of the course have been achieved and is primarily used for promoting pupils from one year of study to the next, or for certifying pupils' mastery of instruction over a period of time. The techniques used in summative evaluation may include teacher-made achievement tests (internal school examinations) or they may include external testing usually by an examining body.

In the context of this work attention is given to the performance of candidates in external examinations. Therefore, the conclusions drawn will be based on summative evaluation.

1.7 TESTS AS MEASURING INSTRUMENTS

By far the most important measuring instrument used in education is a test. Deale (1975) states that a test refers to a particular situation set up for the purpose of making an assessment.⁽³⁵⁾ Kerlinger (1972) defines a test as a systematic procedure in which the testee "is presented with a set of constructed stimuli to which he responds, the responses enabling the tester to assign the testee a numeral or set of numerals from which inferences can be made about the testee's possession of whatever the test is supposed to measure".⁽³⁶⁾

Coulter (1974) defines a test as follows, for him a test is a measuring instrument and as such it serves to convert a behavioural or mental activity into a numeric value. In order to be a good measuring instrument, the test must be selective, accurate and sensitive.⁽³⁷⁾ According to Behr (1973), the purpose of a test is to discover, what a person can do, and the usual method is to get him to answer questions or perform tasks, and then assess the degree of success with which he does so.⁽³⁸⁾

It is submitted that a test can be used not only to measure a pupil's present performance, but also to predict future performance in a particular field of study. In this regard standardised tests have served a useful purpose.

Tests written on a large scale are referred to as examinations. Deale (1975) states that examinations are "a combination of several tests, and perhaps other assessment procedures whether within the school or conducted by an external examining board".⁽³⁹⁾ In Indian schools specially designed tests in a number of subjects are written during specified times, normally towards the end of the first half of the year and the end of the year. These tests are used for promotion of pupils from one standard to the next. Such tests are referred to as examinations. These examinations may be internal or external. All examinations, except the one taken by pupils at the end of standard ten, are internally set and administered by teachers at schools. The external examinations, i.e. the Senior Certificate Examination and the Standard 10 (Practical) Examination, are the two examinations which are set and administered by the Division of Indian Education.

1.8 ATTRIBUTES OF A GOOD TEST

Tests though varied in type and use, should possess certain minimal characteristics. A good test measures what it is supposed to measure to a high degree of reliability and with a minimum expenditure of time, energy and money (De Blassie, 1974).⁽⁴⁰⁾

This definition of a test includes the major desirable characteristics of validity and reliability. Though there are other characteristics that a good test should possess such as discriminating power and usability, attention in this study will be given to the major characteristics only.

The terms "validity" and "reliability" are probably the two most frequently used terms among those involved in examining. Not only is there confusion between the use of these words in a technical sense and their use in everyday language but there is also a lack of clarity in their technical usage. Several authorities Coulter (1974),⁽⁴¹⁾ DeBlassie (1974),⁽⁴²⁾ Deale (1975)⁽⁴³⁾ and Miller (1975)⁽⁴⁴⁾ agree that there is a technical relationship between reliability and validity. The relationship is best explained by Wiseman (1961) in his comment, "Low reliability must be associated with low validity; high reliability is a necessary pre-requisite for high validity but does not guarantee it."⁽⁴⁵⁾

It would seem that while validity is concerned with the content being tested, reliability reflects on the consistency of the measuring instrument.

1.8.1 Validity

Validity is related to the content of the test, the trait it is supposed to measure or the area of knowledge it is supposed to assess. Coulter (1974) states that validity may measure the ability of the test to predict a criterion. If this is the case then a test will have as many validities as there are criteria that it is supposed to predict.⁽⁴⁶⁾

DeBlassie (1974) says that validity must be seen as a matter of degree. It does not exist on an all or none basis and results cannot be considered as valid or invalid.

Validity is best considered in terms of categories that specify degree, such as high validity, moderate validity and low validity. Further, validity is always specific to some particular use. For example, the results of a mathematics test may have a high degree of validity for indicating computational skill, a low degree of validity for mathematical reasoning, a moderate degree of validity for predicting success in future mathematical courses and no validity for predicting success in art or music.⁽⁴⁷⁾ It is therefore essential to relate validity to the purpose and objectives of the tests being administered.

Four types of validity are usually distinguished: content validity, concurrent validity, predictive validity and construct validity. Deale (1975) and DeBlassie (1974) apart from mentioning the above four also refer to face validity. They generally agree that face validity applies more to whether a test appears to measure relevant information and content.⁽⁴⁸⁾ ⁽⁴⁹⁾ Guilford (1954) feels that it is "best restricted to the fact that a test 'looks' valid, particularly to those who are unsophisticated, in test practices."⁽⁵⁰⁾ But since appearance can be deceptive, one can have little confidence in information as superficial as that.

Content Validity

Content validity is usually defined as the degree to which a test samples adequately the specified syllabus. The Division of Indian Education specifies the content as well as objectives to be achieved in a syllabus in any subject. In the Senior Certificate Examination content validity is ensured by requesting the examiner, internal moderator as well as the moderator of the Joint Matriculation Board to indicate

on a pro-forma whether the content of a syllabus has been adequately covered in the question papers set.

Ebel (1956) feels that "the validity of a test is to be judged in terms of its relevance to the materials of instruction rather than the ultimate objectives of instruction."⁽⁵¹⁾ He states further that "only when the 'content' of education is conceived as a set of goals to be attained, rather than as a set of lessons to be studied, or as a set of class activities to be carried out, is it educationally useful to seek content validity in a test."⁽⁵²⁾

In this respect the Division of Indian Education on finding that syllabuses indicating content to be studied served a limited purpose, embarked on a project to cast syllabuses in the form of educational objectives.⁽⁵³⁾ It is possible that indicating the objectives in a syllabus would serve the purpose of giving clear direction to the teacher with regard to the depth of treatment of particular aspects of the syllabus. It is also possible that attaching objectives to syllabuses may restrict originality and confine teaching to the perceivables or measurable educational outcome only. Thus certain important educational aspects such as emotional and social development may be neglected. It would, therefore, be appropriate if teachers are made aware of both the advantages as well as the disadvantages of using syllabuses cast in the form of educational objectives.

Concurrent Validity

Concurrent validity is frequently referred to as status validity. DeBlassie (1974) states that "it is used to determine how well a test can obtain more easily, quickly and inexpensively estimates of the examinee's present status with respect to some attribute that cannot feasibly be measured by a more direct method". (54)

According to the American Educational Research Association, concurrent validity is concerned with "the relationship of test scores to an accepted criterion of performance on the variable which the test is intended to measure". (55)

Since various examining bodies in South Africa set different question papers for different groups of people at the Senior Certificate level, it would seem difficult to establish concurrent validity. These examinations while being based on common syllabuses, vary with regard to the way the syllabuses are dealt with; in addition the examination requirements of the different education departments also vary. It is, therefore, not likely that all the examinations set by the different examining bodies will be measuring exactly the same intellectual skills. It is possible that examinations do, to some extent, cater for the different cultural and linguistic groups. Therefore, one cannot at this stage predict with a great deal of certainty that a candidate offering a subject in the Senior Certificate Examination of one examining body will perform equally well in the examination of another body.

Investigations involving candidates writing question papers in the same subject of the different examining bodies in this country will yield valuable information in respect of concurrent validity of the different examinations at the standard 10 level.

Predictive Validity

Predictive validity is concerned with the predictions that can be made from test scores.

In this country the Senior Certificate examination serves two purposes viz. it is used as a certifying examination at the end of twelve years of schooling as well as a university entrance examination. The requirements for university entrance are laid down by the Joint Matriculation Board.

In an investigation conducted by Murphy (1981) to find out the predictive validity of the General Certificate of Education in Britain it was found that there was a moderate correlation between performance in the General Certificate of Education Examination taken at 16 years + and grades in A level subjects taken two years later.⁽⁵⁶⁾ From the foregoing it may be concluded that performance in a school leaving examination is no index to measure with certainty performance in another examination or course of study.

Construct Validity

Construct validity is more the concern of the constructor of psychological tests than of the constructor of tests of educational attainment. Since this aspect falls outside the concerns of this work it will not be dealt within this study.

1:8.2 Reliability

Reliability is defined as the measure of consistency in a test. (Coulter (1974),⁽⁵⁷⁾ Ebel (1974),⁽⁵⁸⁾ Behr (1971)⁽⁵⁹⁾). This can refer to the consistency of equivalent tests which should produce equivalent scores. This can be evaluated for a single test by examining the internal consistency of the test, that is the equivalence of items that are contained in it. The consistency can also refer to the degree of uniformity across time. A test should produce a similar score for a person each time it is administered. This is measured by the correlation between scores obtained on testing and then re-testing.

Green, Jorgensen and Gerberich (1964),⁽⁶⁰⁾ Davis (1966)⁽⁶¹⁾ and Borg (1967)⁽⁶²⁾ generally discuss three approaches to estimate the reliability of a test. A synthesis of these approaches is given below. The approaches to be discussed are : test-retest, alternative forms and internal consistency. All these methods have in common the derivation of two sets of scores from the "same" test given to the "same" candidates in order to obtain a correlation coefficient.⁽⁶³⁾

Test-retest Reliability

Test-retest reliability is calculated directly by correlating scores on a test with the same candidates' scores on the same test on a different occasion.⁽⁶⁴⁾ This procedure would be very difficult to apply with external examinations since getting the same candidates to write the same question paper after a few days will be met with criticism from the public as well as the pupils concerned. This method could prove a useful tool to teachers when they are doing their internal testing. Establishing the reliability of

their tests would yield information on whether these tests are testing accurately. Teachers, however, would have the problem of finding time to do a test-retest reliability if each and every test was analysed this way. It would, therefore, be preferable if tests used for revision purposes could be analysed to indicate these forms of statistics.

A problem that can be encountered with this type of testing is when the interval between the first and second application of the test is short. Certain factors relating to memory and motivation could influence performance. A long interval between the first and second application means that new learning and other related factors are likely to have taken place so that candidates are no longer the "same".⁽⁶⁵⁾

Alternate Forms

Alternative forms reliability is the result of the correlation between two very similar examinations given to the same candidates on two different occasions.⁽⁶⁶⁾ The main difficulty is in ensuring that in all major respects the two examinations are truly equivalent.

A fairly good illustration of this form of reliability is the consideration of the March and December Examination question papers set by the Division of Indian Education in its Senior Certificate Examination. The candidates who take the March examination are generally those candidates who would have taken the December examination. From

experience in dealing with these examinations over the past six years, it has been noticed that there is a high degree of correlation between the candidates' performance in the March and December Examinations. Candidates taking the March examination are generally those who perform unsatisfactorily in the December examination. However, they generally perform as poorly in the March examination.

This could be attributed to the fact that both question papers are set at the same time by the same panel of examiners. Further they are moderated by the Division's internal moderator as well as the moderator of the Joint Matriculation Board. This method ensures that the alternative forms reliability is maintained.

Internal Consistency

Internal consistency is measured by the extent to which questions in an examination measure the "same thing".⁽⁶⁷⁾ The advantages of this approach are that it eliminates too many questions measuring the "same thing" or similar abilities. Three methods of estimating internal consistency are discussed.

The Split-half Method

In the split-half method an examination is split into two parallel halves. The correlation coefficient between performance gives an alternate form estimate of reliability.⁽⁶⁸⁾ This type of reliability can generally be measured if more than one question paper is set in a subject for the

same examination. The scores obtained in both the papers can be computed to give the correlation coefficient. A high correlation would reflect the reliability of the examination.

Coefficient Alpha

Coefficient Alpha is the most general form of measurement of internal consistency reliability; it is the mean value of all the estimates which would be arrived at by using the split-half method.⁽⁶⁹⁾ In an examination of for example, 6 subjects, setting two papers in each and then determining the mean value of all the splits, would yield coefficient alpha. Christopher (1969) states that "coefficient alpha" is bound to underestimate the actual reliability and he therefore prefers the Kuder-Richardson formula for determining reliability.⁽⁷⁰⁾

Kuder-Richardson Formula 20

Borg (1967) states that this method gets at the internal consistency of the test through an analysis of the individual test items. The formula has been used to an increasing degree to determine the reliability of standardised tests.⁽⁷¹⁾

Christopher (1969) states that one desirable aspect of the Kuder-Richardson formulae is that they generally yield a lower reliability coefficient than would be obtained by using other methods. Thus, they

can be thought of as providing a minimum estimate of reliability and, if used, tend to eliminate the danger of making an over-estimate.⁽⁷²⁾

The trend to use attainment tests and criterion-referenced tests in the Senior Certificate Examination would give more scope for the use of this method of determining reliability. The use of attainment and criterion-referenced tests will be dealt with in Chapter 3.

The Division of Indian Education does not determine the reliability of the question papers set in the Senior Certificate Examination by using any of the methods discussed above. The Division relies on experienced examiners and moderators to construct the various question papers.

Nevertheless some experimentation to determine the reliability of question papers would provide valuable information to teachers and examiners concerned. Guilford (1954) states the following : "examinations are usually regarded as self-validating in the sense that they were tailored to measure the outcome of well-identified objectives in training or education. They serve as their own criteria. To know their accuracy of measurement in terms of an index of reliability, then, is of first importance, for assuming the selection of relevant material, accuracy is the only question to be raised".⁽⁷³⁾

From the above quotation the following points emerge:

1. The objectives of a course or subject can ensure the validity of the test or examination.
2. The accuracy of a test or examination can be determined by the index of reliability.
3. The reliability of a test or examination cannot easily be determined.

The use of attainment tests as well as criterion-referenced tests in examinations should provide valuable information with regard to the validity and reliability of examinations. Such tests have been used on a limited scale in the project schools of the Transvaal Education Department. However, it must be admitted that in these schools they were used for moderation purposes only. ⁽⁷⁴⁾

1.8.3 The Interaction between Validity and Reliability

Validity and reliability are closely linked but validity is the first consideration. Deale (1975) states that a test which is not valid is useless and it does not matter whether it is reliable or not. ⁽⁷⁵⁾ On the other hand, a test which is totally unreliable could not be valid because its results would depend on chance, not on attainment in the subject. Reliability is a necessary condition of validity, but not a sufficient one. Deale (1975) further states "a test can be reliable without being valid but to be valid a test must be reliable". ⁽⁷⁶⁾

Experienced examiners and moderators constructing question papers then, can ensure that a test or examination on a particular syllabus or course can be valid, but what cannot be determined with certainty is its reliability. Since validity is the precondition for reliability one can accept that a valid test is reliable (although the index of reliability may not be established). Therefore, ensuring that question

papers are set and moderated by experienced persons would greatly enhance the validity and reliability of the tests or examinations.

1.9 TYPES OF TESTS USED IN INDIAN SCHOOLS

1.9.1 Routine classroom tests given during the course of the year

The Division of Indian Education does not lay down any set procedure that has to be followed in its schools in respect of tests and testing. In some schools the principals may lay down the minimum number of tests that may be set, administered and marked by teachers during the school year. In most instances the teacher decides when a test should be given to pupils under his care.

Routine classroom tests are short and are normally constructed for the duration of half-an-hour. The test items may comprise essays, objective type questions or a combination of both.

Advice on the construction of tests and the various levels (according to Bloom's Taxonomy) to be tested are normally given to teachers by the Departmental Subject Advisers.⁽⁷⁷⁾

A test administered at the beginning of the school year, serves to give the teacher insight into what knowledge, skills and understanding the pupil has at the outset of his course. These tests are normally referred to as pretests. Ideally the programme of study for each pupil should be planned on the basis of his pre-test scores and other relevant information about him.

Periodically during the year the teacher administers short tests for a variety of purposes. These tests are referred to as class tests. Class tests may be administered to determine the extent to which pupils have learned the subject matter taught.

Most tests used for this purpose are constructed by the teacher to cover specific knowledge, skills and understanding that have been taught. Class tests can also be used to compare the achievements of an individual pupil with the achievement levels of pupils in his own class. They may also be used for diagnostic and remedial purposes. In many schools class tests are also used to estimate a pupil's potential or aptitude for learning a subject or for ability grouping within that subject.

1.9.2 Tests designed for examinations

In Indian schools specially designed tests in a number of subjects are written during specified times, normally towards the end of the first half year and at the end of the year. These tests are used for promotion of pupils from one standard to the next. Such tests are referred to as examinations. In Indian schools two types of examinations are held i.e. internal and external examinations.

Tests designed for internal promotion examinations

The Division of Indian Education lays down the procedure to be followed by schools in respect of the internal promotion examination. The Division stipulates that there must be two examinations for pupils from standards 3 to 9. One is to be written in June and the other in November/December of the same school year. The mark allocation in each of the subjects for the June and the November/December examinations is also stipulated.⁽⁷⁸⁾ The principles governing the conducting and administering of the internal examination are broadly stated. This enables schools to fashion the internal examination according to the conditions at the school.

Test papers for the examinations are set, administered and marked internally at schools. Generally at the beginning of a school year teachers are presented with a memorandum on examinations. The memorandum reflects the total marks for the June and November examinations, the total marks to be allocated to the various subjects in the different standards, the pass mark in each subject or group of subjects and the pass mark in the aggregate. In some schools, instead of presenting teachers with an examination memorandum, principals inform teachers of the examination requirements at a staff meeting. Teachers are required to take note of those aspects that concern them.

A month or so before each examination the principal delegates to certain teachers the responsibility of setting the examination papers in certain subjects. Teachers teaching the subject are normally chosen to set question papers in that subject. Teachers setting the question papers are also required to prepare detailed marking memoranda. The marking memoranda reflect the marks for the various sections of the question paper as well as the expected answers.

The test items normally set by teachers include the essay and objective type questions. Once the papers are set they are moderated by the senior subject teacher. The moderator ensures that the test items are within the prescribed syllabus and the content of the syllabus is adequately covered. Pupils are timeously informed about the examination arrangements. They are issued with examination

time-tables in which are indicated the time and date when a particular subject is to be written. Pupils present themselves for the examination papers as set out on their time-tables.

Once the papers are written, the principal distributes the marking among the subject teachers. Generally each teacher is given a copy of the marking memorandum. After the marking is completed the scripts are moderated by a senior subject teacher. The scripts are then handed to the class or form teacher who enters the marks into the class mark book.

It must be noted that pupils are allocated marks for oral, practical, assignment and project work in certain subjects only. These marks are allocated during normal teaching time during the year. Therefore some form of continuous assessment does take place within certain subjects.

At the end of the school year, the marks obtained by pupils in oral, practical, assessment, and project work is added to the marks obtained in the two school examinations.

The total mark for the school as a whole in a subject is moderated. The moderation is done by the Inspector of Education. The purpose behind this moderation is to ensure that standards are maintained in all the schools under the control of the Division of Indian Education.⁽⁷⁹⁾ In order to assist the Inspector of Education with the moderation, the Division of Education makes available to him a set of norms which are usually arrived at by observing the trends on raw scores in each of the subjects according to standard over a five-year period.⁽⁸⁰⁾

After the moderation has been done, the results of pupils are determined. They are either promoted into the next standard or failed. It is evident that the Division of Indian Education requires candidates to achieve a certain minimum competency level before being promoted into the next standard. However, basing promotion solely on examination results is not the most desirable procedure. Other factors such as pupils' potential as reflected by IQ, study habits, environmental and social conditions, should be given some consideration especially if pupils are to be retarded.

Tests designed for the external promotion examination

As mentioned earlier the Division of Indian Education administers and controls two external examinations viz.: The Senior Certificate Examination and the Standard 10 (Practical) Examination. The Senior Certificate Examination is taken by pupils who have followed the general curriculum which is referred to as the ordinary course. The Standard 10 (Practical) Examination is intended for the less able pupils, normally pupils with an IQ of about 80 to 90 and who have followed the practical course.

The Ordinary Course is a course designed for the normal child with an IQ of above 90+. (81)
The Practical Course, on the other hand, is a course of study designed for the dull normal child (IQ range from 85 - 89). This course is designed to accommodate about 20% of the pupils in Indian schools. There is divergency of views as to the percentage of

children that should fall within this category. Some educators (Behr (1971), Muller (1968)) are of the opinion that this course should cater for $\pm 16\%$ of the secondary school population. (82) (83)

The Senior Certificate Examination

The Senior Certificate Examination is written by pupils who have followed the ordinary course and who are in Standard 10. The examination is written in November/December of each year and subjects may be taken on either the higher or standard grades. Those that have certain outstanding requirements to fulfil in this examination are allowed to enter the supplementary examination which is normally written in March the next year.

Details concerning the administration and control of this examination is dealt with in Chapter 3.

The Standard 10 (Practical) Examination

This examination is written by pupils who have followed the practical course and who are in standard 10. The examination is taken in November/December. No supplementary examination is set for these pupils.

Each subject has two components, a year-mark and a theory mark. The year-mark is arrived at by the class teacher. It is usually determined on the year's work.

For the theory aspect the Division of Education sets attainment tests. The items in the attainment tests in most subjects are of the multi-choice type. These attainment tests are constructed by the Education Planning Section of the Division of Indian Education.⁽⁸⁴⁾

Each year attainment test booklets and answer sheets are sent to schools. The tests are written on dates and times specified by the Division. Once the tests have been written they are marked, in accordance with a marking memorandum submitted by the Division, by teachers at schools.

The schools are responsible for ensuring that the marking is correct in every respect and for the transfer of the total marks from the answer sheets onto a computer sheet.

After the computer sheets are completed these are submitted to the Division of Education. The marks are fed into the computer. The computer bureau then processes a distribution of raw marks.

Using the distribution of raw marks graphs are plotted. These graphs are then presented to the Departmental Statistics Committee who decide on adjustments that need to be made. The method of adjusting marks is the same as that employed for the Senior Certificate Examination. This aspect is dealt with in Chapter 5.

1.9.3 Tests designed for Selection of pupils for the Ordinary and Practical Courses

The selection of pupils for an ordinary or practical type of education is done at the end of the Standard 5 year, when the pupils are about + 12 years old. For the purpose of selection the Division has constructed attainment tests in Mathematics and English.⁽⁸⁵⁾ These tests are made up of pre-tested multi-choice items. The tests are written on dates determined by the Division of Education. Here again marking of the tests is done by teachers at schools in accordance with a marking memorandum submitted by the Division. The Division uses IQ scores, sores in the English and Mathematics attainment tests as well as scores obtained by pupils in English and Mathematics in the internal school examination for selection purposes.⁽⁸⁶⁾

Whether the above criteria is achieving the purpose for which it was intended needs further investigation. However, selection for the ordinary course and practical course as well as for university entrance has been of great concern to many educationists over a length of time.

Mention has been made of both essay type and objective type questions which are used extensively in both the internal and external examinations of the Division of Indian Education. Apart from these written tests use is also made of oral, practical, coursework and projects. Details concerning the format of these tests will be discussed in Chapter 4.

A series of tests taken under specified conditions can be regarded as an examination. Since examinations form an integral part of the educational structure, some attention to examinations in the system of differentiated education is given.

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EXAMINATIONS IN THE CONTEXT OF THE DIFFERENTIATED SYSTEM OF EDUCATION2.1 THE AIMS OF EXAMINATIONS

A survey of literature dealing with examinations will be incomplete if attention is not given to the aims of examinations. These aims will be briefly discussed below:

2.1.1 Examination as a Learning Device

Tests which are followed up by correction of the weaknesses revealed can act as learning devices. Ballard (1923) suggested that pupils should mark their own answers in objective tests : the marking would not call for great judgement on their part, but the examination would achieve a new significance as a learning device.⁽¹⁾

Research by pupils, involving the use of the library and leading towards an assignment to be assessed by the teacher, is another example of a test situation acting as a learning device, and in systems where continuous assessment is part of the examination process, considerable importance is attached to such research projects. With the introduction of differentiated education in most education departments in South Africa in 1973,⁽²⁾ greater self-study is demanded of pupils entering for the Senior Certificate Examination. Assignments, project work, year mark as well as oral and practical tests demand that candidates do individual research. The introduction of these aspects as essential parts of the examination has made it necessary for candidates to adjust to the new learning devices.

Ebel (1968) points out that the sense of achieving good scores is a strong motivator in the learning situation.⁽³⁾

Much of the recent progress in the development of "programmed learning" devices and techniques has been due to the work of Skinner, who has indicated the need for re-inforcement during the learning process. Frequent or continuous testing permits such re-inforcement.⁽⁴⁾

Where short tests are administered at frequent intervals, learning may arise incidentally through repetition and practice - an example being the effect of coaching or practice on intelligence tests as reported by Vernon (1957).⁽⁵⁾ Ballard (1923) praised the true-false tests in which pupils could decide whether statements were true or not : the merit of such a test being that "it is didactic - it teaches as well as it tests; it has a peculiar potency in building up systems of knowledge in the pupil's mind".⁽⁶⁾ The aspect of objective type tests is dealt with in Chapter 4.

By and large in Indian Education, the routine class-room tests constructed by teachers serve a didactic purpose. The school examination held during the first half of the year also serves a similar function. However, the end of year school examinations generally have very little or no influence on remediation or teaching that has to follow. The end of year examinations are used mainly as promotion examinations. It would, however, be more appropriate if the results of such examinations are also used to evaluate the syllabuses and teaching methods employed during the year.

2.1.2 Examinations to ascertain what learning has taken place

Valin (1961) states that an examination is "a measuring instrument; a check; a form of evidence"; and that it checks or gives evidence that learning has taken place.⁽⁷⁾ Any test which requires the candidate to demonstrate that a particular skill or knowledge has been communicated to him obviously effects such a "check". However, because the normal school examination may cover a year or more of schoolwork, it is apparent that only a sample of the work can be tested. This is especially so when essay-type questions are set which require expansive answers. Through sheer chance, a pupil may find that he is tested mainly on those parts of the work which, for a variety of reasons, he does not know well. Again, the marking of essay-type questions is generally subjective. Many researchers (Davis (1966), Story (1968), Ebel (1962)) comment adversely on the validity and reliability of the essay as a measuring instrument.^{(8) (9) (10)} Candidates therefore, could risk heavy penalties when their answers are marked.

The objective type tests do to a greater extent reduce some of the injustice immanent in the essay type tests, but these tests are not regularly used in the classroom situation since the construction of these tests need specialised skills. Therefore, ascertaining what learning has taken place or what achievement-level has been attained, remains an extremely difficult task for the typical school examiners.

2.1.3 Discovering whether pupils can apply principles learned

Several authorities (Burt (1950), Peel (1949), Alexander (1947))^{(11) (12) (13)} state that one of the prime purposes of education should be "to develop the ability to think". If this well-supported aim of education is accepted, it is reasonable to assume that the aim of examinations should be to test the ability to think, i.e. to use learned principles in new situations, or to apply knowledge, as distinct from mere repetition of factual detail. We do not, of course, know much about the process of "thinking", but as Goodlad has stated,

"In order to think, a child must possess information. This is so clearly evident that schools too often begin and end here.

And so the school day becomes a deadly repetition of inert facts - which, ironically, may be facts no longer."⁽¹⁴⁾

The implication is that sometimes tests or examinations, too, place undue emphasis on the repetition of fact rather than the utilisation of detail.

Recent trends in examining do, in fact provide for questions which require the application of knowledge gained. This is clearly indicated in the Senior Certificate Examination question papers set under the system of differentiated education. Most examining bodies in South Africa, including the Division of Indian Education, categorise the questions set on the basis of educational objectives. In question papers set on the higher grade, greater emphasis is placed on the application of knowledge and principles learned rather than on the simple recall of facts. In standard

grade question papers, the degree of difficulty, in respect of application of knowledge and principles, is reduced.

2.1.4 The testing of memory

The ability to recall detail does not necessarily mean that one has profited by education. All tests or examinations where a candidate is not permitted to refer to notes or books are inevitably tests of memory, and under conditions of stress and anxiety often associated with an examination, the memory can easily fail. As has been mentioned earlier, the recent trend in many external examinations has been to test the ability to apply acquired knowledge, or the ability to comprehend written material. In Indian education there was a violent reaction when under the system of differentiated education, examiners set questions which demanded critical thinking rather than the mere recall of facts.⁽¹⁵⁾ Both teachers and pupils expressed disappointment in the questions set as they did not allow for the regurgitation of prepared answers.

Capelle (1967) after pointing out that examinations are "the most nerve-wracking of all the aspects of school life"⁽¹⁶⁾ goes on to state that not all teachers appreciate the true purpose of examinations:

"Alas! It is plainly easier to ask the candidate to reproduce from memory, without using any documents, a piece of the syllabus, than to confront him with a piece of work that demands personal reflection."⁽¹⁷⁾

An essential part of the teachers' task is generally considered by most authorities (Taylor (1965), Holt (1965), Burt (1953))⁽¹⁸⁾ ⁽¹⁹⁾ ⁽²⁰⁾ to be the stimulation of pupils. Discussion, project work, and practical exercises have become

accepted features of secondary school lessons in the United Kingdom as well as in South Africa⁽²¹⁾ - examination techniques have also undergone changes, but rigid syllabuses, set text books and prescribed topics, do to some extent impose limitations on the teacher and pupil. Sometimes these imply that there is no more to know beyond what is contained in them.

Movements towards the so-called "open book" examinations have taken place in the United States (Conant (1959)) - such tests are, of particular importance in the examination of literature or any other subject where appreciation, rather than memory is called for.⁽²²⁾

One of the several objections raised by certain educationists (e.g. Hoffmann (1962))⁽²³⁾ against the objective type tests is that some of these tend to examine only the ability to recall facts. It is important to realise that not all objective tests are concerned with factual knowledge, and that most supporters of such tests agree that they should not be used in isolation but in conjunction with other processes of assessment. Besides, factual knowledge is obviously important and it is generally accepted that any examination at school should reflect the measure of the candidate's acquired basic knowledge. Ebel (1968) states,

"If a subject is not loaded with important factual truths, the value of studying it would seem open to serious question".⁽²⁴⁾

Ebel uses this claim in part support of his plea for well-constructed objective tests, even if a sizeable amount of recall in answering them is required of the pupil.

Wood (1923) confirmed by studies that facts could only be acquired, retained and reproduced by

"organising material in a logical and systematic manner (and) there can be no doubt of the value of a pure information test".⁽²⁵⁾

Ebel (1968) also points out that most of schooling involves the development in the pupil of the command of useful verbal information and verbal ability.⁽²⁶⁾ The implication is that even if tests require a certain amount of factual recall, the preceding schooling need not consist of merely factual information.

2.1.5 Testing a specific, or a general, ability

Tests or examinations set in different subjects presume to assess ability in those particular subjects, and although there may be some relationship between the marks obtained in certain areas, such as in the sciences, no valid generalisations can be made perhaps except after special aptitude tests have been applied. If one considers Guilford's scheme of mental abilities⁽²⁷⁾ then one is inclined to conclude that tests and examinations must test a number of different abilities. Therefore a single test may well test specific as well as general abilities.

The practice therefore of combining the marks of various subjects taken in an examination and arriving at an aggregate mark should to some extent reflect on general abilities. The Joint Matriculation Board as well as the other examining bodies in South Africa require candidates to obtain a certain aggregate mark as one of the requirements for university entrance.⁽²⁸⁾

In Indian schools, the aggregate mark plays an extremely important role in the promotion or retardation of pupils in the primary as well as in secondary schools.

Goodlad has the following to say about promotion and retardation:

"Promotion and non-promotion are merely the trappings of an educational era that should be long past. They do absolutely nothing to ease or expedite the job of the teacher. They certainly do nothing for the children." (29)

While agreeing with the point made by Goodlad, one needs to draw attention to establishing some minimum competency levels which pupils need to attain before continuing with work of a more difficult nature.

Whether school examinations should be used to determine competency levels is debatable. However, any system that focuses attention on continuous assessment, use of attainment tests, teachers' profiles, aptitude tests as well as I.Q. tests would appear to be serving a more useful purpose than one that relies solely on examinations.

According to Herman and Yeh (1980) the use of tests to determine different abilities, rests on a number of assumptions:

- "(1) There exists a common and identifiable set of knowledge and skills that all students must possess in order to function adequately;
- (2) tests can be designed to assess validity and reliably the extent to which a student possesses the identified knowledge and skills;

(3) standards can be set to accurately classify students into various proficiency categories."⁽³⁰⁾

One point that emerges strongly from the above quotation is that test scores and results must be used with caution, bearing in mind their limitations, especially when they are to reflect on "general scholastic ability".

2.1.6 Diagnosing weaknesses in learning or in teaching

Most teachers make use of some form of testing during the course of their work, ideally in an effort to diagnose the difficulties pupils are experiencing so that necessary steps may be taken to ease these difficulties. The results of tests should in some way yield valuable information to teachers. Remedial programmes as well as curriculum development programmes could be based on results yielded by tests.

Wall (1955) has pointed out the advantages of diagnostic tests which are an integral part of the teaching process.⁽³¹⁾ Such tests include those of reading ability, which is generally recognised as a pre-requisite for any success in education.

In South Africa, the Human Sciences Research Council is responsible for the construction of diagnostic tests. The Council among others has constructed tests in the two official languages as well as Mathematics for use in schools.⁽³²⁾ These tests enable the teacher to determine the nature of the problems of pupils. Questions are answered in the test booklet. The tests can be applied to individuals or to groups of pupils. No time limit is imposed. No norms are provided for the tests as the answers of each individual

are analysed.⁽³³⁾ The purpose being to diagnose and assist learning difficulties on an individual basis.

The importance of well-constructed tests to diagnose weaknesses in all subjects throughout the school programme, but particularly in reading is obvious.

The Division of Indian Education uses tests constructed for diagnostic purposes, by the Human Sciences Research Council, mainly in the primary schools under its control.

2.1.7 To encourage learning by competition

Competition among pupils is well-known as an integral part of any educational system where stress is laid on achievement and examination.

Dobinson (1963) feels that the unending competition typical of many school systems leads to the stultifying of the individual. According to him in such an atmosphere,

"It is going to be very difficult to produce a population in which the majority of people are going to regard learning as a life-long process."⁽³⁴⁾

On the other hand, of course, total lack of competition would probably lower motivation. An over-emphasis of competition could lead to certain pupils losing interest in school.

Wall (1955) suggests that what is needed is

"a system whereby effort and attainment are separately assessed and compared, not as between pupils, but by comparison with each pupil's own previous levels."⁽³⁵⁾

In such an ideal system, the normal group

examination would seem to have little place. A truly differentiated system of education does provide for competition, but not of the same kind for all pupils; a child can readily and without harm compete with others of approximately equal ability in a particular subject; or compete with himself, i.e. against his previous attainments.

2.1.8 Examinations as an administrative device

When the placement of pupils is based on the results of examinations, these can be said to have served an administrative purpose.

Selection for different categories of education, grouping for differentiated education, and promotion or retardation are all examples of placements which may arise from examinations.

In the Division of Indian Education the school examination is used for promoting pupils from one standard to the next and for the selection of pupils for an ordinary or practical type of education.

In the selection of pupils for the different types of education various criteria are used, some of which include performance in the school examination, I.Q. of pupils, teachers' estimate of pupils' performance as well as performance in attainment tests in English and Mathematics. (35)

There is no doubt that examinations in South Africa serve both an administrative as well as an educational function. The classification of pupils into classes or standards as well as the selection of pupils for different types of courses on the basis of school examination results has in some instances led to an over stress on the administrative role of examinations.

This would also apply to many schools under the control of Indian Education.

2.1.9 An examination as a tradition

It is clear that many aspects of an educational system arise out of custom or tradition and that they continue to be used when they no longer serve a true purpose, or when more effective means to the same end have been found.

In the United Kingdom examinations conducted by the Oxford and Cambridge examining boards are still steeped in tradition. The essay type tests still predominate. While other examining boards have included an oral/practical dimension in their examination, the examinations of these boards remain unchanged.⁽³⁶⁾

It is clear that at least some of the uses of examination exist mainly to preserve tradition.

2.1.10 To predict future attainment and to select for education

Prediction for future education and selection for the different types of courses is generally based on performance in examinations. The Joint Matriculation Board lays down certain criteria, based on performance in an examination, for university entrance. University faculties also lay down criteria for entrance into them. For example, the Science faculty at most universities require a pass in Mathematics on the higher grade before consideration is given to an applicant.

Hylla (1936) noted that ordinary school marks had less prognostic value for achievement in the secondary school than did the results of intelligence tests. He added,

"The selection of pupils would have been approximately 70% better had the results of intelligence testing been taken into adequate consideration."⁽³⁷⁾

Currently Steffens (1980), a member of the Joint Matriculation Board, is investigating the use of I.Q. scores in the senior certificate examinations. The findings in this investigation will, it is hoped, contribute to our understanding of the predictive value of I.Q. as well as the Senior Certificate Examination.⁽³⁸⁾

Achievement tests of a standardised type are also finding increasingly widespread usage in South Africa. The Transvaal Education Department uses achievement tests constructed by the Human Sciences Research Council in many of its curriculum investigation projects.⁽³⁹⁾ The Division of Indian Education is also making increasing use of achievement tests. These tests are standardised by the Division and are used to control the standards of the various schools, particularly in the Standard 10 Practical Examination where 75% of the marks constitute a year mark allocated by the school.⁽⁴⁰⁾

Mathews and Leece (1976) feel that a major failure of secondary education is that we educate to classify rather than to consider all aspects of all pupils - and that this classification is often the result of unreliable methods of examining.⁽⁴¹⁾

The development of the differentiated system of education in South Africa has to some extent moved away from the final rigid classification of pupils into particular streams. The structure allows for some degree of mobility.⁽⁴²⁾

Recent proposals in respect of education in South Africa by the Human Sciences Research Council (1981) include a structure which allows for flexibility as well as for individual differences among pupils.⁽⁴³⁾

One criticism that is levelled against such a structure is that organisational and administrative issues may tend to overshadow educational considerations. In other words pupils may be forced to select certain subjects or courses because of uneconomic teaching units. Nonetheless if such a structure bases classification or movement of pupils from one module to the next on a variety of factors such as school examination, attainment tests, I.Q. scores, teachers' estimates, aptitude and interest tests as well as continuous assessment then selection and prediction for future education would be more reliable than is at present.

2.1.11 To give candidates qualifications

Society places tremendous emphasis on so-called "paper qualification" when important decisions in respect of personnel selection are made. Valentine (1932) expressed the hope that

"A weakening of the faith in the infallibility of examinations should lessen the insistence by business or professional men on certain paper qualifications, and so reduce the excessive pressure of examinations upon studies at school."⁽⁴⁴⁾

This hope has, however, not materialised, as evidenced in England by the introduction of the Certificate of Secondary Education to provide certificates for those who are unable or unwilling to complete the General Certificate of Education courses but who find that without some form of certificates some avenues of employment

often closed. (45)

The Senior Certificate Examinations in South Africa serve two purposes - i.e. they provide for certification after 12 years for school-leavers and test for entrance to university.

Whether an examination should serve two purposes is a debatable one. There are those that hold the view that a single examination cannot perform two functions. In the United Kingdom the Certificate of Secondary Education was introduced mainly for those who did not intend proceeding to university.

By 1980 the educationists in Britain were becoming more and more aware of the problems of administering and controlling three examinations, viz. the Certificate of Secondary Education; the General Certificate of Education Ordinary Levels and the General Certificate of Education Advance Levels.

Further, many candidates took all three examinations, or took certain subjects, from each of the examinations. The system of education, therefore, tended to become ridden by examinations.

In 1980 the government in England appointed a commission consisting of representatives of the public, private as well as the education sectors to investigate and make its recommendations on the possibility of reducing the number of examinations.

The solution to this problem could possibly be to have common examinations but to utilise different criteria for the different purposes intended. For example for university entrance the examination results as well as other criteria

such as aptitude tests, achievement tests and I.Q. could be used. Further the pass % for university entrance could be different from that of the school leaving certificate.

While this situation applies to the Senior Certificate Examinations conducted in this country, it must be pointed out that the requirements for university entrance tends to influence the nature of the Senior Certificate Examination to a great extent.

2.2 THE AIMS AND PRINCIPLES GOVERNING A SYSTEM OF DIFFERENTIATED EDUCATION

It is a universally accepted fact that the aims of education, and with them, educational practice, should be determined by the educator's view of life. For that matter the aim of education should be determined by the aim of life. The educator's view on life should determine his view on education.⁽⁴⁷⁾ However, this is not always possible since educationists have to at times design the educational structure round the views of the decision-makers in society. It is therefore possible that politicians' or perhaps even administrators' views can become integral parts of the educational structure.

Van der Merwe (1974) states that the aims of the system of differentiated education fit into the "broad framework of pedagogics" and "education in general".⁽⁴⁸⁾ Therefore, according to him one of the aims of the present system of differentiated education in South Africa is "the provision of help and support by the adult (teacher) to one who has yet to become an adult (child) with his differentiated human potentialities."

Differentiated education seen in this light can be regarded as education for the individual and this is best illustrated by the National Education Policy Act (No. 39 of 1967) which states:

"Education shall be provided in accordance with the ability and aptitude of, and interest shown by the pupil, and the needs of the country, and that appropriate guidance shall, with due regard thereto be furnished to all pupils."⁽⁴⁹⁾

Education provided in accordance with the ability, aptitude and interest shown by the pupils may be termed differentiated education.

Another term synonymous with differentiation is streaming which has been applied with some measure of success in comprehensive schools in England.⁽⁵⁰⁾⁽⁵¹⁾ Van der Walt (1972) states that differentiation can be regarded as "the adjustment of education to individual difference."⁽⁵²⁾

Some of the basic principles governing differentiated education in South Africa have been enunciated by the Human Sciences Research Council (1971).⁽⁵³⁾ Attention will be given to some of the more important principles.

.Equality and inequality of human beings.

The Human Sciences Research Council states that every child should have the democratic right to equal educational opportunity. Education should, therefore, offer every pupil the opportunity of full development according to his capacities. It is interesting to note that the recent report of the de Lange Committee (1981) on education in South Africa includes the following as one of the principles for the provision of education in the Republic of South Africa:

"Equal opportunities for education, including equal standards in education, for every inhabitant, irrespective of race, colour, creed or sex, shall be the purposeful endeavour of the State."⁽⁵⁴⁾

From the foregoing it is clear that the first Human Sciences Research Council report (1971) mentioned earlier concerned itself with broad educational principles governing differentiation while the 1981 report gave specific attention to the social, educational and political aspects. What is, however, common in both the reports is the recognition of individual differences and the provision of education to meet the needs of individuals.

• General formative education

General formative education particularly during the first few years of formal education is one of the principles on which differentiation is based. Specialisation could take place after the formative stage. An attempt is made not only to train the child as a specialist, but also to educate him as a human and social being.

After the formative years where the emphasis is on reading, writing and mathematics, the educational system is designed to offer academic, technical, commercial, agricultural, domestic science and aesthetic (art, music) fields of study to prepare pupils to satisfy the manpower requirements of the country.

In Indian schools a general type of education is offered in the primary schools, while specialisation in certain directions of study takes place in the secondary schools. The extent to which specialisation takes place is determined by a number of factors, some of which are : the demand for the course, economic class units, availability of teachers and accommodation.

• Observation or "bridge" period

Differentiation makes allowance for pupils who have been admitted to a course of study which does not suit their capacities to move across to a course more suitable

to their needs. This is referred to as "bridges" between courses.

The aspect of "bridging" between courses, study directions and modules of a course has been given considerable attention by the de Lange Committee (1981). The report also gives attention to the vertical as well as horizontal flow in an educational structure.

Vertical flow is defined as "the completion by the learner of a particular grouping of successive years of study in order to reach a specific scholastic withdrawal point in a particular field of study". Horizontal flow "refers to a change of field of study or degree of difficulty".⁽⁵⁵⁾ When the learner reaches his "academic ceiling" in one course he may then take another course of a different degree of difficulty.

The bridging, vertical and horizontal flow provided for in this structure takes differentiated education to its logical conclusion. The implementation of the structure is going to be challenging and interesting.

. Guidance

Differentiated education provides for an extensive guidance programme. The aim of guidance "is to place pupils in a field of study in accordance with their potential".⁽⁵⁶⁾ In order to undertake this type of work guidance specialists are required to be an integral part of educational administration. Further since "progressively less value is being attached to I.Q. as criterion in the placement of pupils in fields of study", the guidance specialist has to rely on several other factors such as, aptitude, interest, personality structure, characteristics, scholastic tests, school record, the judgement of teachers and parents in order to advise pupils correctly.

It is also noted that the 1981 Human Sciences Research Council's report on Education also emphasises the importance of guidance in the differentiated system of education. The report states : "the demand for school guidance programme involves two aspects : a general guidance component and a career guidance component that make provision for assisting the pupil to fit into the community and the occupational world in a meaningful way". (56)

Having given some attention to some of the underlying principles governing differentiated education attention will now be given to examinations under the system of differentiated education.

2.3 EXAMINATIONS AND DIFFERENTIATION

Certain examinations or tests, notably those which seek to establish the level of an individual's "intelligence" rest upon the assumption that the human mind is in fact measurable. (57)

McIntosh (1949) has stressed that the human personality constantly defied exact measurement. As a result, allowances should always be made, and the educational system should be sufficiently flexible to "allow for the unexpected development of individual children". (58)

Examinations or tests have throughout their history been used to make certain educational decisions such as whether one should be granted admission to university, or whether one should be required to repeat a year's schooling - and, depending on the area and the time concerned, these decisions have sometimes been final and definite. (59) It is only recently that results of examinations and tests are being put into its correct perspective. Educators have realised that such results can only be used meaningfully when their limitations are borne in mind.

Wall (1955) points out that modern European educational developments have provided for a postponement of any rigid or final selection/rejection process among pupils, particularly where such process is based upon written examination. (60)

It is noted that current trends in education favour the consideration of the pupil as an individual. Lister (1958) expresses this clearly as follows:

"Examinations are part and parcel of the business of education, and must be viewed in that light, against the background of educational principles Chief among these is the belief that every child is a separate, different and valuable individual, and that no system, whether examinations or anything else, which cramps or distorts the individual can possibly be good". (61)

Lister quite rightly points out the importance of examinations in education. The problem, however, arises when too much emphasis is placed on examinations rather than on the curriculum. The curriculum should dictate to a great extent the form and type of examination that should be administered. Too often the examination tends to have an undue influence on the curriculum.

Lister also adds that the main function of any examination should be "to summarise and test the work done up to a given point, not to determine the work that shall be done". (62)

Vernon (1957) also stresses the importance of flexibility in considering the individual in a programme of differentiation:

"In view of the complexity of the environmental, emotional and intellectual considerations involved, some errors will occur in any system of selection applied to human beings, and unless there is appreciable administrative elasticity, there will always be unfortunate borderline cases with con-

sequent frustration for the individuals concerned".⁽⁶³⁾

Differentiation of education to suit individual needs in each subject is generally accepted as a major task of educators. The necessity for some sort of examination, is not questioned - but both differentiation and examination should, it seems work to the best interest of the educational needs of individuals.

2.3.1 Differentiation in general in South Africa

In South Africa, the first National Advisory Education Council instituted in 1962 provided the impetus for the appointment in 1964 of a committee under the chairmanship of the Director of the National Bureau of Educational and Social Research (now the President of the Human Sciences Research Council) and comprising senior officials from each education department to look at the problems of differentiated education from a national viewpoint.^{(64) (65)} This Committee was required "(a) to study the question of differentiated education and guidance; (b) to determine what was already being done in these fields; and (c) to pinpoint the problems and to determine what research should still be undertaken before any steps were taken to evolve a mutually acceptable plan".⁽⁶⁶⁾

In drawing up its report, the Committee was influenced by the reports of various commissions presented between 1939 and 1955. (Nicol Commission (1939), Wilks Committee Report (1946), De Villiers Commission Report (1948), Pretorius Commission (1951), Steyn Committee (1953), Van Wyk Report (1955).)^{(67) (68) (69)}

The Committee brought out a comprehensive report in two parts in 1971. By then the National Education Policy Act (no. 39 of 1967) had already

been promulgated and the main recommendations both in regard to the division of the educational system into four phases, and the provision for guidance were accepted by the Government and implemented by regulations published in the Government Gazette of 12 November 1971.

As early as January 1966, in terms of Circular No. 102 of 1965, the Transvaal Education Department permitted a pupil to change his curriculum at any stage of his entire secondary course. In this respect it may be pointed out that the Transvaal Education Department adopted a three stream policy. The A stream candidates were prepared for the Senior Certificate with Matriculation Exemption. On obtaining the Senior Certificate with Matriculation Exemption these candidates could study for degrees at universities. The B stream candidates were prepared for the Senior Certificate which would enable them to study for a diploma at tertiary level, while the C stream candidates were prepared for apprenticeship or employment. Their education terminated at the end of standard 8. (71)

Following on Act No. 39 of 1967 and regulations published in the Government Gazette of 12 November 1971, the Natal Education Department implemented differentiated education at the beginning of 1973. The Division of Indian Education followed suit in 1973 because pupils of this Division were then writing the Senior Certificate controlled by the Natal Education Department. By Circular No. 28 of 1972 dated 4 August 1972, the Division of Indian Education notified schools under its control about the implementation of the new system of differentiated education and the four phase system. (72) The Orange Free State Education

Department, the Cape Province Education Department and the Department of Coloured Affairs introduced differentiated education as from the beginning of 1974.⁽⁷³⁾ Inherent in the system of differentiated education in South Africa is the division of the school system into four phases. A brief overview of the four phase system as well as the type of examinations within each follows.

2.3.2 The four-phase system of schooling and the type of examinations undertaken within each phase.

The four-phase system of differentiated education as laid down in the National Education Policy Act (No. 39 of 1967) for Whites was introduced in Indian schools in 1973. In Indian Education the four-phase system is identical to that for Whites.⁽⁷⁴⁾

The twelve years of schooling are divided into (i) the junior primary phase, which covers the first three years of schooling and includes Class 1, Class 2 and Standard 1; (ii) the senior primary phase, covering the second three years of schooling and embraces Standards 2, 3 and 4; (iii) the junior secondary phase covers the third three years of schooling, and embraces Standards 5, 6 and 7; (iv) the senior secondary phase involving the last three years of schooling and embraces Standards 8, 9 and 10. At the end of this phase the pupils write the Senior Certificate Examination, which may be taken with or without matriculation exemption. Subjects may be offered at Higher or Standard Grade. This aspect will be dealt with in Chapter 3.

Table 2.1 is a flow chart reflecting the four-phase system of differentiated education in South Africa. The flow chart has been adapted from Behr (1978) - New Perspectives in South African Education.⁽⁷⁵⁾

TABLE 2.1

FLOW CHART SHOWING THE FUNCTIONING OF THE SYSTEM OF DIFFERENTIATED EDUCATION

AGE +/-	SCHOOL PHASE	CLASS	C O U R S E S		
6 7 8	PRIMARY PHASE	PHASE ONE JUNIOR	Class i Class ii Std. 1	ACADEMIC COURSE Pupils follow academic course of instruction.	PRACTICAL COURSE
		PHASE TWO SENIOR	Std. 2 Std. 3 Std. 4	Pupils follow academic course of instruction.	
9 10 11	SECONDARY PHASE	PHASE THREE JUNIOR	Std. 5	Pupils follow academic course which comprises: compulsory examination subjects. non-examination subjects	
			Std. 6	Pupils follow academic course which comprises: Compulsory examination subjects. Optional examination subjects. Compulsory non-examination subjects.	Pupils may follow the Practical Course comprises: Compulsory examination subjects. Practical subjects. Compulsory non-examination subjects. Pupils may select and follow one of the following lines of Study: Commercial Home Economics General Technical
		Std. 7	(Pupils are advised to choose subjects which will benefit them in the field of study which they plan to follow at a later stage.)		
		Std. 8	Pupils select and follow a field of study. Such a field comprises: Official languages Subjects characteristic of the field. Compulsory non-examination subjects.	Pupils follow one of two lines of study Technical General Courses comprise: Compulsory examination subjects i.e.: Official languages Back ground subjects Practical subjects.	4th year Std. 9
Std. 9	PHASE FOUR SENIOR	Std. 9	Fields include Natural sciences Humanities Commercial General Technical Home Economics		2nd Phase
		Std. 10	These courses may lead to University Entrance.	Compulsory non-examination subjects	5th year Std. 10

An analysis of the system of differentiated education will be discussed in the sections that follow. Attention will also be given to the methods of examining in each of the phases.

2.3.2.1 The junior primary phase

In classes 1 and 2 and standard 1, differentiation is based on the manner of presentation of subject matter.

"The subject matter is presented in a manner that will develop the potential of every child to the utmost".⁽⁷⁶⁾

There is no differentiation in the subject matter to be presented in this phase. The basis is class teaching, but within it, provision is made for individual help to pupils through grouping. The Division of Indian Education makes extensive use of grouping of pupils in this phase.⁽⁷⁷⁾ The emphasis being on the development of basic skills in reading, mathematics and writing.

Assessment of pupils' work in phase one is done mainly by the class teacher. The class teacher's assessment may, however, be moderated by the Head of Department for the Junior Primary Phase. There are no formal tests or examinations which pupils have to undergo. All assessment is done informally.

In most education departments promotion from one class to the next in this phase is automatic. Pupils tend to move along with their peer groups.^{(78) (79)} In the Division of Indian Education a basic knowledge of general mathematics, main

language (English) and Writing (as a skill) is necessary for a child to be promoted into the next class. In standard 1, however, pupils write short informal tests throughout the year. On the basis of the performance of pupils in these tests, they are either promoted into standard 2 or have to repeat standard 1.⁽⁸⁰⁾

The question of whether pupils should be retarded during their first few years of schooling is one of tremendous concern. Current literature (Goodman and Gardiner (1981)), (Levin, Yussen, De Rose and Pressley (1977)) indicate that "young children may be generally quite inaccurate" in assessing and recalling knowledge gained.^{(81) (82)} Therefore, a system of progression by age would be the most desirable one during the early years of schooling.

Keys (1911) found that "pupils who are retarded often show up less well on achievement tests after a year of repeating the grade than before doing so".⁽⁸³⁾ Such a view is also corroborated by Saunders:

"Children do not appear to learn more by repeating a grade but experience less growth in subject-matter achievement than they do when promoted. Therefore, a practice of non-promotion because a pupil does not learn sufficient subject-matter in the course of a school year, is not justifiable."⁽⁸⁴⁾

Certain arguments in favour of both promotion and retardation have been put forward, and these are summed up by Goodlad (1966) as follows:

Reasons justifying retardation:

- (a) Achievement levels are enhanced by the repetition of only partially-learned material.
- (b) The promoted slow-learner, unable to do the work of the class, develops inferiority feelings which adversely affect his social relationships and personality development.

Reasons justifying promotion:

- (a) Learning is advanced when children move to new endeavours instead of experiencing the dullness and boredom of repetition;
- (b) Promotion retains among a group an approximately common chronological age, which results in easier personal relationship and few behaviour problems. (85)

These arguments are almost diametrically opposed and evidence could be cited to support each point of view, so that no generalised answer is acceptable. The implication is that the educational organisation needs to permit the continuous progress of each individual pupil.

In this respect the Human Sciences Research Council's report on Education (1981) takes into consideration the

differing abilities and aptitudes of pupils and recommends, as mentioned earlier, a structure of education which allows for the horizontal and vertical mobility of pupils.⁽⁸⁶⁾

It will be interesting to note what effect this system will have especially with regard to the mobility of pupils from one class to the next.

2.3.2.2 The senior primary phase

In this phase class teaching still forms the basis of the educational programme, but subject teaching may be attempted in certain subjects. The class teacher is generally responsible for teaching most subjects. However, in certain subjects e.g. Music and art, specialist teachers are utilised. There is no differentiation in the subject matter to be presented. Grouping of pupils into ability groups is still a feature.⁽⁸⁷⁾ The Division of Indian Education states the following as the aim of this phase "to develop to the utmost (pupils') ability".⁽⁸⁸⁾ Here again the emphasis is on Reading, Writing (as a skill) and Mathematics and in standards 3 and 4 some attention is also given to History, Geography, Health Education and General Science.

Generally the assessment of pupils' work in this phase is based on teacher-made classroom tests. In the course of the year the teacher constructs a number of tests which are moderated by the administrative staff at a school.

In Indian education the cumulative results of tests taken by standard 2 pupils are considered for promotion into the next standard. In standards 3 and 4 assessment of pupils' attainment is based on formal tests given during the year as well as on two formal examinations. These examinations are internal ones where the teachers set and moderate the question papers. The scripts of pupils are also marked by teachers. Pupils are promoted to the next standard on the basis of their performance in the examination. (89)

In the Natal Education Department as well as the Transvaal Education Department, pupils are assessed throughout the year on teacher-made tests. These Departments employ a system of "automatic" promotion from one standard to the next. (90) (91)

"Automatic" promotion is based on continuous assessment which according to the Schools Council (1975)

"deliberately allows for periodic assessment throughout the course and takes into account progress towards the goal as well as success in reaching it;

.... the building up of a cumulative judgement about the performance of each individual;

.... a continual updating of teachers' judgements about their pupils." (92)

The essence of continuous assessment is that it is a cumulative process, developing as the pupil develops and reflecting

his changes in response to the course. Boyce (1978) states that in continuous assessment

"A wide variety of methods of assessment is possible. A wider range of skills and abilities can be assessed and therefore the assessment is likely to be more valid than conventional examinations."⁽⁹³⁾

From the foregoing it is quite clear that automatic promotion, based largely on continuous assessment, would serve a more useful purpose than promotion based on achievement in conventional examinations.

2.3.2.3 The junior secondary phase

The Human Sciences Research Council's report on differentiation (1971) recommends that the educational programme in this phase should "provide for the unique physical, social, emotional and intellectual needs of the pre-adolescent, while it must also take into consideration the early changes which go hand in hand with a child's entry into puberty."⁽⁹⁴⁾

Basically the syllabuses for subjects in this phase are not differentiated, but the subject matter is presented, "in a differentiated manner to enable pupils to obtain the maximum benefit from the educational programme according to their aptitude and ability."⁽⁹⁵⁾

During this phase pupils are exposed to a number of subjects so that they can select subjects which interest them.

These subjects may be also taken in the next phase i.e. the senior secondary phase. Pupils proceed into the next phase on the basis of their performance in school examinations.

Those pupils who are unable to benefit from the normal educational programme are identified. A more practical and vocationally orientated course is provided for such pupils.

The Division of Indian Education has developed a procedure whereby pupils are selected for the ordinary and practical courses. This procedure involves the consideration of several factors, such as pupils' I.Q., attainment in school examinations, attainment in achievement tests and teachers' estimates of a pupil's potential, before a pupil is placed into the practical course.⁽⁹⁶⁾

Selection for the different types of secondary education has been a topic that has been extensively debated both locally as well as in the United Kingdom.

Burt (1950), Peel (1949) and Alexander (1947); are in agreement that one of the most essential features in the process of selection for secondary school courses should be the use of intelligence tests.^{(97) (98) (99)} There are others, Blackburn (1945), Fleming (1947) who hold the contrary view.^{(100) (101)} Blackburn has declared that it has been "all too readily assumed that intelligence tests are measuring innate intelligence and

nothing else, whereas all that has been shown is, in fact that they measure the ability to answer intelligence test questions."⁽¹⁰²⁾ Fleming (1947) points out that recent researchers have shown how the subsequent progress of many pupils may fail to conform with the predictions based on intelligence tests applied five or ten years earlier. Burt (1950) states that no psychologist has ever supposed that intelligence tests "furnish perfect measurements of innate ability, any more than a clock or watch gives a perfect measure of the lapse of time."⁽¹⁰³⁾ At a symposium on Selection for Secondary Schools held in Britain in 1950, the vast majority of psychologists agreed that at the age of 11+ innate general intelligence can be estimated with reasonable accuracy by means of standardised tests.⁽¹⁰⁴⁾

McClelland (1942) states that intelligence tests, school examinations as well as teachers' estimates used collectively can provide valid information for selecting pupils for secondary school education. He further states that "no matter what system of selection is adapted, allowance must always be made and the educational system must be sufficiently flexible to allow for the unexpected development of individual children."⁽¹⁰⁵⁾

In this regard the Human Sciences Research Council's report on the "Provision of Education in the RSA - 1981" has provided for the "unexpected development of individual children."⁽¹⁰⁶⁾

Such mobility if implemented would, it is hoped, overcome the many problems surrounding the selection of pupils for the ordinary and practical courses under the present system.

2.3.2.4 The senior secondary phase

In this phase pupils are offered various fields of study and in certain subjects, within the fields of study, a subject may be offered on either the Higher or Standard grade. Subjects that are offered on two levels are taught and examined at two levels. The emphasis in this phase is on subject teaching and the development of the potential of every child to the fullest.

The Division of Indian Education offers 40 subjects in this phase, some of which are offered on the higher as well as on the standard grade, while others are offered on the standard grade only.⁽¹⁰⁷⁾ Details in this regard will be dealt with in Chapter 3.

Generally assessment of pupils' work in this phase (standards 8 and 9) is done by the subject teachers. In Indian schools promotion of pupils in standards 8 and 9 is based on performance in two internal school examinations.⁽¹⁰⁸⁾ Prior to the introduction of differentiated education, promotion was based on written examinations only. With the introduction of differentiation, the assessment procedures were modified to include oral examinations, practical examinations, assignments and coursework in certain subjects.

Standard 10 is the final year of the senior secondary phase and pupils at the end of this year write an external examination, the Senior Certificate Examination. In South Africa nine examining bodies conduct the Senior Certificate Examination.⁽¹⁰⁹⁾ These are:

1. The Transvaal Education Department
2. The Orange Free State Education Department
3. The Natal Education Department
4. The Cape Education Department
5. The Department of National Education
6. The Division of Indian Education
7. The Division of Coloured Education
8. The Department of Education and Training
9. The Joint Matriculation Board

The Joint Matriculation Board recognises, under certain conditions, the Senior Certificate Examination of the preceeding 8 examining bodies for purposes of matriculation exemption. Details in this regard will be dealt with in the next chapter.

From the foregoing it is evident that the Division of Indian Education places considerable emphasis on formal examinations within the structure of differentiated education. With regard to the efficacy of this mode of evaluation Dobie (1969) states that "the formal group examination in a fully differentiated system of education does not, in fact, seem to serve any useful purpose and should, it seems be replaced by some system of assessment which serves more purpose than merely as an instrument of measure."⁽¹¹⁰⁾ He

recommends that the "system should involve continuous assessment, so that the testing which almost all educators consider a vital aspect of teaching, became an integral part of the work."⁽¹¹¹⁾

While continuous assessment might overcome the many maladies present in the formal system of examining, it does, however, create other problems, among which the maintenance of standards within and among schools is one of serious concern. Moderation of continuous assessment to maintain standards is a phenomenal and costly one. Therefore, it would seem that a combination of formal examinations as well as aspects of continuous assessment would be the more feasible one under the current system.

In this respect the Natal Education Department (1978) is experimenting with the inclusion of a year-mark as part of the final assessment for the Senior Certificate Examination. The Natal Education Department states that

"In order to reduce the degree of severity of the Natal Senior Certificate Examination efforts have been made first of all, to "internalise" the examination by involving inspectors of education; subject advisers, subject inspectors, lecturers at colleges of education and teachers in the examining and moderating procedures. Secondly in order to broaden the basis of assessment provision has been made for certain areas of the work in the various subjects to be tested by

internal evaluation with the necessary moderation."⁽¹¹²⁾

While the intention of reducing the severity of the examination is a worthwhile consideration, the matter of moderating and maintaining standards in internal assessments is also of tremendous concern to educators.

In an investigation undertaken by the Division of Indian Education (1979) to determine the relationship between teachers' assessment and the performance of candidates in the Senior Certificate Examination, it was found that there was generally a moderate correlation between teachers' assessment and the performance of candidates in the Senior Certificate Examination.⁽¹¹³⁾ This could imply that the criteria used by teachers in arriving at an assessment and the criteria in the formal examination differ to some extent. The aspect of teacher assessment will be dealt with later in this thesis.

It is clear that research into the field of assessment would offer valuable insights into the form examinations should take in the future. The technique and processes that are used in formulating new types of examinations need to be more widely understood, particularly by those who may engage in curriculum development as well as those who will be examining in the future. Many people operating in different areas of the education system, have to work

together with a common purpose, i.e. to develop the most reliable and valid examination, which takes into consideration the changing school curriculum.

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CHAPTER 3PUBLIC EXAMINATIONS WITH EMPHASIS ON THE SOUTH AFRICAN SENIOR
CERTIFICATE EXAMINATION AND ESPECIALLY ON THE EXAMINATION
CONDUCTED BY THE DIVISION OF INDIAN EDUCATION3.1 BRIEF DEVELOPMENT OF EXAMINATIONS IN BRITAIN AND U.S.A.

According to Montgomery (1965) competitive examinations gathered strength at Oxford and Cambridge in the nineteenth century.⁽¹⁾ Morris (1961) states that the first written examinations were those held in Cambridge in 1902.⁽²⁾ Previously, testing had been oral. The first subject examined in writing was mathematics, and a written examination was only introduced to facilitate easier expression of answers by candidates. Written tests were soon introduced in other subjects, and at first the method was considered administratively and economically the most suitable. It was not long, however, before the reliability and validity of written examinations, particularly essays was subject to attack, and several researchers (Starch and Elliot (1912), Ruch (1929) Eells (1930), Stalnaker (1951) conclusively showed that the usual written examination left much to be desired.^{(3) (4) (5) (6)} Later, with the growth of a more scientific approach to education, through the development of psychology and statistical methods, the new-type tests were introduced as more reliable. Many researchers (McClelland (1949), McIntosh (1949), Emmett (1953-54) stress that no single test or battery, of whatever kind, should be used as the basis for any final decision affecting the placement of pupils within the secondary school - this also implies that no such test or battery should be relied upon for the ultimate certification of pupils when they leave school.^{(7) (8) (9)}

In 1800, however, the Public Examinations Statute had introduced written examinations at the University of Oxford, and in the words of Curtis, "the faith in the efficiency of examinations was born".⁽¹⁰⁾ The effects

of written examinations on education were hardly considered, and in 1952 the university claimed that

"The examinations have become the chief instruments, not only for testing the proficiency of students but also for stimulating and directing the studies of the place."⁽¹¹⁾

Since the universities were concerned with a small privileged minority they were responsible for the organisation of most of the written examinations in England. The main focus of attention was always on the quality of results, rather than on the possible use of examinations to guide educational development or method, or to assist in the development of the pupil. The result was that tests designed to select for higher education came to be regarded as indicators of general achievement in the educational process, so that the same examination came to be used for two purposes, i.e. establishing school achievement and selecting for university entrance, in the field of secondary education.

When secondary education was made available to more, certain external examining bodies retained and still retain the rights of certification, but they work always on the assumption that an examination follows a curriculum, not vice-versa. With the decentralisation of administration in England considerable flexibility in the educational programme came into vogue.⁽¹²⁾

By 1885 in England, largely as a result of the "Payment by Results" scheme, almost every aspect of knowledge was formally examined; the Taunton Commission was told:

"The studies of the classroom must be those wherein progress can be definitely measured by examination for an examination is to the student what the target is to the rifleman; there can be no definite aim, no real training, without it."⁽¹³⁾

This attitude and the resulting stress on examination throughout the educational system was later generally recognised as a failure, but it was tolerated for at least thirty years because, as Wiseman (1961) has shown, the whole organisation of education in England was "in a process of turmoil and uncertainty, and the standards laid down lent an air of order".⁽¹⁴⁾ The final matriculation examination remained the focal point of school education until the development years later of regular methods of internal assessment.

Holmes (1914) observed that the examination system "with its demand for machine - made results" controlled education, and for years later the Board of Education, in a circular to local education authorities, clearly stated that examinations should not determine curricula. This and other moves towards a freedom from "the tyranny of examinations" were important reflections of British educational thought, but examinations still retained an important status - to a large extent because of tradition.⁽¹⁵⁾

The Otholl Committee in Great Britain (1927) recommended a combination of internal and external testing for final certification, and suggested that credit be given for classwork and homework done during the year. Even by that year, such an idea was not new in the United States, in some areas of which a system of "credits", accumulated by pupils during a year or more, replaced a large scale examination. Later, this practice was even adopted by some universities in America, and degrees were awarded to certain students (those who had worked regularly and completed all assignments) without final examinations.

A well-known method of continuous assessment in the United States involves use of the "Carnegie Unit", a standard measuring device or unit whereby a school gives credits for work done. One "Carnegie Unit" is earned for a course which, over 180 days, involves one period of work per day and extra-mural preparation or research. The

system of Carnegie Units was developed by the Carnegie Foundation during 1908 - 1910 as a method of distinguishing a high school from a college.⁽¹⁶⁾

Written examinations were unknown in the United States until they were adopted in some centres in 1856. These were used not only for admission to secondary school, but for promotion within such schools. As in England, criticisms were soon raised - especially about the use of a written examination to determine promotion. In 1886, promotion became based on teachers' assessment, although examinations were retained as part of the teaching process, and educationists who stressed the need for democracy and its promise of equal opportunity, demanded the removal of examinations as devices for promoting pupils, because they imposed conformity, set "courses" and inflexible syllabuses. In 1891 Eliot stated categorically that an aim in state schools should be

"to promote pupils, not by battalions, but in the most irregular and individual way possible".⁽¹⁷⁾

From the above quotation it is clear that Eliot felt that pupils should be treated as individuals and not as classified groups. The traditional examination in which certain subjects had to be passed at certain levels, had no place in Eliot's schemes of promoting pupils.

In America, as in England, before the introduction of standardised tests, old-type examinations were, as usual in those times, given the dual task of assessing achievement and predicting future potential. Belief in the feasibility of such a dual role is subscribed to by a system in which promotion depends upon "achievement in an examination", because the examination must then seek to answer how much has been learnt, how much more can be learnt and how much more will be learnt. The

last two parts of this purpose are almost impossible to achieve by examinations alone. It is quite evident that a device set up to measure achievement cannot also act as a predictor of success. According to current educationists (e.g. Boyce (1978), Heywood (1977), Dunning (1977)) the pupils' best guide should be the school staff, who can best perform the task by means of continuous assessment of assignments which extend individual pupils as far as possible. (18) (19) (20)

3.2 BRIEF OVERVIEW OF EXTERNAL EXAMINATIONS IN SOUTH AFRICA

In South Africa, external or public examinations have played prominent roles in all four provinces. External examinations were conducted at the end of standard 6, 8 and 10. The only such examination still remaining in provincial schools are those administered at the end of secondary schooling. Since Indian Education until 1966 fell under the control of the provinces, the conditions with regard to examinations in this Division were similar to those that applied to White pupils.

The Standard 6 (i.e. the eighth year of schooling) was recognised as part of the primary stage of education. All provinces held external examinations at the end of that year. Pupils who passed could either leave school or proceed to the secondary stage. With the raising of the school-leaving age and the growing tendency for pupils voluntarily to remain longer at school, the Standard 6 external examination gradually disappeared in all four provinces. The Junior Certificate examination (Standard 8 - after ten years of schooling) was at first completely controlled by the University of South Africa, but later came under provincial control (still as an external examination) and was eventually abolished in favour of internal assessment. The University of the Cape of Good Hope was the original examining body in South Africa from the 1870's. The Joint Matriculation Board was from

1916 responsible for the certification of those who had completed secondary education and who desired entrance to university, but here, again, control had to a limited extent become decentralised so that each province administers its own final examination. All these final examinations, however, still ultimately come under the control of the Joint Matriculation Board, through a system of moderation. The Joint Matriculation Board itself conducts its own examination for which some private schools enter candidates. A series of external examinations (from standard 6 to 10) are administered by the Department of National Education. These may be entered by those candidates who have left school or those that are studying privately or by pupils in technical and commercial schools which are now under provincial control.

The main developments in terms of examinations, are reflected in TABLE 3.1.

TABLE 3.1

EXTERNAL EXAMINATIONS IN SOUTH AFRICA ⁽²¹⁾

AREA	1	2	3	4
Natal	1948	1953	1966	1953
Transvaal	1942	1922	1945	1950
Orange Free State	1956	1932	1956	No data
Cape Province	1953	1920	1958	1955
Division of Indian Education	1970	1966	1972	1975

1. Abolition of the external Standard 6 examination;
2. Junior Certificate Examination comes under control of Education Authority;
3. Junior Certificate external examination abolished;
4. Senior Certificate Examination comes under the control of the Education Authority.

From the above table it is quite evident that the Division of Indian Education abolished external examinations in standards 6 and 8 much later than the White education departments. Another feature that emerges is that while White education was being decentralised and control was being localised as far as possible, the control of education for Indians in South Africa was being centralised.

Although examinations and the promotion of pupils are, with the exception of the Standard 10 year, almost completely under the control of the various education authorities, and although the authorities have their own final Standard 10 examinations, the whole secondary educational process in South Africa is, to some extent, moulded by the requirements of the Joint Matriculation Board. This Board prescribes certain subjects and minimum requirements, for entrance to university, over and above those prescribed for passing the examinations of the various examining bodies.

As a result much of the educational programme (particularly for those judged to be of suitable academic ability) is directed at preparation for the final examination, and the choice of subjects for potential university entrants is narrowed down early in the secondary school. As Behr and MacMillan (1971) have pointed out,

"The replacing of an external examination by an internal one does not automatically result in a decrease or a nullifying of the evils so often denounced as part and parcel of the public examination system. Often under the name of "internal examining" the panoply and atmosphere of external system are built up. When schools achieve the right to control their own examination system, then is the time to experiment with different methods and techniques of assessment over the whole year."⁽²²⁾

Where the administration of examination is or has for some time been centralised, it is not unexpected that such examinations should assume major significance in the eyes of pupils, parents and teachers.

Certain experiments, involving moves towards accreditations in selected schools and the abolition of examinations in favour of regular testing, have taken place in most recent years in South Africa (e.g. The Accreditation - Matriculation Project of the Transvaal Education Department, The Year mark Experiment of the Natal Education Department). The success of such experiments will depend largely on the ability of teachers to assess. There is little doubt that external examinations prior to Standard 10 in South African schools are a thing of the past. It is right and proper that properly qualified teaching staffs in schools themselves should control the assessment and promotion of pupils.⁽²³⁾ ⁽²⁴⁾

3.3 THE JOINT MATRICULATION BOARD

The Joint Matriculation Board was established by Act of Parliament in 1916. (Act No. 12 of 1916)⁽²⁵⁾ The function of the Board is to control and conduct the matriculation examination of the universities and to prescribe conditions of exemption from such an examination.⁽²⁶⁾

The Board which operates on a national basis currently consists of 22 members appointed by the Councils of the eleven White universities, 2 representatives appointed by the Committee of University Principals, 2 representatives of the universities for coloured persons, 2 representatives of universities established to serve Bantu National Units, 9 representatives of education departments, and 8 representatives appointed by the Committee of Heads of Education.⁽²⁷⁾ The affairs of the Board are run by a permanently appointed Secretary and his staff.

Apart from conducting its own Matriculation Examination the Board currently has general control over the following examinations:

1. Transvaal Senior Certificate Examination
2. Cape Senior Certificate Examination
3. Orange Free State Senior Certificate Examination
4. Natal Senior Certificate Examination
5. National Senior Certificate Examination
6. Education and Training Senior Certificate Examination
7. Senior Certificate Examination of the Department of Internal Affairs (Indian Education)
8. Senior Certificate Examination of the Department of Internal Affairs (Coloured Education)

As from 1981 the Board also has control over the newly instituted Senior Certificate Examination of the Transkei.⁽²⁸⁾ The Board also accords observer status to the Ministry of Education in Zimbabwe, representatives of Transkei and Bophuthatswana and obviously in the future observer status will also apply to other independent states.

The examinations mentioned above must satisfy the conditions laid down by the Board as to number and grouping of subjects; the Board nominates two of its university members to each of the Examination Committees or Boards controlling the particular departmental examination; proposed changes in syllabuses and regulations must be referred to the Board for approval. In addition, subject moderators, appointed by the Board for its own examinations, act as external moderators for the departmental examinations. These moderators also scrutinize a selected sample of scripts from each of the examining bodies. Further each of the education departments has to present, comparative statistics, details of adjustments made and the moderators reports to the Board in respect of every examination conducted.

If the Board is not satisfied with the conduct of the examination "it may withhold recognition in future of examination results of such Department until such time as the required action has been taken".⁽²⁹⁾

Two recent instances illustrate the action taken by the Board when it was not satisfied with the results of examining bodies.

In 1980 an examining body had for some reasons adjusted marks well beyond the limits approved by the Joint Matriculation Board. The Joint Matriculation Board viewed this matter in a very serious light and reprimanded the examining body concerned.⁽³⁰⁾ Another indication of the control exerted by the Board was its rejection of the statistics presented by one examining body with regard to its 1981 Senior Certificate Examination. In this case the examining body concerned had to re-adjust the marks of all candidates who wrote the examination in 1981. The result was that some candidates who had previously obtained matriculation exemption, did not qualify for an exemption on re-adjustment. Since these candidates were already at university, the Board was prepared to condone the error made and issue these candidates with matriculation exemption certificates.⁽³¹⁾

From the foregoing it will be observed that the control is fairly strict in an effort to maintain sound and reasonably uniform standards, obviously an extremely difficult task.

Malherbe (1977) states that the Joint Matriculation Board has not yet been able to provide any guarantee that the standard applied by one examining body is the same as that applied by another, whether it be in regard to a particular subject or in regard to the examination as a whole.⁽³²⁾ The question of common standards becomes increasingly difficult to achieve if candidates

write different question papers in the same subjects (based on a common syllabus). The Joint Matriculation Board moderator in a subject is faced with the problem of seeing to it that equivalent standards are maintained by the nine examining bodies in the question papers set. In some subjects he has to moderate 18 papers (the "main" and "supplementary" examination papers), it would, therefore, seem that however conscientiously he may try to bring about equivalence in standards, his task borders on the impossible. It would, therefore, seem appropriate if the Joint Matriculation Board could reconsider some of the procedures it adopts with regard to maintaining standards.

Malherbe (1977) states that in most civilized countries the maintenance of common standards for university entrance is "an issue of great national importance".⁽³³⁾ He states that the only way in which this could be effectively achieved in such an educational milieu as we have in the Republic of South Africa would be to institute one common university entrance examination specifically designed only for those who want to go to university instead of nine different ones as at present.⁽³⁴⁾

Failing the introduction of such a common entrance examination for all concerned, Malherbe suggests three devices which might be used to approximate towards a common standard for the nine examining bodies conducting university entrance examinations in South Africa:

1. A "culture free" test of general intelligence might be applied to all candidates. The purpose of this test would be to gauge the "average level of the group" taking the examination under each of the respective examining bodies.
2. One common paper in each of the main subjects usually taken for university entrance in order to arrive at a common national norm.

3. A bank of standardized questions in each subject could also help in developing norms. (35)

While the setting of common papers and tests may be considered as ideal for establishing common standards, there are other important educational considerations such as teaching background, cultural influences and socio-economic factors which may militate against the immediate use of common instruments of measure. Further common instruments of measure tend to have restrictive influence on the curriculum since all teachers and pupils will have to work on common syllabuses and possibly common approaches in handling subject matter.

Educationists (Dent (1963), Rust (1967) and Harris (1967), Hayward (1966)) have strongly criticised any form of central control of education. A decentralised system of education in which the belief that

"a school is a society, free to plan and conduct its corporate life as seems best to it."

is being advocated. (36) (37) (38) The de Lange Commission (1981) also advocates decentralised control of education. (39) Seen against this background it would seem to be more appropriate to devise means which do not have a restrictive influence on the curriculum and which could be used to establish common standards.

In an investigation undertaken by the Joint Matriculation Board in England (1964 - 1977) to establish comparability in the General Certificate Examination, use was made of examination results, monitor tests and cross-moderation for establishing standards. It was found that cross-moderation (where one Board moderates the question papers of the other) was "the most fruitful and sensitive of the methods available for purposes of comparability." (40)

A system whereby a panel of moderators sitting at the same time to moderate the question papers of the nine examining bodies in South Africa would go a long way towards establishing common standards in the question papers currently set.

3.3.1 Matriculation Exemption Certificate

The matriculation examination has been an examination in which a candidate has had to pass at least five out of six or seven approved subjects selected from six prescribed groups of subjects, taken at one time in November/December. The examination can not be taken piecemeal, that is, by accumulating subjects one at a time as, for example, as is the case in the General Certificate of Education in England. It has, however, been possible for a candidate who, having failed one subject and having obtained the minimum aggregate, to write the supplementary examination in that subject. In the past, the six or seven subjects offered for matriculation by a candidate had to be chosen from the following groups which were roughly as follows:

1. The two official languages, namely English and Afrikaans, German and certain Bantu Languages. (At least one of these to be taken on a higher grade).
2. A modern or classical language, any of the languages in group 1 taken on a lower grade if not already taken on a higher grade.
3. Mathematics, the physical and natural sciences, a third language.
4. Geography, History, Biblical Studies.
5. Practical subjects, e.g. Art, Music, Accountancy, Typing, Domestic Science. (41)

A candidate had to pass in at least five subjects and obtain at least 40% in each of four subjects, one selected from each of groups 1 to 4. (The minimum for other subjects was $33\frac{1}{3}\%$). Not more than four languages were to be offered. A candidate with a Bantu language as his home language had to take both the official languages. The minimum aggregate required varied according to whether a candidate took six or seven subjects. It amounted roughly to 45%. According to these regulations it was possible for a candidate to obtain matriculation exemption without Mathematics or a science provided a third language was taken.

In 1975 the Joint Matriculation Board had to review its existing rules for a matriculation certificate. This was necessitated by the introduction of the Differentiated System of Education in South Africa. (Some education departments introduced the new system in 1973. The differentiated system provided for a four phase system of education, details of which have been discussed in Chapter 2.)

The examination requirements set out by the Joint Matriculation Board to meet the needs of the new system are as follows:

Subjects may be taken on either the higher or standard grade. The higher grade syllabuses are more demanding than those for standard grade. Some subjects which are considered to be less academic are offered on the standard grade only. The minimum for a pass in the standard grade is $33\frac{1}{3}\%$ and 40% in the higher grade. A candidate taking the higher grade paper and failing to obtain 40% in it, may be awarded a standard grade pass if he obtains between 25% to 39% in the paper. ⁽⁴²⁾ The grouping of subjects under the

new regulations is different in certain respects from that of the earlier regulations. The subjects are currently grouped as follows:

- Group A : The official languages viz. Afrikaans and English
- Group B : Mathematics
- Group C : The science subjects viz. Biology and Physical Science
- Group D : Third languages including Black languages
- Group E : Biblical Studies, Economics, Geography and History
- Group F : Accountancy, Additional Mathematics, Agricultural Science, Art, Business Economics, Commercial Mathematics, Geography, Home Economics, Music, Shorthand, Speech and Drama, Technical Drawing and Typing.

The group into which a subject is placed is decided by the Board. One such decision was taken in 1979 when the Board decided that Geography should be offered in two groups i.e. Group E and F. This was to allow candidates to offer History and Geography as higher grade subjects from two different groups so that they could fulfil the matriculation exemption requirements. ⁽⁴³⁾

In order to obtain matriculation exemption, candidates taking six or seven subjects are required to pass in at least five subjects from at least four different groups or two subjects from Groups C or E and one subject from each of two other groups; pass in at least three subjects on the higher grade of which one should be the Official First Language Higher Grade and the

other two should be from two of groups B, C, D and F; pass in the other official language on either first or second language higher grade; obtain a subminimum of 20% in the sixth subject and obtain an aggregate of 950 marks. (Black candidates may offer their mother tongue as one of the languages from Group A).

From the foregoing it is clear that the rules are not easy to interpret. This has led to mis-interpretations by a few school principals who advised candidates wrongly. In the past few years the Board has had to condone errors of this nature. ⁽⁴⁴⁾

3.4 THE SENIOR CERTIFICATE EXAMINATION

3.4.1 The early development of the Senior Certificate Examination

As the number and variety of pupils going on to secondary school increased, it was found that the subjects prescribed for matriculation did not suit all the pupils. These subjects were all that the school offered at the time and pupils had no option but to take them whether they went to university or not. Malherbe (1977) states that "what skills most of them did acquire in certain subjects, such as Mathematics, Latin, Greek or the modern languages, were so slight that they soon evaporated after the pupils left school". ⁽⁴⁵⁾ For such school-leavers as were not going to university, first Sir Langham Dale and later Dr Muir during the 1890's proposed a separate examination to be taken a year before matriculation. ⁽⁴⁶⁾ The proposal is similar to the General Certificate Examination in England and Wales in which candidates offer "O" level subjects in their eleventh year of schooling

and "A" level subjects in their thirteenth year of schooling in order to meet university entrance requirements.⁽⁴⁷⁾

Gradually the movement to broaden the secondary school curriculum in South Africa gained momentum until 1905 when the Council of the University of Cape of Good Hope appointed a committee to investigate the institution of a school leaving certificate (The term senior certificate is used as synonymous with school-leaving certificate, as distinct from matriculation which alone qualified for university entrance).⁽⁴⁸⁾ While every combination of subjects required for this examination would not necessarily qualify a candidate for university entrance, the syllabus requirements in subjects common to both examinations would be the same, in order that pupils taking the two examinations could be taught in the same classes in common subjects. This was an important consideration from an administrative point of view.

Thus it came about that in 1910, after considerable negotiations between the education departments and the Council of the University of Cape of Good Hope, the new senior certificate examination was instituted. This was the first concrete step to provide an examination which would meet the need for differentiation at the secondary school level. Even at this stage the University of the Cape of Good Hope was still the only examining body at this level for the schools in Natal, Transvaal, Orange Free State and the Cape.

Malherbe (1977) states that at the beginning this new certificate was not popular. It was viewed with suspicion by employers. They felt that if youngsters could not survive the academically more difficult subjects such as Mathematics and Latin demanded by the traditional matricula-

tion, there must be something lacking in their general intelligence.⁽⁴⁹⁾ In consequence, we find that by 1912 there were only 122 candidates who took the new Senior Certificate Examination compared with 1693 who took the matriculation examination. The proportion obtaining the new certificate as compared with those obtaining matriculation remained about 1 in 10 until 1918 when the Joint Matriculation Board took over the responsibility for conducting these examinations.

At about this time there was a growing feeling among the education departments that the papers for these two examinations conducted by the Joint Matriculation Board were set largely by university professors who were out of touch with the school situation. While the view that university professors have the depth of understanding in their disciplines and should, therefore, be responsible for the setting of question papers is respected. At the school situation it would be appropriate if teachers, as well as university personnel, can be represented on the panel that sets the question papers. In the early 1920's the Cape and the Transvaal education departments instituted their own standard of examinations and certificates. These, however, had to receive a subject for subject recognition by the Joint Matriculation Board which also moderated the question papers set. In 1932 the Cape department made it compulsory for candidates from its public schools to take the departmental examinations. When the Transvaal introduced its own examinations in 1922, it not only broadened the choice of subjects, but also tried to give the examination a more internal character by taking into account the pupils' school record as assessed by the principal.⁽⁵⁰⁾ In 1932 the Orange Free State introduced its own departmental examination and

in 1953 the Natal education department instituted its own examination. It was only during the 1950's that the Senior Certificate Examination, in most provinces, came under provincial control.

Prior to 1966 Indian candidates in South Africa took the Examinations of the Transvaal and Natal Education Departments. Following on the Government's policy of separate development, education for the Indians was transferred by Act 61 of 1965 from the provinces to the Department of Indian Affairs with effect from 1 April 1966. In respect of the school courses and the external examinations the Indian Education Act 61 of 1965, Section 21 (4) made the following provisions:

"Until the Minister otherwise determines, the Department of Education, Arts and Science, shall institute the courses for the education and training of persons in special schools, homes, vocational schools, schools of industries and reform schools and conduct examinations in respect thereof, and a provincial administration shall institute courses for the education and training of persons in other State schools and State-aided schools, and conduct examinations in respect thereof, in the same manner in which it would have done if, the control of such education were still vested in that Department or, as the case may be in the provincial administration."⁽⁵¹⁾

From 1966 to 1971 Indian candidates in Natal wrote the Natal Senior Certificate examination under the rules of the Natal Education Department. In the Transvaal, Indian candidates wrote the Transvaal Senior Certificate Examination until 1973.

With the establishment of its own Examination Board in 1968, the Department of Indian Affairs decided to control its own Senior Certificate Examination. However, from 1972 to 1974, the Department of Indian Affairs purchased the Senior Certificate examination papers from the Natal Education Department under the following conditions: (52)

1. The Natal Education Department would appoint European commissioners in Indian schools.
2. The examination papers would be supplied direct to the commissioners appointed on the basis of figures supplied by the Department of Indian Affairs.
3. The Indian candidates would follow the time table of the Natal Education Department.
4. The Natal Education Department would appoint one European sub-examiner to each Indian marking committee to take charge of the marking.
5. The Natal Education Department would supply the marking memoranda.
6. The Natal Education Department would appoint its own moderators to moderate sample scripts.
7. Standard curves for Indian candidates for each subject over the previous five-years, for the purpose of making statistical adjustments to the marks were to be supplied by the Natal Education Department.

Indian teachers for the first time were appointed as sub-examiners to mark the scripts in the various subjects.

In 1975 the Department of Indian Affairs introduced its own Senior Certificate Examination. The first step towards the complete control of the Senior Certificate Examination was the drawing up of the rules governing the examination. These were approved by the Joint Matriculation Board. In its memorandum to the Joint Matriculation Board, the Department of Indian Affairs set out details of the examination requirements, norms and standards based on the results of the previous five years and the condonation procedures. All syllabuses used in Indian schools, except those used for Indian languages, are based on national core syllabuses. The Department of Indian Affairs is represented on all national syllabus committees. All syllabuses used in Indian secondary schools are subject to the approval of the Joint Matriculation Board.

The Joint Matriculation Board also acts as external moderator for all subjects taken for matriculation exemption purposes. In this way standards are maintained to ensure that these conform to the standards of other education departments in the country.

3.4.2 The Administration and Control of the Senior Certificate Examination

Since examinations form a vital part of education process it is, perhaps, necessary to give some attention to the control of education both locally and in some other countries, in order to appreciate more fully the control and administration of the Senior Certificate Examination.

In most parts of the world, far-reaching changes

in systems of education have taken place over the past few decades, and in England the changes have been particularly marked. The Education Act, 1944, was intended to give a framework to education and to provide secondary education for all. The framework laid down was very general, and considerable autonomy was given to each of the 129 local education authorities in England. Almost the only direct control upon education exerted by the central government in Britain exists through the important financial support given to local authorities for the provision of educational and other facilities. Matters such as syllabuses are not decided at the level of the central government, but by the local authorities, so that local needs are met as efficiently as possible.⁽⁵³⁾ There are, of course, limitations, as when external examinations are taken, but even here schools are free to enter their candidates with any one or more of the examinations offered by the nine examining boards. The point that emerges is that schools have the authority to make decisions with regard to fundamental educational issues.

In South Africa the National Education Policy Act (No. 39 of 1967) was passed to "co-ordinate on a national basis, syllabuses, courses, and examination standards and research" and to bring the provinces into alignment concerning such matters as medium of instruction and age of admission to schools. Thus the Act provided for centralised control of education, which would imply that the provinces cannot take unilateral action to meet any special local needs in education without recourse to the central government. The National Education

Policy Act lays down certain principles within which the national education policy in South Africa must be determined. Such principles include that education should have a "Christian" and "national character"; that the mother-tongue (if English or Afrikaans) should be the medium of instruction; that requirements regarding compulsory school age and education should be uniform; that syllabuses, courses and examination standards should be co-ordinated on a national basis. (54)

Co-ordination and control as provided for in the Act would seem to inhibit the development of diverse patterns in educational administration and provision, and so oppose the general tendency towards such diversity in the majority of other educational systems (e.g. American and British systems). Although the National Education Policy Act (39 of 1967) has been formulated for Whites, its influence is also felt in Indian Education, for Indian Education follows the patterns and structures of White education very closely, lest the community considers any deviations as inferior education. While the Act provides for White education to be controlled by the provinces, education for all Indians in South Africa is under the control of the Division of Indian Education which operates under the aegis of the Ministry of Internal Affairs. The Indian Education Act (No. 61 of 1965) made provision for all education, including special education, teacher training, nursery school education, and vocational education, but excluding university education, to be taken over by the Division of Indian Education. The Act further states that "at the head of which shall be an officer who has expert knowledge of education matters." (55)

The highly centralised system may limit experimentation in schools and also changes in the system suitable or necessary for some schools may not be good for others. Centralisation could, therefore impose conformity.

In each of the many school districts of the United States, the local community elects school boards to establish policy for the education of their children. Because of the decentralisation of educational control in that country, considerable variety and experimentation have been possible. Reller and Morphet (1962) states that

"The people throughout the United States have considered education so basic and so essential to the welfare of the state, that they have insisted that the residents of each local school system should have opportunity to decide upon the kinds of schools they want and the extent of financial support they desire to provide".⁽⁵⁶⁾

In England each education authority (in terms of the 1944 Act) is allowed to develop individually and is required to provide schools:

"sufficient in number, character and equipment to afford for all pupils opportunities for education, offering such variety of instruction and training as may be desirable in view of their differing ages, abilities and aptitudes, and of the differing periods for which they may be expected to remain at school."⁽⁵⁷⁾

The emphasis in control of education at local level is quite evident both in the United States and in Britain. In South Africa although central

control currently exists, there are moves towards decentralisation. The de Lange Committee (1981) states the following as one of its objectives in making recommendations for the provision of education in South Africa.

"To create, develop and maintain decentralised (e.g. regional, local) decision-making, particularly, co-ordinating and control structures and processes which ensure representation of all the interests in the region or locality, and which ensure the right of "free association", the greatest possible freedom of parental choice and the widest range of options to meet the needs of the individual."⁽⁵⁸⁾

The South African structure of education is a complicated one in which education is provided on a provincial basis for the majority of Whites, while in the case of the Blacks, Coloureds and Indians, education comes under the control of three National education divisions, one for each group. Educational provisions are therefore made on the basis of race. It is hoped that with the envisaged social and political changes this racial character in education will eventually be eliminated. The de Lange Committee has been sensitive to this issue and one of its objectives is enunciated as:

"To create, develop and maintain management structures and processes which ensure a system of education that will remain sensitive and responsive to changes (social, economic and political) and which will be based on continuing research, so that it contributes positively to the creation of a society in which equality of opportunity be-

comes increasingly attainable."⁽⁵⁹⁾

The above quotation indicates that while there is no finality about what the Committee had recommended, it allows sufficient latitude for the changes in society.

In South Africa, as mentioned earlier, there are nine examining bodies that control and administer the certification of candidates at the end of their secondary school career.

The four provincial departments cater generally for White candidates. (There are a few non-White candidates in Private Schools who may take these examinations). The Department of National Education and the Joint Matriculation Board cater for both White and non-White candidates. The Department of Education and Training makes provision for Black candidates only, while the Divisions of Coloured Education and Indian Education (Both of which fall under the control of the Department of Internal Affairs) make provision for Coloured and Indian candidates respectively. It is evident that apart from the Department of National Education and the Joint Matriculation Board, the other examining bodies provide for the various ethnic groups which constitute the population of South Africa. In the United Kingdom also there are nine examining bodies that cater for the General Certificate Examinations.⁽⁶⁰⁾ These, however, cater generally for the various regions.

There is a marked similarity in the general control and administration of the Senior Certificate Examination by the various examining bodies in this country. For the purpose of this thesis attention will be given to the Senior Certificate Examination conducted by the Division

of Indian Education and attention will be drawn to the other examining bodies where necessary.

3.4.3 The Examinations Board

The control and administration of the Senior Certificate Examination of the Division of Indian Education is vested in the Examinations Board. The institution of the Board was approved by the Secretary of Indian Affairs on the 15 June 1967 and the Board had its first meeting on 5 March 1968.⁽⁶¹⁾ The Board consisted of the following members : The Director of Education as Chairman, Deputy Director of Education as vice chairman, the Chief Planner, the Chief Inspectors of Education, two representatives from the university, two representatives of the Joint Matriculation Board, a representative of the technical college, teachers' association, colleges of education, the education planner (examinations) and the examinations' officer as secretary. Most members of the Board are appointed by virtue of the position they hold in the Division. The Joint Matriculation Board representatives are appointed by that Board and the representatives of the teachers' association are appointed by that association. Since most members of the Board are officials from within the Division it is possible that decisions taken by this Board might be influenced greatly by the Director of Education and his staff. All decisions with regard to the conduct and control of the examination must be approved by the Board. The Board holds two meetings each year at which the statistics, adjustments, moderators and examiners reports of the examination conducted is presented for approval. The Joint Matriculation Board members, apart from making a contribution with regard to the general running of

examinations, also see to it that matters concerning the issue of matriculation exemption certificates are adhered to. All the other examining bodies in South Africa also have Examination Boards to conduct the Senior Certificate Examinations.

From the constitution of the Board, it is quite evident that educationists concerned with education at universities, colleges of education, secondary schools and the inspectorate are well represented on the board. It would seem to be more appropriate had representatives from commerce and industry been appointed on the Board as well. After all the majority of pupils eventually find their way into commerce and industry. Representatives from this sector could make a valuable contribution with regard to the courses and standards required of candidates. Further certain decisions e.g. the institution of the Standard 10 (Practical) Examination could have been debated thoroughly with such representatives. The Standard 10 (Practical) Certificate issued to candidates who completed a practical course of study was never really accepted by commerce and industry. With the growing opposition to the course from several quarters, parents, teacher organisations, commerce and industry, the public sector and some educationists, the Interdepartmental Committee for General Schooling had withdrawn the course the decision to take effect from 1984.⁽⁶²⁾

3.4.4 Rules for the Senior Certificate Examination

3.4.4.1 Enrolment procedures and subjects offered

Generally the examination is open to any person as a full time or a private candidate who has completed at the date of

commencement of the examination a course or part thereof in accordance with the syllabuses prescribed by the Director. A "full-time candidate" is a candidate who is enrolled as a full time pupil at a school registered with or controlled by the Division of Indian Education. "A private candidate" is not a full-time pupil at school; he normally is employed and is permitted to write the examination in whole or part.

It is clear that this examination is offered to Indian candidates who have completed a "syllabus prescribed by the Director". This is necessary to avoid confusion that may arise because Indian private candidates could also take the examinations of the Department of National Education and the Joint Matriculation Board. The syllabuses, examination requirements as well as set work of these examining bodies may be different from those of the Division of Indian Education. However, the candidate may not present himself for the examinations of two or more different examining bodies at the same time. The rule in this regard states the following:

"A person who is a candidate for a Senior Certificate Examination of any other statutory body in the Republic of South Africa may not enter the examination or part thereof in the same year. If it comes to the notice of the Director that this rule has been contravened he may cancel the candidate's acceptance and the candi-

date shall forfeit the fees paid."

This rule is a difficult rule to apply since the various examining bodies do not co-ordinate the entries of candidates. Further if a candidate wishes to enter for the examinations of other bodies at the same time he is at risk with regard to time-table clashes since all the examining bodies in South Africa generally have their examinations commencing in early November and finishing in early December. The supplementary examinations are held during February-March.

Full-time candidates are enrolled by the principal of every school. The principal "shall furnish the Director on or before 15 August in every year with a schedule containing the names of all candidates". Private candidates are enrolled before the 31st of May each year. This is to allow the Division of Education to make adequate preparation for testing all private candidates in the oral, practical and assignment components in certain subjects. Candidates who wish to enrol are required to pay a fee.

The full-time candidates enrol for six examination subjects. Unlike the General Certificate of Education Examinations of the U.K., the Senior Certificate Examination in South Africa is a group examination. In order to pass a candidate has to pass English, Afrikaans, 3 other subjects and obtain an aggregate of 720 marks. In the United Kingdom candidates are given credits for individual subjects.

The subjects offered by the Division of Indian Education are given in Table 3.2. The table also indicates the number of candidates who took these subjects over the past three years. Subjects offered on the higher grade are denoted by the symbols HG, and the standard grade subjects are indicated by the symbols SG.

TABLE 3.2

SUBJECTS OFFERED AT THE SENIOR CERTIFICATE LEVEL AND THE NUMBER OF CANDIDATES WHO TOOK THESE SUBJECTS DURING 1980-1982

Very important table

<u>SUBJECTS</u>		<u>1980</u>	<u>1981</u>	<u>1982</u>
<u>GROUP A</u>				
English First Language	HG	4306	4733	5067
English First Language	SG	973	1072	1425
Afrikaans Second Language	HG	4266	4768	5103
Afrikaans Second Language	SG	1013	1037	1389
<u>GROUP B</u>				
Mathematics	HG	1365	1321	1462
Mathematics	SG	2952	3489	3700
<u>GROUP C</u>				
Physical Science	HG	1231	1416	1454
Physical Science	SG	660	768	878
Biology	HG	2669	3019	3396
Biology	SG	1582	1608	1956
Physiology	HG	-	-	-
Physiology	SG	-	-	-

SUBJECTS		1980	1981	1982
<u>GROUP D</u>				
Latin	HG	-	-	-
Hindi	SG	-	-	-
Arabic	SG	-	19	42
Gujerati	SG	-	-	-
Tamil	SG	-	-	-
North-Sotho	SG	-	-	-
South-Sotho	SG	-	-	-
Zulu	SG	-	-	-
<u>GROUP E</u>				
History	HG	1061	1153	1249
History	SG	363	342	424
Geography	HG	947	1143	1342
Geography	SG	543	574	668
Economics	HG	356	394	343
Economics	SG	135	166	204
<u>GROUP F</u>				
Accountancy	HG	2945	3093	3070
Accountancy	SG	1690	1907	2419
Business				
Economics	SG	592	643	770
Home Economics	HG	42	29	37
Home Economics	SG	11	14	6
Technical Drawing	HG	94	108	126
Technical Drawing	SG	78	100	139
Woodwork	SG	66	36	83
Metalwork	SG	1	34	32
Needlework and Clothing	SG	39	32	11
Housecraft		200	190	298
Mercantile Law		23	27	21
Commercial Mathematics		-	-	-
Typing		1086	1195	1418
Radiotrician-Work		7	6	11
Electrician-Work		7	3	8
Motor Mechanics		57	44	25
Fitting and Turning		6	7	2
Woodworking		14	12	3

SUBJECTS		1980	1981	1982
Welding and Metalwork		1	8	6
Motor Body Repairing		1	1	2
Plumbing and Sheet-metalworking	SG	2	5	6
Bricklaying & Plastering		-	-	6
Motor Vehicle Construction		-	-	-
Computer Science		-	-	-
Restaurant Studies		16	-	7
Reception Studies		35	28	36
Institutional Management	SG	-	-	-
Music	HG	140	172	182
Music	SG	-	-	-
Art	HG	65	88	85
Art	SG	-	-	-
Geography	HG	15	17	28
Geography	SG	19	9	13
Total No. of full-time candidates		5279	5805	6492

The subjects in the table are grouped from A to F. The grouping is essential to those candidates who wish to satisfy requirements for matriculation exemption purposes. The groups are laid down by the Joint Matriculation Board and all nine examining bodies follow the same grouping of subjects.⁽⁶³⁾ From the table it is quite evident that the most popular subjects among Indian candidates are : English, Afrikaans, Mathematics, Physical Science, Biology, History, Geography, Accountancy and Typing. English and Afrikaans are the only subjects that are compulsory passing subjects for the Senior Certificate Examination as well as for matriculation exemption purposes. Indian

NB

languages were first introduced at Senior Certificate level in 1979. These languages are not popular. The only language that has interested some candidates is Arabic.

NB

It is interesting to note that during 1982 the Division of Education had undertaken an investigation to measure the demand for Indian languages in the primary and junior secondary phases. The opinion of the parents of children in standard 2 and 4 was elicited. The survey revealed that over 90% of Indian parents were in favour of their children being taught Indian languages. (64)

One wonders why then the demand at Senior Certificate Examination level for these languages is minimal. Perhaps the answer lies in the fact that during the senior secondary stage candidates are primarily thinking of career orientated subjects and Indian languages therefore have little relevance in the South African context. It is probable that with the introduction of these languages at the lower end of the educational scale, interest might be generated from them in the future.

There also appears to be little demand for technical and trade subjects. This could be due to the facilities provided by the Division in this regard. Of the 79 schools that take the Senior Certificate Examination, only three offer technical and trade subjects. The de Lange Committee (1981) gives considerable attention to technical and vocational education. The Committee states the following in this regard:

"The dominance of the university entrance examination will have to be decreased drastically before career-oriented education can come into its own." (65)

There is no doubt that the emphasis in Indian Education is the preparation of its candidates for an "academic-oriented education" as de Lange puts it "at the expense of equally general formative education that serves as preparation for career possibilities other than those accessible through further academic study". (66)

The de Lange investigation makes the following recommendations with regard to technical and vocational education:

"That there should be a move towards a balance between general formative preparatory academic education and general formative preparatory career education, which relates better to the manpower needs of the country." and

"That by means of appropriate curriculum design the mathematical, natural science and technical (design and make) development of the learner should be made possible, from as early an age as possible, as a normal part of the process of schooling." (67)

The view that the scope of education should be broader than just vocational preparation is supported. The Committee makes the following point in this regard: "in the great diversity of manpower needs there is ample scope for the realization of the individual's potential". (68)

The problem, however, is to provide such education particularly in respect of the Black community and the lack of an infra structure to co-ordinate and organise informal, non formal and formal education.

3.4.4.2 Requirements for passing

Candidates taking subjects for the Senior Certificate Examination choose a subject-set. A subject set consists of a group of 6 subjects, viz. English, Afrikaans and 4 other subjects selected from the subjects indicated in Table 3.2. The subjects may be offered on either the higher or standard grade.

Higher grade subjects are out of a total of 400 marks, except Afrikaans Second Language Higher Grade which is out of 300 marks. Standard Grade subjects are out of 300 marks. The total marks for each subject are as laid down by the Joint Matriculation Board, and all nine examining bodies follow the same allocation. Higher Grade subjects are generally supposed to be some 20% more difficult than Standard Grade subjects. There is an absence of any laid down criteria indicating how such differences between the question papers can be achieved.

A candidate for the examination is awarded a pass : (1) in an individual subject if he attains at least 160 marks on the Higher Grade (or 100 marks in Second Language Higher Grade) and 100 marks on the Standard Grade : Provided that

a failure in a subject on the Higher Grade, (except Second Language Higher Grade) may be converted to a pass on the Standard Grade if a minimum of 100 marks is obtained in such subject. In the second language on the Higher Grade 90 to 99 marks may be converted to a pass on the Standard Grade. The original marks obtained in such subject on the Higher Grade is used in calculating the aggregate. (2) in the aggregate if he attains at least 720 marks in the case of a six subject examination. In the case of a candidate offering seven subjects the aggregate is calculated according to the total of the six subjects in which the candidate gains the highest marks, provided that both official languages on either the Higher or Standard Grade or one on each grade is included in the six subjects. (3) in the examination as a whole if he passes in the aggregate, passes in five subjects and includes in the five subjects passed the two official languages on the Higher or Standard Grade. (69)

The requirements for obtaining a Senior Certificate in the Republic of South Africa are similar for all examining bodies. While the Joint Matriculation Board does to a great extent influence the requirements for the Senior Certificate, the actual requirements are determined by the Committee of Heads of Education. The National Education Policy Act (No. 39 of 1967) provided for the establishment of this Committee. The Committee comprises the directors of the four provincial education departments, the Director of National Education, and

the Director-General of National Education as chairman. The functions of this Committee are defined in section 6(2) and (3) of the Act. The Committee must submit recommendations to **the** Minister and Administrators in regard to the manner in which the national education policy can be carried out, and on such other matters which the Minister or Administrators may refer to it. ⁽⁷⁰⁾

Furthermore, matters are also referred to the Committee by other bodies e.g. the Joint Matriculation Board.

Decisions taken by the Committee of Heads of Education are implemented by the White education departments as well as the Indian, Coloured and Black education departments. However, the latter three have no representation on this Committee. Therefore, decisions taken by this Committee are transmitted through the Department of National Education, to the Departments of Coloured, Indian and Black Education. Through this process general uniformity with regard to the requirements for the Senior Certificate Examination among all the examining bodies is maintained.

In all the examining bodies symbols or grades for achievement are allocated to candidates on a common scale. The mark range and the symbol allocated to each range are given in the table below.

TABLE 3.3

MARK RANGE AND THE SYMBOLS ALLOCATED
FOR SENIOR CERTIFICATE SUBJECTS

<u>HIGHER GRADE SUBJECTS</u>	<u>SYMBOLS</u>	<u>STANDARD GRADE SUBJECTS</u>
320 and above	A	240 and above
280 - 319	B	210 - 239
240 - 279 Pass	C Pass	180 - 209
200 - 239	D	150 - 179
160 - 199	E	120 - 149
133 - 159 Convert to a	F	100 - 119
120 - 132 pass on Standard	FF	90 - 99
100 - 119 Grade	G	75 - 89
90 - 99	GG Fail	60 - 74
0 - 79 Fail	H	0 - 59

From the table it is noticed that a ten point scale in each subject is used. If a subject is taken on the Higher Grade then A, B, C, D and E are passing symbols, F, FF and G, while being a fail on the Higher Grade are converted to a pass on the Standard Grade. The symbols G, GG and H are failing symbols. If a subject is taken on the standard grade then A, B, C, D, E and F are passing symbols while FF, G, GG and H are failing symbols. In the British General Certificate Examinations (GCE) a six point scale is used. The scale has 5 passing symbols i.e. A, B, C, D, E and one failing symbol viz. U. However, U is not referred to as a fail, but rather as ungraded. In general only subjects in which candidates obtain A, B or C symbols are recognised for university admission purposes. (71)

It is evident that in the General Certificate Examination little attention is paid to grading candidates who have failed. Therefore all failures are given a common symbol. There appears to be merit in this system since failing symbols serve very little purpose, except perhaps to the candidate who would realise how he had fared in the examination. Passing symbols on the other hand provide information for selection purposes.

3.4.4.3 Setting and moderating question papers

The question papers for each subject in the Senior Certificate Examination are generally set by a panel consisting of the chief examiner and two examiners. The three examiners and the moderator have the responsibility of constructing the question paper for the relevant syllabus. They are appointed to particular subjects or sections of subjects on the basis of their knowledge of the subject area. Each year the panel of examiners is generally required to set four question papers in a subject or section of a subject. Two papers are set on the higher grade and two on the standard grade. The first higher and standard grade papers are for the end of year, November/December examination and the other two are for the March supplementary examination. Although the examiners and moderator are considered authorities in their field and much of the construction of the question paper is left to them, there are some general considerations about examination

construction which are drawn to their attention. An examination can only be thought of as having been successful if it provides a valid assessment of the aims and objectives of the subject to which it relates. In this regard the Associated Examining Board (1980) makes the following comment:

"Unless the questions are measuring the achievements which the syllabus intended the students to attain, the examination will be far from adequate."⁽⁷²⁾

The attention of examiners and moderators is drawn to the aims and objectives of the syllabus. It is, however, difficult to assess whether the aims and objectives of a particular syllabus are always reflected in the question paper set. There are occasions when teachers complain bitterly about certain question papers. However, more research needs to be undertaken into this field.

The aims of the syllabus should give a general indication of the purpose of the course, and may be in terms such as:

"To promote, within the special range of his ability and potential, the pupil's intellectual, emotional and social development; to help him to understand himself and others so that he may live more fully, happily and responsibly."⁽⁷³⁾

The examiners and moderators are also required to take cognisance of the objectives of a syllabus. The objec-

tives are more specific and describe levels of attainment which might be expected from candidates who have successfully completed the course. An example of the way in which the objectives of a syllabus might be expressed is given below:

"1. Knowledge

The ability : to identify, recall and express knowledge of biological facts; to construct diagrams of biological systems and generalisations of biology.

2. Application

The ability : to apply biological knowledge; to explain observations and to solve problems which may involve new or unfamiliar situations; to interpret or criticise biological information; to prepare and test hypotheses deriving from this information, to identify relationships between structure and function and between experimental procedure and reliability of results.

3. Experimental

The ability : to devise simple experiments; to handle apparatus and perform experiments to given instructions; to record results accurately and comment on them."⁽⁷⁴⁾

In the example given, the objectives of this particular syllabus have been specified largely in terms of a set of skills to be developed with little reference to any specific content areas of the syllabus to

be covered. The objectives of other syllabuses may relate much more directly to factual knowledge about various content areas, and where this is the case the objectives indicate the extent to which the whole syllabus is covered. In some of the cases e.g. Geography, choices may be offered within the syllabuses. (75)

It is most important for examiners and moderators to be quite clear about the way in which the overall scheme of assessment relates to measuring the objectives of the syllabus with which they are dealing. The examination requirements with regard to types of questions and objectives to be tested are generally indicated to the examiners by the examining bodies. The Division of Indian Education gives guidance to the examiners by means of a theoretical guide for each subject. An example of a guide for Mathematics is given below:

ABILITIES	SYLLABUS AREAS					
	SETS	AVERAGE	FUNCTIONS	GRAPH	RATIOS	TOTAL
TEACHING TIME	5	10	15	5	20	
Recognition of terms	1	2	3	1	4	11
Recall of facts	2	4	6	2	8	22
Recall of principles	3	6	9	3	12	33
Understanding of ideas	4	8	12	4	16	44
Application of principles	5	10	15	5	20	55
Analysis/synthesis/ evaluation of ideas/ facts/principles/terms	6	12	18	6	24	66
TOTAL	21	42	63	21	84	231

The grid relates teaching time to the content of the syllabus as well as the various abilities to be tested. While it may be argued that such a grid may have a restrictive influence on the setting of question papers, nevertheless, it provides a framework on which the pupils, teachers, subject advisers as well as examiners can work. Therefore, those concerned in the teaching-learning-examining situation would have some knowledge of the bases on which question papers are set. Experienced examiners, however, may find such a grid unexceptionable since it can produce a fragmented question paper which may not relate to a common theme.

Once the papers are set they are submitted to the internal moderator for moderation. The internal moderator is appointed by the examining body, and all Senior Certificate question papers are submitted to the internal moderator for the relevant subject.

The comments made by the internal moderator are submitted back to the panel of examiners for consideration and amendments. It is clear that the examining bodies are responsible for the appointment of examiners and internal moderators. It is possible in such a system for the examining body to select those examiners and internal moderators who are inclined to be sympathetic towards the department. Further the results in the Senior Certificate Examination can well be manipulated by the people

chosen to set and moderate the question papers. It is also possible that the question papers set can test only those aspects which are well taught and revised in schools. Thus certain aspects of the syllabus can well be neglected. TO avoid some of the problems that may arise if examining bodies are to continue with the practice of appointing examiners and internal moderators, it would be appropriate if the appointments are ratified by a national controlling body such as the Joint Matriculation Board.

After the amendments are effected those question papers in which the Joint Matriculation Board is interested are subject to a further moderation by the external moderator. The external moderator in a subject is appointed by the Joint Matriculation Board, whose function is to ensure that an equivalent standard is maintained in the examinations of the nine examining bodies in South Africa. As mentioned in an earlier chapter the task of the external moderator is a difficult one since he has to scrutinise some 36 question papers in a subject. (March and December of the nine examining bodies.) It is no wonder that standards from one examining body could possibly vary from that of another.

Another point that emerges is the fact that the Joint Matriculation Board is concerned with only certain question papers. These are generally in subjects in which higher grade question papers are set. In Indian education alone there are

about 20 subjects which are offered on the standard grade only. Question papers in these subjects are moderated internally and are not subject to any form of external moderation. It is possible that in these subjects standards can vary widely from one examining body to the next. Some form of co-ordination to establish and maintain some uniformity in these subjects is necessary.

The moderation of question papers by the Joint Matriculation Board moderator is a condition by which departmental examinations are recognised for matriculation exemption by the Board.

The condition states:-

"The question papers in the subjects in Groups A to E and those subjects in Group F in which examinations are conducted on both Higher and Standard Grades and such other subjects as may from time to time be added to the list, shall be submitted to the Board's moderators in the respective subjects for prior approval."⁽⁷⁶⁾

The Board's moderators normally comment on the question papers. These comments are thereafter referred back to the departmental internal moderator and the panel of examiners for consideration. The education planner for examinations sees to it that the format of the question paper is in keeping with the requirements of his department. These are attended to before the papers are submitted to the administrative section for typing,

printing and eventual despatch to the examination centres.

3.4.4.4 Preparation of marking schemes

In examinations taken by large numbers of candidates, where the scripts are marked by more than one person, it is important for the candidate's script to be marked in such a way that, as far as is humanly possible, the same mark is awarded to a particular candidate irrespective of which examiner marked his script. Houston (1980) states that the "marking scheme provides the foundation whereby such uniformity of marking may be achieved."⁽⁷⁷⁾ Even where only a single examiner is involved in marking the scripts, a marking scheme is required for moderation purposes since it is not always possible for the internal or Joint Matriculation Board moderator to determine the validity of questions by merely scrutinizing the questions set.

The Associated Examining Board (1980) distinguishes between a marking scheme and a mark allocation.

"A mark allocation shows the proportion of the total marks to be allocated to each question or part of a question. A mark scheme shows how the candidates' answers are to be judged. It is a necessary part of any type of assessment, either written or otherwise."⁽⁷⁸⁾

The exact form of the marking scheme will depend on the nature of the subject to be

examined. In some subjects the marking scheme will be detailed with all the correct solutions which result from different approaches likely to be taken by candidates in answering the question; in others it will be written as a list of performance criteria, to aid the examiner in making necessarily subjective judgements about the merit of candidates' answers. Whatever the form of the marking scheme, its purposes may be listed as follows:

To assist the examiners and those who will moderate the paper to check the content validity of the questions being set;

to help the moderators to check if the demands made in the examination are appropriate and in accordance with the aims and objectives of the syllabus;

to allow the moderators to check that the answers expected from the candidates are in accordance with the questions as set;

to ensure that, where there is more than one examiner, each examiner marks in exactly the same way, awarding equal marks for equal levels of performance and

to ensure that each examiner marks consistently throughout the marking period. (79)

Quite apart from the reasons already mentioned, marking schemes provide an accurate record of the marking criteria used in an examination and may be used in conjunction with other records, to check on the maintenance of standards from year to year.

For this reason, the Division of Indian Education keeps a file on marking schemes in which a final amended copy of the marking scheme is lodged, as soon as possible, after the marking of that examination has been completed. It may be argued that a detailed marking scheme may lead to rigidity and uniformity which is not always educationally sound. However, it must be borne in mind that while an experienced examiner may find it easy to maintain standards the less experienced can find a detailed marking scheme of assistance particularly when marking large number of scripts and when the type of answers required are not easily discernable. The Division of Indian Education has recently (1975) taken to examining candidates at the Senior Certificate Examination. Therefore, detailed marking schemes would serve the purpose of providing guidelines to the less experienced examiners.

As already mentioned, types of marking scheme vary considerably, depending on the type of question or assessment technique to which they are to be applied. There are, however, several principles that underlie the construction of an effective marking scheme. These according to the Joint Matriculation Board (Manchester) are:

"reduction to the minimum possible, the amount of judgement which an examiner has to exercise in awarding the marks; reduction to the minimum possible, the amount of computational work which has to be undertaken in order to arrive at the correct mark for a script; (and)

ensuring that, as far as possible, all marks which contribute to the total mark are of equal value."⁽⁸⁰⁾

In the Division of Indian Education the mark scheme is drawn up at the same time as the question paper. The extent of detail provided at the draft stage is generally identical with that of the final marking scheme used in marking the scripts. This draft marking scheme may, of course, be amended along with the question paper during the moderation process and may be subject to further minor modifications after candidates have taken the examination. In some instances the modification even takes place while the scripts are being marked. In such cases it is usually correct unexpected answers, which the marking scheme did not provide for that are taken into consideration.

Marking schemes vary according to the subject being examined and the type of examination question used.

The scheme below is of the analytical kind. It is in the form of a model answer and shows the marks to be given for each stage in working towards the correct answer. It also indicates acceptable alternative values to the correct answer, and procedures to be adopted when errors are made at certain points in the solution.^{(81) (82)}

Example

QUESTION :

Write down the factors of $x^2 - 9y^2$. Hence or otherwise, solve the equations.

$$x^2 - 9y^2 = 15$$

$$x - 3y = 5$$

MARKING SCHEME :

Either

	Marks	Notes
factors are $(x+3y)$ and $(x-3y)$	B1	for factors (cao)
$(x+3y)(x-3y) = 15$		
but $x-3y = 5$		
$(x+3y)5 = 15$	M1	for subst. 5 for $x-3y$
$x+3y = 3$	A1	for this eq.
since $x-3y = 5$		
$2x = 8$	M1	for attempting to solve the pair of linear eqs. properly.
$x = 4$	A1	(cao)
by substitution :		
$4-3y = 5$	M1	for subst. value of x
$3y = -1 \quad y = -\frac{1}{3}$	A1	(ft
	7	

Or

	Marks	notes
factors are $(x+3y)$ and $(x-3y)$	B1	for factors (cao)
$x = 3y+5$ (or $y = \frac{x-5}{3}$)	M1	for trying to get $x =$ or $y =$
Substitution for x (or y) in the other equation.		
e.g. $(3y+5)^2 - 9y^2 = 15$	M1	for subs. for x

	Marks	Notes
$9y^2+30y+25-9y^2 = 15$	A1	for expanding $(3y+5)^2$
$30y = -10$		
$y = -\frac{1}{3}$	A1	(cao)
Substituting:		
$x = -1+5 = 4$	M1	for subst. value of y
	A1	(ft)
	<hr/>	
TOTAL	7	
	<hr/>	

M - method mark for using the correct method.

A - accuracy mark for getting correct answer using correct method.

B - accuracy mark for getting correct answer independent of method used.

As indicated below, a distinction is sometimes drawn between two sets of circumstances in which accuracy marks are awarded.

ft - where accuracy marks are designated as 'follow through', these marks can be obtained for incorrect answer consistent with previous error already penalised.

cao - accuracy marks which can only be gained for the correct answer.

Not all examination questions have a correct answer. For example, in an examination in English Language, a candidate may be required to write an essay and be given a choice of topics. In that case, an analytical marking scheme would be quite inappropriate. A more suitable marking scheme might be one of the type which gives the characteristic features of answers of varying quality. It is assumed that such a scheme enables the examiner to match the work of each candidate to the most appropriate part of a mark range.

This type of marking is generally referred to as impression marking.⁽⁸³⁾

According to the Associated Examining Board a good marking scheme should stand up to being judged against the undermentioned criteria:

- "(a) Does it show clearly which types of approach are acceptable?
- (b) Does it anticipate responses of a kind that candidates are likely to make?
- (c) Are the marks allocated for each part of a question commensurate with the demands made on the candidates?
- (d) Does the marking scheme indicate clearly the marks to be allocated for different parts of a question and, where appropriate, ascribe each mark or group of marks, to a particular part of the answer?
- (e) Does the marking scheme allow for possible alternative answers?
- (f) Has the marking scheme reduced to the minimum possible, the amount of computational work which the examiner has to undertake in order to arrive at the correct mark for a script?
- (g) Does the marking scheme, by specifying performance criteria, reduce as far as possible, the element of subjective judgment that the examiner has to exercise in evaluating candidates' answers?
- (h) Does the marking scheme encourage examiners to reward with very high marks, unusually good performances for candidates at the level being examined?

- (i) Are the abilities being rewarded those which the questions are designed to assess?
- (j) Are the worked solutions to the problems correct?
- (k) Does the marking scheme for particular questions reflect an unfair bias towards a particular viewpoint?
- (l) Can the marking scheme be easily interpreted by a number of different examiners in a way that will ensure that all mark to the same standard?
- (m) Does the marking scheme include instructions on how to deal with scripts where candidates have failed to obey the question paper rubric?"

The nature of the subject and the kind of question paper and marking scheme considered appropriate in that subject will determine largely the precision with which marks can be allocated. This precision is likely to vary between subjects. In examinations where evaluation of the candidates' answers depends upon the subjective judgement of the examiner, it is unrealistic to expect that two examiners will always give identical marks to the work of particular candidates. However, these variations should generally not be more than a few marks.

One of the requirements of the Joint Matriculation Board is that all question papers submitted for moderation to its moderators must be accompanied by detail marking schemes. It is, therefore, necessary for all examining bodies to draw up mark schemes. The nature as to the details required will to some extent vary from one examining body

to another. The experience of the examiners and sub-examiners in marking question papers will be a determining factor.

3.4.4.5 The conduct of the examination

As mentioned earlier the question papers once finalised and printed are submitted to the various examination centres. The Division of Indian Education posts these papers to the centres. Some of the other examining bodies in this country deliver the question papers to the various centres e.g. Natal Education Department.⁽⁸⁴⁾ Likewise British examining boards for the General Certificate Examination also make use of the post in sending question papers to the various centres.⁽⁸⁵⁾ The Division of Indian Education appoints the principals of the various schools who have senior certificate candidates as chief invigilators. Invigilators are appointed from the teachers at the schools. Therefore the responsibility for the safe-keeping of the question papers and the conduct of the examination at the school is totally in the hands of the principals.

The use of principals as chief invigilators and teachers as invigilators is also applied by the provincial examining bodies in this country. The Department of National Education appoints Local Secretaries in the different centres to conduct its examinations while the Joint Matriculation Board appoints chief invigilators who may not be personnel from schools.

It is the responsibility of the chief invigilator to open the appropriate question papers on the days and times of the examination as indicated on the time tables issued by the examining body. Further, he has to accept responsibility for the invigilation as well as the safe despatch of scripts to the examining body concerned.

The chief invigilator has also to indicate the number of candidates who wrote the paper as well as those that were absent. The Division of Indian Education issues a manual to all chief invigilators. The manual gives detail with regard to procedures to be adopted in conducting the examination. (86)

As soon as possible after an examination paper is written the chief invigilator is required to despatch the scripts to the examining body.

The Division of Indian Education on receipt of the scripts, checks these and places them in subject lots. A representative sample of scripts are, however, drawn and submitted to the chief examiner so that he may draw up detailed procedures for his marking team.

3.4.4.6 Marking and Moderating of scripts

The scripts of candidates taking the Senior Certificate Examination of the Division of Indian Education are marked at a central venue. The Division appoints sub-examiners in the different subjects who mark the scripts

under the supervision and control of a chief examiner. The sub-examiners are generally appointed from school teachers although a few university and college of education lecturers may also be appointed.

All the chief examiners and sub-examiners are requested to attend a meeting conducted during the last week of the last school term of the year. At this meeting attention is drawn by officials of the Division to certain administrative issues, concerning marking. These include, how to complete mark sheets, double marking of essays, entry of marks in the answer book, totalling of marks, reporting on irregularities, and submission of scripts to the administrative section.

Following immediately after this meeting, the chief examiners in each of the papers or subjects concerned hold their own meetings. These meetings aim at standardizing procedures. The purposes of these meetings are to ensure that all sub-examiners

"have read and fully understood their conditions of service and general instructions upon procedures which have been issued to them and understand the detailed marking scheme sufficiently well for it to be possible for them to mark accurately all scripts allocated to them."⁽⁸⁷⁾

When a sufficient number of scripts have been marked in a paper or subject, the administrative section generally draws two representative samples of scripts and

submits these to the internal moderator and the Joint Matriculation Moderator respectively for moderation purposes.

Once a script is marked it is thoroughly checked and thereafter the total mark appearing on the front cover of the script is transferred on to a mark sheet. The mark sheets are submitted to the computer section for processing.

The administrative procedures relating to an examination are elaborate and involves many people, from whom utmost accuracy is demanded in the processing of results.

The Division of Indian Education however, does not go without criticism. The following is an extract from a letter received from the Teachers' Association of South Africa, with regard to the release of results:

"The Association is deeply perturbed at the late release of results to Indian candidates. It would be appreciated if the Division decentralises its marking of scripts as is done by the Transvaal Education Department."⁽⁸⁸⁾

The Transvaal Education Department has a number of marking centres, and through a process of cross-moderation is able to maintain uniformity in marking. Further marking is conducted by teachers who have gained the experience of marking in an external examination over a long period of time. With teachers and examiners gaining the necessary experience, it is

hoped that the Division of Indian Education will also be in a position to decentralise its marking and thereby release its results together with the provincial education departments. Although the Natal Education Department does not decentralise its marking, it is able to release its results early because all its candidates come from within the province, unlike Indian education which examines candidates from three different provinces.

3.4.4.7 Normalizing procedures

In most external examinations the marks obtained by candidates are subject to adjustment before the results are determined. These marks are adjusted to predetermined norms or standards. Gledhill (1983) states that "many people feel that it is unfair that candidates who have in fact got a pass mark should be failed by adjustment made by a computer, while in another subject candidates who scored marks below the pass level are passed".⁽⁸⁹⁾

Gledhill goes on to state that "such opinions are based on the feeling that the examination itself should be the measure of success, unaffected by considerations of the percentage of candidates passing or gaining first class marks. The examination paper, set by competent examiners and moderated by experienced moderators, should be the final criterion, would be the position held by those who hold such views."⁽⁹⁰⁾

Ideally, of course, an examination mark should be a reliable measure of a candidate's ability in a subject. In practice there are several reasons why the marks are not immediately acceptable. For example research undertaken by Murphy (1980) demonstrates clearly the difference in standards of marking of different examiners. The marks given by different examiners to the same answer to the same question may differ widely - marks of 30% and 80% for the same answer have been reported.⁽⁹¹⁾ Further it is not always possible to set the same standard of question paper each year. Some years the question paper may be more difficult than in others, the standard of marking could also have changed. Therefore, it would be fairer to all candidates, past and present, to adjust the marks to a suitable standard. The establishment of a suitable standard distribution is therefore important. Gledhill states that "the best way seems to take the means of (unadjusted) distributions of numbers of candidates in the various 10% groups, 0 - 9%, 10 - 19%, etc. over the past five years". This indicates the average level of performance over a five-year period. This is called a norm or standard distribution. The above method indicated by Gledhill is the one approved by the Joint Matriculation Board and this is applied by all the examining bodies in South Africa. An example of how the standard distribution is arrived at is given below. Table 3.4 indicates the raw mark distribution for 1977 - 1981 for Mathematics Higher Grade of the Division of Indian Education.⁽⁹²⁾

TABLE 3.4

SYMBOL DISTRIBUTION FOR MATHEMATICS HIGHER GRADE OVER A FIVE-YEAR PERIOD

MATHE- MATICS HG	H BELOW 20%	G+GG 20 TO 29%	FF 30 TO 33%	F $33\frac{1}{3}$ 39%	E 40 TO 49%	D 50 TO 59%	C 60 TO 69%	B 70 TO 79%	A 80 TO 100%	MEDIAN <i>(mean)</i>	TOTAL NO. OF CANDI- DATES
YEAR											
1977	13,0	17,0	6,8	15,0	17,1	12,8	8,3	6,1	3,9	41,0	1658
1978	24,2	23,3	7,3	13,4	15,8	7,7	4,9	2,8	0,8	31,5	1411
1979	9,5	17,2	7,1	13,1	22,6	14,9	9,6	3,9	2,1	41,75	1195
1980	12,8	22,0	7,4	15,8	17,4	13,0	6,7	3,7	1,2	38,25	1365
1981	7,3	14,9	6,7	13,6	20,1	17,0	11,0	7,2	2,3	44,25	1321
5-Yr Av.	13,4	18,8	7,1	14,2	18,6	13,1	8,1	4,7	2,1	39,35	1390

As can be seen from the table, the distribution of marks is given in symbol categories. The percentages within each category for the five years is added together and then divided by 5 to give the 5-year average. The 5-year average is used to calculate the standard distribution or norm. Generally two points of the 5-year average are taken into consideration, i.e. the % distribution (as indicated by the A symbol) and the % failures (as indicated by cumulative % of all symbols below E), in the calculation of the norm. In this case the percentage A's would be 2,1% and the failures would be 53,5%. These two points are then plotted on a probability graph paper. As will be noticed that this method of determining the norm is based largely on historical data i.e. the performance of candidates in the past will invariably determine the norm for the future. Certain factors such as a difficult question paper in any one year could affect the norm, as is evident from Table 3.4. The 1978 scores indicate 24,2% in the H symbol category, the percentage distinctions is 0,8 and the mean is 31,5. These figures do not follow the general pattern that emerges when one compares them with the scores of the other four years. Therefore, it is unfortunate that this "bad year" should in some way influence the standard distribution in this subject.

Gledhill states that although statistical adjustment of marks to an agreed standard is by no means a perfect solution to the problems of year-to-year variation in standard of examination, it is fairer to

the candidates than would be the simple acceptance of the raw marks.⁽⁹³⁾ This view is also supported by Adams and Wilmut (1977) who state that the most appropriate method of dealing with question paper variations would be the adjustment of marks to some pre-determined criteria.⁽⁹⁴⁾

Although the method of arriving at the standard distribution for the various subjects among the different examining bodies in South Africa is a common one, the way adjustments are effected by the different examining bodies vary to some extent. Attention will be given to this aspect in Chapter 5.

The adjustment of marks are generally done by the Statistics Committee of each examining body. In the case of the Division of Indian Education, the committee is constituted as follows: The Director of Indian Education as Chairman, the three deputy directors, the chief education planner, the examinations officer, the education planner (examinations) and a Joint Matriculation Board representative.⁽⁹⁵⁾ The adjustments decided upon by this committee is fed into the computer which adjusts all the raw marks accordingly, and thereafter determines the results of candidates.

Once candidates receive their results, under certain conditions some candidates may apply to have their marks reviewed or they may apply to write the supplementary examination.

In order to give those candidates who apply for a review of marks a fair chance of obtaining a revised symbol, examining bodies in this country have the scripts reviewed by the internal moderator. There are generally few changes when candidates apply for review. The table below reflects the changes that occurred in the Senior Certificate Examination results of the Division of Indian Education after they were reviewed.

TABLE 3.5

SCRIPTS REVIEWED AND THE CHANGES THAT OCCURRED IN THE SENIOR CERTIFICATE EXAMINATION RESULTS OF THE DIVISION OF INDIAN EDUCATION OVER A FOUR YEAR PERIOD

NUMBER OF SCRIPTS REVIEWED AND THE CHANGES THAT OCCURRED

	1979	1980	1981	1982
No. of candidates who took the examination	5229	5279	5805	6492
No. that applied for reviews	742	762	831	899
% that applied for reviews	14,19	14,43	14,32	13,85
No. that gained improved symbols on review	95	127	72	97
% that gained improvement on review	12,80	16,67	8,66	10,79

While the percentage that applied for reviews over the four years appears to be consistent around 14%, the percentage that gained improved results on review varied markedly from year to year.

The changes on review of scripts may generally reflect on the reliability of marking in the examination. If this is so then one can conclude that in the 1981 examination the marking was very reliable since only 8,66% of those that applied for review had gained improved symbols.

The number of candidates that enter for the supplementary examination is generally small. The matter of whether it is economically feasible to run a whole examination for such a small number of candidates is currently being investigated by the different examining bodies. This matter was also discussed at the July 1979 meeting of the Joint Matriculation Board. The table below gives some indication of the entries for the November/December and supplementary examinations of three examining bodies over the past two years.

TABLE 3.6

SUCCESS RATE IN THE SUPPLEMENTARY EXAMINATION HELD BY THREE EXAMINING BODIES

	1981			1982		
	T.E.D.	N.E.D.	I.E.D.	T.E.D.	N.E.D.	I.E.D.
1. No. that took the December Exam.	24169	5885	5279	24658	6491	5805
2. No. that entered for the Supplementary	2244	425	869	2334	503	873
3. % that entered for the Supplementary	9,28	7,22	16,46	9,46	7,75	15,03
4. No. that passed the Supplementary	765	137	228	893	174	256
5. % that passed the Supplementary	34,09	32,23	26,23	38,26	34,59	29,32

KEY : T.E.D. Transvaal Education Department
 N.E.D. Natal Education Department
 I.E.D. Indian Education Department

With the Natal Education Department and the Transvaal Education Department some 8 and 9% respectively of the November/December Examination candidates enter for the supplementary examination. In the case of Indian Education about 16% enter for this examination. This could be attributed to the higher failure rate, as will be seen in Chapter 5, among candidates taking the examination of the Division of Indian Education, and therefore the need among candidates to complete outstanding requirements in the supplementary examination. Nevertheless the need to conduct the supplementary examination for so few candidates needs to be investigated further.

Having given a broad overview of the Senior Certificate Examination in South Africa with particular reference to Indian Education, and also the influence of the Joint Matriculation Board on these examinations, it is considered necessary to give some attention to the different types of assessment involved in the Senior Certificate Examination.

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CHAPTER FOURAN ANALYSIS OF THE PRACTICAL, ORAL AND WRITTEN MODES OF EXAMINING IN A SELECTED NUMBER OF EXAMINING BODIES BOTH LOCALLY AND OVERSEAS WITH PARTICULAR REFERENCE TO THE EXAMINATION CONDUCTED BY THE DIVISION OF INDIAN EDUCATION

The assessment techniques mainly used in the Senior Certificate Examination are :

- (a) written examination, including objective questions, short answer, structured material and free response questions;
- (b) practical examinations;
- (c) oral examinations;
- (d) projects; and
- (e) internal or coursework assessment.

The techniques decided upon by each examining body to examine a particular syllabus is subject to the approval of the Joint Matriculation Board. This makes it possible for the different examining bodies to have variations in the techniques of examining. Generally, however, most examining bodies employ similar techniques of examining in the same subject. A discussion of the various assessment techniques would yield some information with regard to the similarities and differences that exist among the examining bodies as well as the appropriateness of using certain techniques over others.

4.1. Written Examinations

Questions asked in written tests can be open-ended or closed. Behr (1971) states that in answering an open-ended question the candidate has to construct his own response in his words and in a form that he deems effective. In a closed question several alternative answers are provided from which the candidate has to select one. The open-ended

question is characteristic of the essay type examination, the closed question of the objective type examination.⁽¹⁾

4.1.1. The Essay Type or Free Response Examinations

The term essay, according to Hudson (1973) refers to answers to questions in the form of continuous, connected writing in which the candidate is free to express himself within wide limits in his own way. Essays are "open-ended" in the sense that the candidate himself selects the materials for inclusion and no precise limit is set to either the length or the form of the answer.⁽²⁾ Essay type questions are set in nearly all examinations conducted both locally and overseas. Some examples are given below.

"Although the outstanding characteristics of life is its continuity, the offspring produced from two parents are often different from each other and their parents. Discuss this statement with reference to man."

(Division of Indian Education : Senior Certificate Examination, Biology Higher Grade December 1982, p. 21.)

This question allows different candidates to approach the problem in completely different ways. The examiner will then assess the relative merits of these different approaches. The marking of such answers can be subjective.

In the above example no direction as to length of answer is give. Candidates are required to deduce the time to be spent on the question by considering the marks

allocated. Essay-type questions may sometimes be structured under certain headings. e.g.

"Discuss the importance of water to living organisms, giving examples, under the following headings:

1. Transport
2. Digestion
3. Reproduction
4. Support" (16 marks)

(Joint Matriculation Board : Matriculation Examination November/December 1981, Biology Standard Grade, p. 4).

In this question candidates are generally required to spend about the same time on each part of the answer. It would therefore have been more appropriate to indicate the marks given to each part of the answer. This question allows candidates to assume that each part carries equal marks, while the marking memorandum might indicate otherwise. Essay-type questions, or free response questions as they are sometimes referred to, may require the writing of essay answers or alternatively, the unguided solution of problems as shown in the example below.

"A small bird is on the top of a vertical telegraph pole, 10 m high. The pole is 8 m away from a high wall, which runs east-west, and is to the south of the wall. Calculate the height of the bird's shadow above the ground when the sun has bearing 138° and angle of elevation 40° ."

("Associated Examining Body "O" Level Additional Mathematics, June 1979).

This question does not guide the candidate in any way as to how they are expected to answer it. The principle merit of the free response problem-type of question is that it tests the candidate's ability to employ appropriate problem-solving techniques. It allows the examiner to award marks for any individual stages which may go towards a complete solution of the problem, and candidates may obtain marks for using the appropriate method, even though they may end up with the wrong answer. These factors clearly distinguish some of the advantages of a free response problem over an objective type question, where the candidates may be asked to decide between several possible answers, and where the candidate's choice can only be marked as correct or incorrect.

With regard to essay writing in English, the Associated Examining Board's English Committee takes the view that "composition is a more suitable word than 'essay' to indicate what is expected of sixteen-year-old candidates."⁽³⁾ They argue that the word composition means "a putting-together, presumably of ideas and feelings, whilst the essay is a literary form and the word carries implications of a more intellectual or more self-conscious or more whimsical approach to the subject, than is appropriate at this stage of development".⁽⁴⁾

This view is supported by all the senior certificate examining bodies in South Africa. In their English First Language, Paper One the word composition is used

instead of essay. In other subjects such as History, Geography and Economics, use is made of the word essay.

One major disadvantage of the essay-type answer to the free response question is that it can be difficult to mark in a precise way. For this reason, essay-type questions should not be used if they could just as well be replaced by other types of questions.

Behr (1971) asserts that the essay requires from the examinee clear, logical explanations, expositions, descriptions, etc. in "verbal written" form. The vocabulary and grammar used influence the quality of the essay and in the case of languages, aesthetic quality and originality are also important.⁽⁵⁾ Hopkins and Antes (1979) suggest that freedom of response in essay tests can be used to test the student in the higher cognitive behaviours of analysis, synthesis and evaluation. The student can be asked to apply, compare, explain, describe and contrast knowledge and principles.⁽⁶⁾

A major concern in the essay type test is the question of subjectivity which cannot be removed completely either in the selection of questions or in the marking of the scripts. The examiners' preferences will be reflected in not only the selection of questions but also in the marking of the scripts. In this regard Wood and Quinn (1976) ascribe to each examiner two characteristics of bias and inconsistency. An examiner's bias refers to his relative generosity or severity in awarding marks

whilst his inconsistency is a measure of how erratic he is in deviating from a steady bias.⁽⁷⁾

The authors of the Schools Council Examination Bulletin Number 3 feel that the essay type examinations in their present form are less reliable and probably often less valid than objective tests. They are, however, also of the opinion that some important educational objectives can be assessed only through the medium of essay questions. They add that the reliability of essay examinations can be increased by employing teams of markers so that each essay is independently marked by two or more markers.⁽⁸⁾ In this connection Godshalk, Swineford and Coffman (1965) found in their investigation that when 5 trained raters were used to rate independently five twenty-minute essays, the scorer reliability was about 0,92 and the test reliability was about 0,85.⁽⁹⁾ Coffman's investigation is very encouraging but for the number of raters used. Five "trained raters" could well produce the results he had achieved. In actual practice in external examinations such as the Senior Certificate it is not uncommon to employ some 50 persons to do the marking of about 10 000 scripts. It is under such circumstances that the evaluation of essays is often questioned.

Eells (1930) had 61 teachers score an examination consisting of four essay questions in Geography and History, and eleven weeks later had them score the same answers again. Reliability coefficients obtained by correlating the first and

second set of scores assigned by the same teachers ranged from 0,25 to 0,51 for the four essay questions. This evidence showing wide differences in the two sets of scores assigned by the same person, led him to conclude that,"the same individuals vary from time to time in their judgements about as widely as different individuals."⁽¹⁰⁾

The above views are corroborated by Stalnaker (1951) on the basis of an extensive experiment in the evaluation of English essay papers. The writer observes that "the typical essay test as typically handled ... is not reliably graded and, therefore, cannot stand alone as a good measuring instrument."⁽¹¹⁾

Subjectivity in scoring the essay is more the result of varying standards of expectancy among the teachers concerned than of any other cause. Such standards of expectancy vary from day to day, teacher to teacher, class to class and school to school. The establishment of uniform standards of achievement in the teacher is probably a human impossibility.

The teacher's assessment is the greatest variable which contributes to the subjectivity of the essay test.

Stalnaker (1951) states that the ability to obtain an accurate evaluation of essay questions is "practically prohibitive". A summary of his views on the problems of the essay examination is quoted below.

"The accurate evaluation of a well-

developed essay question is a long and difficult job and one which, properly done, requires intelligence, diligence, and consistency. The expense in time and money can be justified only to the extent that essay items are developed to measure reliably important objectives which cannot otherwise be measured."⁽¹²⁾

In the Senior Certificate Examinations in South Africa and in the General Certificate Examinations in the United Kingdom extensive use is made of essay type questions in the examinations.^{(13) (14)} Educators in these countries probably believe that there are important objectives which can only reliably be measured by essay type questions. Behr (1971) states that it is through the essay-type test that a pupil is able to develop an answer in his own way. The essay type answer reflects the creative ability of the pupil. In the case of language papers a pupil's aesthetic qualities and originality of style are brought to the fore.⁽¹⁵⁾

It is possible to adapt the essay for practically all subjects of the school curriculum.

Advocates of the essay test insist that the discussion type questions have value not found in the objective type test in that they call for comparison, for interpretation of facts, for criticism, for defence of facts, for defence of opinion and for other types of higher mental activity. Ebel (1974) contends that all these aspects can be measured by objective type questions.⁽¹⁶⁾

The freedom of response that the essay test question allows is considered to be one of its main characteristics. By the nature of the question the pupil is required to survey his own background of related information and to select the related facts and organise them for expression in his own words. It is important, however, that the freedom of selection, organisations and expression be suited to the measurable outcome of the course, and it is unfortunate that the essay type question fall short in this respect.

Nevertheless to develop optimum efficiency in the assessment of essays, Behr (1971) suggests two methods of marking i.e. impression marking and analytical marking.⁽¹⁷⁾

Impression marking occurs when the examiner reads through the essay and arrives at an overall impression based on a set procedure.

In the Senior Certificate Examination of the Division of Indian Education essay questions in nearly all subjects are marked once only. The only subject in which double marking is employed is in English composition. In this case the questions are marked independently by two different examiners. If there is a wide variation in the scores of the two examiners, then they are marked by a third examiner who decides on the final score.⁽¹⁸⁾

One possible way of improving the reliability of essay marking is through making the teachers and examiners fully aware of the limitations of this type of assessment and requesting them to exercise circumspection and caution when deciding upon a mark.

Training sessions in which a number of essay type questions are evaluated by a panel of experts to establish a standard will go a long way towards establishing reliability of marking the essay.

When the examiner employs the analytical marking method, he prepares a detailed marking scheme and awards marks for specific aspects of the answer. This is particularly necessary where the answers are largely of a factual nature. Some educationalists hold the view that an essay or composition in a language can be assessed more objectively if marked analytically. Research has, however, shown that the difference in marks awarded by examiners whether by impression or analytical marking is negligible. What does differ is the standard of marking of different examiners.⁽¹⁹⁾

Although reliability of marking is not an overriding consideration in external examinations, it should, as far as is possible, be enhanced. Thus, where essay-type questions have to be used, they should, wherever possible, be combined with other more reliable forms of assessment.

4.1.2 Objective type examination

Use of objective tests is widespread in education, industry, business and research. Their use in external examinations have increased recently, and it is not uncommon to find objective type items combined in a variety of ways in these examinations.

Wrigley (1974) states objective test items are used in nearly most subjects taken for the General Certificate Examination and the Certificate of Secondary Education Examination.⁽²⁰⁾ In South Africa increasing use is also made of these items in the Senior Certificate Examinations. Further the Human Sciences Research Council has constructed a number of objective type tests in a variety of subjects to be used as moderating instruments in the Transvaal Project Schools.⁽²¹⁾ The Division of Indian Education apart from making use of objective test items in the Senior Certificate Examinations, constructs specially standardised objective type tests for use in moderating teachers' assessment in the Standard 10 (Practical) Examination.⁽²²⁾

A test is said to be objective, if each item in it has a precisely pre-determined correct answer or a best answer no matter what form it takes or what educational objective it assesses. Jenkins (1972) states that an objective test is so constructed that the score of a particular candidate on the test is independent of the marker. However, substantial bias may enter into the selection of the content for a test for the individual items within it.⁽²³⁾ Coulter (1974) states that an "objective test item is usually defined as one for which there is a definite score for each possible response, thus eliminating variability in the scoring of the test."⁽²⁴⁾ According to Macintosh and Morrison (1969) the pupil has "to read and think rather than to think and write" in an objective type test.⁽²⁵⁾

It is clear that an objective test item is one set out in such a way that the candidate has to select the answer from a number of given alternatives, only one of which is correct. Several different types of items exist and it is possible to utilise these to satisfy the differing requirements of examinations in different subject areas. An example of one type of item is shown below.

"Which one of the physical quantities below is equivalent to rate of change of momentum?

- A acceleration
- B power
- C force
- D energy
- E velocity"

(Senior Certificate Examination :
Division of Indian Education, Physics
Higher Grade Paper 1, December 1982 p. 2).

The correct answer is C; all candidates who choose it are marked right and all candidates who choose any of the other four options are marked wrong. The item is objective in the sense that there is only one correct answer. The marking process is totally objective since the marker is not permitted to exercise judgement when marking the candidate's answer; agreement is reached by the panel of examiners as well as the moderators, before the examination is taken, as to the correct answer for the item. Houston (1980) states that "setting the item is however, a subjective process; the decision about which is the correct answer is a matter of subjective judgement on the part of the item

writer, as is the decision about which items from those available will be used in a particular test."⁽²⁶⁾ Similarly when a candidate decides to answer the question in a particular way, to select one of the options given, the candidate makes a subjective judgement; hence the examination is not entirely an objective process. Therefore, it would appear that the marking process only is objective and it is this objectivity of marking which distinguishes objective testing from all other forms of testing.

Nevertheless, Coulter (1974) states that objective testing techniques have been developed to such an extent that it is now possible to test most cognitive abilities using these techniques.⁽²⁷⁾ On the other hand, objective testing is not without its drawbacks; it is important to realise its weaknesses and limitations to ensure that "it is used in the right way, at the right time and for the right reasons."⁽²⁸⁾

Houston (1980) has listed the major advantages and disadvantages of objective testing compared with other types of testing. These may be summarised as follows:⁽²⁹⁾

Advantages of objective type tests

1. Since candidates do not have to write the answer, a greater number of items can be answered in a reasonable time than would be possible using other kinds of tests. This ensures a wide coverage of the syllabus and removes the need to offer the candidate a choice between questions, thus making sure that all candidates are assessed

on the same examination. It also discourages "question spotting" by the candidates.

2. In objective tests there is also complete marker reliability, the only errors arising being mechanical ones. The tests may be machine marked which means that, unlike other forms of examinations, a candidate's mark in an objective test does not depend on the subjective judgement of particular examiners; the candidates' scores in the test will not depend on which particular examiner happened to mark it.
3. The marking of objective tests is much more rapid, and often cheaper, than that of other forms of written test. Where a large number of candidates take the examination there is usually a valuable saving of time and money.
4. An objective test item is written to elicit the candidate's response to a clearly and narrowly specified question. When the same question is set in a non-objective format, it is sometimes necessary for the candidate to include in his answer, details that are not of prime importance.
5. Each item in an objective test can be conveniently pre-tested before it is used in the test. This means that it is possible to estimate, in advance, the difficulty level of each item and that of the test as a whole. Pre-testing also provides information about the extent to which each item contributes positively towards what the test as a

whole is measuring. Ambiguities in the wording of items, not discernible to the item writers or test constructor but misleading to the candidates, may be revealed by analysis of the pre-test data.

6. The format of an objective test item ensures that the intentions of the test compiler are clear; the candidates know precisely what is required in responding to each item. With other types of examining, ambiguities in wording the questions may lead to the candidates submitting answers to questions different from those which the examiner intended to ask.
7. Since each objective test item is constructed to test a specific point, it is easier for the test constructor to recognise when too much emphasis in the test is being placed on testing factual knowledge, or when the syllabus coverage has been inadequate, than in a conventional written examination where it is often not clear, until after the candidates have taken the test, just what is being examined.
8. Where a sufficient number of items have been written, it is practicable to store items in an item bank in such a way that future tests can be more easily compiled to a precise specification. It is possible to reuse items from the bank on future occasions, especially if steps are taken to keep the items confidential.

Some of the disadvantages of objective testing are given below.

1. Objective tests take much longer and are more expensive to prepare than traditional examinations. A large number of items have to be written carefully by item writers who need to be trained in the special techniques.
2. Objective test items have to be pre-tested before use in a formal examination. An objective test which contains bad items is worse than a conventional written examination which contains bad questions. If a candidate gets an objective test item wrong because of some flaw in the question, the answer sheet on which he records his answer will not reveal this fact; written answers to traditional questions often show whether the answer was wrong because the candidate had wrong information or because he misunderstood the question. This is particularly so where, in tackling the item or question, the candidate has to work through several stages in getting to the answer.
3. Objective tests cannot be used to test powers of written expression or the ability to develop an argument, or to assess manipulative skills.
4. Objective tests do not test whether the candidate can behave creatively or develop an "open-ended" situation - all possible lines of development were prescribed when the options were decided upon.

5. The scores gained in objective tests may be suspect because the candidate has guessed all or some of the answers. The format of these tests encourages the candidate to guess and it is sometimes considered necessary to take steps to discourage candidates from doing so. ⁽³⁰⁾

From the above it is clear that objective testing is not superior in every respect to all other forms of testing; it has strengths and weaknesses. Nevertheless, it has many advantages over other types of examining. It can be used successfully in most subjects and at most educational levels. If items are carefully constructed and compiled in accordance with a predetermined test specification, the results should provide entirely appropriate and highly reliable measures of educational attainment.

Types of objective test items

Several different types of objective test items are in common use in examinations. Some are straight forward in format, others are complex, but all have the characteristics of requiring the candidate to select the correct answer from amongst several options offered to him. The chart below illustrates the many types of objective test items or questions in use. ⁽³¹⁾

Test Items

Supply type	Selection type
missing word	multiple response
missing phrase	true/false
short answer	multiple choice
	matching block
	assertion/reason

A brief survey of each of these types of tests follows.

Several authorities (Coulter (1974); Jenkins (1972); Houston (1980)) use the term item instead of question on the grounds that an objective test item may not be phrased in the form of a direct question. It follows that a candidate is said to respond to an item rather than answer a question. For that reason the options are usually referred to as responses. (32) (33) (34)

The definition of these terms and others that have been developed to describe the characteristics of objective test items may be best demonstrated by looking at an example of an objective test item. The example below is a multiple choice item which is sometimes referred to as a simple completion item; but the terms are common to items of all types.

Example:

"The prothallus of the fern is the gametophyte plant because it

A has sporangia which bear spores

B arises from a spore which is diploid

C has archegonia and antheridia which produce the sex cells

D has sex organs within which meiosis takes place

E gives rise to a new sporophyte plant which is haploid."

(Senior Certificate Examination, Division of Indian Education : Biology Standard Grade December 1982, p. 3)

In this example, the terms denote the following:

<u>Term</u>	<u>Part of item</u>
Stem	: The prothallus of the fern is the gametophyte plant because
Responses	: Each of the options A,B,C,D, and E
Key	: The correct response to the item - in this case C
Distractors:	The incorrect responses to the item - responses A,B,D and E.

These terms, stem, responses, key and distractors are used in the discussion of the different item types.

Supply-type or completion-type items

In this type of item the pupil is required to recall and supply the answer to questions. Some times the pupil is required to complete a sentence by filling in one or more blanks. The blank may be caused by the omission of a word, a symbol, a phrase, a letter or a number. The pupil may or may not be provided with a list of responses with which to complete the sentence. In supply-type items, marking is not totally objective and answers sometimes require expert interpretation since certain alternative answers may be acceptable. Thomas (1971) says that supply-type items can be used to pre-test, consolidate, revise and post-test during "normal" classroom teaching where the immediate and personal contact with the teacher can help overcome problems of ambiguity. (35)

This technique allows the examiner a wide range of sampling but it lends itself most readily to assessing the responder's ability

to recall information. This type of item is sometimes included as sub-questions in external examinations. Some examples from Senior Certificate Examination question papers are given below.

Example 1

"Complete the following sentences by supplying the correct word(s) to fill the blanks. Write the answers only in the appropriate spaces provided on the answer sheet.

- 1.6.1 The endocrine glands are the _____ glands of the body.
- 1.6.2 These glands secrete _____.
- 1.6.3 The _____ gland is sometimes referred to as the "master gland".
- 1.6.4 The thyroid gland secretes _____ which raises the metabolic rate of the body.
- 1.6.5 In infants, under-secretion by the thyroid gland results in a condition known as _____."

(Senior Certificate Examination : Division of Indian Education, Biology Standard Grade December 1982, p. 6).

In the above example the possible answers are not given to the candidates. Therefore it is possible that more than one answer may be acceptable for one or more of the questions. In the above example question 1.6.3. has two answers either "pituitary" or "hypophysis". A further observation resulting from the above example is that all the questions relate to glands in one way or the other. It is therefore possible to pursue a common theme with completion type items. Another example of a completion type item is:

Example 2.

"Use the following words to complete the sentences:

very much too many more less fewer two

The day was (1) pleasant to spend indoors.

Many people are (2) afraid of snakes.

There was (3) more to do out of doors than indoors.

(4) dassies were devoured each year.

Because the eagles were (5) in number the farmers were (6) keen to shoot them.

(7) vermin was able to infest the lands.

There were at least (8) types of eagle on the farm."

(Senior Certificate Examination : Natal Education Department, English Second Language, Standard Grade December 1982, p. 5)

In the above example eight words are supplied, the candidate is required to write the appropriate word next to the correct question number. This item may be varied by supplying more than eight key words e.g. 12 of which only eight are correct.

A scrutiny of the examination question papers of several examining bodies at the Senior Certificate level in South Africa and at the General Certificate of Education level in Britain indicate wide use of the completion type item.

Selection-type items

The pupil is required to select the correct or best answer from a number of possible options. There are several types of the selection-type items.

Multiple completion items

The multiple completion item is a development of the multiple choice-type (which will be discussed later in this chapter) in which normally four responses are provided to the question asked in the stem. Some, all or none of these are correct. The stem must clearly state what the pupil is required to do. Although the multiple completion item may have more than one correct response, only one correct combination must appear in the set of options.

The multiple completion item is suitable for testing facts or ideas that are related. It is not suitable for testing isolated pieces of information. However, they are easier to construct than the multiple choice items because the responses are related to the stem rather than to each other. Some examples of these items are given below.

Example 1.

"Hydronium ions do not form when

- A protons and water molecules combine
- B hydrogen chloride dissolves in water
- C water molecules react together in pairs
- D sodium hydroxide reacts with water
- E nitric acid reacts with water."

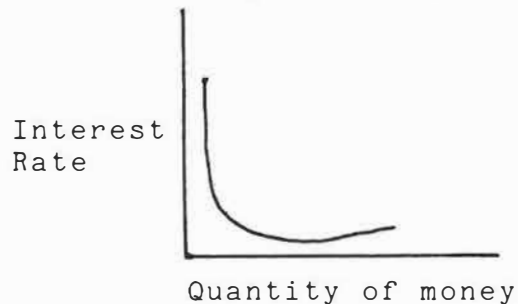
(Senior Certificate Examination ; Division of Indian Education, Physical Science, Paper Two, December 1982, p. 3)

In this item the stem is stated in the negative. All the distractors are related to the stem. A more complex multiple completion item, not frequently used in Senior Certificate Examinations, but often used in the General Certi-

ificate of Education Examination in the United Kingdom is given below.

Example 2.

"In the diagram below the curve shows the demand for money in a liquid form.



Which of the following would cause the curve to move to the right?

1. People think that prices are very low and will rise soon.
2. Businessmen think that sellers might be pressing for an early settlement of outstanding debts.
3. People think that the price of bonds is high in relation to their idea of the normal price.

For items of this type, the directions to candidates might read:

In these questions one or more of the answers given may be correct. Decide which are correct and mark your answer sheet according to the code:

- A if 1, 2 and 3 are correct
- B if 1 and 2 only are correct
- C if 2 and 3 only are correct
- D if 1 only is correct
- E if 3 only is correct."

(General Certificate of Education : The Associated Examining Board, Economics June 1979).

In this coding system only five of the possible eight combinations which arise in a three option item is being used. The other combinations could possibly have been discarded because they do not make sense or they make the answer obvious. The use of a coding system has one disadvantage in that candidates are liable to make errors in encoding their responses. An objection to multiple completion items is that a candidate may be led more easily to the correct answer than in a simple completion item; for instance, if he knows option 2 is incorrect, only responses D and E are possible. In effect these items comprise three true-false items linked by a common theme. The candidate who gets all three correct gets the item correct; conversely, if he gets two correct, but gets the third one incorrect, he gets no credit for his achievement.

Matching pairs (classification) items

Matching-type item is also another variation of the multiple choice type. The candidate is presented with two sets of words, formulae, definitions, equations, diagrams, numbers or statements and asked to select corresponding pairs from the lists. Jenkins (1972) suggests that this technique can effectively test not only recall of knowledge but also, if skilfully handled, can test higher thinking skills. (36)

An advantage of matching pairs is that widely divergent topics can be brought within the compass of one set of items.

Thomas (1971) states that these types of items can be used not only for assessment purposes but also during normal classroom activities.⁽³⁷⁾ Some examples of matching type items and their use in external examinations are given below.

Example 1

"Write down the numbers (1) to (10) next to the margin and next to each number the letter from column B which is the most suitable word relating to the word/words in column A.

<u>COLUMN A</u>	<u>COLUMN B</u>
1. part of chlorophyll molecule	A 12 : 1
2. nitgification	B algae
3. denitrification	C postassium
4. vegetative growth	D ammonia
5. constituent of enzymes	E Pseudomonas
6. iron deficiency in plants	F weak stems
7. excess nitrogen	G magnesium
8. fungi	H Nitrosomonas
9. C : ratio grain stubble	I copper
10. produce own carbohydrates	J nitrogen
	K chlorosis
	L 80 : 1
	M mycelia"

(Senior Certificate Examination : Natal Education Department, Agricultural Science, Higher Grade, December 1982, p. 5).

In the above item it will be noticed that Column B has 13 options which have to be matched with the 10 in Column A. There are 3 additional options which act as distractors. Further there is no common theme (apart from the items being from the Agricultural Science Syllabus) that can be detected in the items. Therefore the matching type item can have a wide coverage of

the syllabus.

Another type of matching item which is related to the stem and is structured to a central idea is given below.

Example 2.

"The correct processing of bottling fruit at home has a definite influence on the final results. Select the possible cause from list B (A - F) for each failure described in list A (1 - 4) by writing the appropriate letters in the spaces provided next to each number in list A.

LIST A : FAILURES	LIST B : CAUSES
1 _____ Fruit rises in bottles	A Contents were not covered by syrup
2 _____ Fermenta- tion takes place	B Fruit was stored in a cool dark place
3 _____ Darkening of fruit	C Insufficient sterilisation
4 _____ Bleached colour in fruit	D Too much acid was added
	E Too thick a syrup was used
	F Fruit was stored in a sunny place."

(Senior Certificate Examination : Natal Education Department, Home Economics, Higher Grade, December 1982, Section A Compulsory, p. 1).

In the above item the stem indicates the central idea. The causes of failure in bottling fruit are given in List B, of the six alternatives given only four are the correct answers, and two are distractors.

Assertion-reason-type items

Thomas (1971) states that this type of item consists of two columns, the student being required to decide whether the assertion in one column and the reason in the other are individually true or not. If they are both correct he has to decide whether the "reason" is a valid explanation of the "assertion".⁽³⁸⁾

Assertion-reason items allow widely different and unrelated topics and ideas to be included in one set and as such they can sample a wide range of subject matter within a short space of time. It is also suited to test higher thinking skills. There is, however, a danger that some candidates may be confused by the elaborate verbal skills used in the items. In this regard Thomas (1971) states that the student is as likely to get the item wrong due to "lack of test wiseness" (not knowing how to go about doing it) as he is through lack of knowledge because the item requires a high level of logical reasoning on his part to interpret the way in which the questions have to be answered. A scrutiny of the Senior Certificate Examination question papers (December 1982) of the Natal Education Department and the Division of Indian Education reveals that these types of items are not set for these examinations. Houston (1980) does not recommend the use of these items for several reasons. Some of these are discussed below. The complexity of the item format necessitates general instructions to candidates which are often more demanding than the subject matter of the items themselves. This is due to the difficulty in

writing such items successfully. These item-types can be written to test in certain special situations only and their use in a test increases the number of item types, which may be distracting for the candidates. Encoding responses to these complex item types results in an additional and considerable hazard for the candidates.⁽³⁹⁾

It seems likely that the assertion-reason type items are not included in the Senior Certificate Examination question papers for some of the reasons listed above.

True-false-type items

In terms of this type the candidate is given a statement and has to choose between two alternative responses : True or False.

Thomas (1971) says that the true/false type item is really a multiple choice item having only two alternatives. In addition they encourage and reward verbal memory.⁽⁴⁰⁾ But Jenkins (1972) holds a different view. He states that the true/false item should not be regarded as a variety of the multiple choice item in which there are only two responses. Instead the true/false item is an example of a group of questions in which a pupil is asked to choose from a pair of contrasted qualities e.g. right/wrong, same/different, yes/no, possible/impossible, true/false.⁽⁴¹⁾

Nevertheless, a wide range of subject matter can be sampled quickly by this type of item but its serious limitation is guessing. True/false type of item is

resorted to if the question does not permit four or five plausible alternatives. True/false items are thought to assess only factual knowledge and only rarely other abilities such as understanding or application. Sometimes the pupils are also requested to identify a false statement.

Some examples of true/false questions extracted from the Senior Certificate Examination question papers are given below.

Example 1.

"The underlined word/phrase in the following statements makes the statements True or False. Encircle 'True' if the statement is true and 'False' if the statement is false. Supply the correct answer in case of False statements.

1.2.1 When emulsions are stabilised,
they are known as saturated
solutions

True False

Correction : _____

1.2.2 Fluorescent bleaching agents are
used in commercial washing powers

True False

Correction : _____."

(Senior Certificate Examination : Division of Indian Education, Home Economics, Higher Grade, December 1982, Section A, p. 6).

In the above item only when the statement is false, are candidates required to supply the correct answer. The answers supplied could to some extent be subjectively marked, since it is possible that a false statement

can be corrected by presenting more than one correct answer. A somewhat slight variation from the above example is evident in the example below.

Example 2.

"Indicate whether the following statements are true or false by drawing a circle around the T (for true) or the F (for false) in the column provided. In the space provided below each statement, give the reason, if you consider the statement as false.

1. Ready-made mayonnaise left open on a shelf on a day when the temperature registers 32°C will remain a stable mixture

T F

2. If a standard butter cake recipe is used at a high altitude, the baking powder content is increased.

T F

(Senior Certificate Examination : Natal Education Department, Home Economics, Higher Grade, December 1982, Section A (Compulsory), p. 6).

This example differs from example 1 in that candidates are requested to give reasons for false statements, whereas in the first example a correction of the statement is required. The marking of the "reasons" given could also be subjective to some extent since it is possible to have more

than one correct reason for a false statement.

Nonetheless these items are generally used in most question papers set for the Senior Certificate Examinations.

Multiple choice items

Ebel (1972) makes the following observation about multiple choice items:

"Multiple choice test items are currently the most highly regarded and widely used form of objective test item. They are adaptable to the measurement of most important educational outcomes - knowledge, understanding, and judgement; ability to solve problems, to recommend appropriate action, to make predictions. Almost any understanding or ability that can be tested by means of any other item form - short answer, completion, true/false, matching or essay - can also be tested by means of multiple choice test items."⁽⁴²⁾

Ebel (1965) states further that in a multi-choice item the correct answer to a question is presented with several alternatives (distractors) which are incorrect.

The distractors are carefully compiled on the basis of the errors in thinking which pupils are likely to make. The shade of difference between the answer and distractors in a multi-choice item must be so subtle and slight that the child must be able to arrive at the correct answer only after careful thought.⁽⁴³⁾ However, in a higher level item all the options (alternatives) could possibly be correct answers and the pupil could be requested to select the "best answer".

Some examples of multiple choice items used in external examinations are given below:

Example 1.

"Which one of the following elements, identified below by their atomic number, is most likely to have the lowest boiling point?

- A 11
- B 14
- C 16
- D 17
- E 18"

(Senior Certificate Examination : Natal Education Department, Physical Science, Second Paper, December 1982, p. 2).

In this example the stem is in the form of a direct question and the responses alternative answers to the question. They comprise the key plus four more or less plausible distractors. These are plausible in the sense that they are answers candidates might get if they do not fully understand the principles involved or have made calculation errors.

Example 2.

"Copper is an excellent conductor of electricity because

- A the nuclei of the copper atoms touch each other
- B copper atoms in metallic copper are all electrically neutral
- C copper atoms have delocalised electrons
- D copper has two oxidation states
- E the nuclei of copper atoms are very unstable."

(Senior Certificate Examination : Division of Indian Education, Physical Science, Paper 2, December 1982, p. 5).

In this case the stem is an incomplete statement and the responses are alternative ways of completing that statement. One is correct and the others incorrect. As in example 1, the distractors are plausible to candidates with incomplete or wrong information.

Example 3.

"Which of the following provides the best evidence that the group of neurons forming the brain differ physiologically from each other?"

- A Neurons are affected differently by increasing the concentration of alcohol in the blood.
- B Different drugs affect the behaviour of different groups of neurons.
- C Neurons are seen to be different when subjected to careful microscopic examination.
- D Control of the body is effected by the grouping of neurons into distinct functional units."

(General Certificate of Education : The Associated Examining Board, Human Biology, Paper 2, June 1979, p. 5).

This example is different from examples 1 and 2. Here the candidate is required to select a best answer. In such cases the best answer, which will be the one marked correct, must be the only acceptable answer in the opinion of experts (examiners) and no others can be accepted. Where examiners disagree about which is the best answer, for example, if it is a matter of opinion or there is insufficient evidence to decide, the item should be regarded as not suitable

for inclusion in an objective test.

As in all testing situations, it is essential to use the item type most appropriate for the test. Complex item types with elaborate coding instruction should be used only where candidates have to demonstrate skills in a subject context where multiple choice items would be considered as inadequate.

It is evident that one or more types of objective-type items can well be used in examination papers. It is, therefore, the duty of the examiner to select the most appropriate types and use them as effectively as possible in the relevant question papers for the different subjects.

4.1.3 Some differences between essay and objective tests

The following are some differences between essays and objective tests as summarised from Ebel (1972).⁽⁴⁴⁾

An essay test question requires the student to plan his own answer and to express it in his own words. An objective test item requires him to choose among several designated alternatives.

In objective test items the student's task and the basis on which the examiner will judge the degree to which it has been accomplished are stated more clearly than they are in essay tests.

An essay test consists of relatively few, more general questions that call for rather extended answers. An objective test ordinarily consists of many rather specific questions requiring only brief answers.

The quality of an objective test is determined largely by the skill of the test constructor. The quality of an essay test is determined largely by the skills of the marker.

An essay examination is relatively easy to prepare but relatively tedious and difficult to score accurately. A good objective examination is relatively tedious and difficult to prepare but relatively easy to score accurately.

4.1.4 Some similarities between essay and objective tests

Ebel (1972) also lists the following similarities between essay and objective tests. ⁽⁴⁵⁾

Either an essay or an objective test can be used to encourage students to study for understanding of principles, organisation and integration of ideas and application of knowledge to the solution of problems.

The value of scores from either type of test is dependent on their objectivity and reliability.

A perusal of the question papers set for the Senior Certificate Examinations by the various examining bodies in South Africa indicate that in most subjects use is made of a combination of both essay type and

objective type questions. This trend is also evident in question papers set for the General Certificate of Education examination in the United Kingdom. A consideration of the essay type as well as the objective type questions has revealed that both have advantages and disadvantages. Therefore, in order to assess as broadly as possible and to attain the important qualities of reliability and validity in an examination, it is desirable that both these forms of assessment should be used in an examination.

Apart from the essay type and objective questions which form the major types of questions set in an examination, short answer questions, structured stimulus material questions and attainment tests questions also sometimes form part of the written examinations. A brief discussion of these types of written tests is given below.

Short Answer Question

These are questions which require a specific answer. The candidate is often required to write his answer in a space provided on the question paper.

Example :

"Explain three reasons for the differences in temperature between cities and their surrounding areas."

(Senior Certificate Examination : Division of Indian Education, Geography, Standard Grade, December 1982, p. 2).

Such questions have some of the advantages and disadvantages of both the objective type and essay type questions. The main difference is that they do allow the candidates some freedom of expression. Since the candidate's response is brief, a large number of such questions may be set in this format, thus allowing a wide syllabus coverage. Short answer questions may also comprise several sub-questions related to one another and can be used to test abilities other than factual recall, for example

"White light shone through a narrow slit onto a white screen produces a pattern of colours.

1. Why do the colours in the white light separate?
2. Which colour deviates most from its original path, and why?"

(Senior Certificate Examination : Natal Education Department, Physical Science, Paper 1, December 1982, p. 7)

The above questions allow a certain amount of free response and yet are restrictive in that each has one solution only. Another advantage of short answer questions is that the number of acceptable answers is normally limited and it is, therefore possible to give fairly precise instructions to examiners who mark them.

Structured Questions

Murphy (1979) states that these questions normally start with an introductory statement which is intended to define the limits

of the question as a whole and to direct the candidates' attention to information which the examiner intends should be used in answering the sub-questions that follow.⁽⁴⁶⁾ These are usually arranged as a series of specific enquiries, each relating to a different aspect of the main theme of the question. The series may be arranged in accordance with one or more dimensions such as difficulty or type of ability measured. In some instances later sub-questions in the series may develop the theme beyond the confines of the information given at the beginning of the question. It is sometimes advantageous to set these questions in such a way that a candidate does not need to arrive at the correct solution for one sub-question in order to be able to attempt other sub-questions. The advantage of adhering to this practice is that structured questions can then provide good discrimination among candidates with quite different abilities.

Example.

"Enzymes play an important role in physiological reactions.

1. List FOUR characteristics of enzymes.
2. State why enzymes are specific in their action.
3. The pancreas secretes both enzymes and the hormone insulin. However, if the pancreatic duct is severed, digestion is affected but diabetes mellitus does not result. Explain why this happens."

(Senior Certificate Examination : Division of Indian Education, Biology, Standard Grade, December 1982, p. 2).

In the above question each sub-question is

related to the main theme as indicated in the stem. Further the sub-questions are structured according to the degree of difficulty. Sub-question one requires the mere recall of information, sub-question two requires the application of what is learnt while sub-question three makes demand of the higher abilities of seeking relationships and explaining these relationships in a logical way.

Perhaps the most important property of a good structured question is its capacity to test candidates' ability to deal with complex problem situations - by restructuring the information learnt and providing it in a way relevant to the question.

Stimulus Material Question

It is extremely difficult to classify written examination questions, since however many types one classifies there will always be questions which do not appear to fit exactly into any one category. Stimulus material questions illustrate this fact quite well, because there is only a marginal distinction between them and the structured questions which have just been described. Stimulus material questions start off by providing the candidate with some stimulus material around which the question is based. This material may be an extract or a series of extract from some original sources or documents, or it may be a picture, or photograph, or a table of statistics or a graph.

This stimulus material is designed to focus the candidates' attention on the topic about

which they are to be asked questions. In this respect stimulus material questions are very similar to structured questions, but they do not necessarily go on to lead the candidate through the question in the same way as structured questions.

Some examples of stimulus material questions are discussed below.

Example 1.

"There is only one indispensable quality which a good teacher must have : a genuine interest in his or her pupils. Without this, all the other attributes - knowledge of one's subject, sporting ability, wide interests, industry, integrity, even enthusiasm - count for nothing.

Discuss these ideas."

(Matriculation Examination : Joint Matriculation Board, English First Language, Higher Grade, Second Paper, November/December 1980, p. 1).

The use of extracts is a common way of introducing stimulus material questions. The above question allows for free response from the candidate and is aimed at testing the higher levels of cognitive abilities. Stimulus materials may also be presented in the form of pictures or graphs.

There are considerable possibilities for introducing stimulus material questions into the examinations of a variety of subjects since they can be adapted to test a number of different skills, depending on the way in which they are used. One advantage of these questions is the way in

which they can take the candidates beyond the level of recalling facts, and test their ability to reason about or discuss complex problems in relation to certain given facts. Stimulus material questions also share one of the advantages of structured questions in that they can closely define the type of response which is required.

Attainment or achievement tests

Stanley and Hopkins (1972) define an achievement test as follows:

"A test that measures the extent to which a person has "achieved" something, acquired certain information or mastered certain skills, usually as a result of specific instruction."⁽⁴⁷⁾

Best (1959) states that achievement tests attempt to measure what an individual has learnt - his present level of performance. They help in determining individual or group status in academic learning.

Achievement tests are used in placing, advancing or retaining students at particular grades or levels. They are used in diagnosing strengths and weaknesses, and as a basis for awards, prizes, scholarships, degrees or certification.⁽⁴⁸⁾

In the General Certificate of Education Examinations conducted by the Joint Matriculation Board and the Associated Examining Board in the United Kingdom use is made of achievement tests in a variety of subjects. Achievement tests, however, are one of the techniques used in assessing candidates.⁽⁴⁹⁾ ⁽⁵⁰⁾ In South Africa

while achievement tests are used extensively for remedial and diagnostic purposes, the only examining body that makes use of achievement tests for certification purposes in a selected number of project schools is the Transvaal Education Department.⁽⁵¹⁾ These achievement tests are referred to as itembank tests and were constructed for the Transvaal Education Department by the Human Sciences Research Council.⁽⁵²⁾ The items used in these tests are mainly of the multiple choice type.

It is evident that written assessment in the Senior Certificate Examinations in South Africa may take a variety of forms. What is clear however, is the general uniformity of the types of written questions set by the various examining bodies in this country. This uniformity is probably due to the Joint Matriculation Board. The Joint Matriculation Board has constituted subject committees. Representatives of all the examining bodies serve on these committees and each year the question papers set by the different examining bodies are discussed at length at meetings held. The advantages, disadvantages, strengths and weaknesses of the different types of questions are debated. In this way some uniformity in the types of questions set by the different examining bodies in a particular subject seems to emerge.

Some examinations contain elements of assessment other than written examinations. Perhaps the most popular of these are practical and oral examinations, coursework

and projects. Again, those responsible for devising examinations need a knowledge of the advantages and disadvantages of these methods of assessment and of their suitability for assessing different syllabuses. These components are generally used to complement written examinations in such cases where they may provide an assessment of relevant skills and abilities not already covered by the written examinations. Some attention is given to these components of assessment.

4.2 Practical Examinations

Murphy (1979) states that "the main advantage of a practical examination is that it tests whether the candidates actually can perform the practical exercise, and it also allows an opportunity to assess how well they carry it out in terms of accuracy, speed, and other relevant factors. It can also be useful as a means of testing the knowledge and use of materials from a technical and aesthetic viewpoint."⁽⁵³⁾ It is also a valuable test of theoretical knowledge, the understanding of concepts, analysis of evidence and synthesis in proposing solutions. Of course, not all questions in a practical examination will necessarily cover all these aspects. They do, however, permit the setting of a range of questions from lower order to higher order.

In the Senior Certificate Examinations practical work is generally examined in the science subjects i.e. Biology and Physical Science.

The three examining bodies that assess practical work in the sciences for the Senior Certificate Examination are: the Natal Education Department, the Orange Free State Education Department and the

Division of Indian Education. (54) (55) (56) . The Joint Matriculation Board while recognising the importance of practical work in the sciences does not formally examine practical work. With regard to practical work in Physical Science the Joint Matriculation Board syllabus states the following:

"Physical Science is an experimental science. The syllabus gives ample scope for experimental work carried out by pupils themselves." (57)

The main aims of the practical work are stated as follows:

- " (i) to help pupils understand the fundamental role played by experiment and observation in establishing and extending the body of scientific knowledge;
- (ii) to facilitate the learning and understanding of facts and principles;
- (iii) to give pupils opportunities of making simple discoveries of their own;
- (iv) to provide experience of elementary measuring techniques, and acquaintance with some of the measuring instruments in common use;
- (v) to give practice in the recording and treatment of observations" (58)

Although these aims relate to Physical Science they could well apply to Biology. In this regard the Transvaal Education Department has a yearmark component to its Senior Certificate Examination. Practical work, therefore, is internally assessed by school teachers. (59) In the three examining bodies mentioned earlier, assessment of practical work is carried out by the class teachers through cumulative assessment, and each candidate is awarded a mark for practical work. This teacher-assessment component is moderated by a panel of moderators appointed by

the respective examining bodies. The marks allocated to the practical examination by the three examining bodies in Physical Science and Biology is given in the table below.

TABLE 4.1

MARK DISTRIBUTION FOR THE PRACTICAL EXAMINATION IN PHYSICAL SCIENCE AND BIOLOGY

TOTAL MARKS FOR THE SUBJECT	BIOLOGY		PHYSICAL SCIENCE	
	H.G. 400	S.G. 300	H.G. 400	S.G. 300
Total marks for Practical work in the three examining bodies				
N.E.D.	70	50	70	50
O.F.S.	70	50	70	50
D.I.E.	70	50	80	60

The table reflects that the mark for the three bodies is more or less the same except in Physical Science where the Division of Indian Education allocates 20% of the total marks.

The Natal⁽⁶⁰⁾ and Orange Free State⁽⁶¹⁾ Education Departments spread the period of cumulative assessment over two years (i.e. over the standard 9 and 10 years) whilst the Division of Indian Education requires teachers "to assess the practical ability of each student continuously throughout the course." (i.e. over the standard 8, 9 and 10 years). In addition to this, the Natal Education Department specifies that 40% of the total of practical work must be from the standard 9 work whilst the remaining 60% must be on standard 10 work.⁽⁶²⁾

The Natal Education Department suggests the use of tests, assignments and assessment of practical drawing (i.e. in practical record books or files)

as techniques to be used in cumulative assessment.

In Biology the Natal Education Department requires candidates to perform a minimum of two tests for practical work in the standard 10 year. However, the Department does not restrict teachers on the maximum number of tests that they could set for assessing the pupils. Besides these practical tests, the Natal Education Department requires teachers to assess at least two practical drawings (i.e. drawings reflected in the practical book or files of candidates) from each section of the syllabus, per pupil, per year (i.e., two in standard 9 and two in standard 10).⁽⁶³⁾

The Orange Free State Education Department, besides indicating the compulsory practical work that must be undertaken by students, outlines the work that is to be assessed, and tests to be used in the standard 9 and 10 years in collating marks for practical work. In the Division of Indian Education the situation is different. Detailed guides reflecting the criteria to be assessed, the scale to be used in assessing the sections, and the "weighting" of the various sections of the syllabus, are provided.⁽⁶⁴⁾

The evaluation of the pupils' performance in each aspect is based on the different ability levels. The suggested norms for this Division are as follows:

ABILITY LEVELS	HIGHER GRADE	STANDARD GRADE
1. Recall of knowledge/facts	55%	70%
2. Comprehension	30%	20%
3. Application	10%	10%
4. Analysis, synthesis, evaluation	5%	-

The table indicates that in the standard grade syllabus no questions on analysis, synthesis and evaluation of knowledge is recommended.

Since this syllabus does cater for pupils of lower academic ability it would appear that the "weighting" given to recall of knowledge and comprehension is in keeping with the expectation from pupils who opt for this syllabus.

A review of assessment of practical work in the above three examining bodies reveals that although all the examining bodies use more or less a common syllabus, there is variance among them in the use of assessment techniques.

Some bodies conduct written examinations and also assess practical work for the Senior Certificate Examination; while other bodies conduct only written examinations. This presupposes that the three examining bodies that assess practical work, do so because abilities measured through practical work are different from those that are measured by written papers. This view is supported by Tamir (1972) and, Kelly and Lister (1969).⁽⁶⁵⁾ ⁽⁶⁶⁾ It may, therefore, be argued that the marks awarded by examining bodies that conduct only written examinations are not comparable, in terms of abilities measured, to the marks awarded by other examining bodies that conduct written examinations and practical assessment.

There are also added difficulties in terms of devising and administering practical examinations when a large number of pupils are involved. The reliability and validity of such examinations become increasingly difficult to achieve. A discussion of some of the moderation procedures employed will now follow.

4.2.1 Moderation procedures

"Moderation" in this context refers to the procedure whereby school based assessments are brought into line with a common national standard or norm. The purpose of moderation is to ensure that the teacher-awarded marks are fair and comparable for all candidates. That is, a uniform standard of marks is maintained.

The Joint Matriculation Board issues certificates of matriculation exemption to holders of the Senior Certificate in the Republic of South Africa provided that the candidates meet with the requirements laid down by the Board.⁽⁶⁷⁾ The Joint Matriculation Board has the responsibility to ensure that equivalent standards are maintained in schools throughout the Republic by a system of moderation. The system of moderation (as mentioned in Chapter 3) by the Board involves the scrutiny of examination papers and scripts with regard to the Senior Certificate Examinations. Assessment of practical work by the class teacher also forms a component of the Senior Certificate Examination in certain subjects. The Natal and Orange Free State Education Departments and the Division of Indian Education (which are the only examining bodies in the country that assess practical work as a component of the Senior Certificate Examination) are entrusted with the responsibility by the Joint Matriculation Board to ensure that the overall standard of awarding marks for the practical work by teachers is fair and comparable for all candidates. To

ensure that these requirements of the Joint Matriculation Board are met, these examining bodies appoint a panel of moderators or examiners to moderate the marks awarded by teachers by the use of control tests. (68) (69) (70)

The procedure for moderation followed by the Natal Education Department is specified in Circular Minute No. 62/1979⁽⁷¹⁾ and information sent by moderators to teachers.⁽⁷²⁾ The local senior teachers in a particular subject play an important role in moderating teacher-awarded works. The high schools in Natal are divided into ten centres according to location. Each centre has three to five schools that have Senior Certificate candidates. A local senior teacher or a lecturer from a college of education is appointed as a moderator for a centre by the Department. This moderator is in charge of all the schools in the centre. In his own school the moderator from a neighbouring centre will be the moderator.⁽⁷³⁾

The moderation procedures of the Division of Indian Education and the Orange Free State Department is different from that of the Natal Education Department. To ensure that the marks awarded by teachers are uniform the Division of Indian Education and the Orange Free State Education Department appoint examiners to moderate these marks by means of control tests. These tests are externally set and marked, and are administered by the examiner on a sample of Senior Certificate candidates at each school sometime during the third school term. The marks awarded by the

examiner to the sample selected for the control test represent the standard of the examining body concerned. The mean mark of the examiner for the sample is then compared with the mean mark of the teacher for the same candidates. If there is a great discrepancy between these mean marks then the teacher-awarded marks are adjusted accordingly.

Since this study is concerned primarily with Indian Education some attention will be given to the moderation procedures employed by this Division. There is general uniformity in the procedure of moderation employed in the different subjects, a discussion of the procedures employed in Physical Science will give a general idea of the procedures used in other subjects (with a practical component) as well.

- . The examining officers select a random sample of candidates from a merit list drawn up by the school teacher. In selecting the sample the examining officer makes sure that the spectrum of marks are fairly representative.
- . Each candidate selected is required to perform two experiments, one in physics and one in chemistry. The performance of the candidates is assessed in accordance with the marking memorandum. The scores attained by the sample are recorded on a marksheet.

- The marks allocated by the examining officers are compared with the marks given by the class teacher. The final mark for each candidate from a school is then obtained by use of a moderation formula.⁽⁷⁴⁾ viz.:

$$F \text{ mark} = \frac{MSD}{TSD} (T \text{ mark} - T \text{ mean}) + M \text{ mean}$$

F mark = Final mark of candidate

T mark = Teacher's mark of candidate

T mean = Mean of teacher's mark for candidates tested

M mean = Mean of moderator's mark for candidate tested

MSD = Standard deviation of moderator's marks

TSD = Standard deviation of teacher's mark

It is evident that the Division of Indian Education apart from employing an elaborate method of moderation also employs about 12 examining officers in a subject to moderate a sample of 20% of candidates. The effectiveness of using a formula for moderation purposes, particularly with regard to small number of candidates needs further investigation. The following is a table reflecting the number of candidates that took Physical Science in the December 1980 Senior Certificate Examination and the number of candidates whose marks for the practical examination were moderated.⁽⁷⁵⁾

TABLE 4.2

CANDIDATES TAKING PHYSICAL SCIENCE IN THE 1980 DECEMBER SENIOR CERTIFICATE EXAMINATION AND THE NUMBER WHO HAD THEIR MARKS MODERATED IN THE PRACTICAL EXAMINATION

	HIGHER GRADE	STANDARD GRADE
No. of candidates	1 232	660
No. moderated	252	128
% moderated	20%	19%

The position with regard to Biology is similar.

With regard to the procedures employed in moderation, the Division of Indian Education undertook an investigation in 1980 to determine the relationship between teachers' assessment and the final assessment given to candidates after moderation. The computed correlations based on a sample of candidates are given in the table below.

TABLE 4.3

CORRELATION COEFFICIENTS AND THEIR VERBAL DESCRIPTION FOR THE PRACTICAL AND THEORY ASPECTS (BASED ON A SAMPLE) IN A SELECTED NUMBER OF SUBJECTS TAKEN FOR THE 1980 SENIOR CERTIFICATE EXAMINATION (76)

SUBJECTS	N	r	VERBAL DESCRIPTION	P
Biology H.G.	267	0,92	very high, rising to perfect relationship	< 0,05
Biology S.G.	159	0,94	high and substantial relationship	< 0,05
Physical Science H.G.	124	0,88	high and substantial relationship	< 0,05
Physical Science S.G.	100	0,73	high and substantial relationship	< 0,05

The correlation in respect of all subjects with regard to teachers' assessment and moderated assessment was fairly high and substantial in most cases (significant at the 5% level). This prompted the Division of Indian Education to investigate other methods of moderation which would not be so time consuming and costly and that which would at the same time be able to maintain standards. The new procedure based on establishing statistical norms taking the historical data of the previous five year performance in the practical aspect of the examination into consideration, will be implemented for the first time in the November/December examination of 1984.⁽⁷⁷⁾ The new procedure entails teachers at schools making the assessment of practical work in the usual way, but this time they also compute the mean, standard deviation and symbol distribution. This information together with the scores of each pupil is submitted to the Division's examining officer. The examining officer uses the average of the previous five years' practical scores for the school as a norm. If the school scores deviate drastically from the average five-year distribution then it is selected for in-depth moderation. Those schools whose scores are within the norm are generally accepted. In order to maintain control over standards at least 10% of the schools in any one year must be moderated by the examining officer. This would include both schools which fall within the norm as well as those that fall outside the norm.⁽⁷⁸⁾

One criticism that can be lodged against this type of moderation is that the scores of candidates are arrived by norm-referenced rather than by criterion-referenced evaluation. That is a statistical procedure which may have little relevance to the actual achievement of candidates in a subject is used to adjust the marks. If the scores were criterion-referenced then subject experts would be applying criteria which are relevant to their subject to moderate marks. Nevertheless it is too early to comment on the effect of the new moderation procedure. Some time needs to be allowed before this system can be effectively evaluated.

4.3 Oral Examinations

Murphy (1979) states that oral examinations have a place in the range of assessment techniques "because they measure skills which cannot be measured by written examinations".⁽⁷⁹⁾ Green (1963) suggests that a skilful administration of the oral examination is necessary to achieve good measurement.⁽⁸⁰⁾ Ebel (1973) adds that personal characteristics which would be impossible to assess on a written test can be evaluated in a face-to-face examination : characteristics such as appearance, manner, personality, alertness, forthrightness, stress, tolerance and speech patterns. One can also judge the impression the examinee would probably make on others.⁽⁸¹⁾ The major limitation of the oral test is the difficulty of obtaining reasonably reliable scores. In order to obtain a more reliable score, Macintosh and Hale (1976) suggest a more structured approach in which the pupil is provided with a framework within which to operate.⁽⁸²⁾ Murphy (1979) states

"Perhaps the most important prerequisite of any oral examination is a definition of exactly what is to be assessed. Once this has been decided, criteria for assessment can be drawn up and the examination can be designed, carried out and marked in a way which ensures that every candidate is given a fair assessment of the skills to be measured." (83)

Many oral examinations are broken up into various parts (e.g. Reading, Conversation and Talk) in a conscious effort to ensure that every candidate is given an opportunity to demonstrate his or her ability in the different aspects of the spoken language, which are to be assessed. This and the use of marking schemes which specify the different aspects of performance to be measured can help to ensure that candidates are marked on each aspect of their performance, rather than being given an overall mark based on a general impression formed by the examiner.

The examining boards in Britain do not generally lay down any specific requirements with regard to what should be tested in spoken English in the Certificate of Secondary Education examinations. Tests in this regard are devised by individual schools. The most common type of test includes a passage for reading, a prepared speech of from two to five minutes' duration on some topic selected by candidates and perhaps some sort of conversation. The exact form of a test normally depends on the interests and convictions of the teachers concerned, and usually provides for assessment at regular intervals throughout the year. An important point is that there is not necessarily a spoken component in assessment at this level, the decision therefore is often left to the school. (84)

There are, however, many private agencies in Britain who for some years offered tuition and tests in spoken English. The English Speaking Board Examinations is one such agency. The tests, and the resulting diplomas and certificates, seem to enjoy widespread currency in England and are apparently valuable to those seeking employment in which spoken English is necessary. The Board is probably best known for the examinations it offers, but its concerns are more widespread than examining; indeed,

"The only justification for the existence of the examination is that they invariably have a beneficial effect on the teaching that precedes and follows them. Many teachers and Heads have written about changes, direct and indirect, brought about in a school after the introduction of the E.S.B. examinations, changes that have stemmed from the increased concern for spoken work in school."⁽⁸⁵⁾

The aims of the English Speaking Board are stated as follows:⁽⁸⁶⁾

- "- to integrate oral training and communication into education at all levels;
- to conduct a series of examinations concerned with the social, vocational, and professional use of spoken English;
- to promote and improve the examining of spoken English in schools and further education;
- to publish books, articles and journals relevant to the foregoing aims;
- to conduct training courses and conferences relevant with oral communications."

The aims of the Board are not only relevant for the certification of candidates who are successful in its examination, but also relevant for the promotion of spoken language on a broad national basis.

The Bullock Report (1975) lays emphasis on the teachers' own ability in speech. The report states that a stimulating classroom environment will not necessarily develop the children's ability to use language as an instrument for learning. The teacher has a vital part to play and his role should be "one of planned intervention".⁽⁸⁷⁾

As part of their professional knowledge teachers should have:

"An explicit understanding of the processes at work in classroom discourse;
the ability to appraise their pupils' spoken language and to plan the means of extending it".⁽⁸⁸⁾

With regard to Drama, the Report states that Drama should be recognised as having a valuable contribution to make to the development of children's language. In secondary schools there should be constructive discussion of the place of drama in English teaching and its contribution to other subjects.⁽⁸⁹⁾

It is clear that the Bullock Commission places considerable importance on spoken language as a vital component in teaching and examining a language. However, Professor Britton commenting on the report, has the following to say:

"I believe the Committee is in error in putting undue emphasis upon talking as a means of learning language. It has its place, but in my view, one of the causes of the decline in English standards today is the recent drift in schools

away from the written to the spoken word". (90)

It would, therefore, be reasonable if in the teaching and examining of languages both the oral and written modes are taken into consideration. There would be certain aspects of language that could be best taught and examined through the oral mode while other aspects could be served best by the written mode. The responsibility, therefore, falls on to the teacher to see to it that the best possible methods are used in order to foster language development.

As in most other examining bodies in the Republic of South Africa, the Division of Indian Education examines languages by a combination of the written and oral modes of assessment, the "weight" given to the oral assessment is 20% of the total marks allocated to the subject.

The oral component for the Senior Certificate Examination of the Division of Indian Education constitutes 80 marks out of a total of 400 for English Higher Grade and 60 marks out of a total of 300 for English Standard Grade. The proportion of marks allocated to the oral component is the same as that of the Natal Education Department. A breakdown of how the marks are allocated for the various aspects of oral English is given below: (91)

	<u>Higher Grade</u>	<u>Standard Grade</u>
Reading	20	15
Speech	20	15
Conversation	40	30

As with the Natal Education Department the marks of candidates in the Division of Indian Education are determined internally by teachers at schools and thereafter subject to external moderation. The moderation procedure until 1983 was similar to the procedures used by the Natal Education Department in

1973. i.e. teams of moderators consisting mainly of senior teachers usually under the supervision of the Inspector of English constituted the moderation panel. Members of the panel visited every school that presented Senior Certificate candidates. At the school the moderator would draw a representative sample of candidates (about 10%) and these candidates were tested on the various aspects of oral work. Thereafter, if necessary the marks of teachers were adjusted.

Unlike the Natal Education Department, where teachers may appeal to the chief moderator or the Inspector of Education, if they do not agree with the moderator's comments or adjustment of marks, in the Division of Indian Education the moderator's decision is final. This does have several disadvantages since by its very nature oral assessment is prone to a greater degree of subjectivity than one can expect in written forms of assessment. The problem is further complicated since no record of what generally transpired between the candidate, the teacher and the moderator in the oral test situation is usually kept.

This elaborate procedure of visiting every school was, during the early stages, considered necessary since teachers had to be made familiar with the techniques of assessing oral work. The situation has, however, somewhat changed and the Division as from 1984 has introduced a new procedure for the moderation of orals. This procedure is the same as the one applicable to the moderation of practical work which has been outlined earlier in this chapter. However, it must be emphasised that the new procedure depends to a large extent on historical data i.e. the school's previous five-year performance in oral work. This is not always the best procedure to use since schools do have years in which they may have outstanding candidates while in other years the reverse

to the overall assessment of those candidates".⁽⁹²⁾ Many of the skills tested by a project, such as being able to approach a given problem, knowing how to collect relevant evidence about that problem and anticipating the difficulties involved, may often be tested through questions in written examinations. Where projects are included in schemes of assessment it is generally done so because their use is necessary to test skills which cannot be measured by other types of assessment. Some such subjects in which projects form an important component, and are taken for the Senior Certificate Examinations in South Africa are : Housecraft, Needlework and Clothing, Woodwork, Metalwork and History.

In Britain, projects form an important technique of assessment used in the Mode 3 examination. In art for instance candidates are given 6 months to complete a project in their special area of interest which may include sculpture, painting or designing.⁽⁹³⁾

In South Africa certain examining bodies (e.g. Natal Education Department, Division of Indian Education) require candidates taking History for the Senior Certificate Examination, to complete a special project (referred to as an assignment) by the end of the Standard 10 school year. The project normally commences in Standard 9 and is continued in Standard 10. It is related to the History syllabus and must cover a particular period of History.

The following are some of the criteria laid down by the Division of Indian Education for assessing the History project.⁽⁹⁴⁾

Assessment Grid

<u>CRITERIA</u>	<u>HIGHER</u>		<u>STANDARD</u>	
	Total	Pupil's Mark	Total	Pupil's Mark
1. Historical Content	15		11	
2. Pupil's grasp of content	15		11	
3. Originality of content	15		11	
4. Proof of research and reading	15		11	
5. Presentation (Table of content, source list, maps, reference, diagrams, illustrations)	10		8	
6. General (Quality of expression, neatness, initiative, etc.)	10		8	
TOTAL	80		60	

Guidance with regard to what is expected of pupils and teachers is also given by the Division's subject advisors. The criteria listed above is weighted in terms of the requirements of the project. It is evident that in the History project "presentation" and "general" receive a lower weighting than the other four criteria. The "weighting" and criteria for other projects in other subjects may be quite different. The length of the project is an important consideration. In this regard, the British Schools Council (1976) report that pupils produce the best individual studies in circumstances where:

- . a manageable problem is defined;

- . a hypothesis or generalization is advanced or model formulated;
- . data are collected (by first-hand observation through field work or from other sources e.g. census returns) even if quite limited;
- . data are analysed and presented (including for example, the making of maps and diagrams and the use of statistical techniques where these are appropriate);
- . conclusions are reached which enable the hypothesis, generalization or model to be evaluated. (95)

In the Division of Indian Education projects in Senior Certificate subjects are assessed internally by teachers and thereafter subject to external moderation by examining officers appointed by the Division. The moderation procedures are similar to those applied in the moderation of oral and practical assessment discussed earlier.

4.5 Coursework

One of the advantages of including an element of coursework in the assessment is that it gives an opportunity to broaden the view of the achievements of candidates, some of whom will not necessarily provide a representative performance in formal examinations. Another advantage is that work which could never be included in a formal examination can be presented as coursework (e.g. certain types of artwork, and fieldwork in geography).

There are, however, considerable disadvantages associated with the inclusion of coursework. Firstly, there is the marking of coursework and the problem of taking account of help which the candidates may have received from teachers, fellow-pupils, parents, or others. Secondly, there is the question of the "weighting" of the different objec-

tives of the syllabus, since the coursework may be measuring some of the objectives which are also being measured in the formal examination. This can lead to an over-emphasis being placed on certain skills or content areas of the syllabus. Finally the whole question of reliability and validity of such assessment and the development of effective techniques for moderating coursework assessment, make it not the most effective form of assessment to administer and control. In the Certificate of Secondary Examination and some syllabuses of the General Certificate Examination in Britain coursework is examined. In such cases the examining bodies concerned appoint moderators to maintain some form of uniformity in assessment among the schools. (96)

In South Africa as early as 1923 the Transvaal Education Department used school records to give a mark for coursework to be included as part of the school leaving examination.

The first Handbook noted that:

"The underlying principle of a School Leaving Examination and the justification for its institution are that its issues shall not depend solely on the results of a written examination but that the school record of the pupil be a largely determining factor" (97)

The "school record" referred to is an important aspect, for in the Transvaal the school record continues to the present day to be taken into account at every stage of the pupil's school career. School records can be in the form of classwork, projects, homework, assignments, test and examinations. Therefore, in this context it is used synonymously with the term 'coursework'. Coursework assessment can be continuous - what is often referred to as continuous assessment is perhaps more accurately

described as intermittent or period assessment, i.e. one made at intervals, more or less frequent, during the course.

Boyce (1978) states that it is important to note that marks given in relation to each child's ability are essentially a measure of progress and not of attainment. In coursework assessment, the pupil's attainment must be assessed in more absolute terms (and not his progress).⁽⁹⁸⁾ Since teachers are essentially required to pass on knowledge to pupils, and since they get to know their pupils well enough to realise their merits and weaknesses, it would be increasingly difficult for them to exercise complete objectivity when making assessments on pupils for whose performance they are responsible. Nevertheless coursework assessment seem to have many merits which supposedly outweigh the disadvantages mentioned above.

Although it has not become a recognisable part of the General Certificate Examination in Britain, it has gained importance in the Certificate of Secondary Education Examination. The coursework component may constitute any proportion from five percent to fifty percent of the marks on which the final grades are awarded. It is now felt that at least fifty percent of the final marks for the Certificate of Secondary Education examinations should be based on coursework. Dunning and his Committee (1977) in their report to the Scottish Education authorities suggested (after having examined the pros and cons of the internal and external assessments in the various countries) that a 50 - 50 weighting would be pedagogically sound and such a ratio would prevent one type of assessment over-shadowing the other.⁽⁹⁹⁾ It is interesting to note that the Natal Education Department which has introduced teacher's assessment (referred to as the yearmark) as part of the final assessment of candidates taking the Natal Senior Certificate examination has also adopted a 50 - 50

weighting.⁽¹⁰⁰⁾

The Associated Examining Board (1980) in Britain states that

"One of the reasons for including coursework in the final assessment of Mode 3 examinations is that they have a valid contribution to make to the overall assessment of the candidates' level of attainment. In some instances, coursework may be used to assess exactly the same skills as are assessed in the final written examinations. Its use, however, will allow candidates who do not perform well under examination conditions, to demonstrate their true ability in more relaxed circumstances. In other cases, coursework may be used to assess quite different skills from those being tested in the written examination; there are often good reasons why certain skills can only properly be tested through coursework."⁽¹⁰¹⁾

While the above quotation highlights the advantages of coursework, there are several other factors such as control and moderation of coursework, methods of achieving teacher reliability and proportional "weighting" of coursework assessment and external assessment that need careful consideration.

In the Senior Certificate Examination, for instance, in certain subjects a component is assessed internally but moderated externally. For example, the proportion of such marks in English and Physical Science is 20 percent of the total marks for the respective subjects. Those favouring an external examination advance the view that the traditional supervised external examination provides a more accurate estimate of the pupils' attainment than any other form of assessment (Thyne, 1974).⁽¹⁰²⁾ However, the "backwash" effect of examinations should not be ignored. Subject content and teaching methods are

dictated by examination requirements and the nature of the examination question papers. The school curriculum, to a large extent even in the lower standards, is influenced by the external examination. Further, it is difficult to assess the psycho-motor and affective domains, especially through the medium of an external examination. Coursework assessment can, therefore, play an important part in the overall assessment of pupils.

4.6 Internal vs External Assessment

Internal assessment implies that teachers are responsible, either on their own or in conjunction with other teachers, for the assessment of their pupils. It is generally accepted that "the teacher is likely to know more about his pupils than an external examiner and that he can provide more information about them than a necessarily short examination can hope to do. He can put his own pupils in an order of merit more accurately than any examination.

What he cannot do is to be sure that he is accurately assessing the standards of his own pupils in relation to those of other pupils in other schools. This requires either positive, widely informed and responsible moderation or an external examination."
(British Schools Council, 1963).⁽¹⁰³⁾

Jooste (1974), commenting on the TED experiment in which 20 schools were exempt from the external matriculation examination, presents the view that tests and examinations could be conducted under circumstances which do not create so many tensions for the pupil as do external examinations.⁽¹⁰⁴⁾

Pupils are assessed on the results of work they have done for a whole year or more, and not on those of a single examination taken at the end of the year.

There is ample opportunity to take into account those qualities not easily measured in an external examination, such as diligence, conscientiousness, motivation, excellence in oral situations, practical skills, perseverance, interest, initiative, creativity, reliability, systematic work habits, and adaptability. Pupils who become tense, anxious and unstable during examinations may be able to acquit themselves better in internal assessment.

In internal assessment consideration needs to be given to such issues as the validity of internal assessment; the aspects of the syllabus that can best be assessed internally; methods and approaches that should be adopted in assessing; when assessments should be made; comparability of standards among different teachers, in different schools, in the various subjects and in different socio-economic areas and the teacher's ability to handle the roles of an educator. In this regard Wilmut (1980) in an investigation into the reliability of teacher assessment in Queensland in Australia found that there was wide variation in teacher assessment. The variation was attributed to partly the assessment techniques used by different teachers, the lack of an effective system of moderation, lack of training for teachers in assessing and subjectivity in assessment.⁽¹⁰⁵⁾

The following are some criticisms concerning internal and external examinations:

- For each paper/subject in the external examination, there is a set duration of time. Because of this, only a limited area of the course may be tested. The depth at which pupils may be required to answer may also be affected by the coverage of the contents. In the Senior Certi-

ificate Examination, usually 1 or 2 papers are set in each subject with a maximum time of not more than 3 hours per paper. In contrast, internal assessment allows the teacher to assess a pupil over a realistic period so as to cover a much greater spectrum of objectives.

- . Miller (1976) points out that the element of luck plays a significant part in the pupil's change of success in an external examination. Internal assessment (which is continuous) obviates such a chance factor. (106)
- . In assessing pupils, the teacher has a number of methods and techniques which he may employ. Each method of assessment has its own strengths and weaknesses. (Hudson, 1973) (107) The external examination is only one of many such methods of assessing pupils, and will, therefore, have its limitations. The internal assessment broadens the scope of assessment and allows the teacher greater freedom to select the techniques of assessment - in this way, the internal assessment may possibly be more reliable and accurate than the external assessment.
- . In the case of an external examination, teaching and learning may become directed towards the goal of getting the pupils through the examination to the exclusion of all else. Yet, experience in countries where internal assessment has been used shows that, although the teacher may broaden the scope of the course, many pupils will control the amount and distribution of their study in response mainly to assessment requirements. (Rowntree, 1977). (108) Hence, internal assessment seems to generate its own requirements relating to the teaching-learning situation.

- . The teacher's pre-eminence in internal assessment goes unquestioned - there is no one else in such a position to find out about the development of the pupil with sufficient accuracy and frequency; and the teacher's assessment is usually characterised by high validity. (Francis 1980)⁽¹⁰⁹⁾ Yet it must be recognised that the individual teacher is limited by lack of knowledge of the total sample and by human traits of variability. Hence, his assessment may be prone to prejudice, oversight, misinterpretation, and by idiosyncrasy of standards. (Rowntree, 1977)⁽¹¹⁰⁾ In contrast, it is argued that the external examination is a common instrument, and therefore a uniform standard is more likely to be maintained. However, the uniformity exists only in so far as a common paper is written by all pupils taking the same subject at the same level. Clift and Imrie (1981)⁽¹¹¹⁾ mention that even in the external examination there may be inconsistency in the standard of marking. A single script may be awarded significantly different marks by different markers, and even an individual marker may be inconsistent in his marking. Hudson (1973) notes that the more a pupil's performance approximates a work of the imagination, the less reliable is the assessment.⁽¹¹²⁾
- . External examination conditions (such as time limit, invigilation, actual content of the paper) are the same for all pupils taking that particular examination and subject. The conditions for internal assessment will differ from teacher to teacher and from school to school. However, most external question papers do allow a choice from a larger set of questions or problems. Nuttal and Willmott (1972) and Rowntree (1977) have shown that because of the choices offered in the examination and because of the different levels of difficulty of different questions, different

pupils will, in effect, be taking a different examination. (113) (114)

- . While it is true that internal assessment reduces the tension and stress experienced by many students facing the end of year examination, Clift and Imrie (1981) point out that there is evidence from a number of studies that other students have to adjust to what is a continuous stress experience. (115)

4.7 A Combination of Internal and External Assessment

Assessment must cover as broad a spectrum of a pupil as possible, i.e. it must take into account the cognitive, affective and psycho-motor aspects of a pupil. The teacher's assessment should thus be given sufficient weighting in the overall assessment of the pupil. At the Sixth Conference of the Chairmen and Secretaries of the Boards of Secondary Education (1964), it was stressed that assessment covering the widest possible area of the pupil could be effectively undertaken by the school; and its potential, therefore, ought not to be left unexplored. (Srivastava, 1979) (116) The British Schools Council also holds that the "only place where there is enough information to do justice to the pupils is the school and full use must be made of it". (117)

Thus, the tendency in many overseas countries has been to de-emphasise the external examination.

While some education systems have achieved this by using only an internal assessment, many use a combination of internal and external assessment. This is evident in Canada, Sweden and Australia. (118) (119) (120) In Great Britain, a school may decide on the form of assessment it wishes to use. It may choose Mode 1 (external examination), Mode 2 (the school provides the syllabus but the

Examination Board examines it), Mode 3 (teachers devise their own syllabus, do their own examining, and then have that examination moderated by the Board). (121)

A combination of internal and external assessment is presently being used by the NED in determining the results of their standard ten pupils.

Both internal and external forms of assessing have been tried out, and, in spite of the arguments for and against each system, "there is a growing desire for a mixture of the two, that is, a proportion of the final assessment being derived from in-course assessment and a proportion from some form of terminal examination". (Clift and Imrie, 1981). (122)

If an internally assessed mark is to be combined with the mark from the external examination then consideration must be given to the following:-

The Weighting of Internal and External Assessment

As mentioned earlier, Dunning and his Committee (1977) in their report to the Scottish Education Authorities suggested that a 50-50 weighting would be pedagogically sound, and that such a ratio would prevent one type of assessment overshadowing the other. Further it was found that a high correlation existed between external examination and internal assessment when each contributed 50% of the marks. (123)

However, the ratio between internal and external marks need not be the same for all subjects. For example, Mathematics may have a higher proportion of external marks than Woodworking. The ratio in the former may be 70-30, while in the latter subject 30-70. The relative weighting, therefore, needs to be determined by subject experts in the different fields of study.

The Criteria to be used in arriving at an Internal Assessment

To minimise the differences that may arise in internal assessment, there is need to establish criteria that will be applied by teachers in their assessment of pupils in the various subjects. These criteria, while aiming at some form of uniformity in assessment, should also allow sufficient latitude for individuality in assessment.

The Control of Internal Assessment

In order to maintain standards a moderation procedure which aims to ensure that each pupil gets a mark that a consensus of teachers would agree with, needs to be implemented. This may be achieved through a teacher comparing his assessment of pupils with that of a colleague's assessment of the same pupils, and subsequently adjusting his own marks (internal moderation); by having his marks adjusted by an external moderator; or by adjusting the marks by statistical means. The matter of maintaining standards in internal assessments will be discussed further in Chapter 7.

4.8 GENERAL

Having discussed the techniques used in assessing candidates in the Senior Certificate Examinations in South Africa and in the Division of Indian Education in particular attention is now given to the performance of candidates in the Senior Certificate Examination conducted by the Division of Indian Education. This aspect is dealt with in the next two chapters.

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CHAPTER FIVEA STUDY OF THE PERFORMANCE OF CANDIDATES IN THE SENIOR CERTIFICATE EXAMINATION CONDUCTED BY THE DIVISION OF INDIAN EDUCATION5.1 THE NATURE OF THE PRESENT STUDY

The present study is essentially a descriptive and statistical research. Good (1963), Borg (1967) and Downie and Heath (1970) state that descriptive research precedes other types of research because "existing facts and prevailing conditions" need to be known before progress can be made in solving certain problems.⁽¹⁾⁽²⁾⁽³⁾ While descriptive research is primarily concerned with conditions as they are, it nevertheless involves much more than mere fact finding. "It must seek to discover cause and effect relationships, and attempt to give interpretations as well".⁽⁴⁾ Statistics are used to draw conclusions and give meaning to the data collected. In this chapter and the next, an attempt is made to find the existing facts and prevailing conditions as they pertain to the Senior Certificate Examination of the Division of Indian Education. Further some interpretation of the findings will be made. As mentioned in an earlier chapter the Division of Indian Education only became a fully fledged examining body in 1975. In comparison with many of the other examining bodies in this country, (Natal Education Department 1953, Transvaal Education Department 1950, Cape Province Education Department 1955) this is considered as fairly recent. Therefore, a study of some of the emerging trends in the examinations conducted by this Division should yield valuable information with regard to the standard of performance of candidates taking this examination, the enrolment patterns, the pass-failure rates, popular and unpopular subjects and areas that would have to be researched further.

Further since the introduction of the system of differentiated education (1973 - in some education departments)

candidates were required to offer subjects on two grades i.e. Standard and Higher Grades. There is no clear indication of the exact level of difficulty or differentiation that ought to exist between these two grades. A survey of literature in this regard reveals that the HSRC Report on Differentiation (1971) states that "subjects should be offered at an advanced and standard level in the senior secondary school period".⁽⁵⁾ No detail with regard to how the differentiation between the two syllabuses should be achieved is mentioned. However, the matter is further complicated when the Report states that "subjects may be offered at different levels for university entrance, i.e. a pass mark in a subject will, in some cases, be accepted at the standard level and in others at the advanced level for university entrance purposes".⁽⁶⁾ Implicit in this quotation is the fact that a combination of both Higher and Standard Grade subjects can be presented for university entrance. This was clearly evident from the discussion on university entrance requirements dealt with in Chapter 3. One problem that emerges with both grades being acceptable for university entrance, is the determination of the level of difficulty of each grade.

The ability to differentiate between the two grades does not only create problems in examining, but also in the teaching-learning situation. Teachers are generally required to present material at two levels and it is assumed that learning also takes place at different levels. The higher grade syllabus should be more demanding than the standard grade in the same subject. It is hoped that by this research some information with regard to the performance of candidates in the different grades of a subject will also be obtained.

5.2 PURPOSE OF THIS STUDY

The Division of Indian Education has shown growing concern over the performance of candidates in its Senior Certificate Examination. This concern has usually been generated when comparisons are made with the results obtained by certain other examining bodies in this country. Several articles appearing in local newspapers substantiate the above observation. The Natal Mercury (10 January 1979) states "while the top child in Indian Education achieved first position in the country with three A's, two B's and a C, several White students in all the provinces had acquired six or seven distinctions".⁽⁷⁾

It is evident that society places tremendous emphasis on the symbols obtained by candidates in an external examination. The quotation, therefore, could imply that there are differing standards in the different examinations taken at the senior certificate level, or that candidates taking the examination of the Division of Indian Education do not come up to the expected standard. Although it would be difficult to draw categorical conclusions on this aspect within the confines of this work, the various limitations in making comparisons of such nature will also be considered.

Another article that expresses concern about the quality of passes in the Senior Certificate Examination of the Division of Indian Education appeared in the Post (11 January 1978). The article stated "The quality of the matric passes can be gauged by the number of those students who have qualified for university admission. The unpleasant factor here is that about 69% of the students who passed the matric examination cannot enter the university".⁽⁸⁾

From the above it is evident that only 31% of candidates of the Division of Indian Education obtained matriculation exemption in that year. An endeavour will be made to com-

pare the matriculation exemption pass rates of this Division with that of the other examining bodies in this country. It is also hoped that some justification for the following statement by Dr Viljoen (Rand Daily Mail 16 Feb. 1982) can be found.

"There is a strong suspicion that the matriculation certificate in too many cases, is not a reasonable indication of a person's potential to succeed in university study", it is the "function of the JMB ... to see that university entrance certificates are a reasonable indication of a person's ability to succeed in university study."⁽⁹⁾

The need to examine the Senior Certificate Examination results more closely has also been highlighted in an editorial in the Daily News (31 December 1982). The editor stated that

"The publication of a succession of lists of matric results over the past few days - first whites, then Indians then Coloured, with African still to come - emphasises once again how costly, inefficient and above all how unjust it is to persist with racially divided systems of education."⁽¹⁰⁾

Although the current research is primarily aimed at examining the Senior Certificate Examination of the Division of Indian Education, some comparisons with the performance of candidates in the other examining bodies will also be made.

Attention will also be given to the choice of grades of subjects and how this affects the performance of candidates, "difficult" and "easy" subjects and the type of adjustments made to the marks of candidates in the different examining bodies will also be examined.

Further, as concern has been expressed by the Examinations Board of the Division of Indian Education on the

performance of candidates in certain subjects e.g. English and Mathematics⁽¹¹⁾, some comparisons with the performance of candidates in the other examining bodies will also be made.

Generally, therefore, this investigation is concerned with examining the performance levels of candidates taking the Senior Certificate Examination conducted by the Division of Indian Education and highlighting certain emerging trends that influence performance.

5.3 ASSUMPTIONS AND LIMITATIONS

For a meaningful appraisal of the findings, a research study needs to take into account the assumptions on what it is based and the limitations within which it is conducted. The present investigation rests on certain assumptions and limitations which are related to the theory and practice of education.

- (i) It is assumed that performance in examinations reflect on the cognitive, affective and psychomotor domain of educational outcomes. It is not possible to deduce the extent to which each is measured in an examination. What may, however, be evident is that in the Senior Certificate Examination the emphasis is on the cognitive aspect followed by the affective and then the psychomotor domain.
- (ii) The question papers for the Senior Certificate Examination are generally set and moderated by subject experts in the respective fields. Further, some papers are subject to further moderation by the Joint Matriculation Board moderators. It is therefore assumed that these question papers are criterion based and represent a fair sample of the field under study. From this one concludes that there should be some consistency in the standard of examining among the different examining bodies.

(iii) In the course of this study some comparisons between the performance of candidates in the Senior Certificate Examination of the Division of Indian Education and the performance of candidates in the other examining bodies in this country will be made. The major limitation of such comparisons is the fact that candidates of different examining bodies write different papers. Variations in the question papers, methods and standards of marking and different methods of adjusting raw scores would require the viewing of such comparisons with circumspection. Nevertheless it is assumed that the Joint Matriculation Board by its system of moderating question papers, discussing previous years question papers at its moderators' meetings and scrutinizing the examination statistics of the different examining bodies would ensure some uniformity in standards in the examinations conducted by the different examining bodies. Any conclusions drawn from comparative statistics of the different examining bodies will of necessity be viewed within the limitations expressed above.

5.4 OUTLINE OF DESIGN AND MATERIAL USED IN THE STUDY

In order to fulfil the aims of this investigation a research design outlining the procedure to be followed had to be drawn up. The research designed and the material to be used in the study are stated below.

Information with regard to the performance of Senior Certificate Examination candidates from 1978 to 1982 was obtained from the Division of Indian Education. The examination statistics were stored on computer tapes and the permission of the Director was obtained for their use. The researcher purchased copies of these tapes from the ICL Computer bureau which processes the results of the Division of Indian Education. These tapes were

thereafter handed to another computer firm who were able to place the information for the five years on a common store and supply data what was required by the researcher.

The tapes contained the number of candidates that entered for the Senior Certificate Examination for the various years, the schools in which they took their examination, the subjects entered for, the raw marks obtained by candidates in each subject, the adjusted marks of candidates and the results obtained by candidates i.e. whether the candidate passed with matriculation exemption, passed senior certificate or failed.

Apart from the above information, the researcher was able to obtain certain information with regard to the Senior Certificate Examinations conducted by the Natal Education Department, Transvaal Education Department, Cape Education Department, the Orange Free State Education Department, the Department of Education and Training and the Division of Coloured Education. The information was supplied on condition that it was treated confidentially and used for research purposes only. Use was made of this information where necessary. Unfortunately it would have been too costly and time-consuming to punch this information into the computer. Therefore, the required information from the other examining bodies was manually collated by means of an electronic calculator.

Although the research is primarily concerned with the examination of the Division of Indian Education, some comparisons with the examinations conducted by the other examining bodies was necessary to place the results with regard to Indian Education into the correct perspective.

5.5 THE SAMPLE USED IN THE STUDY

All candidates who took the Senior Certificate Examination

of the Division of Indian Education during the years 1978 to 1982 constituted the sample. The candidates were from the provinces of Natal, Transvaal and Cape. The majority of candidates came from Natal and the least from the Cape. A distribution of the secondary schools where candidates entered for their examinations according to province is given below.

	Natal	Transvaal	Cape	Total
No. of secondary schools:	55	18	3	76

Indians are not allowed to settle in the Orange Free State, hence there are no candidates from this province.

The number of candidates, according to sex, for the different years involved in this investigation is given in the table below.

TABLE 5.1

TOTAL NUMBER OF SENIOR CERTIFICATE EXAMINATION CANDIDATES
ACCORDING TO SEX USED IN THE INVESTIGATION

	<u>Y E A R S</u>				
	1978	1979	1980	1981	1982
MALES	3001 (60,28)	3007 (57,51)	2945 (55,78)	3135 (54,00)	3488 (53,72)
FEMALES	1978 (39,72)	2222 (42,49)	2334 (44,22)	2670 (46,00)	3004 (46,28)

The table indicates that there has been a general increase in the number of candidates who take the examination. From 1978 to 1982 (a period of five years) the percentage increase is 30,39%. Another interesting observation is the gradual increase in the number of girls who reach senior certificate level. In 1978 girls constituted 39,72% of the candidates and this increased to 46,28% in 1982. According to Naidoo (1969) in the early days the Indian community felt that a formal western education for girls was not necessary. However, since the fifties the impact of the western way of life has been felt by the Indian community with greater force. The last three decades have witnessed a dramatic development in the

education of the Indian girl.⁽¹²⁾ The above statistics support this viewpoint.

The increase of candidates in selected number of examining bodies over a five year period is indicated in the table below.

TABLE 5.2

INCREASE OF CANDIDATES IN THE VARIOUS EXAMINING BODIES
OVER A FIVE YEAR PERIOD

<u>EXAMINING BODY</u>	<u>1978</u>	<u>1982</u>	<u>% INCREASE</u>
Natal Education Department (NED)	6477	6695	3,37
Transvaal Education Department (TED)	21553	20997	(de-crease) -2,57
Orange Free State Education Department (OFS)	3637	3615	(de-crease) -0,60
Cape Education Department (CAPE)	14250	14621	2,60
Coloured Education Dept. (CED)	6891	10207	48,12
Education and Training (ED & TR)	15275	62397	308,49
Indian Education (IED)	4979	6492	30,39

From the above table it would appear that the White education departments viz. (NED, TED, OFS and CAPE) have reached the maximum growth rate with regard to the number of candidates that enter for their examination, in fact two departments have had a decrease in enrolment. Of the three other departments (CED, IED and ED & TR), Indian Education has the smallest increase (30,39) while the enrolment of Education and Training increased by more than three times since 1978.

The increase in the demand for education particularly among the Black, Coloured and Indian groups in South Africa is also corroborated by the recent investigation undertaken by the de Lange Committee (1981).⁽¹³⁾ Further this Committee also advanced several reasons for such growth, among which are the socio-economic and political development of these population groups and the fact that

"just over 37 per cent of the Blacks were urbanised in 1980".⁽¹⁴⁾ The demand for education among Indians, Coloureds and Blacks is clearly illustrated by the fact that the percentage of pupils who started school in 1963 and who then completed twelve years of schooling was as follows for Whites, Indians, Coloureds and Blacks respectively : 58,40; 22,30; 4,40; 1,96.⁽¹⁵⁾

The increase in the number of candidates among the Indian, Coloured and Black communities, taking the Senior Certificate examination as indicated in Table 5.2, is evident of the fact that the holding power of schools in these communities has recently increased.

Since constant reference is made to the different departments conducting the Senior Certificate Examination in the context of this work. The abbreviations in column II are generally used in reference to the education departments listed in column I.

<u>COLUMN I</u>	<u>COLUMN II</u>
Natal Education Department	NED
Transvaal Education Department	TED
Cape Education Department	CAPE
Orange Free State Education Department	OFS
Department of Indian Education	IED
Department of Coloured Education	CED
Department of Education and Training	ED & TR

5.6 DATA PROCESSING AND STATISTICAL ANALYSIS OF RESULTS

5.6.1 Data Processing

The data with regard to the Senior Certificate Examination statistics of the Division of Indian Education for the years 1978 to 1982 was processed at a central computer section. The researcher indicated to the programmer that the following statistics were required in respect of each of the years mentioned above:

1. Total number of candidates taking the examination, total number of passes and failures and the number of candidates obtaining matriculation exemption.
2. A distribution of the symbols in each of the subjects taken for the examination. A distribution of the raw marks as well as a distribution of adjusted marks in each of the subjects for the various years.
3. The calculation of the mean and standard deviation for each subject.
4. In those subjects with an oral/practical/assignment component, the correlation between these aspects and the theory examination be calculated.

The programmer was able to write out a COBOL programme on the data supplied to him. The researcher was able to obtain the above information on computer sheets which facilitated the work undertaken.

Data from the other examining bodies such as, number of candidates that took the examination, the pass and failure rates, mean and standard deviations and in some cases symbol distributions were supplied for each year by the examining bodies concerned. The researcher had to manually compute this information into tables for the five years under study. Further, certain statistical calculations such as Chi-squared statistic was manually computed with the aid of an electronic calculator.

Other general information was obtained from Departmental files and circulars. The Joint

Matriculation Board letters to the various examining bodies were used extensively in this investigation.

5.6.2 Statistical methods in analysis of results

The purpose of the present study, as mentioned earlier, is to determine the relationship in the performance of candidates during the various years between 1978 and 1982, and to make certain comparisons in performance between candidates taking the examinations of the different examining bodies. In order to draw meaningful conclusions from the data collected, certain statistics were used. The ones most frequently used are given below.

The Chi-squared statistic (X^2)

Borg (1967), Downie and Heath (1970) state that the X^2 technique is used as a test of significance when the data are expressed as discrete frequencies.^{(16) (17)} The X^2 statistic is known as a non-parametric or a distribution free statistic. It is a very useful test of significance because no assumptions are necessary about the shape of the parameter distribution.

The X^2 statistic is a method of determining whether the differences between the theoretical and the observed frequencies in any number of categories can reasonably be attributed to chance variations in the sampling.⁽¹⁸⁾ The question arises as to whether the differences between the observed and theoretical frequencies are significant. In this context, the null hypothesis is that no differences exist between the observed and theoretical frequencies. If the observed frequencies depart significantly from the theoretical frequencies, this constitutes evidence for the rejection of the theoretical frequencies.⁽¹⁹⁾

An example of the calculation of the theoretical or expected frequencies and Chi-squared is shown below.

We wish to test the null hypothesis that there is no significant difference in the number of boys and girls that entered for the Senior Certificate Examination of the Division of Indian Education over a five-year period. The calculation is set out in Table 5.3. The procedure followed is as set out in Downie and Heath (1970).⁽²⁰⁾

TABLE 5.3

CALCULATION OF X^2 IN A TEST TO DETERMINE THE RELATIONSHIP BETWEEN THE NUMBER OF BOYS AND GIRLS THAT ENROLLED FOR THE SENIOR CERTIFICATE EXAMINATION OVER A FIVE-YEAR PERIOD

	<u>Y E A R S</u>					
	1978	1979	1980	1981	1982	TOTAL
BOYS :	3015 (a)	3049 (b)	2813 (c)	3503 (d)	3384 (e)	15764
GIRLS :	1987 (f)	2253 (g)	2230 (h)	2984 (i)	2915 (j)	12369
	<hr/> 5002	<hr/> 5302	<hr/> 5043	<hr/> 6487	<hr/> 6299	<hr/> 28133

$$\text{Chi-squared } (X^2) = \frac{(A-E)^2}{E}$$

where A = actual frequencies

E = expected or theoretical frequencies

An example showing details of how the expected or theoretical frequency is calculated is given below.

	A	E	A-E	$(A-E)^2$	$\frac{(A-E)^2}{E}$
a	3015	2802,8	212,2	45023	16,06
b	3049	2970,9	78,1	6097	2,05
c	2813	2825,8	12,8	163,5	0,06
d	3503	3634,9	131,9	17397,6	4,78
e	3384	3529,6	145,6	21191,1	6,00
f	1987	2199,2	212,2	45023,5	2,05
g	2253	2331,1	78,1	6097,4	2,62
h	2230	2217,2	12,8	163,5	0,07
i	2984	2852,1	131,9	17401,6	6,10
j	2915	2769,4	145,6	21191,1	<u>7,65</u>
					47,44

$$X^2 = 47,44$$

$$df = (2-1)(5-1) = 4$$

The obtained X^2 of 47,44 is greater than 11,34 (read off from table), therefore $p < 0,01$.

The null hypothesis is therefore rejected, in other words there is significant difference between the number of boys and girls that enter for the Senior Certificate Examination in each of the five years under study.

Correlation Statistics

The relationship between the oral/practical/assignment scores and the scores in the written examination of candidates is also calculated in the context of this work. This relationship is referred to as the correlation.

Numerically the relationship, called the coefficient of correlation (r), has a value that falls between the limits of +1,0 (a perfect positive relationship) and -1,0 (a perfect negative relationship).⁽²¹⁾ The Pearson's Product Moment Correlation (r) is used in this work. The

formula is given below. (22)

$$r = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{[N \sum x^2 - (\sum x)^2] [N \sum y^2 - (\sum y)^2]}}$$

An example of calculating the Pearson's correlation is given below. The following are marks obtained by 10 candidates in the practical aspect of Metalwork and in the written theory examination in Metalwork.

Candidates	1	2	3	4	5	6	7	8	9	10
Practical mark	45	64	43	41	39	42	59	56	44	67
Theory Exam	33	46	38	39	59	36	54	41	33	51

Let the marks for Practical work be designated x and the Theory exam be y. To facilitate calculation, a table is drawn up.

TABLE 5.4

COMPUTING PEARSON'S PRODUCT MOMENT CORRELATION FOR SCORES IN THE PRACTICAL AND THEORY ASPECTS OF METALWORK - STANDARD GRADE

x	y	x ²	y ²	xy
45	36	2025	1296	1620
64	46	4096	2116	2944
43	38	1849	1444	1634
41	39	1681	1521	1599
39	59	1521	3481	2301
42	36	1764	1296	1512
59	54	3481	2916	3186
56	41	3136	1681	2296
44	33	1936	1089	1452
67	51	4489	2601	3417
$\sum x = 500$	$\sum y = 433$	$\sum x^2 = 5978$	$\sum y^2 = 19441$	$\sum xy = 21961$

$$r = \frac{10 \times 21061 - 433 \times 500}{\sqrt{[10 \times 19441 - (433)^2] [10 \times 25978 - (500)^2]}}$$

$$= 0,37$$

The correlation coefficient for 10 candidates is 0,37. The value of the correlation coefficient required for significance at the 0,05 and 0,01 levels for 10 candidates is read off from a table.⁽²³⁾ In the case of the example $p > 0,05$. The correlation is, therefore, not significant. There is no significant relationship between the scores obtained by the same group of pupils in the practical and theory aspects of the subject under review.

Apart from the chi-squared and correlation statistics other statistics used are : mean, standard deviation, SE mean, and critical ratio.

To get a clear picture of the distribution of scores, we need to determine its central tendency as well as its dispersion.⁽²⁴⁾ The mean, used in this investigation, measures the central tendency and the dispersion of scores around the mean is measured by the standard deviation. In the following example the mean and standard deviation are calculated. The table below gives the scores obtained by a group of senior certificate candidates in Mathematics and English Higher Grade in the 1982 examination of the Division of Indian Education.

TABLE 5.5

MATHEMATICS AND ENGLISH HIGHER GRADE SCORES OBTAINED BY
TEN CANDIDATES IN THE 1982 SENIOR CERTIFICATE EXAMINATION

x = English scores

y = Mathematics scores

x	D	D ²	y	D ²	D ²
56	12,3	151,29	25	1,9	3,61
40	- 3,7	13,69	24	2,9	8,41
53	9,3	86,49	20	6,9	47,61
45	1,3	1,69	19	7,9	62,41
43	- 0,7	0,49	33	6,1	37,21
40	- 3,7	13,69	46	19,1	364,81
40	- 3,7	13,69	26	0,9	0,81
33	-10,7	114,49	14	12,9	166,41
46	2,3	5,29	40	13,1	171,61
41	- 2,7	7,29	22	4,9	24,01
$\sum x = 437$	$\sum D^2 =$	394,41	$\sum y = 269$	$\sum D^2 =$	886,9

$$\begin{aligned} \text{Mean} &= \frac{437}{10} & \text{Mean} &= \frac{269}{10} \\ &= 43,7 & &= 26,9 \end{aligned}$$

$$\text{SD} = \sqrt{\frac{D^2}{N}}$$

$$\text{SD}_x = 6,28 \quad \text{SD}_y = 9,42$$

In the above example the obtained mean and standard deviation for English are 43,7 and 6,28 respectively. For Mathematics the mean is 26,9 and the standard deviation is 9,42. Is there a significant difference between the two means? To test the significance of the difference between the two means the critical ratio is used. (The Critical Ratio (CR) is a statistical technique used for testing the significance level of the difference between means involving large samples.)⁽²⁵⁾

$$CR = \frac{M_1 - M_2}{\sqrt{(SE \text{ mean}_1)^2 + (SE \text{ mean}_2)^2}}$$

$$SE \text{ mean} = \frac{SD}{N - 1}$$

$$SE \text{ mean}_1 = 2,09 \quad SE \text{ mean}_2 = 3,14$$

$$CR = \frac{16,8}{\sqrt{14,22}}$$

$$= 4,46$$

$$p < 0,01$$

Since the CR value is greater than 2,58 significance is beyond the 0,01 level. In other words, such a difference would occur less than once in one hundred times by chance.

Apart from the above statistics discussed other statistics will be used less frequently and these will be explained as they arise.

5.7 THE RESULTS OF THE PRESENT STUDY

5.7.1 An analysis of the number of pupils who on entering class i eventually reach standard 10

The table below indicates the number of pupils entering class i during the years 1967 to 1973 and the number that eventually reach standard 10 in the respective years generally after 12 years of schooling.

TABLE 5.6

CLASS ONE INTAKE AND STANDARD 10 ENROLMENT AFTER 12 YEAR PERIODS

	1967	1968	1969	1970	1971
Class i	14826	15760	18533	20157	20542
	↓	↓	↓	↓	↓
	1978	1979	1980	1981	1982
Std 10	5105	7433	7431	7878	8442
Holding power	34,43	47,16	40,10	39,08	41,10

Of those that were in class one in 1967 only 34,43% reached standard 10. For the year 1968 a substantial improvement is shown and for the remaining three years i.e. 1969, 1970 and 1971, the holding power remains about 40%. This, however, is a tremendous improvement over the figure (22,3%) quoted for 1963 by the de Lange Investigation.⁽²⁶⁾ Economic growth generally has an influence on the holding power of schools.

With the improvement of the economy of a country more jobs are created and some pupils in secondary schools leave to gain employment, however, the reverse applies when there is an economic recession. Therefore, the increase in the holding power is influenced by among other factors, economic conditions.

The holding power of White schools as quoted by de Lange (1981) for 1963 is about 60%.⁽²⁷⁾ It would appear that this figure would hold true even currently since White education had reached stability for quite a while as is evident from Table 5.2.

If one considers the holding power of White schools as the norm then Indian schools have about a 20% lower holding power. The position with regard to Coloured and Black schools would appear to be worse, in 1963 it was 4,4% and 1,96% respectively. While this position would appear to have improved tremendously, it was not possible to obtain adequate information to make up-to-date comment on the holding power of schools in these communities.

5.7.2 An analysis of the entry patterns, pass and failure rates in Indian Education since 1976

Details with regard to the entries, pass-failure rates, exemption passes for the period 1976 to 1982 is given in the table below.

TABLE 5.7

ENTRIES, PASS-FAILURE RATES, EXEMPTION PASSES FOR INDIAN EDUCATION - 1976 TO 1982

	1976	1977	1978	1979	1980	1981	1982
Total number of candidates taking							
(a) The full examination	4196	4871	4979	5229	5279	5805	6492
(b) Total number of passes	3612	4315	4485	4549	4470	4672	5453
(c) Total number of failures	534	524	438	626	690	955	955
(d) Total number of exemption passes from (a) above	1089	1557	1645	1595	1855	2056	2411
(e) Percentage Senior Certificate + Matric. Exemption passes (a) above	86,04	88,59	90,07	87,00	84,67	80,48	83,99
(f) Total number of candidates taking full examination with choice of subjects which will lead to Matric. Exemption	2577	3558	3620	3177	3543	3991	4282
(h) Total number of candidates from (f) above that qualify for Matriculation Exemption	1089	1557	1645	1595	1855	2056	2411
(i) Percentage from (f) above qualifying for Matriculation Exemption	42,25	43,76	45,40	50,20	52,35	51,51	56,30
(j) Percentage of Matriculation Exemption passes from (a) above	25,95	31,96	33,03	30,50	35,14	35,42	37,13
(k) Percentage of candidates offering Matriculation Exemption courses	61,41	73,04	72,70	60,75	67,11	68,75	65,95

A graphic representation of the enrolment, pass-failure and number of matriculation exemptions is given on the next page.

5.7.2.1 Enrolment Patterns

It is evident that within a period of seven years the number of candidates entering for the Senior Certificate Examination has increased by about 55%. The growth rate per year is given below.

	1976	1977	1978	1979	1980	1981	1982
Growth rate %	16,09	2,22	5,02	0,96	9,96	11,83	

The growth rate varies from year to year indicating that no stability has been reached with regard to the number of candidates that enrol for the examination each year. It would therefore be virtually impossible to rely on these figures to predict future enrolment patterns. It seems that the Division of Indian Education is not presently in a position to make any reasonable predictions of the growth and demand for its examination in future years. What may be possible, however, is to rely on the standard 9 enrolment figures to make prediction for the year ahead. This, however, gives educational administrators very little time for planning their examination.

Some comparison with the enrolment trends of a selected number of examining bodies in South Africa should provide valuable insights in this area. Their enrolment and growth rate over a five year period is presented in Table 5.8.

A GRAPHICAL REPRESENTATION OF ENTRIES, PASS-FAILURE RATES
AND EXEMPTION PASSES FOR INDIAN EDUCATION - 1976 TO 1982

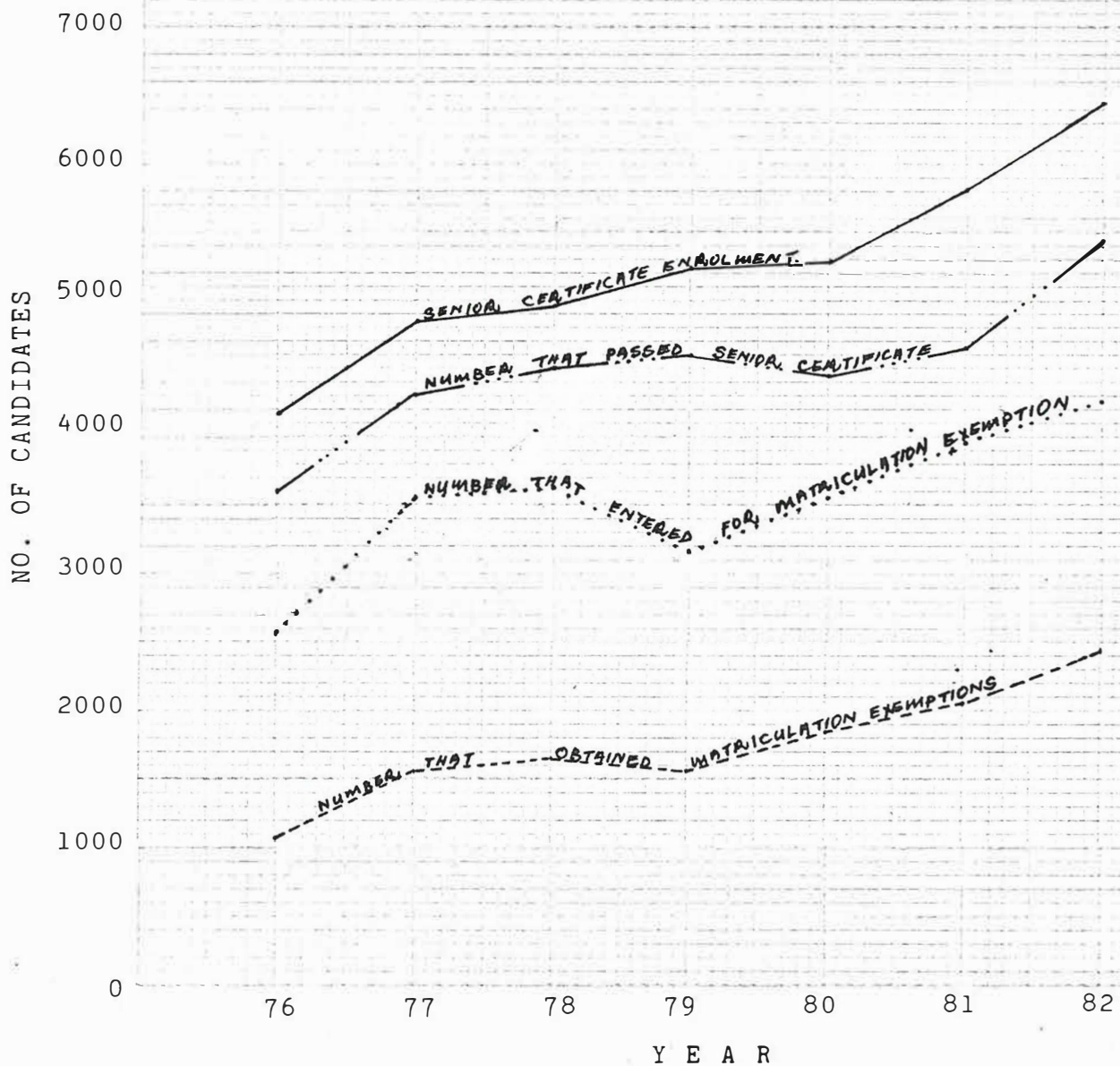


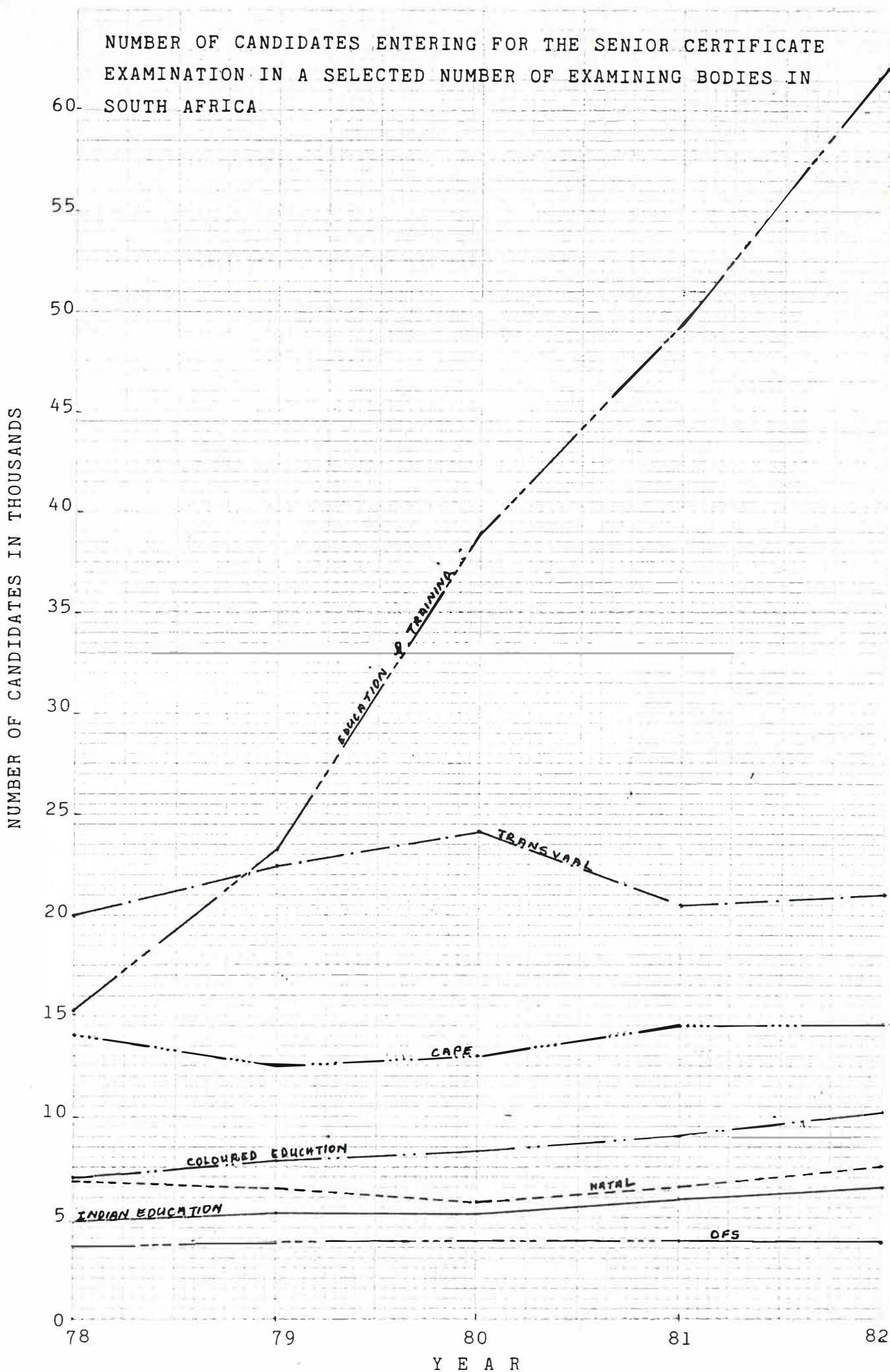
TABLE 5.8

*Very important
table
also*

ENROLMENT AND GROWTH RATES FOR 1978 TO
1982 AMONG A SELECTED NUMBER OF EXAMINING
BODIES

		1978	1979	1980	1981	1982
NED	No.	6477	6500	5885	6491	6695
	Rate		0,36	-9,46	10,30	3,14
TED	No.	21553	22429	24169	20313	20997
	Rate		4,06	7,20	-15,95	3,37
CAPE	No.	14250	12732	13207	14549	14621
	Rate	-	-10,65	3,73	10,16	0,49
OFS	No.	3637	3664	3698	3859	3615
	Rate	-	0,74	0,93	4,35	-6,32
CED	No.	6891	7654	8389	9269	10207
	Rate	-	11,07	9,6	10,49	10,12
IED	No.	4979	5229	5279	5805	6492
	Rate	-	5,02	0,96	9,96	11,83
ED & TR	No.	15275	23251	39177	48571	62397
	Rate	-	34,30	68,50	23,98	28,47

A graphical representation of the enrolment of each of the above education departments Senior Certificate intake is given on the next page. It is clear that the highest growth rate is experienced by Education and Training. The growth rate of Coloured and Indian Education for 1981 and 1982 is very similar (around 10%). The White education departments experience a negative growth in some of the years. Overall the growth rate from year to year varies among all departments and while it is possible to make some predictions about the future Senior Certificate enrolment patterns, these predictions cannot be made with a great degree of certainty. Information of this nature apart from being of use to educational administrators would



also serve a useful purpose for manpower planning and utilization in this country.

5.7.2.2 Pass-fail rates in the Senior Certificate Examination as a whole

An indication of the number and the percentage pass in the Senior Certificate Examination in a selected number of examining bodies is given in Table 5.9.

While the pass rate in the Division of Indian Education seemed to decline from about 90% in 1978 to about 80% in 1981, there was, however, an improvement of about 4% in 1982. One of the possible reasons for the decrease in the pass rate could have been the unrest in Indian schools during the period 1979 to 1981. Indian pupils boycotted classes as a protest against inferior education for the Black groups in this country. This was one of the reasons that led to the South African Government appointing the de Lange Committee to investigate and make recommendations concerning education in the Republic of South Africa. It is interesting to note that the four White education departments have a pass rate of above 90%. The difference in the pass rate among these departments vary slightly implying that there could be co-ordination and consultation with regard to syllabuses, examination requirements and pass-failure rates. The heads of each of these departments is a member of the Committee of Heads of Education, a body through which interdepartmental consultation takes place. (28) However, the Indian, Coloured

TABLE 5.9

→ N.A.

NUMBER AND PERCENTAGE PASS IN THE SENIOR CERTIFICATE EXAMINATION OVER A FIVE YEAR PERIOD IN A
SELECTED NUMBER OF EXAMINING BODIES

	1 9 7 8		1 9 7 9		1 9 8 0		1 9 8 1		1 9 8 2	
	No. Pass	% Pass	No. Pass	% Pass	No. Pass	% Pass	No. Pass	% Pass	No. Pass	% Pass
NED	6106	94	6216	96	5633	96	6202	96	6399	96
TED	20399	94,6	21314	95,0	22978	95,1	18899	93,1	19713	93,9
CAPE	13346	93,7	12007	94,3	12330	93,4	13394	92,1	13594	92,98
OFS	3413	93,8	3404	92,9	3499	94,62	3624	93,91	3402	94,11
CED	4523	65,4	6779	88,5	5282	63,0	5279	57,0	6868	67,3
IED	4485	90,07	4549	87,00	4470	84,67	4672	80,48	5453	83,99
ED & TR	12216	80,0	16405	70,6	22556	57,6	25963	53,50	30595	49,0

Since the failure rate is the inverse of the pass rate, the number and percentage failure is given in the table that follows.

TABLE 5.10

NUMBER AND PERCENTAGE FAIL IN THE SENIOR CERTIFICATE EXAMINATION OVER A FIVE YEAR PERIOD IN A
SELECTED NUMBER OF EXAMINING BODIES

	1 9 7 8		1 9 7 9		1 9 8 0		1 9 8 1		1 9 8 2	
	No. Fail	% Fail	No. Fail	% Fail	No. Fail	% Fail	No. Fail	% Fail	No. Fail	% Fail
NED	388	6,0	260	4,0	235	4,0	260	4,0	268	4,0
TED	1164	5,4	1121	5,0	1184	4,9	1402	6,9	1281	6,1
CAPE	904	6,3	725	5,7	877	6,6	1155	7,9	1026	7,02
OFS	225	6,2	260	7,1	195	5,27	232	6,01	211	5,84
CED	2368	34,6	880	11,5	3104	37,0	3986	43,0	3338	32,7
IED	438	8,8	626	11,97	690	13,07	955	16,45	1039	16,0
ED & TR	3055	20,0	6836	29,4	16623	42,43	22586	46,5	31823	51,0

and Education and Training departments have no representation on this Committee and it is possible that the fluctuation of pass rates from year to year within these departments is as a result of this.

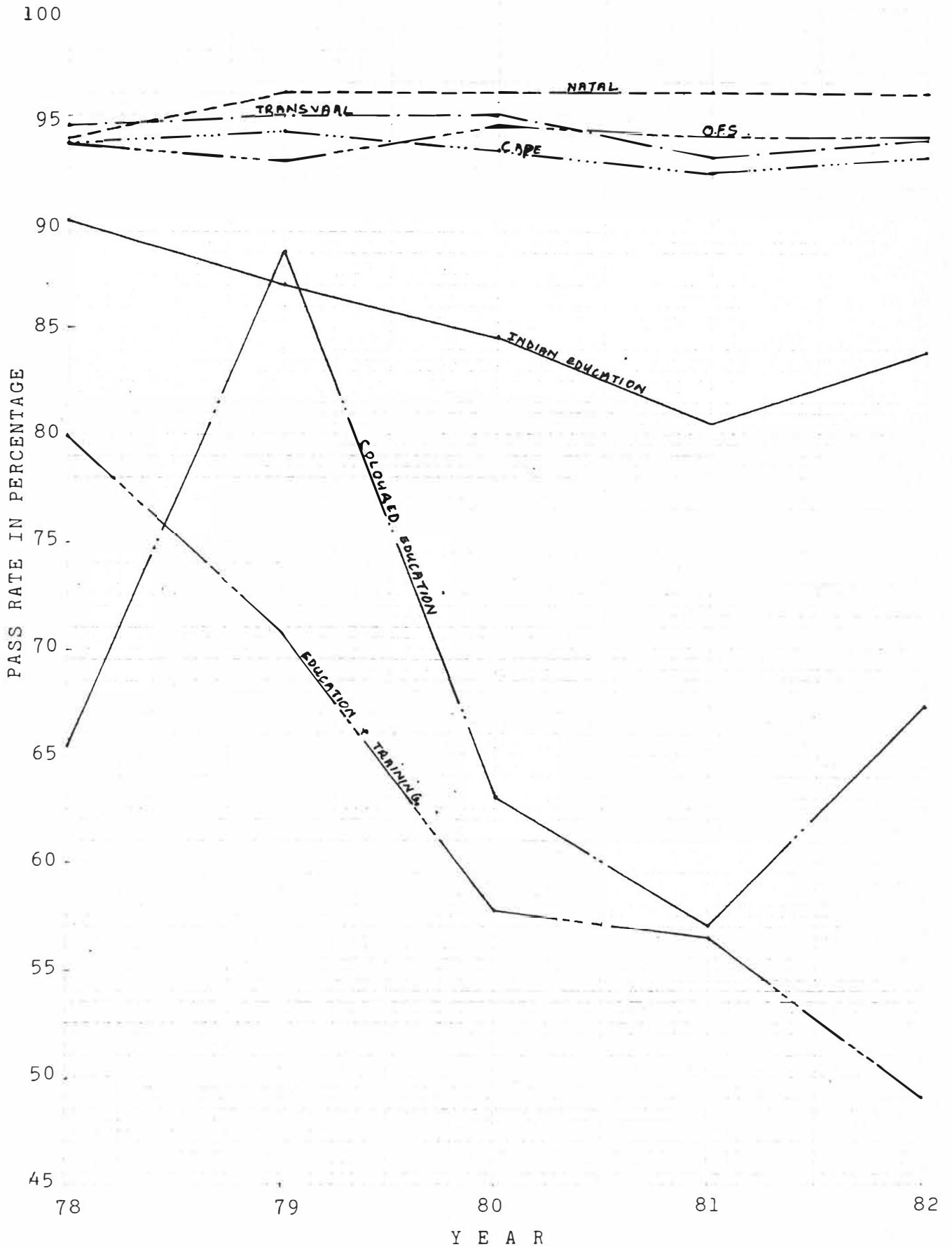
From the table it is also evident that the Natal Education Department norm references its pass-failure rate. From 1979 the pass rate has been consistently 96%. The 1979 pass rate in Coloured Education does not follow the usual trend in that department. It is possible that some other factors such as over-adjustment of marks could have contributed to this unusual trend.

Another observation that is made is the declining pass rate in the Department of Education and Training. One possible reason for this could be the sudden increase and demand for formalised education by the Blacks. Further, protest on inferior education and boycott of classes were also experienced by this department. This could possibly have also affected performance. A graphical representation of the pass rates of the different departments is given on the page that follows.

The consistency of the White departments in performance is clearly evident. Indian Education also has a fairly consistent pass rate which is generally better than that of Coloured and Black education.

From the foregoing it is clear that co-ordination and consultation between examining bodies is necessary. This would enable each of the bodies to apply

PERCENTAGE OF CANDIDATES WHO OBTAIN THE SENIOR CERTIFICATE
IN A SELECTED NUMBER OF EXAMINING BODIES IN SOUTH AFRICA




N.B.


TABLE 5.11
NUMBER OF MATRICULATION EXEMPTION PASSES AND PERCENTAGE OF TOTAL NUMBER OF ENTRIES

	1 9 7 8	1 9 7 9	1 9 8 0	1 9 8 1	1 9 8 2
	ME Pass % of total	ME Pass % of total	ME Pass % of total	ME Pass % of total	ME Pass % of total
NED	2838 43,82	3100 47,69	2794 47,47	3074 47,36	3224 48,16
TED	10847 50,3	12152 54,18	12740 52,71	10044 49,45	9933 47,31
CAPE	5948 41,7	5676 44,6	5766 43,7	6486 44,6	6361 43,51
OFS	1517 41,71	1686 46,10	1752 47,38	1784 46,23	1633 45,17
CED	1062 15,41	2456 32,09	1416 16,8	1384 14,9	1696 16,6
IED	1645 45,4	1595 30,5	1855 35,14	2056 35,42	2411 37,16
ED & TR	5012 32,8	5861 25,21	6325 16,1	6096 12,7	6358 10,8

similar criteria when examining and administering the examination. The variation of results from year to year and from department to department particularly among the Coloured, Indian and Black departments is evident of a lack of clearly defined criteria on which the examinations are based. What needs further investigation is the ever increasing failure among Black candidates. It is possible that research into the curriculum followed as well as teacher proficiency will provide considerable information in this regard.

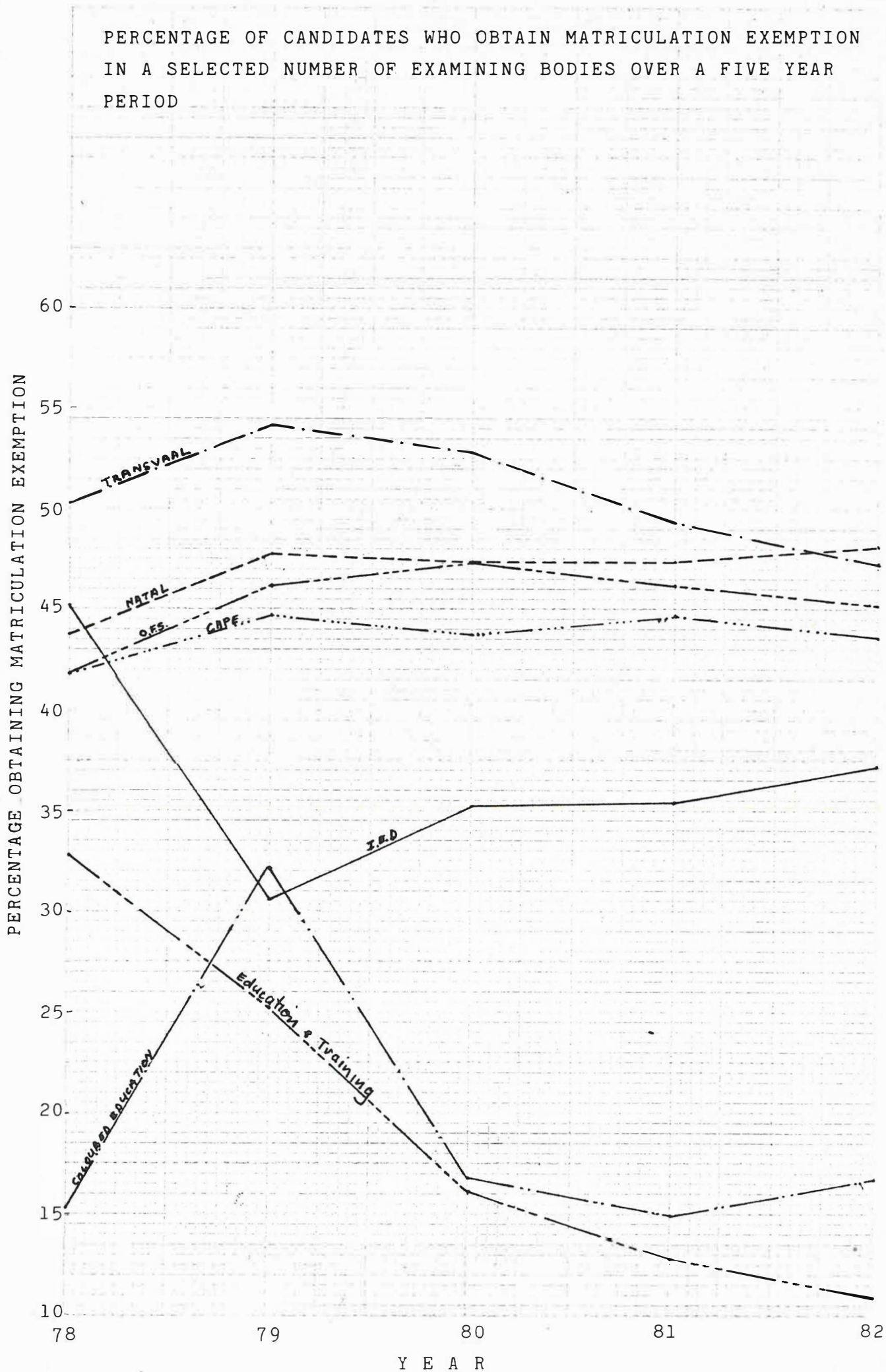
5.7.2.3 Matriculation Exemption passes in a selected number of examining bodies

Since obtaining a Senior Certificate pass with Matriculation Exemption is the requirement for university entrance it is considered necessary to examine the trends that exist in the different examining bodies with regard to candidates that pass with matriculation exemption. Table 5.11 indicates the number of candidates who obtain matriculation exemption passes and the percentage who entered for matriculation exemption in that year.

A graphical representation of the matriculation exemption pass rates is given on the next page.

The Transvaal Education Department seems generally to obtain the highest percentage of exemptions. There is some consistency among the Natal Education Department, Cape Education Department and the Orange Free Education Department in this regard. Among

PERCENTAGE OF CANDIDATES WHO OBTAIN MATRICULATION EXEMPTION
IN A SELECTED NUMBER OF EXAMINING BODIES OVER A FIVE YEAR
PERIOD



the White education departments, the Cape Education Department has consistently for the five years had the lowest percentage matriculation exemption output.

With regard to the Division of Indian Education there was a tremendous decrease in the number of exemptions from 1978 to 1979 (about 15%). Thereafter there has been a gradual increase. This sudden decrease in 1979 could also possibly be attributed to the unrest in schools.

Coloured Education shows consistency, except for 1979 when it would appear some other extraneous factor was responsible for the improved number of exemptions. However, the exemption output from Coloured Education (about 16%) seems to be very low when compared with the other education departments.

Education and Training is experiencing a consistent decline in the exemption output. Here again the causes of this decline can only be determined by an in-depth study of the examination and curriculum offered by this department.

The above analysis indicates that there is variation from one department to the next with regard to the matriculation exemption output, this variation is more evident among the Coloured, Black and Indian Education Departments, among the White education departments the variation is slight. Since these latter departments are well established departments, it is possible that they have developed a standard over the years.

The variations among the Indian, Coloured and Black department may be attributed to several factors among which social, economic conditions, the political situation in South Africa, the difference in standards in the question papers set by the different departments and methods of adjusting raw scores must be taken into consideration.

5.7.2.4 The difference in performance between boys and girls taking the Senior Certificate Examination of the Division of Indian Education

As mentioned earlier in this chapter, traditionally Indian parents believed that formalised education was the prerogative of boys. This belief, however, has changed drastically as more and more girls currently complete the Senior Certificate Examination. At this point it is worth examining whether any significant differences exist in the number of boys and girls passing the Senior Certificate Examination of the Division of Indian Education. The null hypothesis that there is no difference in performance between the sexes is tested at the 5% level of significance.

The table below gives the number of boys and girls that passed the Senior Certificate Examination without matriculation exemption over a five year period.

TABLE 5.12

NUMBER OF MALES AND FEMALES WHO PASSED
THE SENIOR CERTIFICATE EXAMINATION OVER
A FIVE-YEAR PERIOD

	1978	1979	1980	1981	1982
MALES	1653	1676	1430	1376	1606
FEMALE	1187	1278	1185	1240	1436
TOTAL	2840	2954	2615	2616	3042
	466	398	245	136	148

In order to test whether the difference in passing over the five years among the boys and girls was significant or not the X^2 statistics was used. The obtained X^2 is 27,55 for 4 df (degrees of freedom). $p < 0,01$. The difference is significant at the 1% level, the null hypothesis is therefore rejected. There is therefore a significant difference over the five years under review of the performance of boys and girls in the Senior Certificate Examination. It is also noted that girls generally perform better than boys.

TABLE 5.13

PERCENTAGE OF MALES AND FEMALES WHO PASSED
THE SENIOR CERTIFICATE EXAMINATION

	1978	1979	1980	1981	1982
MALES	55,46	56,08	50,55	47,07	46,10
FEMALES	60,44	57,88	52,83	48,89	47,82

The above percentages reflect a decline in the number of candidates obtaining the Senior Certificate.(without matriculation exemption). While this may be attributed to several factors, the increase in the number of candidates that remain at school to take the standard 10 examination and the difficulty level

of the question papers set may also play a significant role.

An examination of the number of boys and girls that obtain senior certificate with matriculation exemption reveals similar trends. Table 5.14 reflects the number who obtained matriculation exemptions over a five year period.

TABLE 5.14

NUMBER OF MALES AND FEMALES WHO OBTAINED
MATRICULATION EXEMPTION OVER A FIVE-YEAR
PERIOD

	1978	1979	1980	1981	1982
MALE	1019	871	985	1066	1237
FEMALE	<u>626</u>	<u>724</u>	<u>870</u>	<u>990</u>	<u>1174</u>
TOTAL	1645	1595	1855	2056	2411
	<u>93</u>	<u>147</u>	<u>115</u>	<u>76</u>	<u>83</u>

The computed X^2 is 53,45 for $df = 4$
 $p < 0,01$. The null hypothesis that there
 is no difference in the number of matri-
 culation exemption obtained by boys and
 girls is therefore rejected. Here again
 the girls seem to perform better than
 the boys.

TABLE 5.15

PERCENTAGE OF MALES AND FEMALES WHO OBTAIN
MATRICULATION EXEMPTION OVER A FIVE-YEAR
PERIOD

	1978	1979	1980	1981	1982
MALES	34,33	28,83	33,70	36,20	35,49
FEMALES	32,01	32,40	37,53	39,48	39,11

It is clear that the girls perform better than the boys in the Senior Certificate Examination conducted by the Division of Indian Education. Unfortunately the various

other examining bodies were not in a position to supply examination statistics according to sex. It would, however, have been interesting to establish whether similar trends exist elsewhere.

5.7.2.5 The performance of candidates in a selected number of subjects in the examination paper set by the Division of Indian Education and in standard 10 itembank tests constructed by the Human Sciences Research Council

An investigation was undertaken by the Division of Indian Education, in which the researcher was involved, to determine the performance of Senior Certificate candidates in tests constructed by the Human Sciences Research Council. The investigation involved the following subjects:

English Higher Grade;
Mathematics Higher and Standard Grade;
Physical Science Higher and Standard Grade;
and
Biology Higher and Standard Grade.

No tests were available on English Standard Grade.

The HSRC tests were constructed by a panel of experienced teachers in the relevant subjects under the guidance of HSRC personnel. The tests were used to control and moderate teachers' assessment in the Transvaal project schools. The test items were mainly of the multi-choice type. Details with regard to the tests, their construction and administration are contained in a guide produced by the HSRC. (29)

These tests were purchased from the HSRC and used for the following purposes:

To determine the performance of candidates in itembank tests in English HG, Mathematics HG and SG, Biology HG and SG and Physical Science HG and SG set by the HSRC;

To determine the relationship between the performance of these candidates in Itembank tests and in the 1982 Senior Certificate Examination question papers in these subjects; and to test the null hypothesis (Ho) that there is no true difference in the performance of candidates in the Itembank tests and in the 1982 Senior Certificate Examination in the relevant subjects. (Ho was to be tested at the 0,05 level of significance).

For purposes of this research, a random sample of 28 secondary schools out of 78 were used. Altogether 1609 HG and 887 SG candidates constituted the sample. The following is the sample of candidates used in each of the subjects.

SAMPLE OF CANDIDATES USED IN THE INVESTIGATION

	ENGLISH	MATHEMATICS		PHY. SC.		BIOLOGY	
	HG	HG	SG	HG	SG	HG	SG
Sample	479	434	429	274	188	422	270
Population	5083	1321	3489	1455	888	3400	1929
% Sample	9,42	32,85	12,30	18,83	21,17	12,41	14,00

In most subjects the sample was over 10%, except in English where the sample was slightly below 10%. The candidates in the sample participated in not more than one

subject. This was done in order not to over burden the candidates as well as the schools involved in the investigation.

A guide, outlining the procedures to be followed by principals in the administration and conducting of the Itembank tests, was drawn up. All the test materials, as well as the guides were posted to the schools concerned. The tests were administered to the candidates, under examination conditions, during the afternoon of those days on which the Senior Certificate papers, in the relevant subjects, were written. The tests, being of the multi-choice type, were marked by two persons from the Examination Section of the Division of Indian Education, under the supervision of an Education Planner. The examination papers were marked in the normal way in which all Senior Certificate examination papers are marked.

The total marks obtained by each candidate in the Itembank tests and in the question papers set for the 1982 Senior Certificate Examination in the respective subjects, were then recorded alongside each other in tabular form.

Using the scores the following statistics were computed in respect of each subject:

- the mean (\bar{m}) of the scores obtained by the candidates in the Itembank tests and in the question papers set for the 1982 Senior Certificate Examination

- . the Pearson's Product Moment Correlation (r), in order to determine the relationship between the performance of the candidates in the Itembank tests and the written papers set in the 1982 Senior Certificate Examination
- . the mean difference (Md) between the two sets of scores
- . the Standard Deviation of the difference between the two sets of scores (SDd), and
- . the Critical Ratio (CR) to test the significance of the mean difference in the sets of scores.

The following is an analyses of the results obtained.

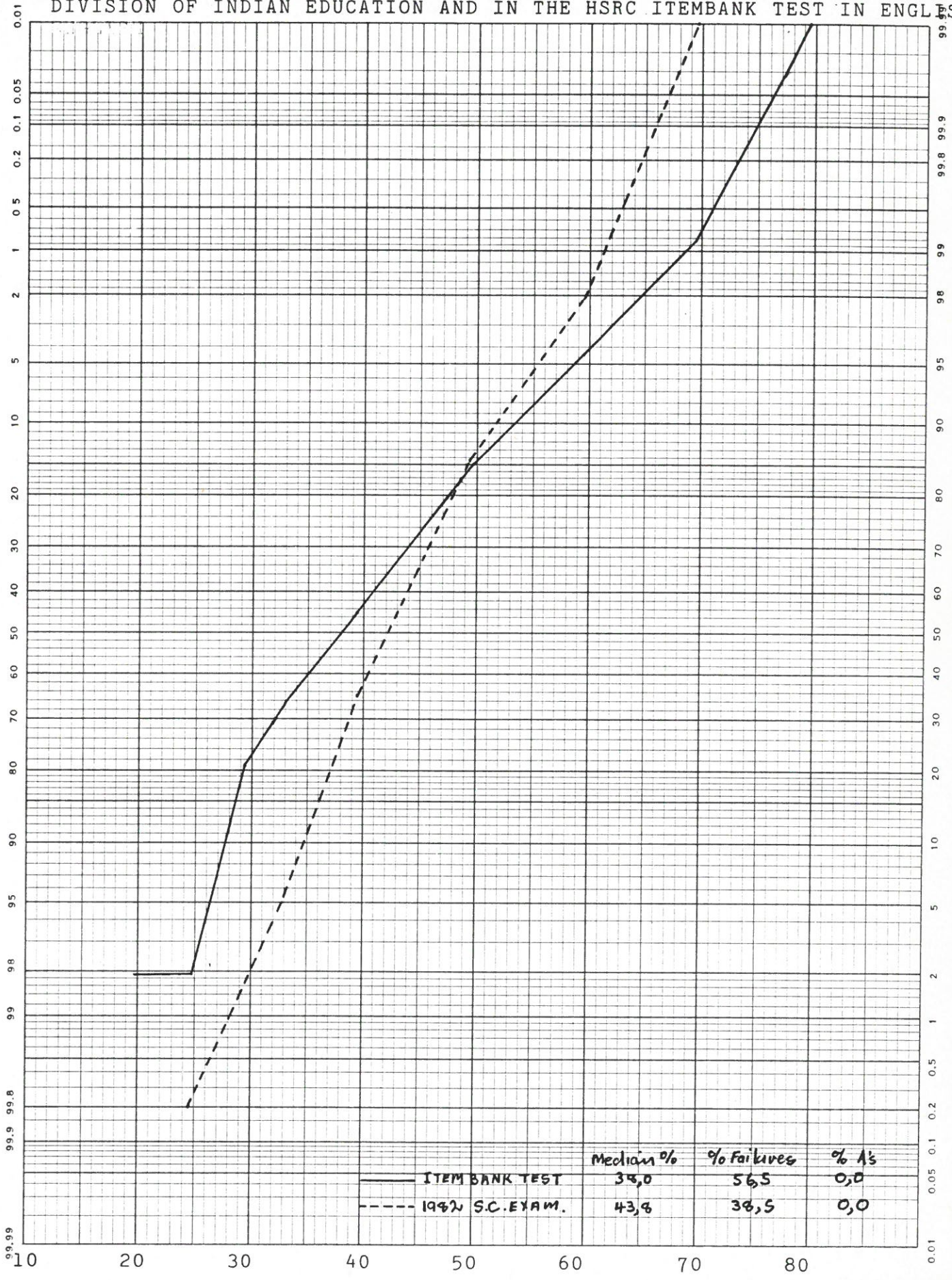
TABLE 5.16

PERFORMANCE OF CANDIDATES IN THE ITEMBANK TEST AND IN THE WRITTEN PAPERS SET FOR THE 1982 SENIOR CERTIFICATE EXAMINATION IN ENGLISH FIRST LANGUAGE HIGHER GRADE

Itembank Test	: \bar{m}	37,8%
1982 S.C. Exam.	: \bar{m}	43,0%
Mean difference	: Md	5,2%
	SDd	9,63%
Critical Ratio	: CR	11,41 ($p < 0,01$)
Correl. Coeff.	: r	0,60 ($p < 0,05$)
	N	479

A graphical representation of the scores obtained by candidates in the two instruments in English follows.

PERFORMANCE OF CANDIDATES IN THE ENGLISH QUESTION PAPER SET BY THE DIVISION OF INDIAN EDUCATION AND IN THE HSRC ITEM BANK TEST IN ENGLISH



If one examines Table 5.16, it is observed that the mean performance of candidates in the Senior Certificate Examination papers in English is better than that of the Itembank tests. However, a scrutiny of the graph reveals that while the majority of the candidates performed better in the Senior Certificate Examination papers, some 16% of the brighter candidates performed better in the Itembank tests. The difference in the mean performance of candidates in the two instruments is significant at the 0,05 level. The null hypothesis that there is no true difference in the performance of candidates in the two instruments is therefore rejected. The computed coefficient of correlation (r) is 0 60. This coefficient indicates a moderate relationship in the performance of candidates in the two instruments. Seen in relation to N , the correlation is significant at the 0,05 level.

If one accepts the itembank tests as being a more reliable measure of the candidates' ability in English, since it is scientifically constructed, then it may be concluded that the question papers set by the Division of Indian Education in English are not up to standard. In other words, the papers do not discriminate adequately between the brighter and weaker candidates. The weaker candidates as is evident from the graph tend to benefit by obtaining better scores in the Senior Certificate Examination.

Another possible reason for the better scores in the Senior Certificate Examination, is the difference in the items set in the two instruments. The itembank tests have mainly objective type questions whereas the examination question papers have a combination of essay and objective type questions. It is possible the general subjectivity in marking essay type questions could also be responsible for the difference. Whatever the reason for the difference, it is clear that a further indepth investigation needs to be undertaken to find possible causes and solutions to the problems encountered by Indian pupils in English.

TABLE 5.17

PERFORMANCE OF CANDIDATES IN THE ITEMBANK TEST AND IN THE WRITTEN PAPERS SET FOR THE 1982 SENIOR CERTIFICATE EXAMINATION IN MATHEMATICS HIGHER AND STANDARD GRADE

		HIGHER GRADE	STANDARD GRADE
Itembank test	: \bar{m}	48,48	41,43
1982 S.C. Exam	: \bar{m}	45,25	34,70
	Md	3,23	6,73
	SDd	17,70	15,00
Critical Ratio	: CR	3,81 ($p < 0,05$)	9,24 ($p < 0,05$)
Correlation Coeff.	: r	0,84 ($p < 0,05$)	0,80 ($p < 0,05$)
	N	434	429

On examining table 5.17 it can be seen that both higher and standard grade candidates performed better in the itembank tests. Further the obtained CR in both grades

indicate that the difference between the means obtained in the two instruments is significant at the 0,05 level. The null hypothesis, that there is no difference in the performance of candidates in the two instruments is therefore rejected.

Here again if one accepts the itembank tests as being a more reliable measure of the candidates' ability in Mathematics, then it is possible that the Mathematics question papers set by the Division of Indian Education are a little too difficult. The marking in both the itembank tests as well as the examination papers in this subject is least subjective. Therefore a closer examination of the types of questions set in both the instruments as well as areas that present problems to candidates will help researchers in determining the standard of the question papers as well as areas where remedial measures are most needed.

TABLE 5.18
PERFORMANCE OF CANDIDATES IN THE ITEMBANK TESTS AND IN THE WRITTEN PAPERS SET FOR THE 1982 SENIOR CERTIFICATE EXAMINATION IN BIOLOGY HIGHER AND STANDARD GRADE

	HIGHER GRADE	STANDARD GRADE
Item test	: \bar{m} 52,8	48,9
1982 S.C. Exam	: \bar{m} 44,7	33,0
	Md 8,1	15,85
	SDd 8,65	8,6
Critical Ratio	: CR 19,2 (p<0,05)	30,31 (p<0,05)
Correl. Coef:	r 0,79 (p<0,05)	0,68 (p<0,05)
	N 422	270

As was the case in Mathematics, the candidates performed better in the itembank tests in Biology than in the question papers set in the 1982 Senior Certificate Examination. The differences in the mean performance of candidates in both instances is significant at the 0,05 level. The null hypothesis that there is no true difference in the performance of candidates in Biology (both grades) in the two instruments, is therefore, rejected. The computed correlation coefficients (HG - 0,76; SG - 0,68), which are significant at the 0,05 level, indicate a high and substantial relationship between the performance of the candidates in the two instruments.

TABLE 5.19
PERFORMANCE OF CANDIDATES IN THE ITEMBANK TESTS AND IN THE WRITTEN PAPERS SET FOR THE 1982 SENIOR CERTIFICATE EXAMINATION IN PHYSICAL SCIENCE HIGHER AND STANDARD GRADE

	HIGHER GRADE	STANDARD GRADE
Itembank Tests	: \bar{m} 62,2	52,2
1982 S.C.Exam:	\bar{m} 44,8	35,8
	Md 17,38	16,43
	SDd 11,32	10,21
Critical Ratio	: CR 25,41 (p<0,05)	22,05 (p<0,05)
Correl. Coeff:	r 0,79 (p<0,05)	0,71 (p<0,05)
	N 274	188

In this subject candidates generally performed better in the Itembank tests than in the Senior Certificate Examination. The mean

difference is over 16%. The null hypothesis, that there is no true difference in the performance of candidates in the two instruments is rejected in both cases, i.e. in the case of higher as well as standard grade candidates. The correlation coefficient is also significant at the 0,05 level.

It is interesting to note that in the science subjects, i.e. Mathematics, Physical Science and Biology the candidates performed better in the Itembank tests than in the Senior Certificate question papers. In Chapter 6 it will be noticed that in the very same subjects Indian candidates performed less well than White candidates. It would seem that the standard of question papers written by Indian candidates may be a contributory factor to the difference in performance. However, it is conceded that such conclusions are drawn from a limited investigation, and a further indepth study into this aspect is necessary.

In English, however, the candidates performed poorly in the Itembank test. Further investigation needs to be undertaken so that the question papers and the curriculum can be evaluated in an effort to improve the quality of results.

5.7.2.6 The performance of candidates in the oral/practical/assignment component and in the written examination in a selected number of subjects taken for the Senior Certificate Examination

In certain subjects taken for the Senior

Certificate Examination, candidates are examined on either an oral, a practical or an assignment component. These components can count up to $33\frac{1}{3}\%$ of the total marks allocated to a subject. A distribution of marks for the oral, practical or assignment component and the theory aspect in a selected number of subjects taken by Indian candidates is given below:

English Higher Grade	:	Oral - 20%;
		Theory - 80%
English Standard Grade:		Oral - 20%;
		Theory - 80%
Afrikaans Second Language Higher Grade	:	Oral - 20%;
		Theory - 80%
Afrikaans Second Language Standard Grade	:	Oral - $33\frac{1}{3}\%$;
		Theory - $66\frac{2}{3}\%$
Physical Science Higher Grade	:	Practical - 20%;
		Theory - 80%
Physical Science Standard Grade	:	Practical - 20%;
		Theory - 80%
Biology Higher Grade	:	Practical - 17,5%;
		Theory - 82,5%
Biology Standard Grade	:	Practical - 16,66%;
		Theory - 83,34%
History Higher Grade	:	Assignment - 20%;
		Theory - 80%
History Standard Grade	:	Assignment - 20%;
		Theory - 80%
Geography Higher Grade	:	Practical - 20%;
		Theory - 80%
Geography Standard Grade:		Practical - 20%;
		Theory - 80%

In most subjects a 20% oral, practical or assignment and 80% theory distribution is applicable. The mark for the oral, practical or assignment aspect with the exception of Geography is generally determined by the class teacher who bases his assessment on the year's work. The teacher's mark is moderated by departmental moderators before they are accepted as part of the examination mark. In Geography the candidates write a formal practical examination for the duration of one hour.

An analysis of the pass rates in these components over a two-year period is given in the tables below.

TABLE 5.20

PASS RATES IN ORAL, PRACTICAL OR ASSIGNMENT COMPONENTS IN A SELECTED NUMBER OF HIGHER GRADE SUBJECTS FOR 1981 AND 1982

Subjects	Pass in Theory %		Pass in oral practical, assignment %	
	1981	1982	1981	1982
English	88,34	80,82	98,59	98,93
Afrikaans	87,62	86,99	99,53	98,82
Physical Science	55,36	56,19	89,14	89,48
Biology	56,27	60,83	93,01	88,46
History	68,69	79,59	99,13	99,52
Geography	79,80	81,23	37,97	68,15

In all the subjects candidates tend to perform better in the school based assessment. The performance in Geography practical, which is not school based, is much lower than in the theory examination.

The wide variation between school based assessment and the formal examination is probably due to different criteria being examined in each of these components. It is possible that teachers know their pupils and therefore other aspects such as the affective and psycho-motor domains play an important part in arriving at assessments. The poor results in Geography practicals indicate that a formal examination may not be the most appropriate way to examine this aspect. Further research needs to be undertaken into this aspect so that means can be sought to improve the performance of candidates in the practical aspect of this subject.

TABLE 5.21

PASS RATES IN ORAL, PRACTICAL OR ASSIGNMENT COMPONENTS IN A SELECTED NUMBER OF STANDARD GRADE SUBJECTS FOR 1981 AND 1982

Subjects	Pass in Theory %		Pass in oral, practical, assignment - %	
	1981	1982	1981	1982
English	98,60	96,99	99,53	98,67
Afrikaans	66,84	90,93	99,03	97,95
Physical Science	61,85	55,02	95,45	98,53
Biology	57,02	50,77	94,90	86,04
History	78,07	86,79	100,00	99,76
Geography	95,82	95,05	69,90	52,19

In the standard grade subjects as well, the performance in the oral, practical or assignment component is better than in the theory examination. In Geography Standard Grade the same comments as for Geography Higher Grade apply.

In order to determine whether the scores obtained by candidates in the orals, practicals or assignment aspects have any relationship with the scores obtained by the same candidates in the theory examination, the correlation coefficient in the different subjects over a two year period was computed. To determine whether the difference between the mean performance was significant or not, the critical ratio was also calculated. These calculations were done by the computer and the relevant statistics are presented.

TABLE 5.22

CORRELATION COEFFICIENTS (r) AND CRITICAL RATIOS (CR) BETWEEN ORAL, PRACTICAL OR ASSIGNMENT SCORES AND THE THEORY EXAMINATION SCORES IN A SELECTED NUMBER OF HIGHER GRADE SUBJECTS TAKEN FOR THE 1981 SENIOR CERTIFICATE EXAMINATION

Subjects	No of candidates	Correlation coefficients & verbal description	Critical ratios
English	4008	0,59 moderate relationship	41,86 p<0,01
Afrikaans	4059	0,64 "	39,06 p<0,01
Physical Sc.	1107	0,69 "	20,80 p<0,01
Biology	2497	0,67 "	50,94 p<0,01
History	1206	0,44 "	23,34 p<0,01
Geography	1107	0,48 "	21,22 p<0,01

The difference between the means of the oral, practical or assignment components and the relevant theory examination are all significant at the 0,01 level. There is a moderate relationship between the sets of scores in a subject. If one examines the means obtained in the oral, practical or assignment aspect and in the theory examination it is quite clear that candidates tend to perform better in the teacher based assessment. The means in respect of the subjects mentioned are as follows:

English	:	Theory - 42,52	Oral - 51,98
Afrikaans	:	Theory - 40,35	Oral - 51,13
Physical Sc:		Theory - 45,33	Prac- tical - 58,31
Biology	:	Theory - 39,07	Prac- tical - 50,94
History	:	Theory - 45,42	Assign- ment - 60,45
Geography	:	Theory - 51,04	Written Prac- tical- 35,55

In History there is a difference of about 15% between the mean of the assignment and the mean of the theory examination. Further, if one examines the correlation coefficient in this subject it is the lowest i.e. 0,44. It would therefore appear that the theory examination and the assignment are generally testing different aspects of the syllabus which does not necessarily lead to related performance. In other words candidates who do well in the assignment aspect need not necessarily do well in the theory aspect.

Another interesting observation is the poor performance of candidates in a written practical paper in Geography. It would seem that the written mode of testing practicals in this subject is not the most desirable thing to do.

TABLE 5.23

CORRELATION COEFFICIENTS (r) AND CRITICAL RATIOS (CR) BETWEEN ORAL, PRACTICAL OR ASSIGNMENT SCORES AND THE THEORY EXAMINATION SCORES IN A SELECTED NUMBER OF STANDARD GRADE SUBJECTS TAKEN FOR THE 1981 SENIOR CERTIFICATE EXAMINATION

Subjects	No. of candidates	Correlation coefficients & verbal description	Critical Ratios
English	1416	0,35 slight relationship	6,26 $p < 0,01$
Afrikaans	1409	0,60 moderate relationship	5,10 $p < 0,01$
Physical Sc.	683	0,61 moderate relationship	12,77 $p < 0,01$
Biology	1641	0,49 relationship	8,58 $p < 0,01$
History	389	0,32 slight relationship	18,21 $p < 0,01$
Geography	574	0,43 moderate relationship	16,23 $p < 0,01$

Although the obtained critical ratios in standard grade subjects is significant at the 0,01 level, there is a slight relationship between the performance of candidates in English oral and in the theory examination. Such relationship is also found in History where the assignment and the theory examination are slightly related.

In the other subjects a moderate relationship exists. This is similar to the findings in higher grade subjects.

TABLE 5.24

CORRELATION COEFFICIENTS (r) AND CRITICAL RATIOS (CR) BETWEEN ORAL, PRACTICAL OR ASSIGNMENT SCORES AND THE THEORY EXAMINATION SCORES IN A SELECTED NUMBER OF HIGHER GRADE SUBJECTS TAKEN FOR THE 1982 SENIOR CERTIFICATE EXAMINATION

Subjects	No. of candidates	Correlation coefficients and verbal descriptions	Critical Ratios
English	4972	0,63 moderate relationship	34,40 p<0,01
Afrikaans	5015	0,61 "	42,38 p<0,01
Physical Science	1480	0,61 "	23,72 p<0,01
Biology	3220	0,64 "	34,76 p<0,01
History	1232	0,46 "	24,95 p<0,01
Geography	1342	0,52 "	25,33 p<0,01

The above correlation coefficients as well as the critical ratios are similar to the ones obtained for the subjects taken in 1981 (refer Table 5.22). What is interesting is that History still emerges as the subject with the lowest correlation coefficient. The obtained correlation although described as moderate is still significant at the 0,01 level.

TABLE 5.25

CORRELATION COEFFICIENTS (r) AND CRITICAL RATIOS (CR) BETWEEN ORAL, PRACTICAL OR ASSIGNMENT SCORES AND THE THEORY EXAMINATION SCORES IN A SELECTED NUMBER OF STANDARD GRADE SUBJECTS TAKEN FOR THE 1982 SENIOR CERTIFICATE EXAMINATION

Subjects	No. of candidates	Correlation coefficients & verbal descriptions	Critical Ratios
English	1081	0,24 slight relationship	57,53 p<0,01
Afrikaans	1073	0,58 moderate relationship	14,19 p<0,01
Physical Science	778	0,48 "	18,25 p<0,01
Biology	1639	0,52 "	35,92 p<0,01
History	349	0,21 slight relationship	14,15 p<0,01
Geography	668	0,42 moderate relationship	20,05 p<0,01

The trend that emerges is similar to that of the 1981 examination. Both in English and History on the standard grade there is a definite but slight relationship between the oral and theory components and the assignment and theory components respectively.

From the foregoing it is evident that the difference between the means in the oral, practical or assignment components and the theory examination is significant at the 0,01 level in both grades in all subjects under review. Further in most subjects moderate correlation exists between the different forms of assessment used.

5.7.2.7 Procedures employed in the adjustment of marks in the Senior Certificate Examination

(A) Approved norms

raw scores adjusted to predetermined norm ←

In the Senior Certificate Examination conducted by the different examining bodies in this country, the raw marks obtained by candidates are generally adjusted onto or towards a predetermined norm.

norm = average scores of candidates over a five year period is the standard distribution ←

The reasons why adjustments are effected have been dealt with in an earlier chapter. The norm is generally obtained by taking the average scores of candidates over a five year period in a subject. The norm which is often referred to as the standard distribution by most examining bodies must have been approved by the Joint Matriculation Board.

The Joint Matriculation Board also lays down conditions on how adjustments onto or towards the norms must be made. In this connection the following is stated:

.... "in cases where the norm can be regarded as "reasonably acceptable" the following adjustments be made:

- onto the norm if the difference is 10% or less than 10% of the maximum mark that can be attained in a subject, and
- in the direction of the norm if the difference is more than 10%, with a maximum adjustment of 10%. If the adjustment required is greater than 10% such requests be fully

motivated."⁽³⁰⁾


A 10% variation in adjustment implies that candidates taking subjects on the higher grade can obtain an additional 40 marks and those on the standard grade, an additional 30 marks. This decision led to great variations in the way in which examining bodies applied the adjustment. Some examining bodies interpreted the 10% variation to be on the mean performance in a subject. Therefore, if the mean was 40% it was adjusted to 50%. This implied that some candidates gained advantage from the adjustment. Other examining bodies interpreted the adjustment to mean that each candidate should be allowed marks within the 10% limit.

It is evident, therefore, that the Joint Matriculation Board instruction with regard to adjustments was open to widely varying interpretation. On realising this the Board appointed a Special Committee to investigate and develop new norms for each of the examining bodies.⁽³¹⁾ This Committee also invited representatives from the examining bodies to a conference on adjustments (6 to 8 June 1983). Arising out of this conference the Joint Matriculation Board recommended a new set of norms for each of the examining bodies and amended the conditions relating to the adjustment of marks. In this regard the Board recommended that:

- New norms*
- "- in cases where raw marks exceed these norms by more than 5%, downward adjustments be made in the direction of the norm onto the 5% limit;
 - should raw marks exceed the norms with 5% or less, adjustments need not be made onto the approved norms; and
 - if adjustments are not made according to these prescriptions, such cases be thoroughly motivated."⁽³²⁾

It is clear that the Joint Matriculation Board is concerned about the way in which examining bodies adjust their marks. In order to bring about some uniformity in standards on a national level it is apparent that the Board has established some criteria by which adjustments can be made. The effectiveness of the above criteria can only be judged once examining bodies have applied them. Information concerning norms are treated confidentially by the different examining bodies, it was therefore not possible to obtain the actual norms used by the different examining bodies for comparative purposes.

Why should examining bodies not disclose norms




(B) Methods of adjusting marks

In the Division of Indian Education the adjustment to marks are decided upon at a special meeting held at the Division, soon after the marking has been completed and the marks have been handed to the computer section.

The computer section issues a print-out on which all the subjects are recorded and the percentage of candidates obtaining the different symbol range on raw scores is given. An example of the information presented in respect of each subject is given on the next page.

The cumulative percentage normally adds up to 100%, but it is not uncommon to find it ranging from 99,97 to 100,03. This happens because of the rounding off of numbers and also because the figures are given within two decimal places. However, a difference of 0,03 does not have any significant statistical effect on decisions taken in connection with the adjustment of marks.

 Using the cumulative percentages a graph is plotted on probability graph paper. This graph represents the distribution of raw scores and is generally not a straight line graph. Using the mean and standard deviation supplied a straight line graph is drawn. This graph is the best straight line graph that runs through the distribution of raw scores. Other information such as the approved standard distribution, the five year average scores and the previous year raw scores are also plotted on the same probability graph paper. In any one subject, therefore, it is not uncommon to have five graphs. The graphs are drawn in

ENGLISH HIGHER GRADE

Symbol :	H	GG	G	FF	F	E	D	C	B	A	TOTAL
Symbol range :	0-19	20-24	25-29	30-33	33 $\frac{1}{3}$ -39	40-49	50-59	60-69	70-79	80-100	
% of candidates :	0,51	0,0	0,34	1,30	17,0	55,6	22,2	2,82	0,23	0,0	5067
Cumulative % :	0,51	0,51	0,85	2,15	19,15	74,75	96,95	99,77	100	100	
Mean :	45,5										
											Standard Deviation : 7,36

respect of all subjects in which there are more than 100 candidates. In subjects with less than 100 candidates, the adjustment of marks, if necessary is based on the recommendations made by the examiners and moderators.

All adjustments of marks are decided on at the special meeting of the Division's Statistics Committee. The Chairman of this committee is the Chairman of the Examination Board. Other members of the committee are the three deputy directors of education, the chief education planner, the examinations officer, the education planner for examinations and a representative of the Joint Matriculation Board.

From the constitution of the committee it can be seen that the decisions taken at such meetings are based purely on the statistical information presented to the committee and also on the comments made by moderators and examiners with regard to adjustment. Subject experts, such as subject advisers, moderators, and examiners have very little influence on the nature of adjustment decided upon in their respective subjects. The argument can be presented that subject experts are the most competent persons to comment on the degree of difficulty of the question papers and on the standard of marking. It would therefore seem preferable if sub-committees consis-

ting of subject experts on each subject are constituted. These sub-committees should scrutinise the statistical information supplied and make certain recommendations to the Statistics Committee.

The Departmental Statistics Committee is guided in its decision on adjustments, by the approved standard distribution, the five year average, previous years performance and the moderators' and examiners' comments. The members on the committee generally reach consensus on the desired adjustment. In some of the examining bodies, the adjustments are based on the mean and standard deviation. The Statistics Committee decides on a new mean and a new standard deviation where necessary.

This information is submitted to the computer section where all raw scores are adjusted accordingly. The following is the formula used in adjusting the marks.

Formula for adjustment →

$$\text{Adjusted score} = \frac{M_1 - M_2}{SD_1 + SD_2} + \text{Raw Score}$$

Where M_1 is the mean of Raw Scores

M_2 is the mean of the Adjusted Scores

SD_1 is the Standard Deviation of Raw Scores and

SD_2 is the Standard Deviation of Adjusted Scores

While this method of adjusting marks may have several advantages, it also has a major weakness which has become evident through the progress of this research.

The advantages of this method are that it allows the Statistics Committee to decide on adjustments in a short space of time. The Committee merely decides on a new mean and standard deviation. Further this method facilitates easy processing of results and the same conditions are applied to all subjects. Therefore, from an administrative point of view this method has advantages. The disadvantage is associated with not being able to make clear predictions on the number of failures or distinctions that one can obtain on adjustment. It is only after the results are processed that the actual number of distinctions and failures become evident. This method of adjusting marks is possibly the reason why there is a great variation in failures from one year to the next among candidates taking the examination in certain examining bodies.

Other examining bodies in this country use block adjustments as a method of adjusting raw scores. This method entails allocating marks at particular intervals. For example candidates obtaining 0 to 100 marks may have 10 marks added to the original

Block adjustment

mark, those between 101 to 250 may have 15 marks added and those between 251 to 400 may have 10 marks subtracted from their original marks. By the use of this method it is possible to ensure constant pass rates and failure rates. One disadvantage of this method is that it is quite possible to change the rank order of candidates. For example a candidate with 250 marks has 15 marks added giving a total of 265 becomes higher in rank than a candidate with 255 marks having 10 subtracted for that. Nevertheless if applied judiciously, this method has fewer limitations than the one discussed earlier.

constant pass & failure rates ←

Another method of adjusting marks which has been recommended by Troskie (1981) and Steffens (1981) is the use of scale adjustment.^{(33) (34)} In scale adjustment the candidates retain their original rank and adjustments are done in intervals similar to block adjustments. For example, the adjustment committee can decide that from 0 to 100 marks, 5 must be added at 0 and 10 at 100, then from 101 to 200, add 10 at 101 scaling down to 5 at 200, at 201 add 5 to - 10 at 400.

scale adjustments ←

The following formula has been devised in order to facilitate scale adjustments. This formula was used effectively to adjust the examination marks of the Transkei Education Department during 1981 and 1982.

$$y = y_1 + m(x - x_1)$$

where x = the mark to be adjusted

y = the adjusted mark

x_1 = the lower limit of the interval

y_1 = the lower limit of the interval + the adjustment required at the lower limit

$$= x_1 + \text{the adjustment at the lower limit}$$

and m = the gradient

' m ' can be calculated using the following formula:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

where x_2 = the upper limit of the interval

y_2 = the upper limit of the interval + the adjustment required at the upper limit

$$= x_2 + \text{the adjustment at the upper limit}$$

x_1
 y_1 = as above

Example

In the interval 200 to 300, the marks are to be adjusted such that at 200 the marks are increased by 10, and at 300 they are decreased by 5.

What are the adjusted marks corresponding to 230 and 290?

Lower limit of interval : $x_1 = 200$
 $y_1 = x_1 + \text{adjustment at lower limit}$
 $= 200 + 10$
 $= 210$

Upper limit of interval : $x_2 = 300$
 $y_2 = x_2 + \text{adjustment at upper limit}$
 $= 300 + (-5)$
 $= 295$

$$(x_1; y_1) = (200; 210) \text{ and } (x_2; y_2) = (300; 295)$$

Gradient : $m = \frac{y_2 - y_1}{x_2 - x_1}$
 $= \frac{295 - 210}{300 - 200} = \frac{85}{100}$

The adjusted mark for 230

$$\begin{aligned}
 y &= y_1 + m (x - x_1) \\
 &= 210 + \frac{85}{100} (230 - 200) \\
 &= 210 + \frac{85}{100} (30) \\
 &= 210 + 25,5 \\
 &= 235,5 \\
 &= 236
 \end{aligned}$$

The adjusted mark for 290

$$\begin{aligned}
 y &= y_1 + m (x - x_1) \\
 &= 210 + \frac{85}{100} (290 - 200) \\
 &= 210 + \frac{85}{100} (90) \\
 &= 210 + 76,5 \\
 &= 286,5 \\
 &= 287
 \end{aligned}$$

Using the above formula, the adjusted mark for each of the marks in the interval can be calculated.

The formula can easily be written into computer language. One of the disadvantages of scale adjustment is that it is time consuming. It leads to additional administrative work. Nevertheless it does have advantages over the application of the mean and standard deviation method as well as the block adjustment method.

- (C) An analysis of failure rates before and after adjustment of marks in a selected number of subjects over a two year period.

An analysis of failures before and after adjustment of marks should

indicate the degree to which adjustments have an influence on failures. Further it should indicate the differences in adjustments applied by the different examining bodies in this country. For purposes of confidentiality the examining bodies are not identified but are referred to by symbols i.e. A, B, C, D, E, F and G.

NB.

TABLE 5.26

FAILURES ON ADJUSTED (A) AND UNADJUSTED (U) SCORES IN A SELECTED NUMBER OF HIGHER GRADE SUBJECTS IN DIFFERENT EXAMINING BODIES FOR THE 1981 EXAMINATION

		EXAMINING BODIES						
		A	B	C	D	E	F	G
English	U	4,71	17,3	31,0	39,3	11,7	52,0	55,9
First Language	A	4,48	10,9	12,0	8,5	18,2	37,0	68,3
Afrikaans	U	2,94	4,7	2,0	1,0	12,5	21,1	43,4
Second Language	A	4,11	5,5	2,0	3,7	17,9	12,3	39,5
Mathe-	U	17,1	44,0	36,0	36,4	28,9	63,6	89,6
matics	A	11,78	30,3	26,0	23,8	28,9	51,8	86,5
Phy. Sc.	U	18,69	31,7	36,0	20,1	24,0	60,3	96,9
	A	11,51	17,7	22,0	15,3	23,7	43,9	90,4
Biology	U	14,57	25,3	30,0	15,7	23,8	74,8	72,4
	A	15,08	18,1	20,0	16,0	19,7	57,8	65,9
History	U	11,12	22,4	30,0	12,6	19,3	79,6	90,8
	A	11,59	15,0	20,0	14,9	14,0	61,2	85,8
Geography	U	14,92	8,9	17,0	34,3	8,4	64,8	93,4
	A	15,50	16,4	17,0	19,3	5,0	48,7	86,0
Account.	U	16,32	32,5	32,0	3,6	25,2	84,8	90,0
	A	14,35	20,2	21,0	6,0	14,9	64,7	73,1

very important table

In English Higher Grade, examining body D reduced its failures by over 30% on adjustment, C by 19%, F by 15% and B by about 6%. Examining

body A made a very small adjustment while E and G increased their failure rates by 6,5% and 12,4 respectively.

It is clear that the failure in English Higher Grade varies widely from one examining body to the next, further adjustments made in many respects vary from one examining body to the next.

In Afrikaans Second Language Higher Grade the failure rate on adjusted and unadjusted scores among certain examining bodies is more or less the same. Examining body E, as in English Higher Grade, has an increased failure rate on adjustment.

The unadjusted failure rate in Mathematics for most examining bodies is generally high. It is interesting to note that with an exception of a few cases, there is generally a decrease in the number of candidates who fail on adjustment. However, the failure rates in examining bodies F and G remain consistently high. In some subjects G has a failure rate of over 90%.

Generally the percentage difference between adjusted and unadjusted scores in the different subjects varies from one examining body to the next. An examination of the 1982 failures on adjusted and unadjusted scores would indicate if the trends observed for 1981 recurs.

TABLE 5.27

FAILURES ON ADJUSTED (A) AND UNADJUSTED (U)
SCORES IN A SELECTED NUMBER OF HIGHER GRADE
SUBJECTS IN DIFFERENT EXAMINING BODIES FOR
THE 1982 EXAMINATION

		EXAMINING BODIES						
		A	B	C	D	E	F	G
English	U	7,14	14,4	25,3	28,9	19,15	47,6	93,7
First								
Language	A	4,43	11,5	13,2	8,2	20,40	37,6	79,1
Afrikaans	U	8,52	4,3	5,7	2,4	13,01	17,5	77,2
Second								
Language	A	11,2	6,0	4,5	4,2	17,24	9,3	54,5
Mathe-	U	30,91	43,6	29,6	38,8	42,4	41,9	93,0
matics	A	11,80	30,3	25,5	23,0	42,75	39,0	86,2
Phy. Sc.	U	24,93	31,9	33,5	22,4	43,82	59,2	85,0
	A	11,75	19,5	19,9	15,3	34,81	38,1	85,0
Biology	U	25,75	23,4	15,4	20,9	39,17	63,7	95,0
	A	14,91	16,7	15,4	16,8	34,95	47,8	81,4
History	U	22,81	21,0	34,9	9,9	20,4	59,4	90,1
	A	11,51	14,8	18,1	16,6	21,46	48,2	88,4
Geography	U	10,76	22,3	17,3	37,6	18,76	54,5	76,6
	A	16,01	16,2	16,2	19,2	14,71	46,3	76,6
Account.	U	19,65	16,5	18,7	13,2	14,98	54,9	85,8
	A	13,72	14,7	18,7	14,0	16,25	39,9	70,1

As was evident from the 1981 figures, ↓
NB
it is noticed that this time examining
body D reduced its failures in English
Higher Grade by over 20%. Examining
body E in this subject is the only
body that increased its failures on
adjusted scores. One possible reason
for this is possibly the method of
adjustment employed. From this
table it is seen that in five sub-
jects examining body E increased the
failures on adjustment. Generally,
NB → however, there is a tendency to de-
crease failures on adjustment.

The high failure rate in Mathematics is evident again. It is possible that the syllabus in this subject needs reviewing since the pattern of high failure rates is a common feature with all examining bodies.

TABLE 5.28

FAILURES ON ADJUSTED (A) AND UNADJUSTED (U)
SCORES IN A SELECTED NUMBER OF STANDARD
GRADE SUBJECTS FOR THE 1981 EXAMINATION

		EXAMINING BODIES						
		A	B	C	D	E	F	G
Mathe- matics	U	25,95	40,7	18,0	1,1	43,5	70,8	76,3
	A	10,45	29,7	16,0	1,8	42,0	53,8	66,7
Biology	U	4,92	29,3	16,0	0,7	29,0	44,0	37,3
	A	5,45	16,7	14,0	0,7	19,5	29,6	32,7
Phy. Sc	U	12,7	25,5	15,0	0,0	25,7	35,6	55,1
	A	4,81	13,1	8,0	0,2	8,5	15,8	52,5
Eco- nomics	U	12,7	32,4	16,0	1,7	19,9	46,0	Subject
	A	4,76	19,2	19,0	2,3	13,5	28,8	not offered

Examining body D has the lowest failure rates in standard grade subjects. In Mathematics Standard Grade the failure rate in all bodies, except D, remains quite high. Here again the general trend has been to decrease the failures on adjustment.

NB ←

TABLE 5.29

FAILURES ON ADJUSTED (A) AND UNADJUSTED (U)
SCORES IN A SELECTED NUMBER OF STANDARD
GRADE SUBJECTS FOR THE 1982 EXAMINATION

	EXAMINING BODIES							
	A	B	C	D	E	F	G	
Mathe- matics	U	22,43	28,8	39,2	13,5	50,67	55,4	84,9
	A	10,45	25,4	21,7	20,6	48,89	44,2	74,3
Biology	U	9,84	15,6	14,4	9,9	49,21	46,5	31,9
	A	5,34	12,3	13,3	16,3	33,48	27,1	31,9
Phy. Sc	U	27,69	16,2	16,0	18,0	44,99	35,3	56,1
	A	4,90	11,5	9,2	9,6	23,64	18,4	56,1
Eco- nomics	U	5,04	41,9	24,7	22,0	10,29	22,0	Subject not offered
	A	5,04	24,7	20,4	15,6	16,67	22,0	

The high failure rates in standard grade subjects in examining bodies E, F and G is evident from this Table. The adjustments effected by the different departments varies from subject to subject. In some subjects over 20% of candidates pass on adjustment. Unlike in 1981 there is a different trend that emerges with the performance of candidates in standard grade subjects in examining body D. In this body more candidates have failed during 1982 than in 1981, further the failures have been increased on adjustment. The failure rates on adjusted scores of examining body A for the two years concerned remains very consistent.

An analysis of the failure rates on unadjusted and adjusted scores reveal wide variations. This variation

is evident from one department to the next as well as in the different subjects within departments. If we accept that the question papers written by candidates of the different departments are moderated by the Joint Matriculation Board, whose duty is to ensure that some equivalence or uniformity in standards among the different question papers set in a subject are maintained, then we must conclude that the performance levels in some departments are poor. However, it must be pointed out that this conclusion is reached on the assumption that equivalent standards can be maintained in the different question papers set. While it is a difficult task to ensure uniformity, it becomes even more difficult to make comparisons between the performance of candidates who write different question papers.

Common question papers written by candidates of the different departments would appear to be the answer in ensuring uniform standards and at the same time provide a common yardstick to make comparisons on performance levels in the different departments. However, there is the argument that common question papers could militate against candidates from the different socio-economic and cultural groups. What is in support of common question papers is the fact that candidates follow the same core

syllabuses in the different departments and further that once these candidates pass their examination they function in similar economic environments. However, the de Lange Committee has pointed out the variations in the education systems of the different population groups in this country. There is no doubt that such variations as teacher qualifications, expenditure on education cultural and socio-economic factors would have an effect on performance and this therefore would support the argument for different question papers. While different question papers may meet the current short-term goals in this country moves should be afoot to prepare candidates to write common question papers in the future. Separate question papers as well as different examinations can be interpreted as inferior education by some groups. A beginning can be made in those subjects in which comparable pass-failure rates in the different departments are obtained.

5.8 CONCLUSION

In this chapter the following became evident:
 The holding power of Indian schools is about 20% lower than those of Whites. The number of candidates that enrol for the Senior Certificate Examination varies in the different examining bodies from year to year. There is no consistent pattern in the growth rate of Indian candidates entering the Senior Certificate Examination as in some years the growth is about 16% while in other years it can be as low as 0,96%.

While the four White education departments have pass rates of above 90%, Indian Education has a pass rate that is just over 80%, which is generally better than those of Coloured and Black education. The number of candidates that obtain matriculation exemption over the five year period varies from one department to the next. This variation is most evident among the Coloured, Black and Indian education departments, among the White education departments the variation is slight.

In the Division of Indian Education girls tend to perform better in the Senior Certificate Examination than boys.

With regard to those candidates who wrote the itembank tests constructed by the Human Sciences Research Council and the Senior Certificate Examination in a selected number of subjects, it was found that the candidates performed better in the HSRC Tests in Mathematics, Physical Science and Biology than in the question papers set in the examination in these subjects. In English, however, the performance in the HSRC test was worse off than in the examination.

In those subjects with an oral, a practical or an assignment component, there was generally a moderate correlation between performance in these components and in the theory examination in the relevant subjects. The differences between the means of the oral, practical or assignment aspect and the relevant theory examination was significant at the 0,01 level.

The method of adjusting marks employed by some examining bodies has certain weaknesses particularly when predictions about failures or distinctions are concerned. The Block Adjustment method and the Scale Adjustment method have certain advantages over the application of the Mean and Standard Deviation method.

An analysis of the failure rates on unadjusted and adjusted scores in a selected number of subjects reveal wide variations. This variation is evident in all the different examining bodies, as well as in the different subjects within examining bodies.

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CHAPTER SIXA STUDY OF THE PERFORMANCE OF CANDIDATES IN A SELECTED NUMBER OF HIGHER AND STANDARD GRADE SUBJECTS TAKEN FOR THE SENIOR CERTIFICATE EXAMINATION

Since a study of all the subjects taken in the Senior Certificate Examination would have been extensive and time consuming, an analysis is made of a selected sample of subjects only. The subjects chosen for analysis are those which may be regarded as traditional secondary school subjects for which there is a great demand by candidates.

6.1 PASS-RATES IN A SELECTED NUMBER OF HIGHER GRADE SUBJECTS TAKEN FOR THE SENIOR CERTIFICATE EXAMINATION

Generally higher grade subjects count 400 marks and the pass requirement is 40% or 160 marks. Second Language Higher Grade subjects are the only higher grade subjects which have 300 as a total mark and a pass requirement of $33\frac{1}{3}\%$ or 100 marks.

Efforts to make all higher grade subjects to count out of 400 marks have so far been unsuccessful. Having Second Language Higher Grade out of a total of 300 marks has created confusion among pupils and principals in schools.⁽¹⁾ The Joint Matriculation Board, however, argues that being second languages these should not have the same mark requirement as First Languages Higher Grade.⁽²⁾ While there may be some merit in this point of view it is however, possible to set different question papers of different degrees of difficulty having the same total marks. Further the confusion that arises in the administering of an examination can be minimised if all higher grade subjects were out of 400 marks.

As mentioned earlier candidates who obtain between 25 and 30% in higher grade subjects (out of 400 marks) which is considered a fail on the higher grade, have their marks converted to a pass on the standard grade. In the case

of second language higher grade, 25 to 33% is converted to a pass on the standard grade. The aspect of converting a fail in a higher grade subject to a pass on the standard grade will be dealt with in greater detail later in this chapter.

The pass-rates in a selected number of higher grade subjects taken by candidates of the Division of Indian Education is indicated in the tables that follow. Some comparisons with the pass-rates of some of the other examining bodies in this country is also presented.

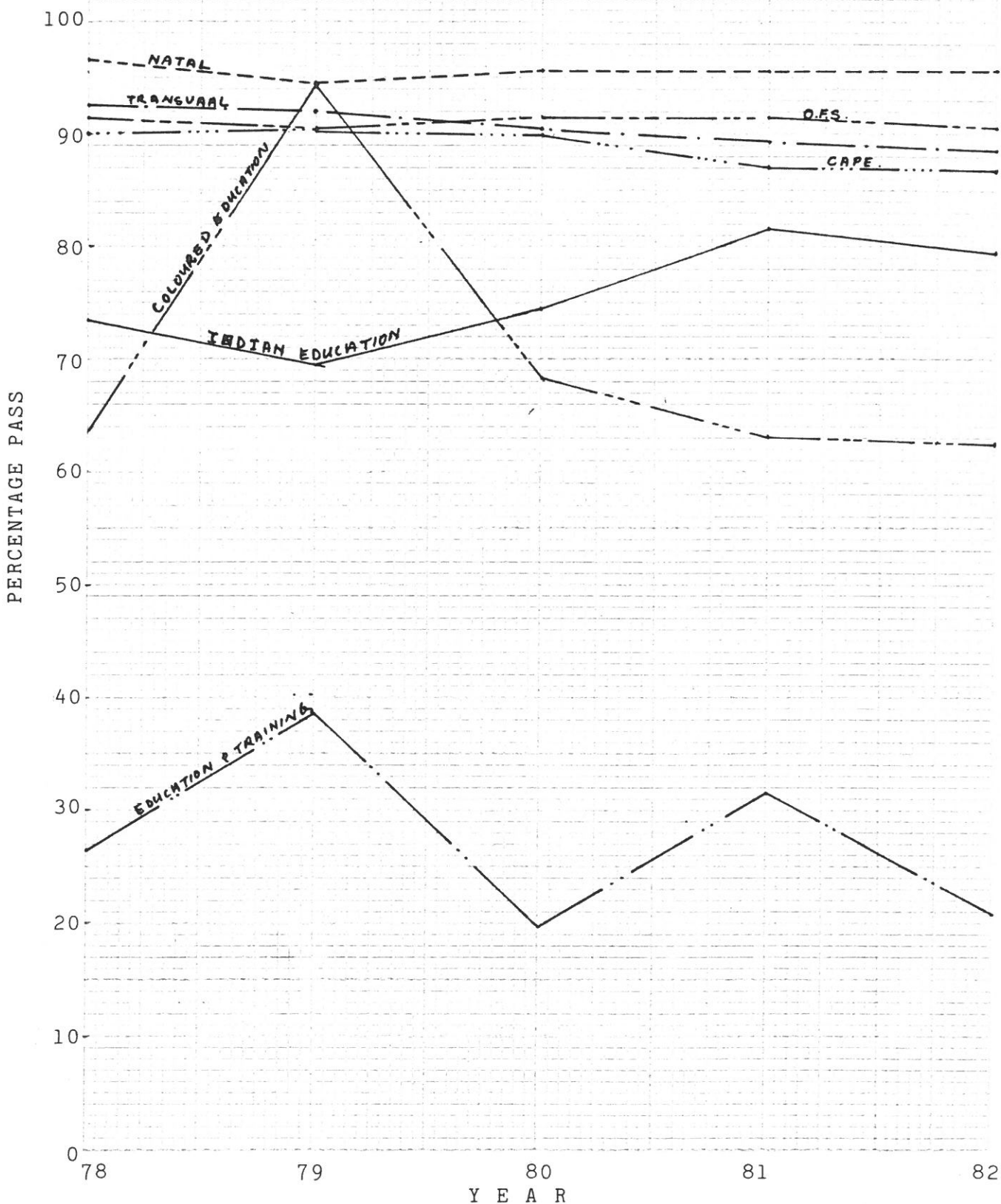
TABLE 6.1

PERCENTAGE PASS IN ENGLISH FIRST LANGUAGE HIGHER GRADE
IN A SELECTED NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	96,79	94,81	95,54	95,52	95,57
TED	92,50	92,40	90,50	89,10	88,50
CAPE	90,00	91,00	90,00	88,00	86,80
OFS	91,70	91,10	91,40	91,50	91,80
IED	73,60	69,30	74,60	81,80	79,60
CED	63,90	93,40	58,60	63,00	62,40
ED & TR	26,50	38,70	19,60	31,70	20,90

It is evident that while the White education departments have a pass-rate of about 90% in English Higher Grade, the pass-rate of Indian Education in the last two years has only improved to about 80%. Coloured Education seems to have a pass-rate in the 60 percent range, except for the year 1979 which does not follow the usual trend. The trend in Education and Training seems somewhat varied. A graphical representation of the pass-rate is given on page 329. As was mentioned in Chapter 5 it would appear that the White education departments have some standardisation procedure to ensure that the pass-rate of one department does not differ greatly from that of the

PERCENTAGE PASS IN ENGLISH FIRST LANGUAGE HIGHER GRADE IN A SELECTED NUMBER OF EXAMINING BODIES



other. It is possible that such factors may be discussed at meetings of the Committee of Heads of Education. From the graph it is also noticed that the Department of Indian Education, Coloured Education and Education and Training have fluctuations in the number of candidates that pass English Higher Grade each year. Further there is wide variation between the pass-rates of these three departments. One possible reason for the differing pass-rates within each department from year to year is the apparent lack of standardisation. Since obtaining and maintaining a standard requires experience which develops over several years of examining, it would appear that the White Education departments have this advantage over the other three examining bodies, who have taken on examining fairly recently. However, no categorical conclusion can be drawn on this aspect since each department sets its own examination question papers. Further the Indian, Coloured and Education and Training Departments have no representation on the Committee of Heads of Education. It is possible that the syllabus requirements, examination papers, methods of adjusting marks as well as experience in examining all collectively contribute to differences in performance.

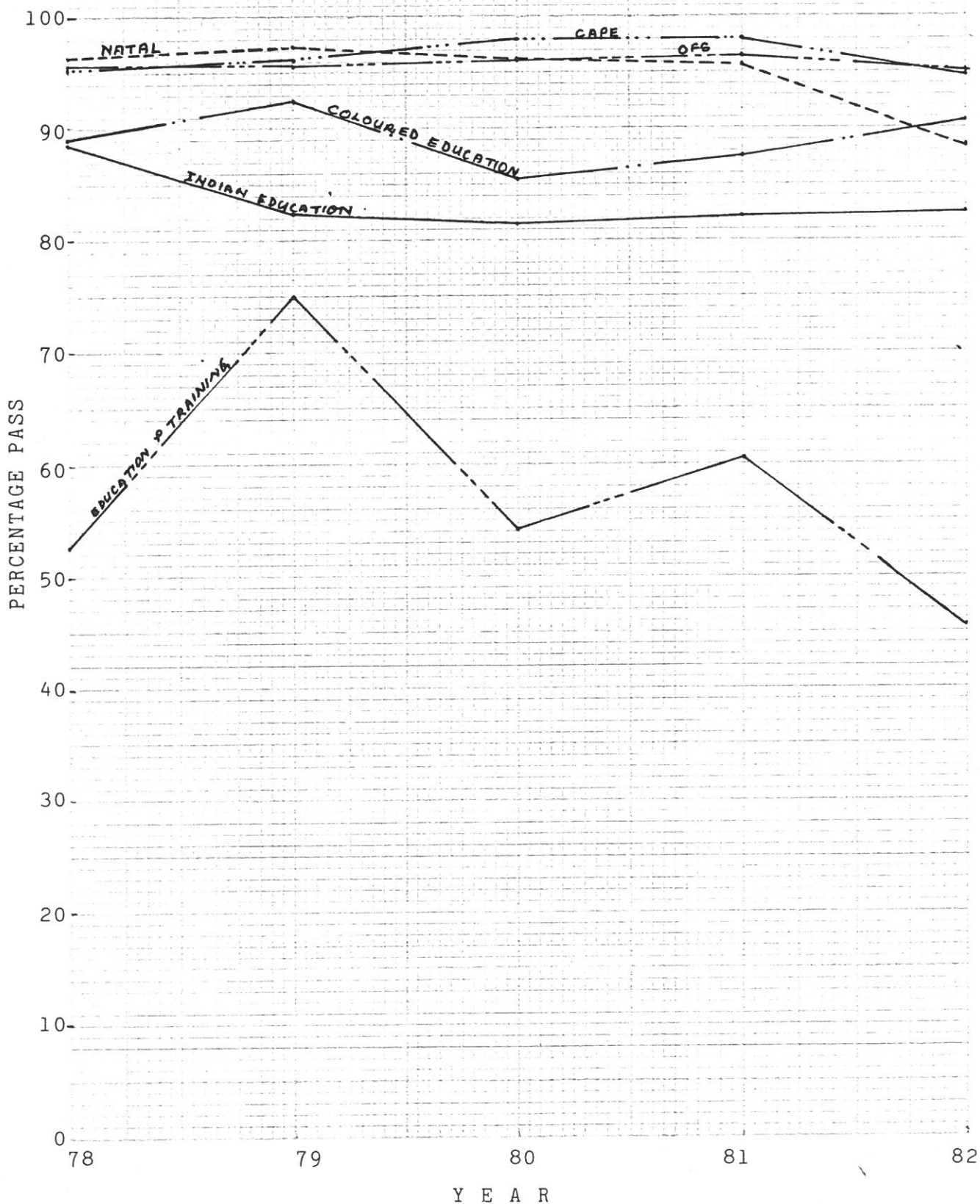
TABLE 6.2

PERCENTAGE PASS IN AFRIKAANS SECOND LANGUAGE HIGHER GRADE
IN A SELECTED NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	96,34	97,26	96,23	95,89	88,80
TED	93,10	93,50	94,10	94,50	94,00
CAPE	95,00	96,00	98,00	98,00	95,50
OFS	95,20	95,80	96,10	96,30	95,80
IED	88,20	82,30	81,60	82,10	82,76
CED	88,70	92,50	85,50	87,70	90,70
ED & TR	52,60	75,00	54,30	60,50	45,50

A graphical representation of the data in this table appears on the next page.

PERCENTAGE PASS IN AFRIKAANS SECOND LANGUAGE HIGHER GRADE IN A
SELECTED NUMBER OF EXAMINING BODIES



The Division of Indian Education offers Afrikaans as a Second Language. Therefore no information with regard to Afrikaans as a first language is being presented. The table reveals that with the exception of Education and Training there is greater consistency in performance in Afrikaans HG among the various departments.

An interesting feature is the relatively high pass rate among candidates of the Coloured Education Department. This is consistent with the fact that the majority of Coloureds are from the Cape Province where Afrikaans is predominantly spoken. It is therefore clear that environmental factors have a considerable influence on performance.

With the exception of Education and Training all the other examining bodies have a pass-rate of over 80%. Indian Education seems to have a somewhat constant pass-rate of about 82%. There is wide variation from year to year in the pass-rate of candidates taking the examination of Education and Training.

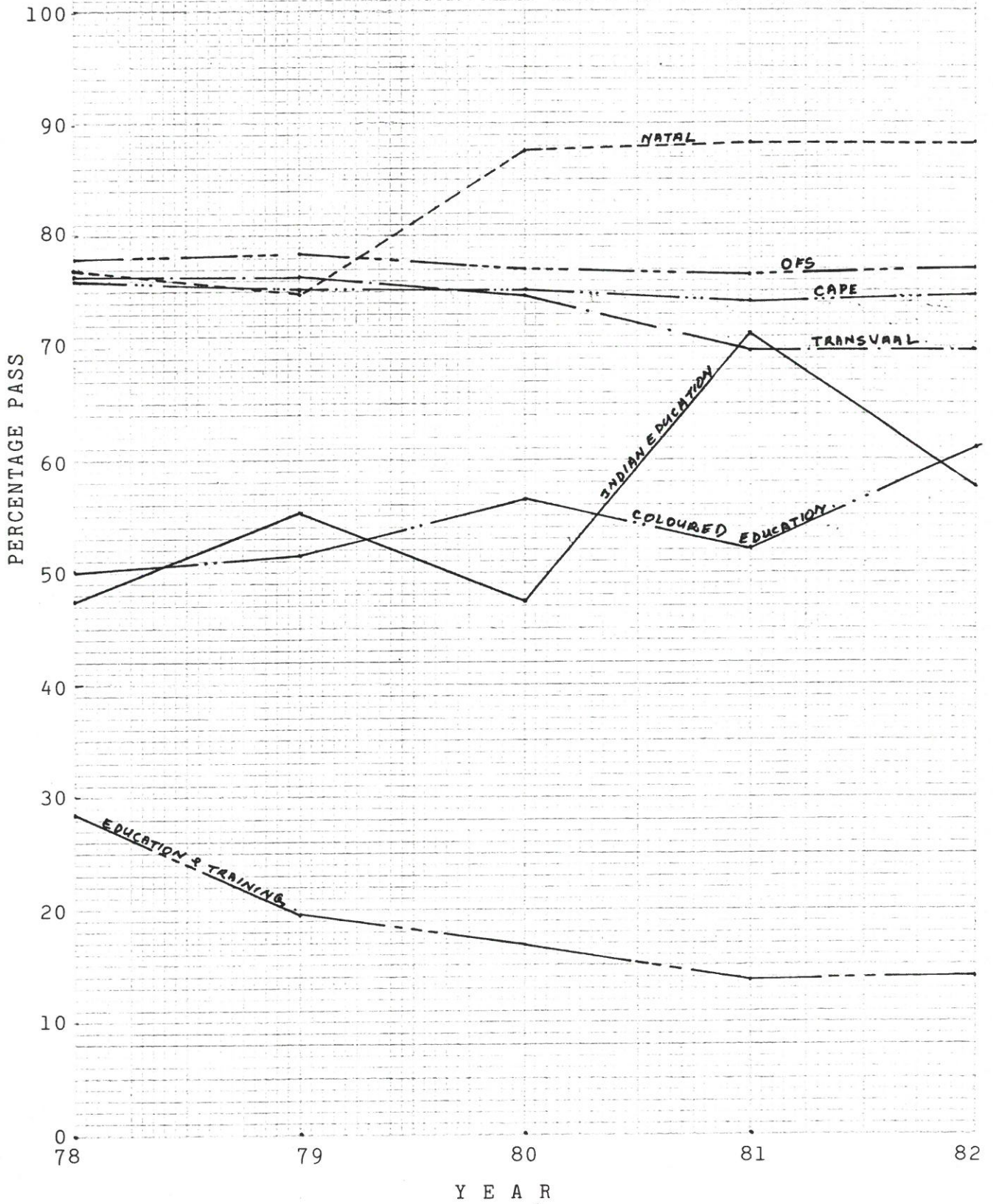
TABLE 6.3

PERCENTAGE PASS IN MATHEMATICS HIGHER GRADE IN A
SELECTED NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	77,86	74,81	87,92	88,22	88,22
TED	76,60	76,10	74,60	69,70	69,70
CAPE	76,00	75,00	75,00	74,00	74,50
OFS	78,00	78,40	77,00	76,20	77,00
IED	47,70	55,20	47,10	71,10	57,25
CED	41,40	48,30	43,80	48,20	61,00
ED & TR	38,80	19,50	16,60	13,50	13,80

A graphical representation of the pass-rates in Mathematics higher grade follows.

PERCENTAGE PASS IN MATHEMATICS HIGHER GRADE IN A SELECTED NUMBER OF EXAMINING BODIES



Although there appears to be some consistency in the pass-rates within the White examining bodies, the Natal Education Department since 1980 has the highest pass-rate in Mathematics and this is approximately 10% higher than those of the other White examining bodies. The Division of Indian Education has a pass-rate of about 30% below that of the White examining bodies; further the pass-rate fluctuates from year to year. It would appear that this Division has not as yet established a suitable standard in its examination in Mathematics. This conclusion would also appear to apply to the pass-rate of Coloured Education. Education and Training shows a tremendous decline in the pass obtained in Mathematics. In 1978 it was about 40% and this declined to about 14% in 1982.

TABLE 6.4

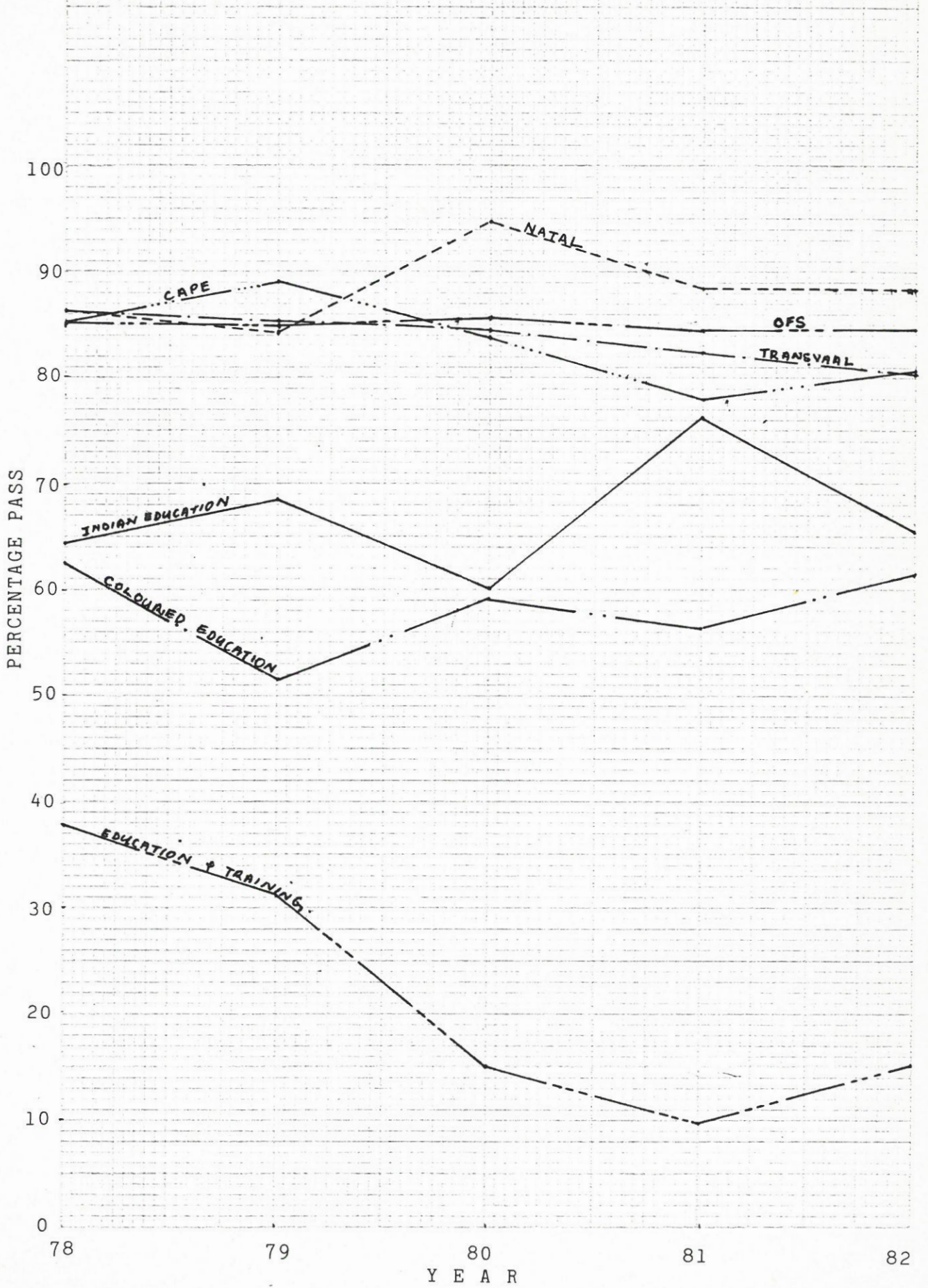
PERCENTAGE PASS IN PHYSICAL SCIENCE HIGHER GRADE IN A SELECTED NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	86,06	84,18	94,91	88,49	88,25
TED	86,20	86,40	84,40	82,30	80,50
CAPE	85,00	89,00	84,00	78,00	80,10
OFS	85,40	84,70	85,80	84,70	84,70
IED	64,20	68,50	60,00	76,30	65,19
CED	62,70	51,50	59,10	56,10	61,30
ED & TR	37,90	31,10	14,90	9,60	15,00

Data from this table appears on the graph on the next page. In Physical Science the White examining bodies have a pass-rate around 80% while Indian and Coloured Education seem to linger around 60%. Education and Training having had a pass-rate of 37,90% in 1978 showed a declining trend until 1981 to 9,60%.

As is evident in Mathematics, the Natal Education Department from 1980 also had the highest pass-rate in Physical Science.

PERCENTAGE PASS IN PHYSICAL SCIENCE HIGHER GRADE IN A SELECTED NUMBER OF EXAMINING BODIES



A trend that seems to be common among the Indian, Coloured and Education and Training departments, as mentioned earlier, is the great variation in pass-rates from year to year. This has been also noted in the subjects that have already been discussed.

TABLE 6.5

PERCENTAGE PASS IN BIOLOGY HIGHER GRADE IN A SELECTED
NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	80,12	80,65	86,73	84,92	85,09
TED	85,30	85,40	88,20	81,90	83,30
CAPE	84,00	84,00	81,00	80,00	84,60
OFS	82,90	83,00	82,50	84,00	83,20
IED	48,30	52,60	60,10	80,30	65,05
CED	83,20	72,00	41,30	42,20	52,20
ED & TR	49,20	37,90	43,30	34,10	18,60

What is evident is the wide variation again in pass rates in the Indian, Coloured and Education and Training departments. The consistency in performance among the White education departments is further highlighted.

A graphical representation of the pass-rates is given on the next page.

PERCENTAGE PASS IN BIOLOGY HIGHER GRADE IN A SELECTED NUMBER OF EXAMINING BODIES

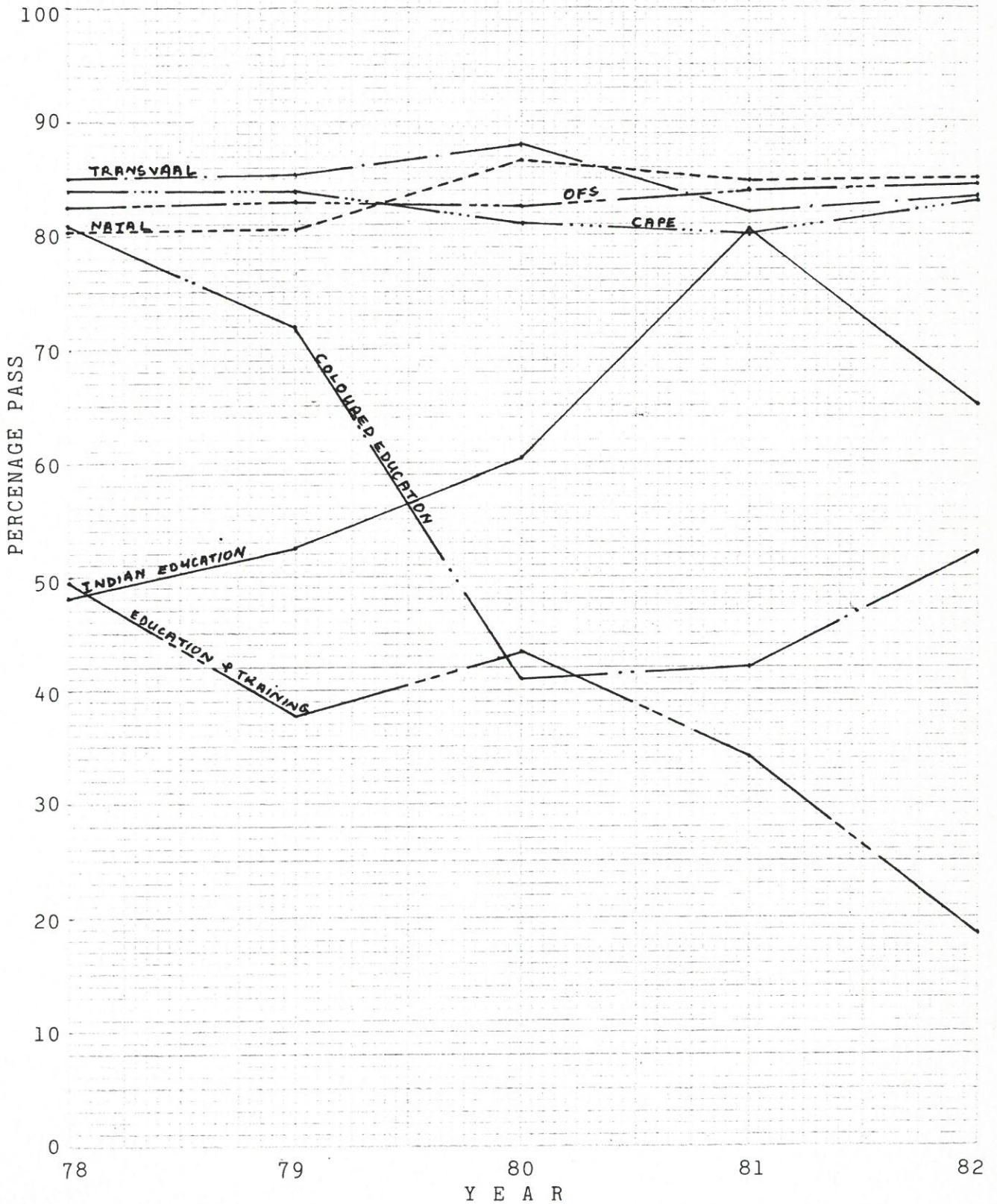


TABLE 6.6

PERCENTAGE PASS IN HISTORY HIGHER GRADE IN A SELECTED
NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	86,70	88,52	88,50	88,40	88,48
TED	85,30	85,30	85,00	85,00	85,20
CAPE	84,00	85,00	84,00	80,00	81,90
OFS	84,80	84,70	85,80	85,10	83,40
IED	69,10	72,10	74,40	86,00	78,54
CED	45,60	49,80	42,80	38,80	51,80
ED & TR	32,90	27,50	15,20	14,20	11,60

The general trends noted so far in subjects reviewed are also evident in History Higher Grade. An interesting feature, however, is the gradual improvement shown in the pass-rates of the Division of Indian Education. It is apparent that the pass-rates during 1981 and 1982 are comparable with those of the White education departments. There are several factors which influence performance and it is not possible at this stage to isolate any one or even a group of factors which could have contributed to this improved results.

A constant decline in the performance of candidates under the Department of Education and Training is also noted in this subject.

PERCENTAGE PASS IN HISTORY HIGHER GRADE IN A SELECTED NUMBER OF EXAMINING BODIES

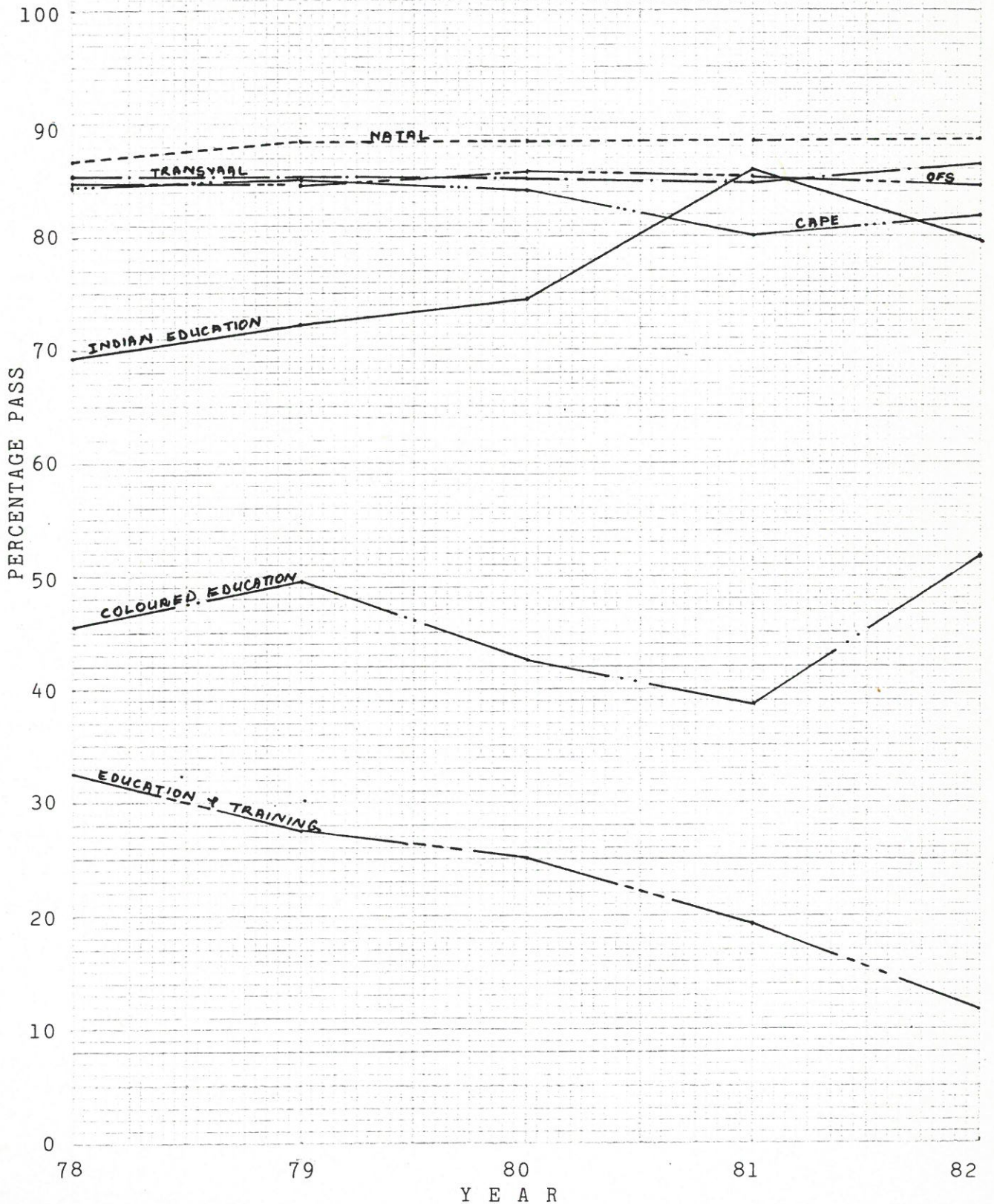


TABLE 6.7

PERCENTAGE PASS IN GEOGRAPHY HIGHER GRADE IN A SELECTED
NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	83,20	86,40	84,65	84,50	83,99
TEC	83,30	83,60	83,50	83,60	83,60
CAPE	82,00	83,00	83,00	83,00	83,80
OFS	81,20	80,90	80,30	80,70	80,80
IED	56,10	55,80	80,10	95,00	85,29
CED	37,30	60,10	45,20	51,30	53,70
ED & TR	23,00	17,70	9,60	14,00	23,40

(For graphical representation see page 337).

As in History a marked improvement in the pass-rate in Geography Higher Grade in the Division of Indian Education is noted. What is of interest is the phenomenal improvement achieved in one year, i.e. a pass-rate of about 56% in 1979 to about 80% in 1980. Further the pass-rate in Indian Education in 1981 and 1982 was the highest achieved by any Department. It would be interesting to find out the possible reasons for such improvement in this subject. However, such a research is outside the scope of this work.

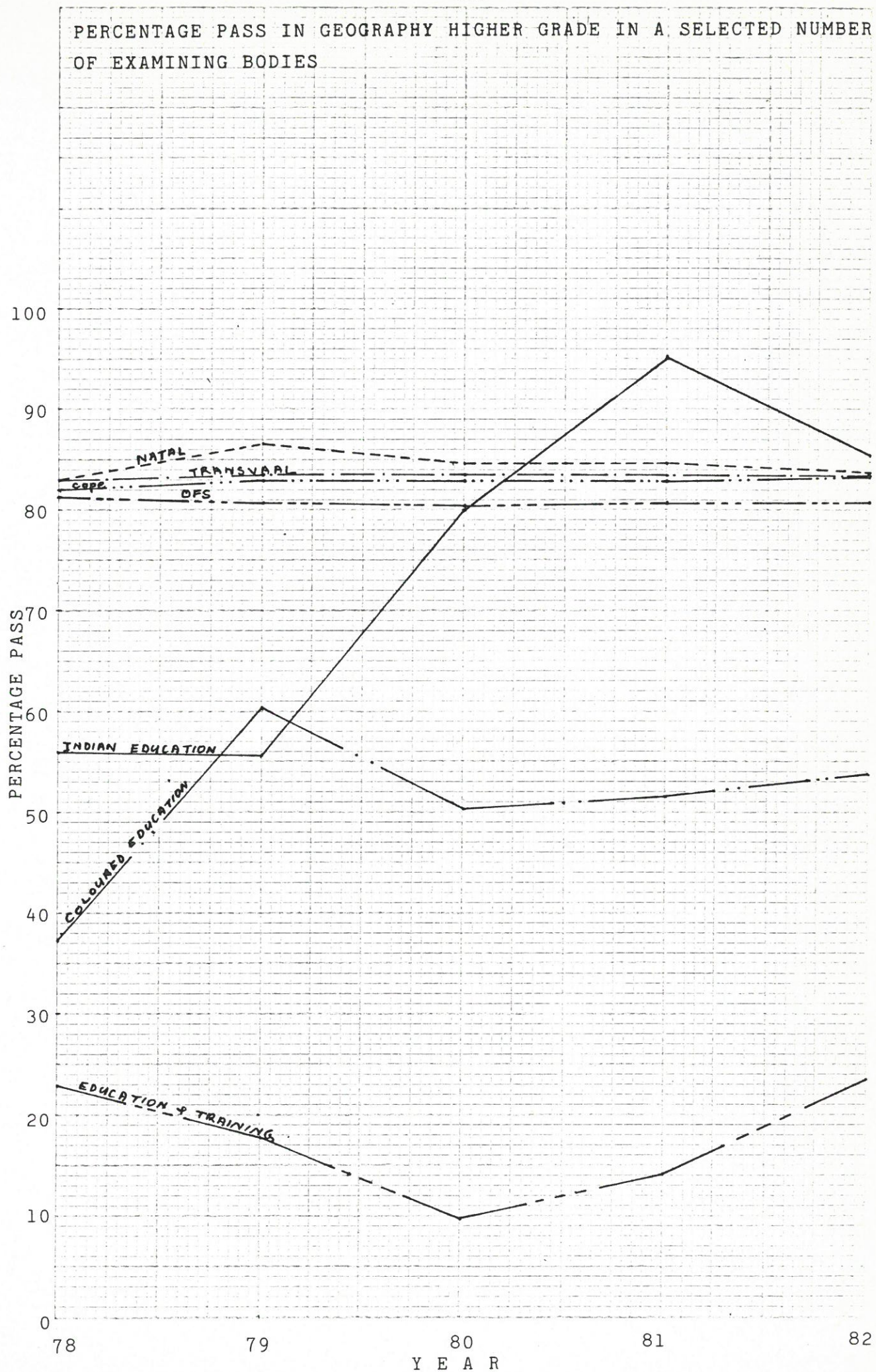
TABLE 6.8

PERCENTAGE PASS IN ACCOUNTANCY HIGHER GRADE IN A SELECTED
NUMBER OF EXAMINING BODIES

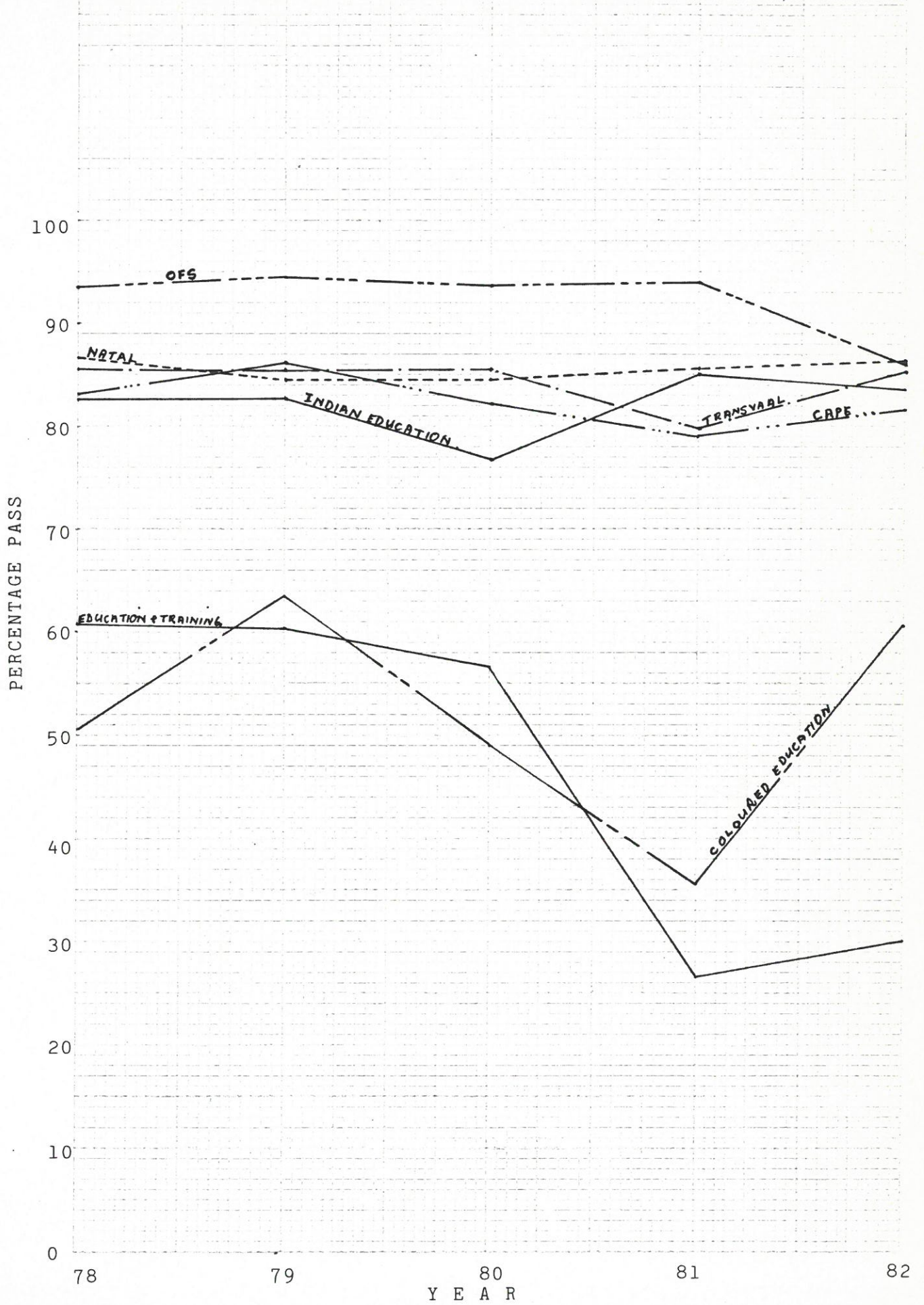
EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	86,83	84,57	84,62	85,65	86,28
TED	85,20	85,40	85,40	79,80	85,30
CAPE	83,00	86,00	82,00	79,00	81,30
OFS	93,40	94,50	93,90	94,00	86,00
IED	82,50	82,80	76,60	85,10	83,75
CED	50,70	63,50	49,00	35,30	60,10
ED & TR	60,70	60,20	56,60	26,90	29,90

(For graphical representation see page 338).

PERCENTAGE PASS IN GEOGRAPHY HIGHER GRADE IN A SELECTED NUMBER OF EXAMINING BODIES



PERCENTAGE PASS IN ACCOUNTANCY HIGHER GRADE IN A SELECTED NUMBER OF EXAMINING BODIES



The Orange Free State tends to have the highest pass-rate in Accountancy Higher Grade. However in 1982 its pass-rate compares favourably with that of the other White examining bodies. The pass-rates obtained by the Indian Education Department is comparable with those of the White education departments; further there appears to be greater consistency in the pass-rate from year to year in Indian Education. Coloured and Education and Training have tremendous fluctuations in the percentage of candidates passing Accountancy Higher Grade each year.

From the foregoing it is clear that in certain subjects i.e. History, Geography and Accountancy the pass-rates in Indian Education compare favourably with those of the White Education Departments. The position is, however, not the same when one compares the pass-rate in the sciences and languages i.e. Mathematics, Physical Science, Biology, English and Afrikaans. In these subjects there is wide variation in the pass-rates, and it is clear that Indian candidates fare poorly when compared with those taking the examination of the White examining bodies.

The pass-rates in the Coloured Education Department are generally lower than that of Indian Education (except Afrikaans Second Language Higher Grade). Education and Training generally has a lower pass rate than all the other examining bodies. There appears to be a decline in the pass-rate from year to year in many subjects offered by candidates of this department.

6.2 PASS-RATES IN A SELECTED NUMBER OF STANDARD GRADE SUBJECTS TAKEN FOR THE SENIOR CERTIFICATE EXAMINATION

Standard Grade subjects are out of a total of 300 marks and the pass requirement is 100 marks ($33\frac{1}{3}\%$).

English and Afrikaans as standard grade subjects are offered by very few education departments. These subjects have, therefore, not been selected for purposes of analysis and discussion. The subjects chosen are again mainly traditional secondary school subjects for which there is a great demand. These are discussed in the tables that follow.

TABLE 6.9

PERCENTAGE PASS IN MATHEMATICS STANDARD GRADE IN A
SELECTED NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1980	1982
NED	79,14	78,20	89,48	89,55	89,55
TED	76,60	76,20	76,30	70,30	74,60
CAPE	67,00	78,00	87,00	84,00	78,30
OFS	97,70	97,60	97,70	98,20	79,40
IED	66,40	66,60	67,10	58,00	51,11
CED	54,80	57,40	45,40	46,20	55,80
ED & TR	37,70	60,70	29,80	33,30	25,70

The data from this table is represented graphically on page 341 . It is evident that there is wide variation in the number of candidates that pass Mathematics in each of the departments; further, the pass-rates tend to vary from year to year. From 1980 a steady decline in the number of candidates passing Mathematics in Indian Education is noticed. As in the higher grade subjects one observes that the best pass-rates are achieved by the White Education Departments, then followed by Indian Education, Coloured Education and lastly Education and Training. This trend in education in South Africa is also supported by the de Lange Investigation findings. The reasons for such trends has been extensively dealt with by this inquiry.

PERCENTAGE PASS IN MATHEMATICS STANDARD GRADE IN A SELECTED NUMBER OF EXAMINING BODIES

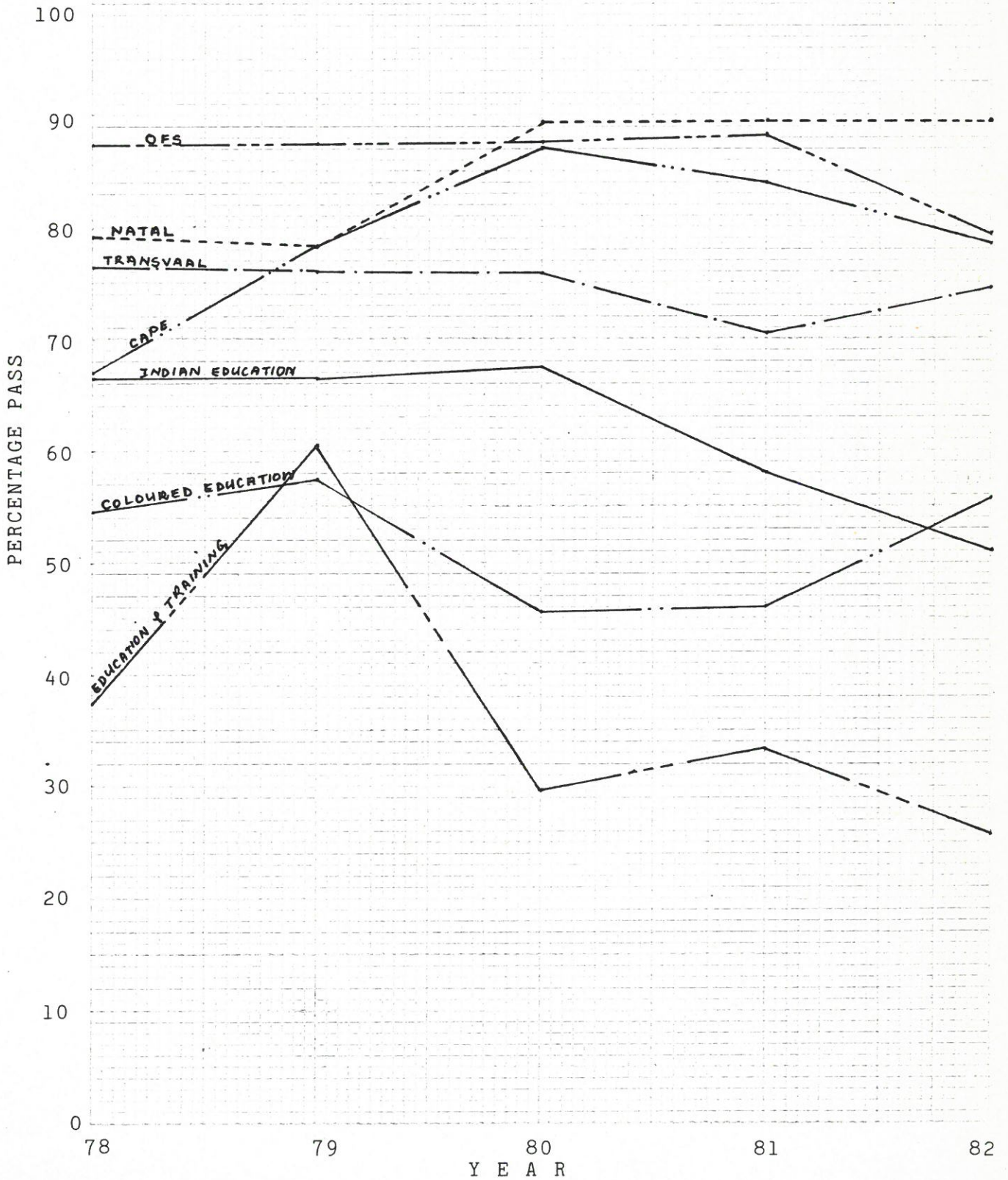


TABLE 6.10

PERCENTAGE PASS IN PHYSICAL SCIENCE STANDARD GRADE IN A
SELECTED NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	94,64	94,35	87,21	95,20	95,10
TED	90,30	90,10	88,90	86,90	88,50
CAPE	93,00	95,00	92,00	92,00	90,80
OFS	99,50	99,70	99,60	99,80	90,40
IED	79,10	79,40	79,30	91,50	76,40
CED	79,10	81,70	77,80	84,20	81,60
ED & TR	54,50	52,90	41,90	47,50	43,90

A graphical representation of the data on this table is given on page 343. The White Education Departments have a pass-rate of generally over 85%. Indian and Coloured Education with the exception of 1981 have displayed a more or less constant pass-rate. The pass-rates of these departments are about 8% lower than that of the Whites. Education and Training has pass-rates well below the other examining bodies.

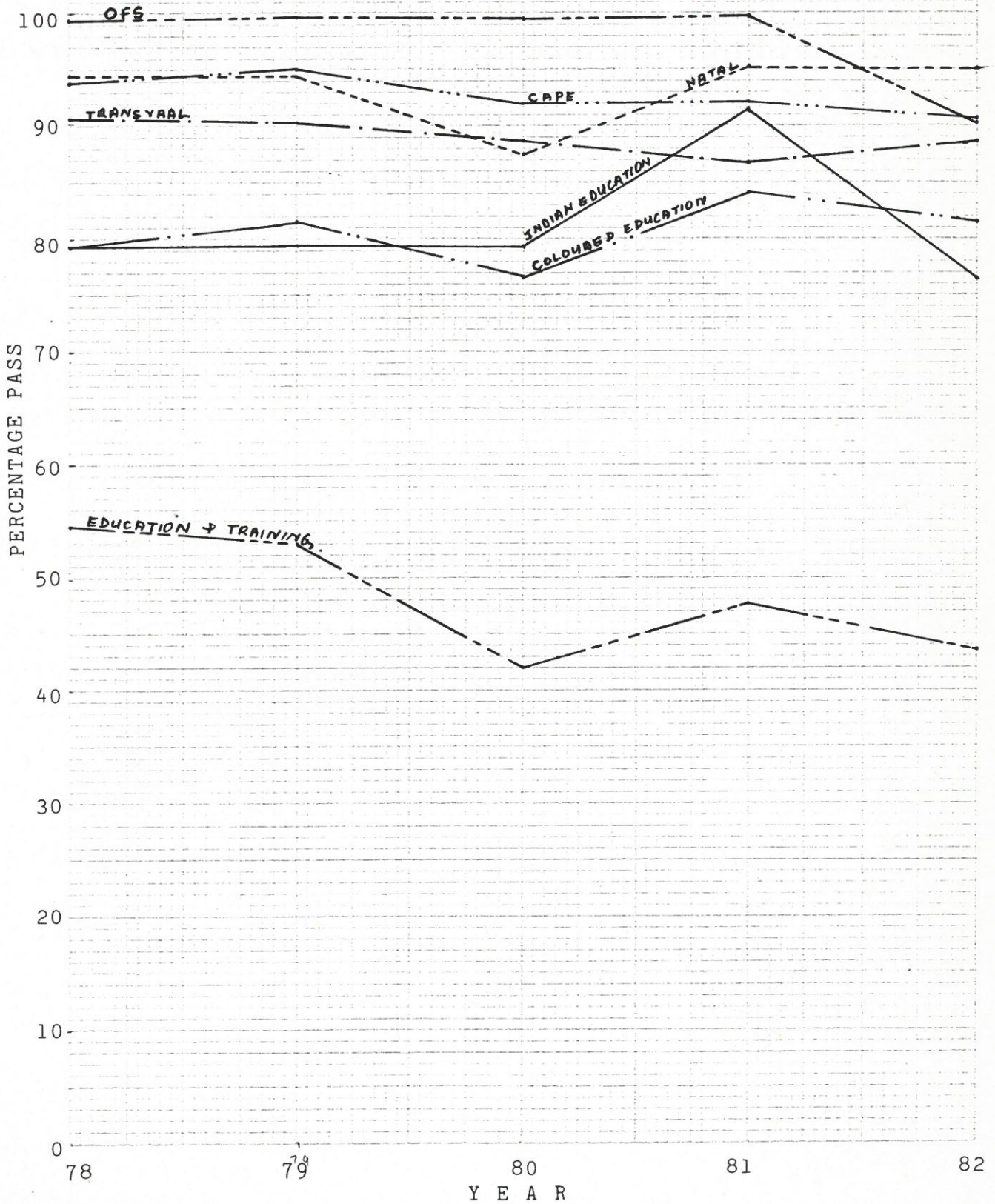
TABLE 6.11

PERCENTAGE PASS IN BIOLOGY STANDARD GRADE IN A SELECTED
NUMBER OF EXAMINING BODIES

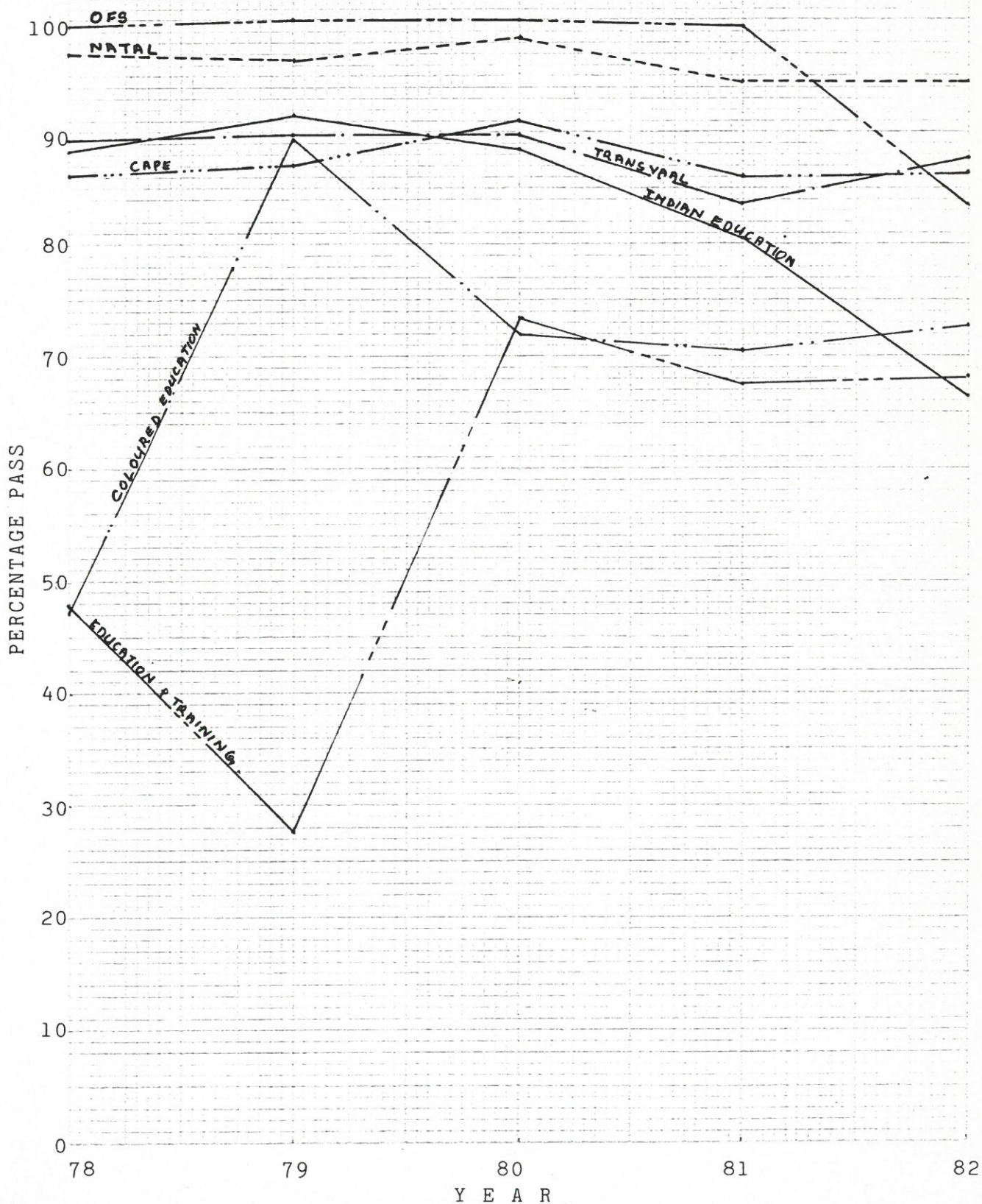
EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	97,00	96,57	98,60	94,55	94,66
TED	89,40	89,90	89,70	83,30	87,70
CAPE	86,00	87,00	91,00	86,00	86,70
OFS	99,40	100,00	100,00	99,30	83,70
IED	88,40	91,10	88,50	80,50	66,52
CED	47,00	89,50	71,90	70,40	72,90
ED & TR	47,90	28,80	73,40	67,30	68,10

(Graphical representation on page 344).

PERCENTAGE PASS IN PHYSICAL SCIENCE STANDARD GRADE IN A
SELECTED NUMBER OF EXAMINING BODIES



PERCENTAGE PASS IN BIOLOGY STANDARD GRADE IN A SELECTED NUMBER OF EXAMINING BODIES



In this subject the White Education Departments have a pass-rate of over 80%. The pass-rate of Indian Education is comparable with that of the White departments up to 1980; thereafter a declining trend emerges.

The increased pass-rate of Coloured Education in 1979 has also emerged in this subject. It is again possible that this trend in many subjects during that particular year can be attributed to the way the marks were adjusted. An interesting feature is the tremendous increase in the pass-rate of Education and Training in this subject. In 1979 this department had a pass-rate of 28,80% which increased by 44,6% in 1980 and thereafter maintained a more or less even rate.

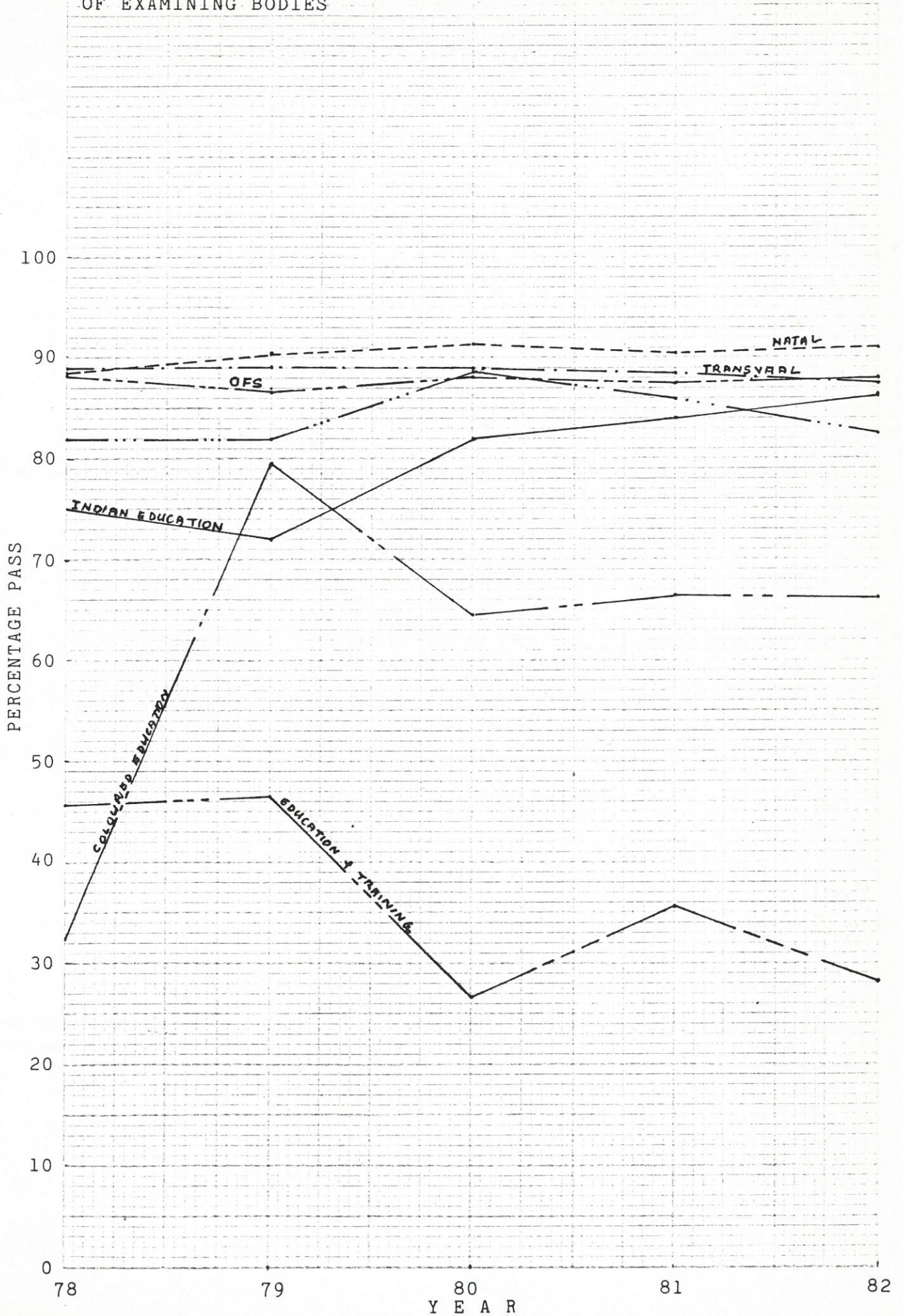
TABLE 6.12

PERCENTAGE PASS IN HISTORY STANDARD GRADE IN A SELECTED
NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	88,87	90,06	91,13	90,29	91,20
TED	89,00	89,10	89,10	88,40	87,50
CAPE	82,00	82,00	89,00	86,00	82,20
OFS	98,30	97,80	98,00	97,90	99,60
IED	75,10	72,00	82,30	84,00	86,28
CED	32,30	79,80	64,50	66,30	66,10
ED & TR	45,80	46,59	26,60	35,80	28,20

The performance of Indian candidates in History standard grade since 1980 is comparable with that of White candidates. It is interesting to note that the White Education Departments and Indian Education have pass-rates of over 80%. Coloured Education seems to be stabilising its performance around 65%. The pass rates in Education and Training fluctuates from year to year. A graphical representation of the data in table 6.12 is given on page 346. The wide variation in pass-rates between Coloured Education (about 20%), Education and Training

PERCENTAGE PASS IN HISTORY STANDARD GRADE IN A SELECTED NUMBER OF EXAMINING BODIES



(about 50%) and the other examining bodies is evident from the graph.

TABLE 6.13

PERCENTAGE PASS IN GEOGRAPHY STANDARD GRADE IN A SELECTED
NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	95,41	96,11	91,88	90,29	91,62
TED	88,10	88,90	88,00	88,40	88,60
CAPE	91,00	92,00	89,00	90,00	90,50
OFS	100,00	99,04	98,90	99,20	84,10
IED	82,60	87,20	96,10	98,70	96,15
CED	55,80	77,70	69,90	73,60	77,50
ED & TR	53,2	40,30	40,0	48,70	58,60

As in History, the performance levels of Indian candidates in this subject is comparable with that of White candidates. The situation with regard to Coloured Education and Education and Training is different. These departments have an average pass-rate of about 70% and 50% respectively.

The data in Table 6.13 is represented graphically on the page that follows. The trends that have emerged in History are also evident here.

PERCENTAGE PASS IN GEOGRAPHY STANDARD GRADE IN A SELECTED NUMBER OF EXAMINING BODIES

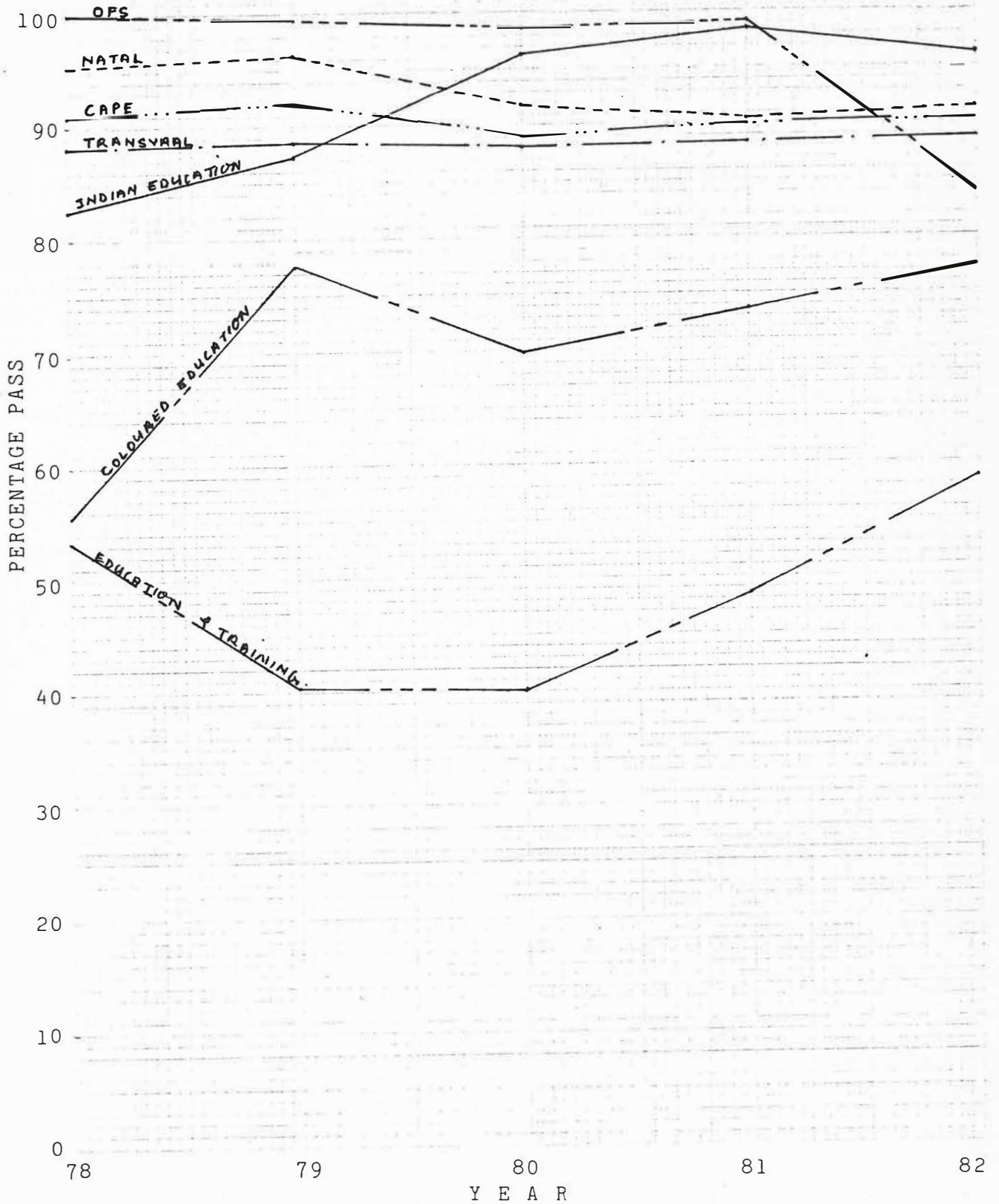


TABLE 6.14

PERCENTAGE PASS IN ACCOUNTANCY STANDARD GRADE IN A SELECTED
NUMBER OF EXAMINING BODIES

EXAMINING BODIES	Y E A R S				
	1978	1979	1980	1981	1982
NED	93,69	95,52	94,04	93,95	94,30
TED	89,40	89,20	89,10	89,20	89,60
CAPE	86,00	85,00	86,00	86,00	85,00
OFS	98,20	98,30	96,90	97,00	88,30
IED	91,90	95,30	94,20	90,80	89,44
CED	73,80	74,80	72,40	75,90	82,70
ED & TR		NOT	OFFERED		

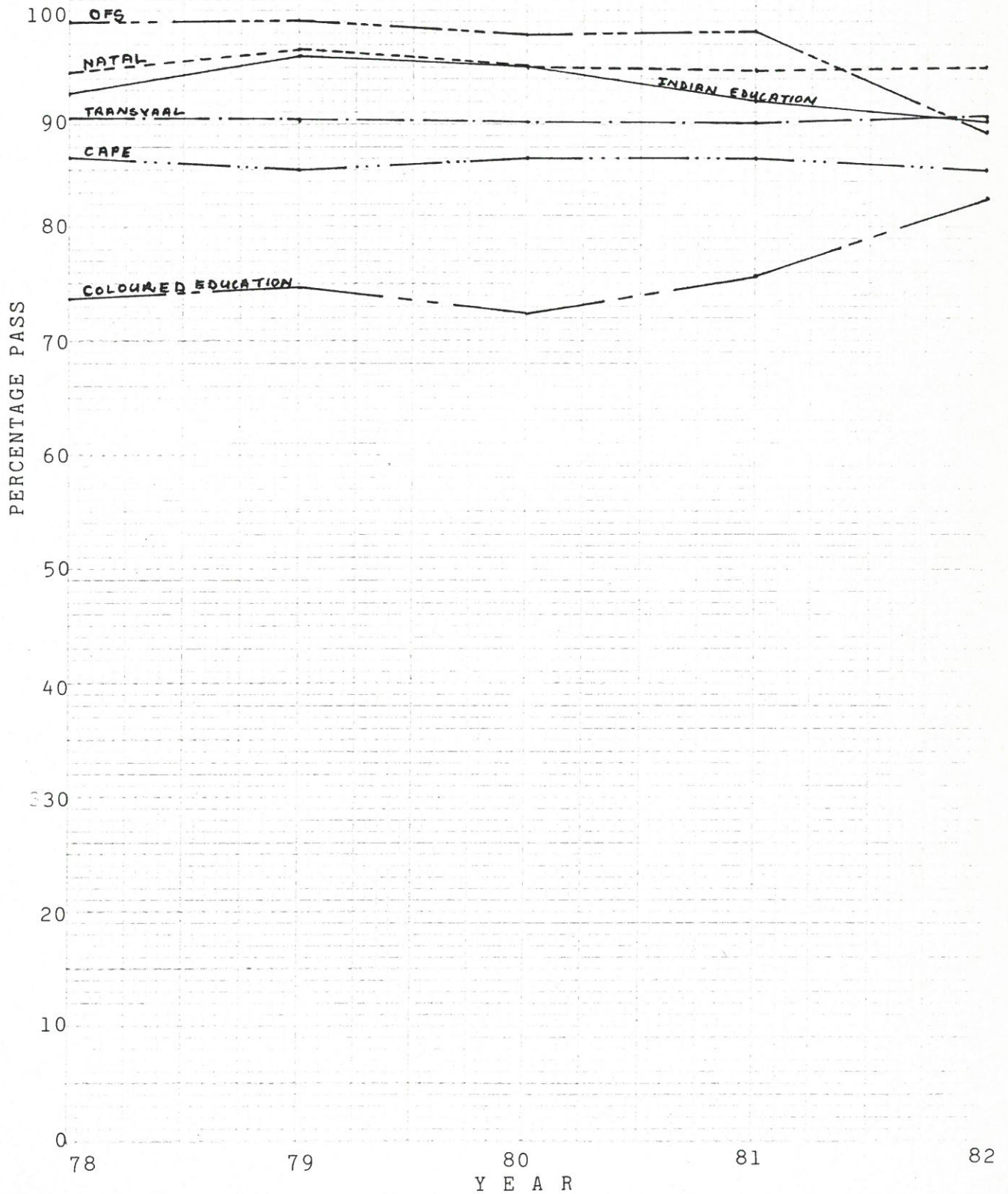
(Graph on page 350).

In Accountancy standard grade it is observed that in 1982 all the examining bodies that offered the subject had a pass rate of above 80%. Coloured education has made a phenomenal improvement. However, considering the general trends it may be concluded that there is very little difference in the pass-rate between the White examining bodies and that of Indian Education. Apart from Coloured Education, there is very little variation in the number of candidates that pass each year within each department.

A general overview of the performance in standard grade subjects reveals that the White Education Departments generally fare better in these subjects than the Coloured, Indian and Education and Training Departments. Of the latter three departments Indian Education fares the best, then Coloured Education and lastly Education and Training.

As in the case of higher grade subjects there is greater variation in performance in science subjects among the different examining bodies. In the case of History, Geography and Accountancy, the pass rates of the Division of Indian Education is comparable with that of the Whites.

PERCENTAGE PASS IN ACCOUNTANCY STANDARD GRADE IN A SELECTED NUMBER OF EXAMINING BODIES



The wide variation in standards among the examining bodies, particularly among the Indian, Coloured and Education and Training bodies, imply that different conditions may operate in the different communities. If it is accepted that the standard of question papers set by the different examining bodies are of an equivalent standard, then one can conclude that socio-economic conditions and cultural factors are among the factors that contribute to the different pass-rates. However, the assumption is limited to the standard of the different question papers and can best be investigated if common question papers in different subjects are written by candidates of all departments. Mention must, however, be made of the fact that the recent investigation into education in the Republic of South Africa has drawn attention to the disparity that exists particularly with regard to the financing of education for the different population groups in this country.⁽³⁾ It can therefore, reasonably be deduced that the pass-rates among the different population groups in this country are influenced by several factors, among which the socio-economic, political and cultural factors play a major role.

6.3 CONVERSION OF A FAILURE ON A HIGHER GRADE SUBJECT INTO A PASS ON THE STANDARD GRADE

As noted earlier the Joint Matriculation Board allows candidates who obtain between 25 to 39% in higher grade subjects (except Second Language HG) to have their marks converted to a pass on the standard grade. In the Second Language Higher Grade between 25 and 33% is converted to a pass on the standard grade.⁽⁴⁾

The purpose of the conversion is to allow those candidates who take the subject on the higher grade and who get over 25% to obtain a pass on the standard grade. In other words a candidate taking a subject on the higher grade has two chances of passing, viz. on the higher grade if he obtains 40% or more (except second

language HG) and on the standard grade if he obtains between 25 and 39%.

The principle of converting a failure on the higher grade to a pass on the standard grade has created several problems particularly among pupils who do not have the potential but desire to take subjects on the higher grade. These problems will become more evident as the table below, reflecting the number of candidates who obtain converted standard grade passes in Indian Education is analysed.

TABLE 6.15

PERCENTAGE OF CANDIDATES TAKING HIGHER GRADE SUBJECTS WHO OBTAIN CONVERTED STANDARD GRADE PASSES

HIGHER GRADE SUBJECTS	1978	1979	1980	1981	1982	AVERAGE FOR 5 YRS
ENGLISH	22,83	25,21	21,57	14,03	16,89	20,11
AFRIKAANS SEC. LANGUAGE	7,88	9,01	6,02	9,27	9,03	8,24
MATHEMATICS	36,57	29,79	34,87	29,07	27,50	31,56
PHYSICAL SC.	29,35	26,78	32,90	32,13	30,54	30,34
BIOLOGY	40,02	37,41	32,44	29,45	29,21	33,71
HISTORY	23,28	19,18	16,49	21,77	16,97	19,54
GEOGRAPHY	33,98	36,34	16,26	12,16	12,22	22,19
ACCOUNTANCY	13,65	13,65	20,07	26,35	13,16	17,38

Some 20% of candidates who take English on the higher grade obtain converted standard grade passes. In the case of the sciences i.e. Mathematics, Physical Science and Biology the percentage obtaining converted passes is generally over 30%. In History, Geography and Accountancy it is generally below 20%.

In Afrikaans Second Language Higher Grade some 8% of candidates on the average obtain converted standard grade passes. This percentage is much lower when compared with

the converted passes in the other higher grade subjects. One possible reason for this could be the total marks allocated to Afrikaans. Afrikaans Second Language Higher Grade is out of 300 marks whereas all other higher grade subjects are out of 400. Further mention must be made of the fact that Afrikaans Second Language Higher Grade and Afrikaans Second Language Standard Grade both enjoy the same total mark i.e. 300, whereas all other higher grade subjects and their equivalent standard grade subjects have totals of 400 and 300 respectively.

It is possible that having both higher and standard grade subjects out of the same total mark may influence the percentage that obtain converted passes in that subject i.e. fewer candidates may obtain converted passes.

Several problems are encountered when candidates are allowed to convert a failure on the higher grade into a pass on the standard grade. The most important is that teaching and learning is often directed at the minimum requirement to obtain a converted pass.

In 1978 the Division of Indian Education found that pupils, irrespective of potential, in standard 8 chose to study most of their subjects, on the higher grade. Many of these pupils passed into standard 9 by merely obtaining converted standard grade passes in certain subjects. In standard 9 they opted to offer these subjects again on the higher grade and at the end of that year passed into standard ten by obtaining converted standard grade passes. It is quite evident that these pupils used the conversion of a higher grade fail into a pass on the standard grade as the minimum attainment level in order to gain a pass into the next standard.⁽⁵⁾ Teaching was also directed according to Beyer (1978) "at minimum competency levels just to push the pupils over the next hurdle".⁽⁶⁾

Since the adjustment of marks in the standard 10 school year is based on norms which are determined largely on historical data i.e. the performance of pupils over a period of 5 years, the indiscriminate choice of grade of subjects and allowing pupils with little potential to take subjects on the higher grade, can influence the norms for the external examination adversely.

These factors prompted the Division of Indian Education at the beginning of 1979 to introduce the principle of "earning the right to continue a subject on the higher grade" in the senior secondary phase.⁽⁷⁾ Basically this implied that the parent had the right to determine the grade in which his child may take subjects in standard 8 at the beginning of the senior secondary phase. Thereafter the pupil had to pass the subject on the higher grade i.e. obtain 40% (except Afrikaans Second Language where the pass requirement was $33\frac{1}{3}\%$) if he wished to continue that subject on the higher grade in standard 9 or into standard 10. The parental right therefore ceased in standard 8, and in standard 9 and 10 the Principal of the school was to make the decision as to the grade on which a pupil should continue his study.⁽⁸⁾

In this regard the Division of Indian Education states the following:

"A pupil who received instruction in a subject based on the Higher Grade syllabus in Standard Eight or Nine and who fails to gain a pass on the Higher Grade shall follow the syllabus in Nine or Ten respectively in the grade as determined by the Principal."⁽⁹⁾

The Division further stipulates some guidelines on which the principal should make his decision

"In determining the grade in which a pupil will pursue his studies the Principal will make a thorough assessment of the pupil as a whole, i.e. his achievement in

the subject concerned as well as in the subject set as a whole as reflected in the results of a school examination; the potential of the pupils as indicated by standardised tests; the degree of maturity of the pupil (to allow for the late developer); the assessment by the teacher(s) concerned based on the year mark of the pupil as well as his cumulative record."⁽¹⁰⁾

It is clear that the Principal is allowed sufficient latitude in making the decision on which a child should pursue his subjects in the senior secondary phase. However, it must be pointed out that from a moral point of view the parental right at this final stage of a child's education should be respected. It would, therefore, be more appropriate if the decision on the grade on which a child pursues his studies is determined by the principal in consultation with the parent. The parents' wishes should most definitely be respected. This view is further strengthened by the HSRC report (1971) which states that the "parental and pupil choice" with regard to course selection must be respected.⁽¹¹⁾

Some comparisons are made below with the number of candidates who obtain converted passes in a selected number of higher grade subjects in some of the examining bodies in South Africa.

There is wide variation in the percentage of candidates who obtain converted passes in the different examining bodies. Further the percentage also varies from one subject to the next. In the sciences there is generally a greater number of converted passes than in the other subjects. Generally the White examining bodies have fewer converted passes than the Indian, Coloured and Education and Training Departments. It is possible that in the White departments candidates are generally more selective in choosing the grade in which they offer a subject for the examination. In Indian Education there

TABLE 6.16

PERCENTAGE OF CANDIDATES WHO OBTAIN CONVERTED PASSES IN A SELECTED NUMBER OF HIGHER
GRADE SUBJECTS IN SOME OF THE EXAMINING BODIES IN SOUTH AFRICA

		NED	TED	CAPE	OFS	IED	CED	ED & TR
ENGLISH	1981	4,48	10,80	12,0	8,5	14,03	27,05	61,50
	1982	4,43	11,30	12,7	8,2	16,89	32,20	72,10
AFRIKAANS	1981	3,71	5,50	3,00	3,2	9,27	9,30	34,10
	1982	10,01	6,00	3,20	3,8	9,03	7,20	47,60
MATHEMATICS	1981	10,69	26,40	19,00	20,0	29,07	21,80	40,6
	1982	10,18	26,00	18,90	20,1	27,50	21,40	40,6
PHYSICAL SCIENCE	1981	11,00	16,8	20,0	14,6	32,13	25,0	61,6
	1982	10,16	18,3	17,9	14,9	30,54	23,9	48,5
BIOLOGY	1981	14,23	16,9	18,0	15,3	29,45	28,5	53,0
	1982	13,69	15,8	13,6	15,8	29,21	28,5	75,2
HISTORY	1981	11,05	13,9	18,0	15,0	21,77	33,4	55,3
	1982	10,10	13,9	15,2	15,5	16,97	32,5	48,1
GEOGRAPHY	1981	15,0	15,8	15,0	18,0	12,16	35,3	70,0
	1982	14,45	15,2	15,1	18,7	12,22	37,8	67,3
ACCOUNTANCY	1981	13,40	19,0	18,0	13,4	26,16	38,7	58,0
	1982	12,01	13,9	17,1	13,4	13,16	31,8	51,8

generally has been a decline in the number of converted passes in most subjects during the two years under review. It is possible that the principle of earning the right to enter a subject on the higher grade in this Division is having a positive effect. The converted passes in the Coloured and Education and Training departments is generally high. It would appear that too many candidates in these departments take subjects on grades for which they do not have the potential.

6.4 THE RATIOS BETWEEN HIGHER AND STANDARD GRADE ENTRIES AND PERCENTAGE PASS IN A SELECTED NUMBER OF SUBJECTS TAKEN BY CANDIDATES OF THE DIVISION OF INDIAN EDUCATION

The number of candidates who enter for higher and standard grade subjects and the pass rates yield some interesting information.

In order to evolve a theoretical framework on which ratios of higher and standard grade entries can be based certain assumptions are made. These include that if Principals consider several factors (e.g. potential, study habit, previous performance) in determining the grade in which a candidate should enter a subject, then theoretically there should be few or no failures in that subject. Further if a candidate passes a higher grade subject then it must be assumed that he has the potential to take that subject. The converse also applies that if a candidate fails a higher grade subject then he does not have the potential for that subject. At this stage it is conceded that potential is difficult to determine since it is influenced by many factors such as inherent ability as well as environmental factors. Further that a choice of grade of subject may well be influenced by factors such as job opportunities and entrance requirements to tertiary institutions. Bearing these factors in mind it is still possible to arrive at some framework which could influence the pass rates in higher grade subjects. An example of determining a theoretical ratio for English is given below.

Step 1 : Determine the number of candidates entering for English Higher Grade and Standard Grade in any given year.

Eg.	1982	English
Higher Grade	-	5067 candidates
Standard Grade	-	1425 candidates

Step 2 : Determine the % that passed higher grade on adjusted scores. In this example it is 82,59%.

Step 3 : 82,59% of the higher grade entries = 4185 candidates. Theoretically 4185 candidates have the potential to pass higher grade and the rest therefore ought to have entered the subject on the standard grade.

Step 4 : The standard grade entry is determined by adding the higher grade failures to the actual standard grade entry i.e. 1011 (higher grade failures) + 1425 (actual standard grade entry) = 2436.

From the above it is possible to determine the number that ought to have entered higher and standard grades respectively i.e. 4185 HG and 2436 SG, the ratio being HG : SG - 63 : 37.

NR

The average of this ratio taken over a period of five years would yield interesting information to education departments in determining the optimum pass-rates in higher grade subjects; further certain confidence limits can be built into the ratios to allow for flexibility. For example if it is felt that approximately 90% of higher grade candidates should pass, then some additional candidates from the standard grade lot can be allowed to offer the subject on the higher grade. In this example, this would imply considering the 4185 higher grade candidates as being 90% and then determining 100% i.e. 4650. The entry ratio would then be:-

HG	SG	TOTAL
4650	1971	6621
70	: 30	

These ratios, however, would be influenced by changes in syllabuses, approaches to teaching as well as examination requirements.

The actual entry ratios and the theoretical ratios in a selected number of subjects taken by Indian candidates are given in Table 6.17. (pages 360 to 362). A confidence limit of 90% pass in each subject is used in determining the theoretical ratio.

From the table it is possible to calculate the average 5 year actual ratio and a 5 year theoretical ratio.

This would enable the determination of subjects in which too many candidates take the higher grade as well as those subjects in which the choice of grade is within acceptable limits. The average 5 year ratios are given in the table below.

TABLE 6.18

AVERAGE ACTUAL AND AVERAGE THEORETICAL RATIOS IN A
SELECTED NUMBER OF SUBJECTS

SUBJECTS	AVERAGE ACTUAL RATIOS		AVERAGE THEO- RETICAL RATIOS	
	HG	SG	HG	SG
English	80	20	70	30
Afrikaans	79	21	75	25
Mathematics	32	68	20	80
Physical Science	66	34	48	52
Biology	64	36	43	57
History	76	24	64	36
Geography	64	36	53	47
Accountancy	58	42	52	48

In determining the theoretical ratio allowance was made for about 10% of candidates who may be border line cases where a decision on a choice of grade may be difficult.

TABLE 6.17

THE ACTUAL AND THEORETICAL RATIOS IN A SELECTED NUMBER OF SUBJECTS TAKEN FOR THE SENIOR CERTIFICATE
EXAMINATION OF THE DIVISION OF INDIAN EDUCATION

	1978			1979			1980			1981			1982		
	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL
ENGLISH															
Actual Entry	4213	766	4979	3820	1409	5229	4306	973	5273	4733	1072	5805	5067	1425	6492
Entry Ratio	85	15		73	27		82	17		82	18		78	22	
Pass % HG	76,57			74,29			77,89			85,40			82,59		
Number - using HG passes	3226	1753	4979	2837	2392	5229	3354	1919	5273	4042	1763	5805	4185	2307	6492
Theoretical Ratio	3584	1395		3152	2077		3727	1546		4491	1314		4650	1842	
	72	28		60	40		71	29		77	23		72	28	
AFRIKAANS															
Actual Entry	4062	917	4979	3840	1389	5229	4266	1013	5273	4768	1037	5805	5103	1389	6492
Entry Ratio	82	18		73	27		81	19		82	18		79	21	
Pass % HG	83,03			85,65			87,74			84,58			85,24		
Number - using HG passes	3372	1602	4979	3289	1940	5229	3743	1530	5273	4033	1772	5805	4350	2142	6492
Theoretical Ratio	3747	1232		3654	1575		4159	1114		4481	1324		4833	1659	
MATHEMATICS															
Actual Entry	1318	2084	3402	1195	2470	3665	1365	2952	4317	1321	3489	4810	1462	3700	5162
Entry Ratio	39	61		33	67		32	68		27	73		28	72	
Pass % HG	53,56			57,90			49,15			57,83			59,30		
Number - using HG passes	706	2696	3402	692	2973	3665	671	3646	4317	764	4046	4810	867	4295	5162
Theoretical Ratio	784	2618		769	2896		745	3572		849	3961		963	4199	
	23	77		21	79		17	83		18	82		19	81	

	1978			1979			1980			1981			1982		
	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL
PHYSICAL SCIENCE															
Actual Entry	1254	387	1641	1083	663	1696	1231	660	1891	1416	768	2184	1454	878	2332
Entry Ratio	76	24		62	38		65	35		65	35		62	38	
Pass % HG	67,06			70,63			62,22			61,72			66,57		
Number - using HG passes	841	800	1641	765	931	1696	766	1125	1891	874	1310	2184	968	1364	2332
Theoretical Ratio	934	707		850	846		851	1040		971	1213		1076	1256	
	57	43		50	50		45	55		44	56		46	54	
BIOLOGY															
Actual Entry	2504	1193	3697	2320	1629	3949	2669	1582	4251	3019	1608	4627	3396	1956	5352
Entry Ratio	68	32		59	41		63	37		65	35		63	37	
Pass % HG	52,55			56,33			63,16			65,91			67,60		
Number - using HG passes	1316	2381	3697	1307	2642	3949	1686	2565	4251	1990	2637	4627	2296	3056	5352
Theoretical Ratio	1462	2235		1452	2497		1873	2378		2211	2416		2551	2801	
	40	60		37	63		44	56		48	52		48	52	
HISTORY															
Actual Entry	1319	357	1675	1142	382	1524	1061	363	1424	1153	342	1495	1249	424	1673
Entry Ratio	79	21		75	25		75	25		77	23		75	25	
Pass % HG	71,03			73,90			76,81			75,97			79,74		
Number - using HG passes	937	738	1675	844	680	1524	815	609	1424	876	619	1495	996	677	1673
Theoretical Ratio	1041	634		938	586		906	518		973	522		1107	566	
	62	38		62	38		64	36		65	35		66	34	

GEOGRAPHY	1978			1979			1980			1981			1982		
	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL	HG	SG	TOTAL
Actual Entry	871	506	1377	754	566	1320	947	543	1490	1160	583	1743	1342	668	2010
Entry Ratio	63	37		57	43		64	36		67	33		67	33	
Pass % HG	59,24			59,68			81,41		86,55				86,73		
Number - using HG passes	516	861	1377	450	870	1320	771	719	1490	1004	739	1743	1163	846	2010
Theoretical Ratio	573	804		500	820		857	633		1116	627		1292	718	
	42	58		38	62		58	42		64	36		64	36	
ACCOUNTANCY															
Actual Entry	2337	1951	4288	2527	2049	4576	2945	1690	4635	3093	1907	5000	3070	2419	5489
Entry Ratio	55	45		55	45		64	36		61	39		56	44	
Pass % HG	84,21			85,23			78,43		70,67				85,89		
Number - using HG passes	1968	2320	4288	2154	2422	4576	2310	2325	4635	2186	2814	5000	2637	2852	5489
Theoretical Ratio	2187	2101		2393	2183		2567	2068		2429	2571		2930	2559	
	51	49		52	48		55	45		49	51		53	47	

In such cases these candidates ought to be allowed to take the subject on the grade of their choice. Mention must be made of the fact that the choice of 10% was an arbitrary figure. Some departments may want to increase the confidence limits to 5% or decrease it to 15%. What is however important is the principle involved in arriving at a theoretical ratio.

A scrutiny of the above table reveals that too many candidates are offering English Higher Grade in the Division of Indian Education. The number of candidates taking higher grade should be reduced by about 10% if the Division wants to improve the percentage pass in this subject.

The actual average in Afrikaans is about 4% higher than the theoretical average. This is considered to be not a very great difference. It would therefore appear that the number of candidates taking Afrikaans Higher Grade is more realistic than those taking English Higher Grade. One possible reason why more candidates opt to offer English Higher Grade is because of entrance requirements to teacher education institutions. For entrance to these institutions candidates must pass English on the Higher Grade.

In Mathematics more candidates offer it on the standard grade than on the higher grade. From the ratios it is evident that some 12% of candidates taking Mathematics Higher Grade fail to pass the subject. Here again to improve the performance in Mathematics a ratio of 20% higher grade and 80% standard grade would, at the present time, be more appropriate for the Division of Indian Education.

With regard to the other subjects in the table similar patterns emerge i.e. generally candidates need to be more selective in the grade of subjects offered. It is most likely that the current practical of candidates

choosing higher grade subjects even if they do not have the potential for that grade would be eliminated if the conversion of a higher grade fail to a standard grade pass is done away with. Currently the Joint Matriculation Board and the Committee of Heads of Education are looking into this possibility, but as an interim measure as from Nov/Dec 1984 the current practice of converting a failure of 25% to 39% on a higher grade to standard grade pass has been raised to 30% to 39%.⁽¹²⁾ In other words all candidates obtaining below 30% in a higher grade subject would fail. The application of the conversion has created many problems not only for educational administrators but also for pupils. The conversion builds in the chance factor in passing a subject, and many candidates even though ill-prepared are willing to "take a chance at the higher grade". For the educational administrator constant attention has to be paid to the changing ratios of higher grade and standard grade, since all statistical adjustments to marks in a subject are greatly influenced by the 5 year historical data. The changes in these ratios as well as the potential of candidates offering the subject in any one year can influence decisions on adjustment of marks of candidates taking the examination in future years.

6.5 THE DEGREE OF DIFFICULTY OF HIGHER GRADE AND STANDARD GRADE QUESTION PAPERS IN SELECTED SUBJECTS

The Division of Indian Education as well as the other examining bodies in this country use the panel system of setting question papers in most subjects. Generally a panel of three experienced teachers are appointed to set the higher and standard grade papers in a subject. It is, therefore, in the first instance, the responsibility of the panel to set papers of different degrees of difficulty in the two grades. Although the panel is guided by a syllabus and teaching objectives in the

construction of question papers for the two grades, it is a difficult task to determine the degree of difficulty of the two question papers set.

An investigation was undertaken to determine the degree of difficulty of higher grade and standard grade question papers set in English, Afrikaans, Mathematics and Physical Science for the Senior Certificate Examination of 1980.⁽¹³⁾ The researcher was involved with this investigation.

For purposes of this investigation a random sample of candidates taking the November/December 1981 Senior Certificate Examination was chosen. The sample was divided into higher and standard grade candidates on the basis of their entry in the subject concerned for the Senior Certificate Examination. The sample is given below:

TABLE 6.19

SAMPLE OF CANDIDATES USED TO DETERMINE THE DEGREE OF DIFFICULTY OF HIGHER AND STANDARD GRADE QUESTION PAPERS IN A SELECTED NUMBER OF SUBJECTS

SUBJECTS	CANDIDATES		TOTAL
	HIGHER GRADE	STANDARD GRADE	
English	307	304	611
Afrikaans	237	210	447
Mathematics	280	253	533
Physical Science	211	186	397

The consent of pupils as well as teachers was obtained to participate in this investigation. The candidates taking a particular subject wrote two papers, one higher and one standard on two separate days during October 1981. The scripts were marked by the teachers using the marking memoranda provided by the Department. They were then moderated by the Departmental moderators, who in the first instance, were responsible for the moderation of the question papers.

The marks obtained by candidates were then collated for statistical analysis. The following statistical computations were made:

Means (\bar{m}) of each test; Standard Deviations (SD) Standard Error of Mean (SE mean), Correlation (r) and Critical Ratio (CR).

The results of this investigation are as follows:

TABLE 6.20

THE PERFORMANCE OF HIGHER GRADE CANDIDATES IN HIGHER AND STANDARD GRADE QUESTION PAPERS IN ENGLISH

	HG PAPER	SG PAPER
\bar{m}	47,06%	55,34%
SD	8,68	8,51
SE mean	0,50	0,49

N = 307

r = 0,83 $p < 0,01$

CR = 11,83 $p < 0,01$

The difference in performance of higher grade candidates in the English Higher and English Standard Grade question papers is significant at the 1% level. The candidates performed better in the standard grade paper, the mean difference being about 8%. It is also noticed that the spread of scores around the mean in both papers is more or less the same (HG = 8,68 and SG = 8,51). There is a high correlation in the performance of candidates in both papers. The correlation is also significant at the 1% level.

It is clear that the higher and standard grade papers do differentiate, but what is not clear is whether the obtained difference lies with the acceptable limits of those who designed the two syllabuses.

TABLE 6.21

THE PERFORMANCE OF STANDARD GRADE CANDIDATES IN HIGHER
AND STANDARD GRADE QUESTION PAPERS IN ENGLISH

	HG PAPER	SG PAPER
\bar{m}	31,27	43,21
SD	7,38	6,68
SE mean	0,42	0,38

N = 304

$r = 0,73$ $p < 0,01$

CR = 20,95 $p < 0,01$

Here again the performance in these two papers reflects a significant difference. The standard grade pupils performed poorly in the higher grade paper. This also supports the view that the two papers do differentiate.

TABLE 6.22

THE PERFORMANCE OF HIGHER GRADE CANDIDATES IN HIGHER
AND STANDARD GRADE QUESTION PAPERS IN AFRIKAANS SECOND
LANGUAGE

	HG PAPER	SG PAPER
\bar{m}	38,05%	44,42
SD	12,46	12,17
SE mean	0,81	0,79

N = 237

$r = 0,87$ $p < 0,01$

CR = 5,31 $p < 0,01$

The higher grade candidates perform better in Afrikaans standard grade. It is, however, interesting to note that the mean difference is only about 6%. There is also a greater spread of scores around the mean than was the case with English.

TABLE 6.23

THE PERFORMANCE OF STANDARD GRADE CANDIDATES IN HIGHER AND STANDARD GRADE QUESTION PAPERS IN AFRIKAANS SECOND LANGUAGE

	HG PAPER	SG PAPER
\bar{m}	27,65	35,44
SD	7,98	9,30
SE mean	0,55	0,64

N = 210

$r = 0,69 \quad p < 0,01$

CR = 9,27 $p < 0,01$

The performance of standard grade Afrikaans candidates in higher and standard grade papers reveals that the difference between the means is significant at the 0,01 level. The standard grade candidates perform poorly in the higher grade papers.

TABLE 6.24

THE PERFORMANCE OF HIGHER GRADE CANDIDATES IN HIGHER AND STANDARD GRADE QUESTION PAPERS IN MATHEMATICS

	HG PAPERS	SG PAPERS
\bar{m}	43,0	54,68
SD	15,39	16,21
SE mean	0,92	0,97

N = 28

$r = 0,82 \quad p < 0,01$

CR = 8,72 $p < 0,01$

The higher grade candidates performed better in the standard grade Mathematics question paper. The mean difference between the two papers is 11,68%. What is interesting is that there is a greater spread of scores in Mathematics than in the languages. This is probably due to the marking in Mathematics being less subjective. The correlation between the performance of the candidates

in both the tests is very high, further the difference between the mean performance is significant at the 0,01 level.

TABLE 6.25

THE PERFORMANCE OF STANDARD GRADE CANDIDATES IN HIGHER AND STANDARD GRADE QUESTION PAPERS IN MATHEMATICS

	HG PAPERS	SG PAPERS
\bar{m}	27,31	34,33
SD	20,15	18,23
SE mean	1,27	1,15

N = 253

r = 0,79 $p < 0,01$

CR = 6,10 $p < 0,01$

Standard grade Mathematics candidates performed very poorly on the higher grade question papers. The mean difference between higher grade and standard grade performance is about 7%. The difference between the means is significant at the 1% level. In the higher grade papers there is a wide range of performance. This is indicated by the high Standard Deviation of 20,15%. It would, therefore, appear that candidates who offer Mathematics standard grade are not a homogeneous group, with their abilities in the subject ranging from weak to good.

TABLE 6.26

THE PERFORMANCE OF HIGHER GRADE CANDIDATES, IN HIGHER AND STANDARD GRADE QUESTION PAPERS IN PHYSICAL SCIENCE

	HG PAPERS	SG PAPERS
\bar{m}	43,5	51,27
SD	15,17	12,89
SE mean	1,05	0,89

N = 211

r = 0,69 $p < 0,01$

CR = 5,63 $p < 0,01$

A significant difference in the mean performance of candidates who wrote the two question papers is also noticed here.

TABLE 6.27
THE PERFORMANCE OF STANDARD GRADE CANDIDATES IN HIGHER
AND STANDARD GRADE QUESTION PAPERS IN PHYSICAL SCIENCE

	HG PAPERS	SG PAPERS
\bar{m}	27,22	34,64
SD	15,05	11,55
SE mean	1,11	0,85

N = 186

$r = 0,70$ $p < 0,01$

CR = 5,30 $p < 0,01$

As in the other subjects discussed, in Physical Science there is a significant difference in the mean performance of candidates in the two papers set.

It is noted that there is a significant difference between higher and standard grade question papers set by the Division of Indian Education. Further the difference varies from subject to subject. It is also possible that these differences can vary within subjects from year to year. At this stage it is not possible to comment on whether the differences between the two grades should be greater or less. More research into the field needs to be undertaken so that acceptable limits within which higher and standard grade question papers should vary may be determined.

6.6 CONCLUSION

In this chapter the following conclusions were reached:

In certain higher grade subjects, notably History, Geography and Accountancy the pass-rates in Indian Education compare favourably with those of the White

education departments. In the sciences and languages, the position is different. In these subjects there is wide variations in the pass-rates, and it is clear that Indian candidates fare poorly when compared with those taking the examination of White examining bodies.

The pass-rates in the Coloured Education Department are generally lower than that of Indian Education. Education and Training on the other hand has a lower pass-rate than all the other examining bodies. There appears to be a decline in the number of candidates that pass each year in many subjects offered by candidates of this department.

The general overview of performance in standard grade subjects reveals that the White education departments fare better than the Coloured, Indian and Education and Training departments. Of the latter three departments Indian Education fares the best, followed by Coloured Education and lastly Education and Training.

A consideration of the number of candidates that enter for higher grade subjects and the number that pass in these subjects in Indian education, leads one to conclude that too many candidates present subjects on the higher grade. A theoretical framework which could serve as a guide in determining the number of candidates that should take higher grade subjects is presented.

The investigation into the differentiation between higher and standard grade question papers in a selected number of subjects indicate that there is a significant difference between higher and standard grade question papers set by the Division of Indian Education.

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CHAPTER 7

A CRITICAL ANALYSIS OF FINDINGS AND CONCLUSIONS REACHED IN THIS INVESTIGATION

In this chapter an attempt is made to bring together the overall findings in this investigation and to draw certain conclusions from the evidence obtained.

While each preceding chapter confined itself to specific areas of this research, an attempt is made to synthesise and relate the findings reached in the different chapters. One of the major problems related to assessment and measurement is the question of reliability and validity.

7.1 VALIDITY AND RELIABILITY OF THE SENIOR CERTIFICATE EXAMINATION

In dealing with the question of validity, that is, whether the Senior Certificate Examination actually does measure what it purports to measure, the point regarding the relationship between reliability and validity made by Wiseman (1961) is worth repeating. He states "Low reliability must be associated with low validity; high reliability is a necessary prerequisite for high validity but does not guarantee it".⁽¹⁾

Malherbe (1977) states that the "reliability of our matriculation examination is low", and on these grounds alone one "could conclude immediately that the validity would also be low".⁽²⁾

He further points out that what the matriculation examination purports to do is vague.

"Its objectives are not clearly defined. What does the matriculation examination or its equivalent really measure? Is it a stock-taking of knowledge acquired, or is it to provide a prognosis for future success in acquiring knowledge? If both, which criteria are we

to apply when determining validity".⁽³⁾

Unfortunately the questions posed above have remained unanswered and have been further complicated by the findings in this investigation. The relative differences in performance of candidates in the different Senior Certificate Examinations taken in this country further reflects on its validity as a certifying instrument at the end of twelve years of schooling.

If it is argued that these different examinations are necessary for they take into account cultural and environmental differences of the different population groups in South Africa, then one would have expected the pass rates in the different examining bodies to be more or less equivalent. Therefore it would appear that these different examinations particularly for the Indian, Coloured and Black groups are not serving the purpose for which they were intended. It is conceded that there are several factors such as the curriculum itself that can contribute to poor performance in an examination. Therefore any comment on the performance of candidates in an examination must be seen in relationship to the curriculum followed. It is possible that the poor performance of certain groups in the Senior Certificate Examination can be directly linked to the curriculum followed.

Reliability of performance if measured by the consistency of pass from one year to the next, would indicate that among the White examining bodies in South Africa there is a fair degree of consistency in pass-rates from one year to the next. In the case of the Indian, Coloured and Black candidates, the pass-rate tends to vary, in some instances greatly. It is therefore possible that in these departments the "low reliability involves low validity".⁽⁴⁾

The problem of low validity and reliability in certifying examinations is not peculiar to the examinations conducted in this country alone. In Britain, Bardell (1978) con-

cluded that the predictive validity of the General Certificate of Education examination conducted by the Joint Matriculation Board was low.⁽⁵⁾ Further the Schools' Council (1979) in its investigation into the standards in public examinations also expressed the view that performance in the General Certificate of Education examination was no guarantee of future success.⁽⁶⁾

While it is agreed that the problem of reliability and validity are not peculiar to the examinations conducted in this country, it must be pointed out that the situation is further complicated here by having different examinations based on similar curricula to serve the needs of the different population groups. It would appear to be more appropriate if specific curricula which serves the needs of specific groups are devised, so that the examinations conducted could become more meaningful and reliable. This, however, could be exploited politically in the promotion of ethnically and culturally differentiated education, but what is worth noting is that many candidates are following a curriculum which is not designed to develop their potential to the optimum.

7.2 COMPARABILITY OF STANDARDS IN THE SENIOR CERTIFICATE EXAMINATION

Comparisons in the performance levels of candidates taking the examinations of the different examining bodies does create several problems. First of all such comparisons become extremely complex since candidates write different examination question papers in similar subjects and secondly because some examinations in this country are controlled and administered by provincial authorities and others by the central government. Thirdly some examining bodies cater mainly for certain ethnic groups only.

Nevertheless society tends to place considerable emphasis on examinations and it is not uncommon, as was evident in Chapter 5, for people from the different population groups to make comparisons of the achievement of candidates taking the examinations of the different examining bodies.

Further with the increased demand for tertiary education and university places in particular, there is extensive competition for places in tertiary education. Universities are also expressing concern over the high failure rates particularly in the first year and this has led to many introducing new criteria for the selection of students.

The use of common criteria in the selection of students from the different examining bodies would be limited by the extent to which the examinations of the different examining bodies are comparable.

Malherbe (1977) points out that the variation of results and therefore the standards within examining bodies "undoubtedly had serious social and economic consequences for the individuals concerned".⁽⁷⁾ He further mentions that variation can generally be ascribed to the variations in the standards of examinations, variations in the standards applied as well as the fact that "certain education departments appeared to be more generous than others".

This point has been further corroborated by this investigation where it was found that the different examining bodies applied different criteria in adjusting the marks of candidates. Some tended to be generous while others were severe, but mention must be made of the fact that overall most examining bodies adjusted the marks within the guidelines supplied by the Joint Matriculation Board.

A necessary condition for the achievement of comparability between different examinations is that the symbols awarded to candidates who sat for the different examinations with

the same result should reflect similar performance. For example an A symbol awarded by the Division of Indian Education should, if the curriculum is the same, be comparable with an A symbol in the same subject awarded by say the Natal Education Department. The degree of precision with which comparability can be achieved at this basic level may be limited. The Schools' Council (1979) states that "the measurement of educational attainment is not, and can never be absolutely precise".⁽⁸⁾ A candidate's performance in the examination might be unrepresentative of his real attainment in the subject and, in addition a measure of inconsistency in the assessment process, as referred to in Chapter 1, is unavoidable. Therefore the degree of precision with which equivalent symbols awarded to individual candidates, by the different examining bodies, can be comparable is necessarily affected by the error of measurement attached to the symbols themselves. This is particularly so because the symbols are norm-referenced i.e. for example: 80 to 100 is allocated an A symbol and 79 to 60 is allocated a B symbol. The difference between an A and B symbol can well be 1%. In the case of the Senior Certificate Examinations there are no laid down criteria as to what an A symbol really measures and how this differs from say a B symbol.

Therefore there is need for the user such as universities, industry and commerce to know what each symbol represents, or what can be assumed about the level of competence in the subject of candidates who have obtained a given symbol. What is clear is that certain symbols reflect a pass while others reflect a failure. This, however, does not give adequate information on the level of mastery of facts in a particular subject. The interpretation of comparability in terms of mastery represents the necessity for generally agreed definitions of subject areas, syllabus coverage, examination requirements and above all symbol criteria.⁽⁹⁾ In the General Certificate of Education examinations symbols are allocated by subject experts

who have defined within reasonable limits what is expected of candidates within each symbol category. (10)

Before this refinement can be achieved in the Senior Certificate Examinations certain aspects such as method of adjusting marks, types of questions set in the different examination papers and the examination requirements in the different examining bodies need careful consideration. The research has shown that the Joint Matriculation Board has gone a long way in trying to establish equivalent standards in common syllabus areas used by the different examining bodies. It is possible that the poor performance of candidates from some population groups within this country may be attributed to their following syllabuses which are not entirely designed to take into account their particular circumstances. The Joint Matriculation Boards demand for and quest for equivalent standards in the different examining bodies is possibly one of the reasons why some of these bodies achieve poor results.

In view of this it would seem appropriate for bridging curricula to be developed for these groups, which take into account their degree of acculturation; and at the same time link with the current curricula used. However, one needs to take into consideration the political, social and economic aspirations of these groups as well, and it is possible that whatever curricula are designed even on educational principles, may not always be acceptable.

It is evident that establishing comparability between the different examining bodies in South Africa is a complex problem interwoven with the social, political and economic realities on the one hand and educational considerations on the other. Whatever comparisons are made from the results of the different examining bodies must be viewed in the light of the limitations mentioned above. Here again, it would appear that in order to improve performance, the curricula followed by certain candidates needs

to be revised.

7.3 EXAMINATIONS AND THE CURRICULUM

The curriculum followed by candidates in the Senior Secondary School phase in the different education divisions in this country is basically similar. The Committee of Heads of Education is responsible for the curriculum that is used in White schools. Blacks, Coloureds and Indians have no representation on this Committee. The curriculum drawn up by this Committee with minor modifications, is also adopted by the Indian, Coloured and Black education divisions. It is possible that one of the reasons for the difference in performance among the Indian, Coloured and Black candidates may be the inappropriateness of the curriculum.

When one considers the performance particularly of Black candidates and notices that in many subjects over 80% of them fail, one is inclined to conclude that the curriculum followed needs revision. It is possible that several factors such as socio-economic status, poor teaching as well as culture may contribute to the majority achieving poor results. Mathews and Leece (1976) have pointed out that a study of examination results can provide valuable information for purposes of curriculum development.⁽¹¹⁾ The current curriculum based on western norms would appear to be unsuitable for the majority of candidates in the Black and Coloured education divisions. While the performance levels of Indian candidates does not differ drastically from that of Whites, there is great disparity in performance between Whites and the other two groups, viz. Blacks and Coloureds. This introduces a problem which is currently of particular interest in the Republic of South Africa. The problem arises from the task of educating a child from "a so-called underdeveloped culture in a so-called more developed culture which is foreign to him".⁽¹²⁾ Groenewald (1976) states that in some communities "a child is linked to his world of culture to such an extent and is so strongly oriented

towards the concrete reality that he cannot always successfully detach himself from his subjective experiences".⁽¹³⁾

It is possible that the lack of written languages in the original traditional Black society contributed largely to the differences in learning between the Blacks generally on the one hand and the Whites on the other. It would therefore seem possible that such cultural differences and mastery of learning can only be overcome by the process of acculturation. Biesheuvel (1962) states that by the time the child goes to school the world of culture has had "an irrevocable influence on the moulding of his personality and in particular on his intellectual development".⁽¹⁴⁾ This point is further emphasised by Fleming (1968) when he states, "the child begins to build up his way of seeing the world, his private frame of reference, at three, four or five (years of age). Those early conceptions, those early patterns of perception and interpretation of the world, largely persist throughout life without being much changed or greatly revised".⁽¹⁵⁾

It is clear that the performance of candidates in the Senior Certificate Examinations conducted by the different examining bodies can in some way be related to the cumulative effects of, among other factors, culture and socio-economic conditions. It is also possible that the curriculum followed by the vast majority of Black candidates and to a lesser degree the Coloured and Indian candidates is not adequately serving the educational needs of the majority. It would seem appropriate to develop curricula which takes into consideration the cultural and environmental factors that affect learning among these pupils. However, such a move while being desirable from an educational point of view, may not be acceptable from a political viewpoint and any suggestion of supporting different curricula for different groups would be interpreted as having racist connotations. Further the reality of the

situation is that candidates from the different population groups generally function in similar socio-economic environments. Therefore the standards applicable to one should also be applicable to the other.

The problem that educationists face with regard to examinations and the curriculum in South Africa is a very complex and difficult one. If different curricula are designed for the different population groups, which takes into account their particular needs, it would be possible to achieve comparable pass-rates in the different terminal examinations. However, any difference in curricula from that of the Whites may be interpreted as "inferior education" and will be regarded as undesirable. It would therefore appear that the practice of offering similar curricula to all population groups needs to be refined in the light of curriculum development programmes.

It would seem that the solution might be found if examinations and the curricula are not imposed on schools. The decentralization of education, firstly from a national level to a local level and then from the local level to individual schools could go a long way towards developing a system that might be acceptable to most.

In Britain schools taking the Certificate of Secondary Education (CSE) examination make the decision on which syllabuses their candidates are prepared for. They may choose Mode 1 (external examinations), Mode 2 (the school provides the syllabus but the Examination Board examines it). Mode 3 (teachers devise their own syllabus, do their own examining, and then have that examination moderated by the Board).⁽¹⁶⁾ Further schools can take both the CSE and GCE examinations.

It is possible that allowing schools to make decisions concerning curricula as well as the type of examinations that best suits the needs of certain pupils, would go a

long way in bringing about a closer link between the curricula and examinations taken by candidates, particularly in the Indian, Coloured and Black communities. However, in order to maintain standards among the schools there is need for a central co-ordinating body whose function should be to approve curricula developed at the local levels. Further such a body should provide expert knowledge and guidance to the people entrusted with the task of developing a curriculum for a particular school or region. In this regard the HSRC Work Committee concerned with curriculum development (1981) states that the "problem surrounding the curriculum are of national importance and should therefore continually be evaluated and investigated preferably by a national institution for curriculum and curriculum development".⁽¹⁷⁾

The Committee further recommends that the national institution "should effectively make provision for the determination of suitable curriculum content for groups in society for whom only limited and inadequate provision is at present made on particular levels of education".⁽¹⁸⁾

A closer investigation of the performance levels of candidates taking the Senior Certificate Examination would indicate areas within the current curriculum, followed by some groups, that need revision or need to be supplemented by bridging courses or possibly by extensive pre-school and adult education programmes. Such programmes may in the long term assist in improving the pass-rates.

7.4 EXAMINATIONS AND DIFFERENTIATED EDUCATION

The introduction of the system of differentiated education in many education departments in South Africa in 1973 had the effect of extending the school curriculum to cater for pupils with differing interests, aptitudes and abilities. However, the extended curriculum also has had the effect of increasing the number of candidates that qualify for university entrance.⁽¹⁹⁾ Universities

apart from being faced with accommodation problems, also had to face the problem of first-year failure rates. It would, therefore, appear that the current requirements for matriculation exemption are not a satisfactory predictor of university success. In 1963, before the introduction of the new differentiated curriculum and examination, Steyn found that the matriculation was a reasonable predictor of success at universities.⁽²⁰⁾ In view of this it is possible that the differentiated curriculum as well as examination requirements currently followed should be reviewed particularly for university selection purposes. This, however, does not imply that the current curriculum for the Senior Certificate Examination should in any way be restricted. What is implied is that those candidates who wish to follow a university course should be directed to a curriculum and entrance criteria which should be different from that followed by the vast majority of candidates. The research has indicated that candidates taking four higher grade subjects as well as two standard grade subjects can qualify for university entrance. The standard grade subjects which in this case constitute a third of the candidates senior secondary course, and which are generally not subject to external moderation, are accepted for university entrance purposes. Further, these subjects in many instances can be regarded as easy options and are therefore taken by some candidates.

SG subjects enable easy matric to be obtained

It is not possible within the confines of this work to examine closely the criteria that should be applied for matriculation exemption purposes. However, this aspect is presently being investigated by the Human Sciences Research Council and the report is nearing completion.⁽²¹⁾

Apart from serving as a selection instrument for university purposes, the Senior Certificate Examination is also a certifying examination taken after twelve years of schooling. From the large number of candidates that fail this examination particularly among the Coloured

and Black communities, it would seem that further differentiation in examining is necessary. In this regard it is interesting to note that the Committee of Heads of Education is presently developing syllabuses for lower grade subjects.⁽²²⁾ It would, therefore, be possible for candidates to take some subjects on the higher, standard or lower grades. Lower grade subjects would appear to be less demanding than the standard or higher grade subjects. The Committee and the Joint Matriculation Board however, state that lower grade subjects will not be recognised for matriculation exemption purposes.

It is possible that the introduction of these subjects would provide a level of education for those who would have previously failed their examination. There will, however, be certain problems such as grade selection, degree of difficulty of the syllabuses and teaching different grades in the same class that would arise. In small schools the availability of staff might dictate that the 3 grades be offered together. This could have the effects of teachers teaching to the middle grade thus being of little benefit to the higher and lower grade pupils.

It is at this stage too early to comment on the effectiveness or otherwise of the new differentiated examination. It is interesting to note that the introduction of the Certificate of Secondary Education in Britain, which was designed to cater for about 10% of the school population below the group which entered for the GCE "O" Level had certain problems. Both the Waddel and Keohane Reports made frequent reference to the importance of considering "users' attitudes to examinations".⁽²³⁾ Further it was clear that many employers did not fully understand the nature of the GCE and CSE examinations.⁽²⁴⁾ Whether lower grade subjects as part of the Senior Certificate Examination are acceptable to employers needs to be carefully monitored. While differentiated curricula and examinations may improve performance and may serve the needs of certain groups of candidates, the attitudes in society towards these differences cannot be ignored. Therefore the educator is sometimes

faced with the problem of making decisions not purely on educational grounds but on matters dictated by society, as well as economy in terms of finance and staff, and administrative convenience.

7.5 TYPES OF ASSESSMENT MADE IN THE SENIOR CERTIFICATE EXAMINATION

The Senior Certificate Examination is basically an external examination which is set by an examining body and administered and controlled by principals at schools. The marking of scripts and the determination of results are undertaken by the examining body. Similar procedures are also applied in the General Certificate of Education examinations conducted in Britain.⁽²⁵⁾ One major difference between the two systems is that in the United Kingdom the schools are generally not controlled by the examining bodies.

In some subjects taken for the Senior Certificate Examination an oral, assignment or practical component applies. This component generally counts for about 20% of the marks allocated for the subject. The oral, practical or assignment aspect is assessed as course-work by teachers at schools, and the marks allocated is subject to moderation by moderators appointed by the examining bodies. In many countries including Britain and America, certain components of a subject which can best be examined internally are examined internally and then moderated externally. Internal assessment is used because it is considered to be the best or perhaps more often the only satisfactory form of assessment.⁽²⁶⁾

In some examining bodies in South Africa notably the Transvaal Education Department and the Natal Education Department internal school based assessment has recently become an important part of the Senior Certificate Examination. In these examining bodies the internal assessment counts for about 50% of the marks allocated to a subject. Therefore, in most, if not in all cases, the

internal and external components should be complementary. Owen and Wilmot (1980) state that the internal and external aspects of assessment should enable "us to produce a more comprehensive assessment often including syllabus objectives which could not be dealt with by external examinations alone".⁽²⁷⁾

The merits and demerits of internal assessment have been dealt with in Chapter 4. While there is tremendous support for combining the both forms of assessment in a terminal examination, the control and moderation of internal assessment leaves much to be desired. Owen and Wilmot state that "a major concern will be to see that all teachers perform in the same way".⁽²⁸⁾ It is, of course, possible for the examining body to consider supervising the actions of teachers, but this is frequently extremely time-consuming and expensive since the entries for the examination are often numbered in terms of thousands rather than hundreds of candidates.

To ensure the internal assessment of pupils' attainments in different schools and in the various subjects are comparable, suitable and reliable methods of moderating such assessments need to be considered. Elley and Livingstone (1972)⁽²⁹⁾ and Dunning (1977)⁽³⁰⁾ cite some of the following possible methods of moderating internal assessment.

1. Moderation by inspection
2. The use of reference tests
3. The use of Scholastic Aptitude and Verbal Intelligence Tests
4. General Achievement Tests
5. Moderation by an external paper
6. Moderation by means of tests drawn from item banks

A brief overview of the above is necessary to note the merits and demerits of each.

Moderation by inspection

Departmental or Education Board moderators (inspectors or subject specialists) visit schools and make judgement about the relative levels of attainment of pupils in each subject. Adjustment is made if there is inconsistency in the teachers' assessments. A strong criticism that could be levelled against this system is that the adjustment is determined in terms of examining a limited sample of pupils. Further, standards may vary from moderator to moderator since each moderator would be inclined to use his own standards and values. An advantage of this method is that the moderation is left in the hands of specialists, and therefore the moderation is criteria-based rather than being norm-referenced.

The use of the Reference Tests

A reference test is a test used to determine the general level of ability or attainment of various groups of students. The average score of the group is useful for adjusting or moderating any assessments made within the group.⁽³¹⁾ Reference tests could be used either to supplement the internal assessment of each pupil, or as a moderating device to set group standards. Elley and Livingstone (1972) prefer the use of reference tests for moderation rather than using the scores to augment internal assessment. They argue that a reference test of 50 items can provide information on only 50 samples of a pupil's behaviour, not enough to provide a reasonable coverage of all his capabilities. Some of his strengths may remain untapped. For 30 pupils however, such a test would produce information on 1 500 samples of behaviour. If the questions are well chosen and sufficiently diverse, they should lead to a fairer estimate of the various strengths of the group, since an unlucky choice of items for some pupils would be balanced by a more fortunate one for others.⁽³²⁾

The use of Scholastic Aptitude and Verbal Intelligence Tests

A Verbal Intelligence Test is designed to measure an individual's general ability. It usually contains questions which require the individual to reason, to see and use new relationships among words, numbers, shapes and other materials.⁽³³⁾ Scholastic Aptitude Tests differ from the tests of intelligence in that they do depend on the acquisition of skills specifically taught and developed in schools, in particular verbal and mathematical skills.⁽³⁴⁾ Craig (1974) states that the chief disadvantage of such a scheme is that these tests, while discriminating well between pupils at opposite extremes of the ability range, are not very successful in predicting the performance of pupils of similar abilities.⁽³⁵⁾ These tests which test general ability and aptitude would probably not be the best instruments to control internal assessment of subjects since subjects require special ability.

The use of General Achievement Tests

These tests differ from Scholastic Aptitude Tests in that their questions are derived from specific subjects, without being dependent on any one syllabus. Specific facts and figures needed to answer the questions are given in these tests and pupils show the extent to which they have mastered the underlying abilities involved in each subject by applying them to the given problems. These would appear to be more valid than the Scholastic Aptitude Tests in moderating internal assessments for they contain questions which are related to the different school subjects.

Standardised tests can serve a useful purpose in controlling internal assessment. Shipman (1979) suggests two places where standardised tests are invaluable in school evaluation programmes viz. to compare the attainment of pupils, or groups of pupils with those in different schools, or in the school over a period of time and to measure progress across a course of curriculum over a given period of time.⁽³⁶⁾

The use of an External Examination Paper

Dunning and his Committee (1977) recommend to the Scottish Education Department a curriculum with an internal syllabus component and an external syllabus component. Internal assessment is based on the internal syllabus and the external assessment on the external syllabus. The marks of the external paper are used to scale the internal assessment. The combination of the external paper mark and the scaled internal mark decides the final grade of the pupils.⁽³⁷⁾

The principle of scaling in this way is promising but this method of moderation is based on the assumption that both the internal and external assessments are measuring similar or like abilities and therefore it is possible to scale the one in terms of the other. According to Owen and Wilmot (1980) moderation "is only possible when there is a substantial cross matching of information between that which is being moderated and the instrument which is being used as a reference".⁽³⁸⁾ Therefore, the method of scaling suggested by Dunning and his Committee is not in keeping with the purposes advanced for making internal assessment a part of the overall assessment of candidates in a terminal examination.

The use of Item Banks

An item bank is a large file or library of test questions, usually prepared by specialists, and carefully screened and trial-tested before qualifying for inclusion into tests. With regard to the use of an Item Bank, the British Schools Council states the following:

"A question bank would enable comparability procedures to be carried out concurrently rather than retrospectively as at present. Until recently, comparability studies have entailed administration of an aptitude test to a representative sample of candidates.

Such studies help to detect major deviations among boards in terms of the award of grades, but gradual transition to a MODE III pattern of examining would mean that the problem of ensuring comparability of grades would become more acute in future. The practice of pre-testing questions with a representative sample would mean that the teacher could compare the performances of his own pupils with those of a wider population, thus contributing to the overall maintenance of national standards".⁽³⁹⁾

A question bank or an item bank would include questions in the form of the objective type, short answer, essay type, and structured situations for oral and practical assessments. However, this would mean an extensive programme of constructing and pre-testing such questions. The item banking approach could possibly help in combining the advantages of an external examination with those of an internal assessment. Teachers could choose their own topics and methods of teaching and examining. This would in effect, mean that the teachers could adapt their examinations to fit their curricula rather than the reverse. Wood and Skurnik (1969) found further support for item banking in their study which showed that 40 item (90 minutes) Mathematics tests selected from item banks correlated as well as teacher estimates with final examination grades in seven different schools, the coefficients in each case clustering around 0,8.⁽⁴⁰⁾

If internal assessment is to be controlled by an item bank, then a very large bank of items would need to be prepared. Moreover, items would become familiar in repeated use and the bank would require a considerable amount of up-dating, modification of items and re-assessing of difficulty levels. It is interesting to note that the Human Sciences Research Council is currently engaged in creating a national bank of items for the Senior Secondary school phase.

While it may be possible to standardise internal assessments to some extent, the procedures involved, as discussed above, are in many instances elaborate and will be costly and time consuming to apply. Further there is no guarantee that the scores obtained after moderation would still reflect those desirable qualities which internal assessments are supposed to possess. It would therefore seem that there is need to avoid the problems of moderation of any type, and of statistical moderation in particular. Owen and Wilmot (1980) have the following to say in this regard.

"A more radical step would be to abandon moderation altogether. Having decided that only the teacher is capable of making certain assessments, we could rely entirely on his integrity and judgement for that part of the assessment. The advantage would be that we would openly acknowledge the difficulty of dealing with a large number of candidates in a subject. Quite obviously we could not permit such a situation to run riot; there would need to be a degree of control but this could be more realistically achieved by some sort of pre-assessment standardisation rather than a post-assessment moderation."⁽⁴¹⁾ The problem is that teachers can rank but as a result of the limits of their assessment spectrum they find it difficult or impossible to grade accurately.

The need for pre-assessment training sessions for teachers so that some form of standardisation is achieved is important. This, however, would be the ideal if professionally qualified teachers could be brought together prior to making internal assessments. Teachers with related interests could make valuable contributions in developing the criteria to be used for internal assessment. The question of maintaining standards in internal assessment would therefore appear to be in the training and re-training of teachers in establishing criteria and techniques for assessment. Such training can but help in the process of obtaining

reliable and valid internally assessed marks, which can then form part of the overall assessment of candidates.

7.6 THE NUMBER OF PUPILS WHO ENTER CLASS I AND WHO EVENTUALLY REACH STANDARD 10

It has been noted that about 40% of Indian pupils who enter class one, eventually reach standard 10. This is about 20% lower than that of Whites. The position with regard to Coloured and Black schools would appear to be even worse. With urbanisation and a greater awareness of the need for education, the holding power of schools in the Indian, Coloured and Black communities can only but improve. It is important to note that the holding power of the White secondary school only made significant advancement after the end of the World War II, and that this would appear in all societies to be a result of the achievement of universal compulsory education. The need for non-formal education to cater for school drop-outs is of vital importance if the living standard of the South African community as a whole is to be raised.

In the Indian community alone some 60% of pupils do not reach standard 10. There may be a multitude of reasons for school drop-outs but what is important is that an infrastructure needs to be created so that these school drop-outs can receive further education and training to improve their quality of life. The de Lange Committee has gone a long way towards developing the basis for a link between formal, non-formal and informal education. Further the Committee recognises the shortcomings in the current system of formalised education and recommends an educational structure which not only provides for an academic and vocational type of education, but also allows for vertical and horizontal mobility of pupils, each according to his ability, interest and needs.⁽⁴²⁾ It is hoped that such a structure will provide adequately for the needs of the majority of pupils. In such a structure the holding power of schools becomes less relevant since after basic

education, pupils will receive training in the non-formal sector.

One criticism that can be advanced against this system is that it is possible that vocational education may be over-emphasised. The aims of education are much broader in scope than merely fitting individuals into certain vocations in life. Vocational education must be seen as one aspect of the total education of individuals. While some 60% of secondary school pupils who do not complete the Senior Certificate Examination in Indian education will undoubtedly benefit from the provision of non-formal education, efforts must also be made to evaluate and possibly re-assess the current curricula followed by candidates in the formal sector so that this type of education is also available to the vast majority. In this regard the de Lange Committee states the following:

"Syllabi should periodically be revised whereas the curricula of subjects, having been built up around syllabus content should continually be studied with a view to improvement or innovation".⁽⁴³⁾

It is indeed the task of a central curriculum institution to give attention to the structure of the curriculum on the various levels of and phases in education. Such an institution could undertake the different activities "underlying curriculums scientifically and in a co-ordinated way".⁽⁴⁴⁾ Co-ordination is important as attention should continually be given not only to the needs of certain groups, but also to the needs of the country as a whole in the light of its particular manpower requirements caused by a growing economy.⁽⁴⁵⁾

The number of candidates who enter for the Senior Certificate Examination varies from year to year. In Indian Education in some years the growth rate has been about 16% while in other years it has been below 1%. In 1980 there was a growth rate of 0,96% which rose to 9,96% in 1981 and by 1982 it was 11,83%. In White education the

growth rate from one year to the next also varies. In some years some of these departments have growth rates of about 11% while at other times a negative growth rate in excess of 15% has been noticed. Education and Training has the highest growth rate and in one year (1980) experienced a growth of over 68%. Coloured education has by far the most constant growth rate of about 10% per year.

Overall the growth rate from year to year varies among all departments and while it may be possible to make certain predictions about future Senior Certificate enrolment patterns, this prediction cannot be made with a great degree of certainty. This would invariably also affect the accuracy of projections for manpower utilization and the demand for university and technical education in the years to come. However, what is clear is that in 1982, with the exception of the Transvaal Education Department, all the other White education departments have had a decline in the growth rate of Senior Certificate candidates. On the other hand Indian Education and Education and Training have had an increase. It would therefore appear that the demand for secondary education in these communities have not reached stability and an increased demand can be expected in the future. This view is further corroborated by the findings of the de Lange Committee (1981) and the Science Committee of the President's Council (1983).⁽⁴⁷⁾ In their findings these Committees express the view that the demand for education among the Indian, Coloured and Black communities in South Africa would increase in the future.

With regard to the pass-rates in the Senior Certificate Examination it was found that the White education departments have pass-rates of above 90%. Indian Education had a pass-rate of about 90% in 1978 but thereafter there has been a decline to about 80% in 1981 and a slight rise to 84% in 1982. This decline can be attributed to several factors such as the difficulty levels of question papers, variations in marking

and certain socio-political issues. One problem that was encountered during this period was the boycott of classes by Indian pupils in protest against inferior education. Coloured education as well as Education and Training were also affected by the school boycott. However, the pass-rates in these departments is well below that of Indian Education. Coloured education pass-rates is in the 60 per cents while that of Education and Training has declined from 80,0% in 1978 to 49,0% in 1982, a decline of about 30%. One possible reason for the decline in the pass-rate of candidates taking the examination of Education and Training is the greater demand for education among this community. It is possible that more candidates are entering for the examination even though they have not reached the minimum competency levels required to pass the Senior Certificate Examination. There are several factors that affect performance in examinations. Some of these have been noted earlier in this chapter.

It is clear that the White examining bodies, being well established, have the highest pass rates in the Senior Certificate Examinations. Indian education follows closely, followed by Coloured education and then Education and Training. This trend has also emerged in the investigation undertaken by the de Lange Committee.⁽⁴⁸⁾ What is interesting is that the trend relates very closely to the socio-economic status of the different population groups in this country. Kijne (1980) points out that on a socio-economic ladder, the Whites appear right on top, followed by the Indians, Coloureds and then the Blacks.⁽⁴⁹⁾

7.7 THE DUAL PURPOSE OF THE SENIOR CERTIFICATE EXAMINATION

As mentioned earlier the Senior Certificate Examination conducted by the different examining bodies serves two purposes. Firstly it certifies candidates at the end of their secondary school education and secondly candidates who fulfil certain other requirements, obtain matriculation exemption which entitles them to enrol at a

South African university. Therefore the Senior Certificate Examination can be seen as Lewis (1974) states serving a "multi-functional role".⁽⁵⁰⁾ Whether the examination is able to fulfil this role has been a matter which has received widespread attention. Niven (1976) puts the following question "... is the present examination a valid selector mechanism for university entrance?"⁽⁵¹⁾ Further Malherbe (1974) presents the problem as follows: "... the absence of a common reference criterion by which the J.M.B. can be assured that the standards applied by the respective examining bodies can be regarded as comparable".⁽⁵²⁾

The certifying and selector roles of the examination have resulted in an HSRC investigation.⁽⁵³⁾ One area in which the Division of Indian Education was involved, in this investigation was the consideration of raising the aggregate of 950 marks, required for matriculation exemption, to 1 000 marks. When this was applied to the 1982 Senior Certificate Examination results of the Division of Indian Education, the matriculation exemption pass rate of 37,13% dropped to 33,37%. About 4% of candidates obtained their matriculation exemption with aggregates of between 950 and 1 000 marks. Therefore increasing the aggregate to 1 000 would have resulted in about 4% fewer candidates obtaining matriculation exemption. In terms of numbers this would have meant 260 candidates. However, Malherbe (1977) points out "The effectiveness ... of achieving selectivity by raising the qualifying aggregate again depended upon the validity of the marking methods in the examination".⁽⁵⁴⁾ He further states that when the minimum aggregate to be obtained for a matriculation exemption pass was increased from 750 to 860 marks in 1913, the percentage passing dropped from 56% to 42%. However, the percentage passing recovered quickly in the subsequent years and reached 71% in 1916.⁽⁵⁵⁾ It would therefore appear that apart from the aggregate requirement other factors such as choice of subjects and grades should also be considered for raising the university entrance requirement.

The other role of the Senior Certificate Examination is to certify candidates at the end of 12 years of schooling. According to the De Vries Commission (1974) only about "15 percent of the school going population has the aptitude for university education".⁽⁵⁶⁾ Therefore, for the sake of a small percentage and their future, the whole of secondary education should not be unduly influenced by the Joint Matriculation Board and its requirements for matriculation exemption. If there is undue influence then "justice cannot be done to other equally important objectives of secondary education".⁽⁵⁷⁾

7.8 MATRICULATION EXEMPTION PASS RATES COMPARED

A consideration of the current research indicates that there is wide variation in the number of candidates that obtain matriculation exemptions within the different examining bodies.

The White examining bodies pass-rates range between 40 and 50% for the past five years (1978 - 1982). It is interesting to note that among these bodies, the Cape examining body has the lowest pass rate in each of the five years under review. Indian Education has an average pass rate of about 35%. Coloured Education about 16% and Education and Training had a pass rate of 32,8% in 1978 which then began to decline gradually each year to reach about 11% in 1982. The de Vries Commission comment on the percentage of candidates who have the potential for university education is supported by Francis (1980) who states that only 15% of the General Certificate of Education candidates who take A level subjects eventually go to university.⁽⁵⁸⁾ If this figure is anything to go by then it would appear that too many candidates in the White and Indian education departments are obtaining university entrance passes.

Malherebe (1974) states that the "drop-out rate of 45% of all university students in South African universities is greater than in any other country with which South

Africa has been associated educationally".⁽⁵⁹⁾ He further states: "Most of this is due to the fact that familiarity with poor methods of evaluation and selection has bred acceptance".⁽⁶⁰⁾

It is evident that there is a need to evaluate the university entrance requirements in order to devise methods that will select candidates more appropriately.

7.9 PASS-RATES IN A SELECTED NUMBER OF SUBJECTS TAKEN FOR THE SENIOR CERTIFICATE EXAMINATION

In certain higher grade subjects e.g. History, Geography and Accountancy, the pass rates in Indian Education compare favourably with those of the White education departments. In other subjects particularly among the sciences and language, i.e. Mathematics, Physical Science, Biology and English, the pass rates in Indian Education are very much lower. The question that arises is why do White candidates perform better in the sciences than Indian candidates? The syllabuses used by both is the one approved by the Joint Matriculation Board. Further, the Board is responsible for the moderation of question papers of all examining bodies. Could environmental factors and/or innate abilities play an important role in the difference in performance between the two groups? Answers to these questions will provide valuable information particularly with regard to curriculum development in Indian education in the future.

The poor performance of candidates of the Division of Indian Education in English Higher Grade is evident from this research. The HSRC itembank tests also corroborated this fact.

It has been found that while the pass rates in most White education departments in English Higher Grade is about 90%, that of Indian Education is about 80%. While this might be considered very much better than the performance in Coloured Education (about 63%) and Education and Training (about 35%), it must however be pointed out that

poor performance in English

English is offered by all Indian candidates as a first language. Further English is the language most often spoken by the vast majority of Indians at home as well. A consideration of the distribution of scores of candidates in Indian Education over a five year period reveals that the majority of candidates obtain symbols of E and below. Table 7.1 on the following page contains the data that illustrates the distribution of symbols.

Some 70% of Indian candidates obtain symbols between F and E. Although the pass-rate may well be 80%, the quality of pass leaves much to be desired. In the Natal Education Department, the majority of candidates, (about 68%) obtain symbols of between E and D.⁽⁶¹⁾ In the Cape Education Department about 65% of candidates fall within these symbols.⁽⁶²⁾ Possible reasons for the differences in performance among candidates of the different departments may be found in cultural and environmental factors.

Indians came to this country in 1860 from India with their own cultural and language background. Since then, they have had to adapt to the mainstream culture in South Africa, i.e. a western technological culture with mainly English as the medium of communication in Natal. The community has had exposure to this environment for about one hundred and twenty years. There may be many reasons for the problem, some of which may be linked to teaching methods and an encouragement of rote learning in former times which results in some of today's teachers adopting similar techniques. This could result in a superficial familiarity with the structure of language with a less than fluent command of written language. Deliberate efforts through curriculum development programmes would probably go a long way towards improving the language competency of the vast majority in this community.

The position with regard to Afrikaans Second Language Higher Grade in the Division of Indian Education is somewhat better than that of English. In this subject

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TABLE 7.1

SYMBOL DISTRIBUTION BASED ON ADJUSTED SCORES OVER A FIVE YEAR PERIOD FOR ENGLISH HIGHER GRADE

YEAR	H BELOW 20%	G + GG 20 TO 29%	FF 30 TO 33%	F 33 1/3 TO 39%	E 40 TO 49%	D 50 TO 59%	C 60 TO 69%	B 70 TO 79%	A 80 TO 100%	MEDIAN NO. OF % CANDI- DATES	TOTAL NO. OF CANDI- DATES
1978	1,3	1,0	2,7	21,4	51,6	18,8	3,0	0,3	0,02	45,0	4 369
1979	1,4	1,7	3,8	23,8	44,3	20,2	4,3	0,4	0,22	45,0	4 008
1980	1,3	1,1	2,4	20,6	51,4	20,6	2,7	0,1	0,0	45,0	4 457
1981	1,8	0,6	1,1	13,8	51,6	26,9	4,2	0,2	0,0	46,8	4 972
1982	1,33	0,5	1,4	17,2	55,1	21,6	2,7	0,2	0,0	45,0	5 245
5 YEAR AVERAGE	1,43	1,0	2,3	19,4	50,8	21,6	3,4	0,2	0,05	45,36	4 611

The majority of
Indian candidates
fall within these
two symbols

some 59% of candidates obtain symbols of F and E. The pass rate is also above 80%. In the Natal Education Department about 56% of candidates obtain symbols between E and D.⁽⁶³⁾ In the Cape Education Department the position is about 60%.⁽⁶⁴⁾ Even in this subject the majority of Indian candidates appear to be about one symbol below that of the two White departments mentioned.

The Science subjects seem to present more problems to Indian, Coloured and Black candidates than White candidates. A possible reason is the poorly qualified teachers of science in these departments, a factor mentioned by the de Lange Committee.⁽⁶⁵⁾ Further, teacher factor as a reason for performance in science subjects is also evident among the White examining bodies. A "Survey of the Training and Employment of Scientists and Engineers in South Africa" conducted by HSRC showed that the academic qualifications of teachers of Mathematics and Physical Science in South African schools were unsatisfactory".⁽⁶⁶⁾

Malherbe (1977) has the following to say in this regard:

"To be properly qualified to teach as a subject specialist in high school at least two years' training at university is required in that subject. Barely 50% of our high school teachers in Mathematics and Physical Science have that qualification as compared with nearly 75% in such subjects as History and Geography".⁽⁶⁷⁾

Malherbe further points out that the "majority, totally unqualified as specialists, could not be expected to fire pupils' imagination and enthusiasm for the more demanding subjects like Mathematics and the Physical Sciences".⁽⁶⁸⁾

It is clear that if the White education departments in this country have problems with regard to teachers in the science subjects, the problem could be even greater

in the Indian, Coloured and Black education departments. It is possible that the poor performance in the science subjects, particularly among the Indian, Coloured and Black candidates may be attributed to, among other factors, poorly qualified teachers.

Similar trends that have emerged in the higher grade subjects have also emerged in the standard grade subjects. The White education departments generally fare better in these subjects, than the Coloured, Indian and Education and Training departments. Of the latter three departments Indian Education fares the best, followed by Coloured Education and lastly Education and Training.

It would appear that similar factors that are in operation in determining the performance of candidates in higher grade subjects are also in operation in determining the performance of candidates in standard grade subjects.

As is the case in higher grade subjects, there is greater variation in performance in the standard grade science subjects among the different examining bodies. In the case of History, Geography and Accountancy, the pass-rates of the Division of Indian Education are comparable with those of the White examining bodies. If performance is a criterion to be considered, it is interesting to note that in a few Senior Certificate subjects both on higher and standard grades it would be possible for candidates from the different examining bodies to write common papers. However, if this were possible, then certain factors such as qualification of teachers, the approach to sections of syllabuses as well as examination requirements in the different examining bodies need to be taken into consideration. The research indicates that common question papers in all subjects among the White, Indian, Coloured and Education and Training examining bodies is not a feasible proposition at the moment, since there are wide differences in performance. While common question papers among all the White examining bodies is a possi-

bility, these may not take into account the environmental differences that exist from one province to the next. The problems associated with differences in performance and the possibilities of different curricula for the different groups has been dealt with earlier in this Chapter.

7.10 CONVERSION OF A FAILURE IN A HIGHER GRADE SUBJECT TO A PASS ON THE STANDARD GRADE

The wide variation in the number of candidates who obtain converted passes in the different examining bodies has been noted. In the Natal Education Department the converted passes range from about 4 to 15% in many subjects. In the Transvaal Education Department the conversions generally range from about 6 to 19% with the exception being in Mathematics where the converted passes are quite high at about 26%. In the Cape and in the Orange Free State Education Departments the conversions range from about 3 to 20%. In Indian Education, particularly in the science subjects the conversions can be as high as 32%. Coloured education also has a large number of converted passes. In some subjects it can be as high as 38%. Education and Training has the highest number of conversions. Over 70% has been noticed in subjects such as English, Biology and History. What is interesting is the relatively low number of conversions in Afrikaans Second Language Higher Grade in the different examining bodies.

It must be pointed out that conversions apart from reflecting on the potential of candidates entering for higher grade subjects, also reflects on the guidance and counselling services rendered in the different education departments with regard to grade selection. The question of the suitability of the curricula followed by the vast majority in some examining bodies arises when one considers the number of conversions.

NB

It is seen that in the established White Education Departments, the number of candidates who obtain converted passes is generally fewer than those of the Indian, Coloured and Black education departments. Since all examining bodies in this country base their adjustment of marks on historical data, i.e. performance of candidates in the examinations of the past five years, it is clear that candidates who are not higher grade material have a negative influence on the norms of a department. It is therefore possible that one factor that contributes towards the poor performance of candidates in the Senior Certificate Examination of the Indian, Coloured and Black Education Departments is the indiscriminate choice of grade of subjects by many. It is evident that the position in Indian Education is not as bad as that of the Coloured and Black departments. The Division of Indian Education has embarked on a programme of requiring their candidates to "earn the right" to enter a subject on the higher grade. This procedure has been explained in an earlier chapter.

To determine the most appropriate theoretical ratios which would yield a reasonable pass rate in higher grade subjects a framework has been developed. This could be used as a guide for the different examining bodies to determine what the ratios of higher grade : standard grade should be. Further use can be made of the HSRC achievement tests in the different subjects to distinguish higher grade and standard grade candidates.

7.11 THE DEGREE OF DIFFICULTY OF HIGHER AND STANDARD GRADE QUESTION PAPERS IN SELECTED SUBJECTS

The findings indicate that there is a significant difference between higher and standard grade question papers set by the Division of Indian Education. The degree of difference varies from subject to subject and it is probable that the

extent of difference also varies from year to year.

The present investigation itself is limited in scope since it was conducted over one year only and further the difference between the two grades was tested out in a few subjects only. Apart from these limitations there are some valuable deductions that can be made. The research shows that the question papers set for the different grades within a subject do vary. It is possible that the differences will vary from one year to the next and from one subject to another. The differences between the subjects can also vary among the different examining bodies. What needs to be investigated, however, is the acceptable limits within which question papers should vary. Generally there is very little information on the degree of difficulty or variation between higher and standard grade papers. One can assume that since higher grade question papers are generally out of 400 marks and standard grade out of 300 marks, there should be a difference of about 25% between higher and standard grade papers in terms of degree of difficulty. This assumption is based on the ratio of marks allocated to higher and standard grade subjects. However, this is also vague and what is necessary are clear guidelines in which details with regard to the aims and objectives of the different grades in a subject and also an assessment plan stating in some detail the levels at which questions should be testing in each of the question papers, needs to be given. While it might be argued that such information may be construed as being prescriptive, nevertheless it would serve a useful purpose in setting out criteria for the different grades which would enable the teacher, pupil and examiner to function within certain known guidelines.

If one examines the findings in this investigation, it is noted that the mean difference in performance of higher grade candidates in English higher and standard grade question papers is 8,28%. Standard Grade candidates have a mean difference of 11,94% in the same question

papers. One of the limitations of drawing any categorical conclusions from the above, is the bases on which candidates are classified as higher grade and standard grade. In this investigation such classification was done by the teachers and principals on school records, previous performances and predicted performances by teachers. However, it would appear that the conclusions are drawn on the assumption that the higher grade candidates have the potential for passing subjects on the higher grade and those on the standard grade have the potential to pass subjects on that grade. It would seem appropriate if the classification was done on the basis of several factors including performance in standardised achievement tests such as the ones constructed by the HSRC. With regard to the performance of higher grade candidates in Afrikaans Second Language Higher and Standard grade, the mean difference is 6,37%. Standard grade candidates obtained a mean difference of 7,79% in both the question papers. The mean difference in this case between higher and standard grade candidates is about 1,4% which is considered to be negligible.

In Mathematics the mean differences between higher and standard grade candidates in the two sets of question papers were 11,68% and 7,02% respectively. In Physical Science the differences were 7,77% and 7,42%.

It is evident that the mean differences between the two sets of question papers in a subject varies from one subject to the next. Further it would have been more appropriate if the potential of candidates could have been more accurately determined prior to their being designated as higher and standard grade candidates in a subject. In view of the above it is not possible to comment on whether the obtained differences between the two grades in the subjects under review should be greater or less. More research into this field needs to be undertaken so that acceptable limits within which higher and standard grade question papers should vary may be determined.

7.12 THE PERFORMANCE OF CANDIDATES IN A SELECTED NUMBER OF SUBJECTS IN THE EXAMINATION PAPERS SET BY THE DIVISION OF INDIAN EDUCATION AND IN STANDARD 10 ITEM BANK TESTS CONSTRUCTED BY THE HSRC

The findings indicate that in Mathematics, Physical Science and Biology the candidates performed better in the Itembank tests than in the Senior Certificate question papers. In English, however, the candidates performed poorly in the itembank test.

It must be pointed out that the itembank tests comprised purely of multi-choice items whereas the Senior Certificate question papers in most subjects had objective type, structured, paragraph and essay type questions. This factor could have contributed to the difference in performance in the two instruments under review. Further, the itembank tests are norm-referenced, and the items in the tests have been pre-tested and selected on the basis of their discrimination and facility indices. The tests therefore can be regarded as a reasonable measure of the general standard that could apply in a subject. This view is supported by authorities such as Baker (1980), Macintosh (1978), Kritzinger (1977) and Nunnally (1972).^(69, 70, 71, 72)

The question papers in the external examinations are set by a panel of experts in a particular field. The panel is guided by the syllabus, aims and objectives of the course and the examination requirements. Further the question papers are subject to the scrutiny and comment of internal and external moderators. The papers can therefore be regarded as criterion-referenced tests. The disadvantage of such question papers is that the personal preferences of examiners and moderators may dictate the type of questions to be set and also the content areas to be sampled. With regard to the standard of the question papers, the examiner and moderators are guided by their experience. The question papers can therefore vary in standard from one year to the next depending on the experience of the examiners and moderators and the degree of subjectivity relating to

the personal choice of certain sections of the syllabus.

From the foregoing it is possible to regard performance in an itembank test as a reasonable indicator of the standard in a subject. The HSRC tests used in this investigation, however, included pre-tested items which were standardised on White candidates. One deficiency in the instrument is that Indian candidates were not involved at the pre-testing stage and therefore conditions that are peculiar to this group of candidates would not have been reflected in the way items functioned in the pre-test, and these conditions would not have been taken into consideration in the selection of items for the test.

Nevertheless, since White education tends to set the norm in this country, by virtue of the socio-economic and political conditions of the South African community, the construction of the HSRC tests using White candidates is not seen as a major deficiency. The tests would therefore indicate the strengths and weaknesses in Indian education in comparison to the standards in White education. Further they would provide valuable information for curriculum development purposes.

7.13 THE PERFORMANCE OF CANDIDATES IN THE ORAL/PRACTICAL/ASSIGNMENT COMPONENT AND IN THE WRITTEN EXAMINATION IN A SELECTED NUMBER OF SUBJECTS TAKEN FOR THE SENIOR CERTIFICATE EXAMINATION

The difference between the means in the oral, practical or assignment component and the relevant theory examination in the subjects concerned is significant at 0,01 level. Further in most subjects the correlation can be described as moderate. The Natal Education Department in an investigation undertaken to include school based assessment as a component of the final mark for the Senior Certificate Examination found that in most subjects there was a moderate correlation between school assess-

ment and the examination marks.⁽⁷³⁾ This finding is different from that obtained by the Transvaal Education Department. In this Department a high correlation between the school assessment and the examination mark was found.⁽⁷⁴⁾

A high correlation implies that the two forms of assessment are measuring similar or related abilities. A moderate correlation could imply that the abilities that are being assessed in the different forms of assessment are somewhat different but have certain similarities as well.

A moderate correlation between two forms of assessment e.g. internal and external assessments, supports the use of both types of assessment in arriving at a final assessment. This is due to the fact that it is difficult to assess which of the two types of assessment is more reliable and valid. Therefore a combination of both would give recognition to similar and different abilities that are being assessed by the different forms of assessment. This view is supported by a number of examining bodies both locally and overseas who have recently included a school based assessment as part of the marks for certification purposes.^(75, 76, 77, 78, 79)

In the Division of Indian Education school based assessment in a selected number of subjects have been included as part of the Senior Certificate Examination marks. The assessment, however, is confined to orals in the Languages, assignment in History and practical work in Biology and Physical Science. The scope of school based assessment needs to be extended to include all subjects as well as different types of assessments in each of the subjects. The Transvaal Education Department, Cape Education Department and the Natal Education Department have included school assessment as an important component in the overall assessment of candidates taking the Senior Certificate Examination.^(80, 81, 82)

The Division of Indian Education needs to consider the

inclusion of a school based assessment as part of the assessment of candidates in the Senior Certificate Examination in all subjects. Before this is done consideration needs to be given to the criteria to be used in each subject, and training programmes for teachers in techniques and methods of arriving at internal assessments which can be considered for certification purposes.

7.14 THE DIFFERENCE IN PERFORMANCE BETWEEN BOYS AND GIRLS TAKING THE SENIOR CERTIFICATE EXAMINATION OF THE DIVISION OF INDIAN EDUCATION

Girls tend to perform better in the Senior Certificate Examination than boys. Although traditionally Indian parents believed that formalised education was the prerogative of boys, the research shows that this belief has changed drastically. The percentage of girls that presented themselves for the Senior Certificate Examination over the past five years are given below:

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Total No. of candidates	5 002	5 302	5 043	6 487	6 299
No. of girls	1 987	2 253	2 230	2 984	2 915
% of girls	39,7	42,3	44,2	46,0	46,3

It will be noticed that there is a gradual increase in the percentage of girls entering for the examination. Theoretically the ratio of boys : girls should be 50 : 50, however, of the current intake of Senior Certificate candidates about 46% are girls and this is considered to be close to the theoretical ratio. The Central Statistical Services (1983) gives the percentage of girls that reach standard 10 among the White community in 1982 as 49,82%. (83)

This figure is about 3% greater than that of the percentage of girls that reach standard 10 in Indian Education. It is possible that in the next few years the number of Indian girls reaching standard 10 would also be very close to the theoretical ratio as is the case in the White community.

A consideration of the pass rates indicate that more girls than boys obtain the Senior Certificate with matriculation exemption. The Senior Certificate pass-rate for girls is generally about one percent better than than of the boys. However, when it comes to satisfying matriculation exemption requirements about 4% more girls obtain matriculation exemption than boys.

Similar findings, also highlighting the better performance of girls in the General Certificate of Education examination conducted in Britain, has been found by Murphy (1978).⁽⁸⁴⁾ Murphy concludes that the nature of examinations generally required candidates to present answers in essay form which tends to favour girls. He further found that boys tend to perform better in objective type questions than in essay type questions.

It is possible that because of the nature of the Senior Certificate Examination in which a great part of the questions are either essay type or open-ended, that girls tend to perform better.

In order to lessen this type of advantage it would be more appropriate if a greater balance between objective and essay type questions can be achieved in the Senior Certificate Examination.

7.15 PROCEDURES EMPLOYED IN THE ADJUSTMENT OF MARKS IN THE SENIOR CERTIFICATE EXAMINATION

It would appear that from the three methods employed by most examining bodies in the adjustment of marks in this country, the scale adjustment method appears to have certain advantages over the mean and standard deviation method and the block adjustment method.

In the mean and standard deviation method, the raw mean and standard deviation is adjusted onto a new mean and standard deviation. Failures and the percentage dis-

tinctions cannot readily be determined when the adjustments are made. It is for this reason that the failures in subjects in some examining bodies fluctuates from year to year. The block adjustment method makes it possible for one to predict the percentage of distinction and failures on adjustment. However, it is also possible to change the rank order of candidates by employing this method. The Scale Adjustment method has an advantage over the above two methods in that the rank order of candidates can be maintained.

It is clear that the examining bodies in South Africa all use some statistical methods to adjust marks of candidates. Whether it is always possible to solve educational problems by statistical means is debatable. It is generally felt that no examiner can set a perfect question paper and therefore to compensate for examiner subjectivity, adjustments are necessary. While this might be the major reason why adjustments are effected, it is felt that methods should be sought to minimise examiner subjectivity. At the same time adjustments should be kept to a minimum. One possible method of reducing examiner subjectivity is to use pre-tested items (objective type as well as essay type questions) in an examination.

Nuttal and Willmot (1972) state that it is possible to determine facility and discrimination indexes not only for objective type questions but also for essay type questions.⁽⁸⁵⁾ While pre-testing questions might be time consuming and require considerably more administrative work, it is possible to draw up a bank of questions in a particular subject which can not only be used for examining but also for didactic purposes by the class teacher. Further, an examination developed in this way will be reliable and require minimal adjustment since the examination will be constructed on pre-tested items.

Another method of reducing examiner subjectivity is the one currently used by some examining bodies in South Africa, i.e. the panel system of setting question papers. It would be appropriate if a panel of about five persons are appointed generally to set the four papers in a subject i.e. two higher grade and two standard grade, one each for November/December and March examinations. The members of the panel should be all experts in their field and they should include the questions in an examination only after they have been thoroughly discussed and a consensus of opinion is reached by the panel on the suitability of questions.

In Britain in the General Certificate of Education examinations the marks of candidates are not adjusted, but symbols are allocated by a group of examiners to the various mark categories in their subject.⁽⁸⁶⁾ The examiners take into consideration previous years' question papers and answers given by candidates in each symbol category. Usually three scripts in each symbol category, i.e. the upper limit, middle and lower limit of each symbol, of the previous three years' examinations are stored for use by the grade (symbol) allocation meeting. Each subject has its own meeting at which a list of marks of candidates in a subject in rank order is presented to the meeting. The meeting after considering previous years' question papers and the answers given, considers the present question papers and answers of candidates. The meeting then decides the cut off points, on the rank of scores, as to where each symbol should range from. In this method marks allocated to a particular symbol in an one year can differ from year to year depending on the decision of the grade allocation meeting.

The advantage of this method of allocating symbols is that the symbol ranges are decided upon by educational experts in a particular field and not by statisticians who relate the scores to some normalising procedure or distribution. The disadvantages of this method are that it

is time consuming and, further, total subjectivity cannot be eliminated. Nevertheless the subjectivity of educational experts would appear to be more desirable than the subjectivity that prevails when adjustments are made for statistical reasons.

It is interesting to note that in the United States the move is towards the use of criterion-referenced tests in examinations. Candidates are graded on the basis of their performance in these tests. The emphasis therefore appears to be in the construction of valid instruments of measure rather than adjusting marks by statistical means. (87)

From the foregoing it would appear that attention needs to be given to the construction of reliable and valid instruments of measure for use in an examination. Statistical adjustments need to be kept at a minimum.

There is wide variation in the number of failures on unadjusted marks in the different examining bodies. Most education departments tend to reduce the failures on adjustment. The Joint Matriculation Board tries to maintain standards in the different examining bodies by means of moderating question papers. However, the variation of adjustments in most examining bodies, in some subjects by over 10%, indicates that the moderation does not always serve a useful purpose. Each examining body adjusts the marks according to the norms approved by the Joint Matriculation Board. If this is the reason why there is such variations in the failures on adjusted and unadjusted scores, then it stands to reason that the norms need to be reviewed.

Since the Joint Matriculation Board moderators' decisions and recommendations could effectively be disregarded by the statistical adjustments effected, it would be preferable if the moderation of question papers of the different examining bodies were to be done by a panel of moderators, who operate on criteria for moderation deter-

mined by the Joint Matriculation moderator. The question papers should therefore be criterion-referenced. Further, if adjustments are effected in a particular subject by an examining body these adjustments should receive the approval of the panel of moderators at some stage even after the results are published. In this way the principle of accountability can be assured.

7.16 CONCLUSION

From the evidence in this research it would appear that one of the major factors that influences performance in examinations is the curriculum followed by the candidates. In this context curriculum "comprises all the opportunities for learning provided by a school".⁽⁸⁸⁾ The curriculum has to satisfy two seemingly contrary requirements. "On the one hand it has to reflect the broad aims of education which hold good for all children, whatever their capacities and whatever schools they attend. On the other hand, it has to allow for differences in the abilities and other characteristics of children".⁽⁸⁹⁾ On the basis of performance in the Senior Certificate Examination, one may conclude that the curriculum designed for the senior secondary phase satisfies the needs of the majority of White candidates. With regard to Indian candidates in certain subjects the performance is not as good as that of the White candidates. It would therefore seem appropriate that the syllabuses followed by Indian candidates in certain subjects be evaluated in order to determine problem areas. Means should be sought to either bridge existing gaps in knowledge or revise the current syllabuses, if it is felt that this would be the most desirable thing to do. However, one must not lose sight of the broad aims of education which should hold good for all children no matter from which environment they come from.

In the case of Coloured and Black candidates it is evident that the majority have difficulty in coping with the curriculum followed in the senior secondary phase. There is a vast gap in the performance of the majority of Coloured and Black candidates and the performance of White candidates. It would, therefore, appear that the curriculum followed by the majority of Black and Coloured candidates presents certain problems which need further investigation.

The de Lange Committee, after pointing out the inadequacies of the current system of education makes several recommendations concerning the development of curricula to serve the educational needs of the vast majority in this country.⁽⁹⁰⁾ While there should be differences in approaches used to achieve the educational needs of the different groups, at the same time all pupils need to be prepared to meet the basic intellectual and social demands of adult life, and helped to form an acceptable set of personal values.

If it is to be effective the school curriculum must allow, for differences. "It must contribute to children's present well-being, whatever the age and stage of growth and development they have reached, and to their ability to take advantage of the opportunities available to them".⁽⁹¹⁾ While differences are desirable, they should aim at enabling all pupils to achieve a comparable quality of education and also a comparable quality of adult life.

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CHAPTER 8RECOMMENDATIONS FLOWING OUT OF THIS STUDY

From the discussion of the findings in the preceeding Chapter, it is clear that several areas where recommendations can be made with a view to improving the quality of education and more specifically the performance of candidates in the Senior Certificate Examination does arise.

Several of the recommendations relate specifically to Indian Education, while others relate generally to the examinations conducted by some or all the examining bodies. Some areas for further research are also indicated.

8.1 PASS AND FAILURE RATES IN THE SENIOR CERTIFICATE EXAMINATION

The research has established that generally the results of Indian, Coloured and Black candidates are worse than those of White candidates. There appears to be a link between performance and the socio-economic status of the different groups in the South African community. While many factors, including the curricula followed as well as teacher competency, play an important role in performance, efforts to upgrade the quality of life mainly in the Coloured, Black and to some extent in the Indian community would go a long way towards improving performance. In this regard, joint projec between the school and the community aimed at raising adult literacy would be helpful. The establishment of community learning centres (as proposed by the de Lange Committee) would most definitely contribute towards the upliftment of the community.

As a long term measure, improved performance can best be achieved if there is a substantial change in the social, economic and political fabric of the South African community which should have the concomitant effect of

improving the quality of life of those taking the Senior Certificate Examination. According to the HSRC Investigation into Education (1981) "Inequalities in educational opportunities as a result of discrimination, deprivation or privilege occur in one form or another in most countries, but particularly in societies which are markedly differentiated in terms of race, language, religion, ethnicity, socio-economic stratification or one or other combination of these divisive factors".⁽¹⁾

In the South African community, some disadvantages with regard to educational opportunities are suffered by certain groups. It is possible that some of these factors affect performance in examinations. Efforts should, therefore, be generated towards removing inequalities that have an influence on performance, where they exist.

8.2 PROVISION OF INFORMAL AND NON FORMAL EDUCATION

It is evident that the current academic type of secondary education is not providing adequately for the needs of many pupils at school. In the Indian community alone, some 60% of pupils who begin class one never reach standard ten. The desirability of greater curricula differentiation particularly at the secondary school level needs further investigation. A vocational type of education may have the desired effect of reducing the number of school drop-outs. However, those that do drop-out need to be provided for by means of non-formal education.

For purposes of non-formal education a new infra-structure needs to be developed. Non-formal education should be co-ordinated and organised by a professional body which has its links with industry, commerce and the formal education structures. While formal education is expected to provide the basis for an individual's whole future life, non-formal education should meet the short-term as well as the long-term learning needs of individuals. It should

therefore entail the learning of specific knowledge and skills and the inculcation of specific attitudes towards society. As mentioned earlier, it is essential that community learning centres be established. As a short term solution existing school buildings and sports fields should be made available to the community during the afternoons, evenings, week-ends and also during school vacations. The State as well as commerce and industry should be approached to fund the training of personnel to man the community learning centres. Health educators, teachers for continuing education, sports coaches, social workers, pre-school teachers and librarians should be provided at such centres. The training programme at such centres should be developed in consultation with commerce and industry.

Education Departments should take the responsibility for developing and co-ordinating formal, non-formal and informal education. The needs of the community should be measured by consulting community leaders, and leaders from commerce and industry.

With regard to informal education the mass media such as newspapers, television and radio should be used to educate people in certain basic issues such as health, family planning, positive attitudes, human relations and opportunities for vocational and recreational training. The media should be used extensively to educate people towards improving their quality of life.

8.3 CURRICULUM DEVELOPMENT PROGRAMMES

There is need to devise curriculum development strategies so that areas which present problems may be reviewed critically in order to improve the performance of candidates in the examination. It has been evident that in certain subjects, particularly in the sciences, there is a very high failure rate in the examinations taken by some groups. It is possible that the curriculum followed by the vast majority in these groups is not having the desired effect.

Curriculum development, as Entwistle and Nisbet (1972) note is not simply a matter of devising new syllabuses.⁽²⁾ Hill (1980) points out that the curriculum of a subject is more than a syllabus. It contains carefully selected and ordered objectives and content where the latter includes subject matter and didactic guide-lines which form the basis for the teacher's eventual detailed lesson planning.⁽³⁾ The main activities carried out in the process of curriculum development should be: Drawing up an initial draft curriculum, evaluation of this curriculum, adaptation and finalisation of this, and finally drawing up revised curricula in the light of insights gained.⁽⁴⁾

Curriculum research should be a continuous process because there is a constant need for curriculum improvement since the needs of society are constantly changing. The result of one analysis should be recycled to serve as a basis or input for the next analysis.

In view of the anticipated changes in the economic, political as well as social lives of the majority in the South African community it is necessary for examining bodies to consider the establishment of a permanent curriculum development unit which takes cognisance of the changing needs of society and devices curricula best suited to meet these needs. Further there should be co-ordination of these units at a national level so that some uniformity as well as diversity in the educational structure in this country is maintained.

The Report of the Education Working Party (November 1983) recommends the following in this regard:

"A central curriculum service, primarily concerning itself with the research component, is recommended..⁽⁵⁾

The de Lange Committee (1981) as well as the Government White Paper (November 1983) see relevance in involving the organised teaching profession as well as "users of

the products of education in curriculum design".

While it is desirable to involve as many people as possible in the design of curricula, it must also be pointed out that curriculum design is a specialised field and requires specialised training. In this regard it is recommended that universities as well as teacher training institutions provide the necessary courses on curriculum development. Further as an interim measure, Departments of Education should be responsible for organising in-service courses for practicing teachers. In this way the teachers input into the curriculum may be assured.

In keeping with the new educational dispensation curriculum development and research should, at a local level, take place within each education department. The department responsible should develop an infra-structure to involve teachers, parents, representatives of commerce and industry as well as experts in the field of curriculum development and research. However, curricula developed at a local level should take into consideration the broad general principles laid down by the central curriculum body. There should be free flow of communication between the local and central curriculum bodies. The central curriculum body should also be responsible for curriculum research at a national level.

8.4 COMMON EXAMINATIONS

The research has indicated clearly vast differences in performance of candidates in the Senior Certificate Examinations taken by the different ethnic groups. There are several factors which contribute to these differences among which cultural issues, socio-economic factors, teacher-competency and the curriculum have considerable influence. In view of the influence these factors have on performance, it would not seem feasible at this stage to introduce common examinations for all. Common examinations raise

important problems where systems at different levels of sophistication embark upon them. Candidates from the more sophisticated are likely to achieve better results than those from the less developed sectors. The issue of common examinations will, of necessity, be a controversial area. It is, therefore, important that views of educators, including those on examining boards, from all the different groups of the South African community be solicited in order to arrive at a consensus on this issue.

8.5 CO-ORDINATION OF EXAMINATIONS ON A NATIONAL LEVEL

In order to establish some kind of national standard there is need for co-ordination and control of examinations at a national level. Currently the Joint Matriculation Board exercises some control in certain subjects which are recognised for matriculation exemption purposes. Further among the White Education Departments co-ordination with regard to syllabuses, examination requirements, courses and the administration and control of education is done by the Committee of Heads of Education. Co-ordination among the White Education Departments therefore does exist, and the Joint Matriculation Board and the Committee of Heads of Education are bodies which serve this function.

With regard to the Indian, Coloured and Black education departments, these departments have representation only on the Joint Matriculation Board. This Board, however, has control over certain subjects offered by these education departments. However, there are many other subjects, mainly in the commercial and technical fields of study over which the Board has no control. Each department sets and moderates the question papers in these subjects. There is no external moderation for the purpose of establishing similar standards between the different departments.

In view of the above, a national body which maintains standards in all subjects of all the examining bodies is a necessity. It is recommended that the South African

Council for Education give consideration to the establishment of a body for controlling and maintaining standards in education. Further such a body should also be responsible for certifying and accrediting candidates of the different education departments in this country. In this way equivalent standards may be ensured.

8.6 THE ROLE OF THE JOINT MATRICULATION BOARD IN EDUCATION

There is no doubt that the number of candidates obtaining matriculation exemption passes in the White and Indian examining bodies is considerably higher than the 15% indicated by the De Vries Commission (1974).⁽⁶⁾ (The small number of matriculation exemptions obtained by the Coloured and Black communities is as a result of several factors referred to earlier.) It is evident that the requirement for matriculation exemption as set out by the Joint Matriculation Board is not serving its intended purpose. This fact is further borne out by the different methods currently being investigated by universities to limit their intake. The universities of Cape Town, Rhodes and Witwatersrand have used a rating scale for some years now, while the University of Natal is currently looking into the possibility of determining its entrance requirements on the basis of awarding points to each symbol obtained by candidates.⁽⁷⁾ ⁽⁸⁾ Many universities apart from requiring a matriculation exemption pass, also set out other criteria which candidates need to satisfy before gaining entrance into a particular faculty.⁽⁹⁾ ⁽¹⁰⁾ ⁽¹¹⁾

The White Paper points out that, "The Joint Matriculation Board (JMB) at present performs an extremely important function in that it regulates the standards for university entrance on behalf of all the universities jointly and prevents a fragmented system with different standards for admission to different universities from arising."⁽¹²⁾

Recently, however, it would appear that universities were not entirely satisfied by the requirements set out by the JMB for university entrance. Many universities began to

regard the JMB requirements as the minimum for university entrance and therefore set their own additional requirements in many facilities.

These developments suggest that the JMB will have to reconsider the entrance requirements it imposes on candidates wishing to study at a university. Further, to avoid confusion from one university to the next, and to prevent "a fragmented system" from developing, the JMB needs to develop criteria that are acceptable to all the universities.

It is clear that the JMB has a meaningful role to play in maintaining standards for university entrance and at the same time developing common criteria for admission to the different universities.

In this context the JMB should abandon its traditional role as an examining body which sets and controls its own examination. Its current function in this regard can well be performed by the Department of National Education or any of the Provincial examining bodies.

The JMB should liaise with the different university facilities with a view to developing common criteria for the different faculties. Consideration should be given to the establishment of committees representative of each university faculty to make recommendations in this regard.

The JMB should also undertake research into the most appropriate measurement techniques to be used in certifying examinations. In addition, research into university entrance requirements might also be undertaken. Major research projects can well be handled by the HSRC, but there will always be areas particularly with regard to entrance requirements and examining which can best be handled by the JMB itself.

The JMB should provide the infrastructure for contact between the universities, examining bodies and schools. Such contact can provide interesting information to researchers particularly in the field of curriculum development and career guidance for schools.

8.7 THE INCLUSION OF SCHOOL-BASED ASSESSMENT AS PART OF THE SENIOR CERTIFICATE EXAMINATION

Both internal and external forms of assessing have been tried out in a number of examining systems in various parts of the world and in spite of the arguments for and against each system, "there is a growing desire for a mixture of the two, that is a proportion of the final assessment being derived from in-course assessment and a proportion from some form of terminal examination."⁽¹³⁾

The research has indicated that the inclusion of school based assessment as part of the marks for the Senior Certificate Examination needs to be considered. However, the degree of validity and reliability that may be attached to such assessment would depend on the quality and experience of the teaching force in the different education departments. It is, however, recommended that the Division of Indian Education investigates the possibility of combining internal and external assessments for the purpose of the Senior Certificate Examination. The basis on how these two components should be combined has been discussed in Chapter 4.

8.8 PRETESTING OF EXAMINATION QUESTIONS

The answers to examination questions, if analysed can provide valuable data that can be used in constructing future examination questions. It is possible that soon after candidates have written an examination, the marks for the different questions whether objective or essay type, can be subjected to statistical analysis to yield the discrimination and difficulty indices. An

item bank of examination questions can be created. Over a period of five years a large store of questions in the different subjects can be built up with their relevant difficulty and discrimination indices.

Once a bank of examination questions is created, the panel of examiners will be in a better position to construct a more reliable examination in their subject. In such an examination the need to adjust marks will become the exception, since the examination will be composed of selected items.

Apart from such items being used for examinations, they could also be used for didactic purposes in schools. It is therefore recommended that examining bodies analyse answers to questions in the Senior Certificate Examination with a view to developing an items bank of both objective as well as essay type questions which can be used for examining as well as didactic purposes.

8.9 ASSESSMENT AND MEASUREMENT IN EDUCATION AS A SUBJECT FOR TEACHER TRAINEES

Assessment and measurement in education are currently treated as part discipline of the subject Education offered at colleges of education and at universities. In view of the importance of this aspect of education and further because of the current trends which tend to give importance to school based assessment, it is recommended that Assessment and Measurement be offered as a subject on its own at the colleges and universities. Further a syllabus should be devised which places emphasis on the theory as well as the practical aspects of assessment and measurement. This subject should be offered as a compulsory subject for those who want to train as teachers, since assessment and measurement form an integral part of the teaching-learning-evaluating situation at schools.

8.10 TEACHER DEVELOPMENT PROGRAMMES

There is no doubt that teachers play an important role in the performance of candidates in examinations. Teachers are the most significant variable in the successful implementation of innovation. Since the introduction of the system of differentiated education, teachers have been required to prepare pupils for examinations on two grades, i.e. the higher and standard grades. Teaching in this system has been further complicated by the introduction of the Lower Grade to cater for pupils with below average intelligence. To update teachers with procedures of handling the different syllabuses for the different grades, in-service courses on a continuous basis should be held. Such courses are necessary if the principles underlying differentiation are to be successfully implemented. It must also be borne in mind that the de Lange Committee (1981) also sees pupils being taught at different levels. It advocates a system in which there is a "vertical" and "horizontal" flow of pupils. "After horizontal flow has taken place, the learner then moves vertically at a different degree of difficulty in his particular field, in another field of study or subject, or at another educational institution and reaches a withdrawal point with the minimum, if any, loss of years of study."⁽¹⁴⁾

In order to make allowance for pupils of different abilities and interests, in-service courses for teachers are of considerable importance. Further teacher-training institutions should also look at their current programmes and evaluate them in terms of what could be expected of teachers in the near future. The programmes should be revised if necessary to provide students in training with means of dealing with social changes and methods of dealing with pupils of different abilities and interests, sometimes in the same class unit.

One other area that needs consideration, and which has been highlighted by several research projects recently,

is the need for qualified teachers of Mathematics and the Science subjects. This problem is experienced by most of the education departments in this country and it is interesting to note that the Government White Paper (23 November 1983) states the following in this regard : "The Government is well aware that there are serious problems in regard to the natural sciences and Mathematics in education. It shares the view of the Education Working Party on the urgency of the matter and has already taken certain initiatives."⁽¹⁵⁾ It is hoped that every conceivable avenue is explored to improve the supply of qualified Mathematics and Science teachers.

8.11 RATIOS FOR HIGHER AND STANDARD GRADE SUBJECTS

The number of candidates taking subjects at the higher grade in the Division of Indian Education is considered to be high. More guidance in the selection of grades of subjects should be given to candidates. The guidance should be included in the normal guidance periods allocated to pupils in schools, and it should be the duty of the guidance-counsellor to study the background of candidates, their previous school records, achievement in standardised tests as well as their IQ before advising candidates to take subjects on grades for which they have the potential.

The parents should be kept informed of the advice given to their children, and at the same time, the parents should be provided with information on how certain decisions were arrived at.

Guidance-counsellors should be aware of the following principle with regard to conversion of higher grade fail (generally between 25 to 39%) in a subject to pass on the standard grade. In any school in the Senior Secondary Phase it should be possible (within reasonable limits) for the principal, guidance-counsellor and teachers to divide pupils generally into three groups viz. those that have the potential to take subjects on

the higher grade, those that have the potential for standard grade only and a group of candidates, where making a decision on grade choice would not be easily possible. This last group should be given the benefit of the doubt and be allowed to take subjects on the grade of their choice. If they do not obtain a higher grade pass then at least they should obtain a converted standard grade pass. It is for this group of candidates where educators are unable to make a clear decision with regard to grade choice, that the conversion serves a useful purpose. There are many instances where candidates who do not have the potential for higher grade subjects offer these subjects, with the expectation that they might obtain a higher grade pass by chance.

In this research, allowing for a 10% conversion from higher grade to standard grade and using the success rate of the past five years, theoretical ratios of higher and standard grade entries in the different subjects for the Senior Certificate Examination of the Division of Indian Education have been worked out. (Details on how these ratios have been arrived at are given in an Chapter 6. It is recommended that in order to ensure a better pass rate in higher grade subjects and to improve the standard distributions used for the adjustment of marks, the following theoretical ratios be used as a guide by principals to determine the number of candidates that should enter for each grade in their schools. These ratios can also provide useful information when adjustments to marks are decided upon. The ratios devised are:

	<u>AVERAGE</u>	<u>THEORETICAL RATIOS</u>
	HG	SG
English	70	30
Afrikaans	75	25
Mathematics	20	80

	<u>AVERAGE</u>	<u>THEORETICAL RATIOS</u>
	HG	SG
Physical Science	48	52
Biology	43	57
History	64	36
Geography	53	47
Accountancy	52	48

These ratios should be reviewed each year.

8.12 METHODS OF ADJUSTING MARKS IN THE SENIOR CERTIFICATE EXAMINATION

It is felt that if the question papers are set by a panel of experienced examiners and moderators; and if this panel had statistical information on how certain questions functioned under examination conditions in past examinations, then adjustment of marks in an examination should be resorted to only when exceptional circumstances prevail. Circumstances such as the introduction of new syllabuses, examination requirements and teaching approaches can be regarded as exceptional and due consideration can be given to some form of adjustment then.

Even when adjustment to marks are considered they should preferably be based on the decisions of a panel of experts in the relevant subject. This panel after consideration of the relevant information in the subject concerned should make its recommendations with regard to the nature of adjustments to be employed by the examining body. It is considered educationally unsound to leave the adjustment of marks entirely to statisticians.

The examining body should consider the recommendations made by the subject panel with regard to adjustments, if the recommendations are within the approved norms (5 year-averages) and they satisfy the departmental policy, they should be implemented. If, however, the examining body is not in agreement with recommendations made, then it

must refer the recommendations back to the subject committees for re-consideration. It would be preferable in such cases for the examining body to indicate why the recommendations were not acceptable.

On accepting the adjustments, the examining body should give consideration to the number of failures on adjusted and unadjusted scores. Further, it would be desirable if the scale adjustment method is used to adjust scores, since this method has several advantages over the methods currently employed by some examining bodies.

In terms of timing and examination organisation, particularly at the end of a year, this procedure would possibly delay publication of results by two or three days. But this procedure would certainly enhance the reliability and validity of the examination and therefore the additional time spent would balance against the educational gains.

8.13 THE CREATION OF A RESEARCH BUREAU

Presently research in the Division of Indian Education is undertaken by the Education Planners. Research becomes one of the many functions that the Planners perform. It is recommended that research in the Division should be undertaken by a research bureau, similar to the one of the Transvaal Education Department.⁽¹⁶⁾

The function of the Research Bureau should be to organise and undertake research on all matters concerning the education of the child in this Division. Such research should provide sufficient information to the Director on which decisions can be made.

Several areas in which further research needs to be undertaken were identified in the course of this work. Some of the areas are:

- The relative value of higher and standard grade question papers set by the Division of Indian Education.

- . The performance of candidates in itembank tests and in the Senior Certificate question papers.
- . The performance of girls and boys in objective type and essay type questions.
- . An indepth investigation into the poor performance of candidates in English higher grade.
- . An investigation into the reasons for the poor performance of candidates in the science subjects.

There are some areas of research which affect all the examining bodies concerned. In such instances, research should be undertaken on a national basis.

The Human Sciences Research Council is in the most fortunate position to undertake research which is of national importance. Further its request for certain confidential information from examining bodies is generally readily supplied. Individual researchers as well as private organisations have difficulty in obtaining information which is considered confidential by many examining bodies.

The Human Sciences Research Council should undertake further research into university entrance requirements and devise a system whereby only those that have the potential for university education should be given the opportunity to continue their academic career. Further, the institution of a common examination after 12 years of schooling for all South Africans should be investigated. Methods of adjusting marks particularly when small number of candidates are involved is another area which needs investigation. Comparability of standards in subjects offered by the different education authorities is another area of research which should be undertaken.

8.14 APPOINTMENT OF SCHOOL SOCIAL WORKERS

The effects of environment on the education of the children is only too well known to educationists. Authorities such as Bernstein (1962), Cohen (1965) and Wiegand (1983) agree to the influence of socio-economic factors on education. (17) (18) (19) In this research the varying degrees of performance between the Indian, Coloured and Black candidates on the one hand and the White candidates on the other has been highlighted. In the light of the above it is suggested that some of the education departments concerned should employ social workers who could help schools in coping with problems associated with environmental deprivation.

It would appear that different conditions, probably social, cultural and environmental operate in the different communities. An understanding of these different conditions will enable educators to devise programmes to suit the educational needs of each community. In this regard the assistance of the social worker is seen as important.

8.15 CONCLUSION

The assessment of educational achievement is an integral part of teaching and learning, though most assessments are carried out informally - through questions and answers in class, through observation of candidates at work - rather than through the formal means of tests and examinations. Yet it is these latter forms of assessment that inevitably catch the public eye and generate debate and possibly research. This research has revealed differences in the performance of candidates taking the examinations conducted by the various examining bodies. The differences became increasingly significant when ethnicity becomes a factor for consideration.

However, examination results alone do not present the entire picture. A closer look at the suitability of the curricula followed, methods of teaching - learning and teacher competency could well indicate reasons for the differences in performance.

The improvement of educational standards in the South African community should be tackled at grass root levels. Among other factors, improving teacher competency, methods of learning, devising appropriate curricula and bridging courses would go a long way towards raising competency levels.

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