THE RELATIONSHIP BETWEEN GRADE 12 LEARNERS' CAREER CHOICES AND THEIR ACADEMIC PERFORMANCE AND APTITUDES

By

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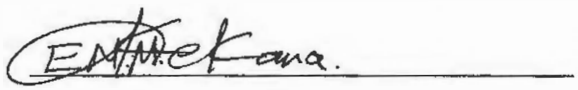
DECLARATION

I declare that:

"The relationship between grade 12 learners' career choices and their academic performance and aptitudes" is my own work and all the sources used or quoted have been indicated and acknowledged by means of complete references.

ELIAS NIMROD MPHALO KEKANA



ABSTRACT

This research seeks to assist school learners in identifying careers that would match their aptitude, interest and academic performance. A case study was undertaken at Vukani Mawethu High School in Mamelodi to establish the problems that high school learners have in choosing careers where they have potential to succeed. Three groups, the Economic and Management Sciences, Human and Social Sciences and Natural Sciences were used in the study. The research instruments used were the June reports, Differential Aptitude Test Form-K, the Career Preference Inventory and the Careers questionnaire. The study found that the Natural Sciences group had a better understanding of their career paths than the other groups.

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CHAPTER ONE

INTRODUCTORY ORIENTATION

1.1 INTRODUCTION

To date, little attention has been given in South Africa about realistic career choices among black learners. Unwise career decisions and educational courses can have far-reaching negative implications for both the education and career satisfaction of the young adolescent. To make a responsible career choice, the secondary school learner needs a career choice identity, based on self-knowledge and career knowledge (Stead & Watson, 1998:291). In practice, the results of aptitude tests and interest questionnaires are used to extend self-knowledge. A discrepancy between a person's aptitude and his/her interests can have distinct implications for the choice of a career.

Much attention has recently been given in South Africa to the effective use of human potential. The Human Sciences Research Council in collaboration with the Department of Labour, had developed a computerised career guidance programme as a means to effectively use human potential (Beneke, 1994:1). However, due to the past political setup

of our country, these programmes were not exposed to learners in black schools. Specialised career guidance has become more important in our complicated career world. A simple matching of men and jobs according to the Parsons model (1909) is no more effective (Zunker, 1998:9). It has become a long and difficult process to make a reliable career choice where a person can be utilized to his/her full potential.

Nemangwele (1998:1) points out, that the present education for black secondary school learners in the country is at the centre of ongoing controversy. Lack of interest in education among some teachers as well as learners has created an aura of pessimism and has therefore obscured the purpose of education. Black schools are often characterised by an undisciplined learning and teaching milieu.

The researcher's personal experience as a grade 12 learner in a township school makes him to conclude that lack of career guidance and counselling for the black youth in South Africa has resulted in a number of problems, which include:

- poor school performance
- making wrong career choices,
- high failure and drop-out rates, and
- moving from one course to the other at tertiary institutions.

Clifford (1990:22) is concerned about learners who abandon school each year to begin lives of unemployment, poverty, hardship, crime and psychological distress. He regards the causes of school abandonment as being learners' apathy, indifference and under achievement. There are questions concerning certain factors which are contributing to drop-out. These include:

- are teachers doing their work effectively?
- are the learners sufficiently interested in learning as they appear to be only passively involved in the classroom activities?
- is there a remedy?.

Career counsellors should try and solve these problems to make learning more desirable for the learners. Different incentives, such as motivating learners and teaching learners to tolerate failure for the sake of success should be implemented to promote active learning. However, some schools do not have trained and skilled career counsellors to take the responsibility of helping learners with their career choices. This is a problem for the learners as they have teachers who may be willing to assist in career decision-making, but lack the knowledge and skills to guide the learners.

Haynes (1990:163) regards disturbing trends, such as high drop-out rates, absenteeism and suspension rates, coupled with poor academic performance as of great concern. In order to remedy the problem of poor academic achievement, teachers should try to make it desirable for learners to choose to enter the doors of learning.

Raymond (1967:63) feels that poor academic performance is associated with poor teaching strategies and unrest in schools, including class boycotts and intimidation. These factors alienate secondary school learners and tend to suggest that teachers are not performing their teaching task adequately. This has resulted in indiscipline in schools. Taunyane (1989:5) asserted that:

> "In many cases teachers have given up the battle to try and teach children who are rejecting education."

Teachers and learners should mutually accept the responsibility for the learning and education situations in which they find themselves. In order to help learners to accept such responsibility, teachers ought to break down the existing barriers to learning. Pupils should feel free to accept learning. Teachers should, through teaching, promote the culture of learning in schools to which learners are able to relate.

1.2 THE RESEARCH PROBLEM

This study investigates the research problem: to what extent do black learners in secondary schools use their knowledge, academic performance and aptitudes to make well informed career choices?

Education is an important aspect of any society and it is essential for a stable community to develop. The school is an important institution of human life and since learners spend the largest proportion of their time in school, their well-being is important. Learners in the classroom often do not explore their full potential. Sometimes teachers and parents are guilty of educational purposelessness in that they disregard the learner's educational needs in a one-sided concentration upon the learner's intellectual abilities (Singh, 1999:1).

There is currently an outcry in South Africa over the quality of education offered in black schools. Educators and parents are concerned about the quality of education in these schools in comparison with that of historically white schools. Given the high cost of post matriculation studies in South Africa, it is imperative that students choose careers that are consistent with their interests and aptitudes. In this way students are more likely to succeed academically and to experience job satisfaction. Although secondary schools do provide learners with basic information about careers and the

institutions that offer these careers, there is a need for a systematic career assessment that includes the assessment of aptitudes, interests and personality. Such systematic assessments are almost non-existent in black secondary schools. This is because in South Africa, career guidance and counselling has been less illustrious and more contentious. Stead and Watson (1999:3) mention that politics, economics and prevailing social conditions affect the nature and form of career psychology in the country.

Unfortunately, in South Africa, the development of career guidance was influenced by political and economic factors. At first, career guidance for black learners was provided largely on an informal basis. With the establishment of differentiated education, the important role of career guidance was emphasised by various people and institutions (Marais, 1987:82). The Soweto riots in 1976 in which black youths expressed their extreme frustration with schooling for blacks was a major contributing reason for the introduction of a career guidance service for young blacks in schools. This led to the compilation of syllabi aimed at providing the needs of black youth in relation to their personality, social, educational and career development.

The researcher's personal experience in disadvantaged educational settings suggests that the current educational problems may be associated with the country's political history. The school has the task of supporting

and guiding learners to become mature and responsible adults who will be able to continue their lives without further adult guidance. It is through the career counsellor, motivated teachers and parents' support that this may be accomplished.

The environment that black learners grow in, has an influence on the development of their interests. It is well known that students entering tertiary studies are often influenced in their career choices by their peers and parents. Poor academic achievement, high failure rates, inadequate facilities, lack of excursions and career exhibitions, lack of textbooks and under-qualified teachers are some of the factors that contribute negatively to the life of the learners. The school, teachers and career counsellors have an important task, which is, to motivate learners.

The problem that is facing the schools is that learners' career choices are often inconsistent with their academic performance and aptitudes and the result is high drop-out rates and failure to accomplish educational and career goals.

1.3 AIM AND OBJECTIVES OF THE STUDY

The aim of the study is to understand how black secondary school learners may be assisted in making career choices that are consistent with their academic performance and aptitudes.

The research has the following objectives:

- To determine the relationship between grade 12 learners' career choices and their academic performance.
- To determine the relationship between grade 12 learners' career choices and their aptitudes.
- To establish the extent to which grade 12 learners make realistic career choices.

1.4 HYPOTHESES

The research is guided by the following hypotheses:

- There is no relationship between grade 12 learners' career choices and their academic performance.

- There is no relationship between grade 12 learners' career choices and their aptitudes.
- Grade 12 learners make unrealistic career choices, based neither on their academic performance nor their aptitudes.

1.5 DEFINITION OF KEY CONCEPTS

1.5.1 ACADEMIC PERFORMANCE

Academic performance refers to a score assigned to the learner as indicative of how much he/she understands academic material learnt as tested by the educator (Nene, 1998:61). In this study academic performance is operationalized as the mark/s attained in Grade 12 mid-year (June) examinations.

1.5.2 CAREER

Literature interprets and defines the term "career" in various ways. When viewed from a broad perspective it is not a new word for "occupation". The term "career" semantically means "a course or process through life" and "personal advancement and success in life" (Concise Oxford Dictionary, 1972:180). A career is a chronological sequence of a person's work related activities (Isaacson, 1993:12), vocations, jobs as well as related activities

associated with an individual's lifetime of work (McDaniels & Gysbers, 1992:3).

1.5.3 CAREER CHOICES

Career choices are decisions a person makes concerning his/ her preferences on occupations he or she is most interested in and wants to pursue in life for a period of many years without being bored (Holland, 1978). For the purpose of this study, a realistic career choice would be considered to be one which is commensurate with the learners academic performance and aptitude as measured by the Differential Aptitude Test (Coetzee & Vosloo, 2000:2).

1.5.4 APTITUDE

For Owen and Taljaard (1996:199) an aptitude:

> *"... can be regarded as the potential which a person has and which enables him to attain a specific level of ability with a given amount of training and/or practice. Aptitudes, together with other personality characteristics such as interest, attitude and motivation as well as training and instruction, will determine the level of skill and proficiency which may be reached."*

1.6 OUTLINE OF THE STUDY

The chapters in the study are as follows:

Chapter 1

This chapter introduces the research topic, the research problem as well as the aim and objectives of the study. The hypotheses of the study are presented as well as the key concepts.

Chapter 2

This chapter deals with the relevant literature and the relationship between career choices, academic performance and aptitudes. The factors which influence the academic performance of learners are also discussed.

Chapter 3

This chapter describes the research method, the research design, research instruments as well as their administration.

Chapter 4

This chapter presents the findings of the study.

Chapter 5

This chapter presents a summary of each chapter. Recommendations are formulated and prospects for further research are also provided.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Due to the fact that limited research has been done with regard to realistic career choices, especially for black learners, a prospective career seeker has to rely heavily on theories about the normal career choices process. However, there are no career theories that have been specifically developed in order to explain the career behaviour of South Africa's diverse population groups. The absence of theory that could describe individual career development relevant to the South African context requires us to examine international career theories (Stead & Watson, 1999:13).

In order to be relevant in the South African context, career theories have to reckon with the work patterns, resources and aspirations of people from different backgrounds and cultural groupings. The content, structure, methods and techniques of the various theories need to be adjusted for a changing workforce and workplace. According to Malan (1999:22) contemporary career guidance must be conceptualised in such a manner that its purpose and methods can be studied, understood and utilised by the careers practitioner. The guiding efforts

of the careers practitioner are bound to be more sound, effective and accountable if they are based on carefully formulated, tested and consistent theoretical approaches on application.

2.2 THEORIES OF CAREER CHOICES

A theory of careers may metaphorically be seen as a map for career-pathing on which a few points are known and the road between points is inferred (Burk, 1979:2).

According to Sharf (1992:2), a theory is a grouping of logically organised laws or relationships that constitute explanation in a discipline. There is no dichotomy between theory and practicality, nothing is so practical as a good theory. It is necessary for the careers practitioner in the execution of his/her guidance service to young people, to judge the accountability and soundness of a theory. A sound theory, according to Sharf (1992:2):

- **is consistent and clear**, in that there is agreement among its general principles (philosophy) and agreement of its observation. It is clear in that it is communicable. It is like an easily read map and not too complex.

- **is comprehensive**, in that it has a wide scope and accounts for much behaviour. It approaches all-purpose utility.

- **is explicit** about its rules, terms and theories; it is precise. Concepts will be translatable into denotative statements so that they can be checked against clear references in the real world.

- **is parsimonious** and does not over explain phenomena. A theory should be precise about the limitations of its predictions.

- **generates useful research**. Theories need to be continually tested.

The careers practitioner needs to apply general principles for judging the appropriateness of a theory. The attributes of a good theory can also be utilised as criteria for the evaluation of career development theories.

2.2.1 TRAIT-AND-FACTOR THEORY

It is generally accepted that the first description of trait-factor theory was offered by Frank Parsons at the start of this century. Indeed, Parsons pioneered the development of career theory. In his book, *Choosing a Vocation*, which was published posthumously in 1909, Parsons proposed that certain steps were needed to match individuals and occupations successfully. According to Parsons

(1909:5) the ideal career choice process requires the following three steps of any individual:

- A clear understanding of oneself, one's attitudes, abilities, interests, ambitions, resource limitations and their causes.

- A knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities and prospects in different lines of work.

- True reasoning on the relations of these two groups of facts.

The first step of Parsons model defines the "trait" aspect of the theory in that it refers to the characteristics of the individual who is making a career choice. Traits are regarded as lasting individual characteristics that help differentiate one individual from another. It is the differential nature of an individual's career-related attitudes, abilities and interests that Parsons emphasises. Parsons believes that an individual's characteristics can be assessed through psychometric testing. However, at the time of proposing his views, there were few measures available and Parsons relied predominantly on a case study approach.

In the second step, Parsons emphasises the differential nature of work itself (the "factor" aspect of the theory) in that different careers vary in what they require of an individual and how they reward the individual. Thus, factors refer to characteristics of the work environment that are required if work performance is to be successful.

The third step requires a matching of the differential characteristics of the individual with the differential requirements of the work. The better the "relations" between these traits and factors, the better the match. Betz and Fitzgerald (1987:27) suggest that the ability of an individual to adjust successfully and satisfactorily to a chosen career is directly proportional to this "goodness of fit" that occurs in this third step.

These three steps are rooted in an analytical process which aims to describe individual traits or characteristics, describe factors in the work environment and then match traits with factors.

Williamson (1939) was another prominent advocate of trait-factor counselling. His counselling procedures maintained the early impetus of the trait-factor approach that evolved from the work of Parsons. Even when integrated into other theories of career guidance, the trait-and-factor theory approach plays a very vital role. Its impact and influence on the development of assessment

techniques and the utilisation of career information have been of inestimable value (Zunker, 1998:23).

2.2.2 PERSONALITY-BASED THEORIES

The two most viable personality-based viewpoints are represented by Anne Roe's needs approach and John Holland's typology approach (Herring, 1997:27). Even though personality tests were not used in the present study, it is important however to briefly mention how personality plays a role in career choices. Roe and Holland advocated that the appropriateness of an occupation for a specific individual depends on that individual's personality, which in turn is primarily the product of early experiences.

2.2.2.1 ANNE ROE'S THEORY ON CAREER CHOICES

The main focus of Roe's work (1956) has been on the early relations within the family and their subsequent effects on career directions. Roe emphasised that early childhood experiences play an important role in finding satisfaction in one's chosen field. Her work led her to investigate how parental styles affect need hierarchy and the relationships of these needs to later adult lifestyles (Zunker, 1998:50).

According to Lunneborg (1990:74), Roe's (1956) theoretical orientation is based primarily on Maslow's hierarchy of human needs and the effects of childhood relationships within the family on career direction. The hierarchy of needs concept suggests that lower order needs, those essential for maintaining life, are so strong that higher level needs will not be addressed until lower order needs are reasonably well satisfied. The hierarchy suggests the order of priority of the basic needs, as follows:

- Physiological needs
- Safety needs
- Need for belongingness
- Need for importance, respect, self-esteem, and independence
- Need for self-actualisation
- Need for information
- Need for understanding
- Need for beauty

In her research, Roe classified occupations into two major categories: *person-oriented* and *nonperson-oriented*. Examples of person-oriented occupations are:

(1) service (concerned with service to other people);

(2) business contact (person-to-person contact, primarily in sales);

(3) managerial (management in business, industry and government);

(4) general culture (teaching, ministry, and journalism); and

(5) arts and entertainment (performing in creative arts).

Examples of *non-person oriented* jobs are in the arenas of:

(1) technology (production, maintenance, and transport);

(2) the outdoors (agriculture, forestry, and mining); and

(3) science (scientific theory and application).

Within each occupational classification are progressively higher levels of functioning. Roe (1956) contended that the selection of an occupational category was primarily a function of the individual's need structure but that the level of attainment within the category was more dependent on the individual's level of ability and socioeconomic background. The climate of the relationship between child and parent was the main generating force of needs, interests and attitudes that were later reflected in vocational choice.

Roe's work has contributed significantly to vocational guidance as a lot of theories have evolved from hers.

2.2.2.2 JOHN HOLLAND: A TYPOLOGY APPROACH

Holland set forth a comprehensive trait-oriented explanation of vocational choice that built on but extended the trait-and-factor model of Parsons (1909). According to Mokaba (1993:24), Holland's theory postulates that occupational choice is a process of matching up an individual's different abilities, interests and personality traits with available jobs. Thus, wise career choice is comprised of three broad factors:

(1) A clear understanding of oneself, one's attitudes, abilities, interests, ambitions, resources, limitations and their cause;
(2) A knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities and the prospects in different lines of work; and
(3) True recognition of the relationship of these groups of factors.

According to Holland (1992:38), there is no one suitable occupation or group of occupations for any particular individual, and that every individual needs to make a single career choice to fulfill this requirement, usually during late adolescent and early adulthood, a point not viewed favourably by developmental theorists.

The vocational testing movement that has dominated the South African counselling scene stemmed from the trait factor models as propounded

differently by Parsons (1909) and Holland (1966). Holland in particular, introduced personality traits of need into the trait factor model. Holland's (1985:1) theory provides explanations for three fundamental questions:

(1) What personal and environmental characteristics lead to satisfying career decisions, involvement, and achievement; what characteristics lead to indecision, dissatisfying decisions, or lack of accomplishment?

(2) What personal and environmental characteristics lead to stability or change in the kind of work a person performs over a lifetime?

(3) What are the most effective methods of providing assistance to people with career problems?

Holland's theory is said to be "structurally interactive", because it combines information about self with some knowledge of the sphere of work. The theory makes the following assumptions about the nature of humanity and occupations: First, it assumes that occupational choice is an expression of personality and that all occupational inventories are necessarily personality tests. This view contradicts some of the original views of Super (1957) and Crites (1962) who espoused the idea that vocational interest only measures interest and choice. In fact, Holland's Vocational Interest Inventory (Mokaba, 1993:26) was developed and based on the hypothesis that:

"the choice of an occupation is an expressive act which reflects the person's motivation, knowledge, personality and ability. Occupation represents a way of life, an environmental rather than a set of isolated work functions or skills. To work as a carpenter means not only to use tools but also to have a certain status, community role, and a special pattern of living. In this essence, the choice of an occupational title represents several kinds of information: the subject's motivation, his knowledge of the occupation in question, his insight and understanding of himself, and his abilities" (Holland, 1985:8).

Secondly, it assumes that people perceive related professions identically and that they develop stereotypes of the occupational environment within which these occupations are operative. These occupational stereotypes "have reliable and important psychological and sociological meanings" (Holland; 1985:9). Based on this assumption, Holland provided six general occupational environmental types within which people work:

- a **realistic environment** characterised by the predominance of tasks that require ordered, systematic manipulation of objects, tools, machinery or animals;
- an **investigative environment** requiring symbolic, systematic, creative investigation of physical, biological, or cultural phenomena;

- an **artistic environment** with rather free, ambiguous and unsystematic activities to create art forms or products;
- a **social environment** characterised by the predominance of activities and opportunities requiring manipulation of others to inform, train, develop, cure or educate them;
- the **enterprising and conventional environments** which require manipulation of others to attain organisational or personal goals, and systematic and explicit manipulation of information (data), respectively.

The third assumption of Holland's theory is that members of a vocation have similar personalities and histories of personal development. This "birds of the same feathers" proposition was the basis of the personality types associated with each of the occupational environmental types explained above.

The fourth assumption states that because of their similarities, people in the same occupation are likely to respond to the same situation similarly, and that they will create an environment consistent with their personality. This is Holland's link between the environmental type and the personality types. Associated with these environmental types are personality types. They include: the Realistic, Investigative, Artistic, Social, Enterprising, and Conventional.

Fifth, vocational satisfaction, stability, and achievement are assumed to depend on the congruence between the personality and the type of environment within which one works.

Although Holland had assumed the effect of other variables such as age, gender, social class, and effort required, he acknowledges their importance in determining the level of occupational aspiration and expressed the hope that readers [and researchers] would at least include measures of age, gender, social class, and intelligence, as well as gross characteristics of the work environment so that the contribution of these and the theoretical constructs can be applied or studied in a more integrated way (Holland, 1985:13).

Anne Roe's theory on Career Choices and John Holland's Typology Approach are said to be adaptable to the South African situation because they do not threaten the *status quo*. This is because personality-based theories focus primarily on the individual rather than the socio-political and economic system that prevent a person from entering high level occupations (Burns, 1986; Watts, 1980; Dovey, 1983). Burns (1986:2) presented the assumptions on which the matching theories are based, namely; that the assessment instruments used are highly reliable and valid, providing accurate information about the individual; that the traits being measured are stable and unchanging over the life-span; that job activities remain static; and that each person makes only a single career choice. Though maybe false, such an approach to career development would seem to

be consistent with the racial policies of South Africa which encouraged racial domination and labour aristocracy.

2.2.3 DEVELOPMENTAL THEORIES

Developmental theorists see career choices as part of the individual's developmental process. Their primary assumption is that career development is a process that takes place over the life span. Because career development is viewed as a lifelong process, career guidance programmes should be designed to meet the needs of individuals at all stages of life. Thus the stages of career development are important points of reference for the career development theorists. The models of career development were propounded primarily by Ginzberg, Ginsburg, Axelrad and Herma (1951) and were later modified by Super (1957). Developmental models were also influenced by the Client Centered therapy of Carl Rogers. The basic tenets of these groups of models are that:

(a) Individuals develop more clearly defined self-concepts as they grow older. However, these vary to conform with change in one's views of reality as correlated with ageing.

(b) People develop images of the occupational world which they compare with their self-images in trying to make career decisions.

(c) The adequacy of the eventual career decision is based on the similarity between the individual's self-concept and the vocational concept of the career he/she eventually chooses.

2.2.3.1 GINZBERG AND ASSOCIATES

Ginzberg, Ginsburg, Axelrad and Herma (1951) are generally considered to be the first to approach a theory of occupational choice from a developmental standpoint. This team, consisting of an economist, a psychiatrist, a sociologist and a psychologist, set out to develop and test a theory of occupational choice. They presented a "radical new psychologically based theory of career development that broke with the static trait and factor theory of occupational choice" (Brown & Brooks, 1990:3). On the basis of research results comparing male youths from high socioeconomic backgrounds with male youths with unskilled or semiskilled fathers, and a second group of female college students, these researchers concluded that occupational choice is a developmental process that occurs over time (Herring, 1997:45).

According to Ginzberg and his colleagues, career choice is the result of a developmental process that occurs in three periods, each with separate substages (Yost & Corbishley, 1987:6). This developmental process generally covers a period of six to ten years, beginning around age 11 and ending shortly

after age 17 or in young adulthood. The three distinct periods in the occupational choice process according to Zunker (1998:30) are:

- *Fantasy period*, in which play gradually becomes work-oriented and reflects initial preferences for certain kinds of activities. Various occupational roles are assumed in play, resulting in initial value judgements on the world of work.

- *Tentative period*, which is divided into four stages. First, is the interest stage, during which the individual makes more definite decisions concerning likes and dislikes. Second, is the capacity stage of becoming aware of one's ability as related to vocational aspirations. Third, is the value stage, a time when clearer perceptions of occupational styles emerge. During the final transition stage, the individual becomes aware of the decision for vocational choice and the subsequent responsibilities accompanying a career choice.

- *Realistic period*, which is divided into three stages. The first stage is the exploration stage, which, for the group studied by Ginzberg (1984)., centred around college entrance. During this stage, the individual narrows the career choice to two or three possibilities but is generally in a stage of ambivalence and indecisiveness. However, the career focus is much narrower in scope. The second stage, crystallisation, is when the

commitment to a specific career field is made. Change of direction for some even at this stage is referred to as pseudo-crystallisation. The final stage, specification, is when the individual selects a job or professional training for a specific career.

In the original study, Ginzberg (1984) stated that, the developmental process of occupational choice decision making was irreversible in that the individual could not return chronologically or psychologically to the point where earlier decisions could be repeated (Zunker, 1998:32). This conclusion was later modified to refute the earlier stand that occupational decision making is an irreversible process. However, Ginzberg (1984) continued to stress the importance of early choices in the career decision process. In a later review of his theory, Super and Osborne (1992:76) re-emphasised that occupational choice is lifelong and coextensive with a person's working life:

> "Occupational choice is a lifelong process of decision making for those who seek major satisfaction from their work. This leads them to reassess repeatedly how they can improve the fit between their changing career goals and the realities of the world of work".

2.2.3.2 THE LIFE-SPAN, LIFE-SPACE APPROACH TO CAREERS

Self-concept theory is a very vital part of Super's approach to vocational behaviour. As people grow up, they develop a view of their own roles, personality traits and abilities. They then compare this self-view with what they know about various occupations and try to translate their self-concept into an occupational concept (Yost & Corbishley, 1987:7). Super's approach has generated a number of research projects aimed at determining how the self-concept is implemented in vocational behaviour (Norell & Grater, 1960; Englander, 1960; Stephenson, 1961; Kibrick & Tiedeman, 1961; Schutz & Blocher, 1961; Anderson & Olsen, 1965).

Van den Aardweg and Van den Aardweg (1993:193) define self-concept as the person's way of perceiving himself/herself. They also identify three mutually dependent components of self-concept, namely, identity, action and self-assessment of which identity forms the umbrella concept. According to Silbereisen and Todt (1994:287), the concept identity has been generally accepted as referring to:

- the accomplishment of a coherent and firm sense of self,
- a sense of being at home in one's own body,
- a sense of reasonably being comfortable with who one has become, and

- a sense of knowing where one is going.

Super's research has indicated that vocational self-concept develops through physical and mental growth, observations of work, identification with working adults, general environment, and general experiences. Ultimately, differences and similarities between self and others are assimilated. As experiences become broader in relation to awareness of the world of work, the more sophisticated vocational self-concept is formed. Zunker (1998:32) emphasised that although the vocational self-concept is only a part of the total self-concept, it is the driving force that establishes a career pattern that one will follow throughout life. Thus individuals implement their self-concepts into careers that will provide the most efficient means of self-expression.

Another of Super's important contribution has been his formalisation of vocational developmental stages. According to Isaacson (1985:51), these stages are as follows:

- Growth (birth – age 14 or 15), characterised by development of capacity, attitudes, interests and needs associated with self-concepts;
- Exploratory (ages 16-24), characterised by a tentative phase in which choices are narrowed but not finalised;
- Establishment (ages 25-44), characterised by trial and stabilisation through work experiences;

- Maintenance (ages 45-64), characterised by a continual adjustment process to improve working position and situation; and
- Decline (ages 65+), characterised by pre-retirement considerations, reduced work output, and eventual retirement.

Throughout all these stages, people play various roles that can change over their life span and which will assume different salience at various points. Similarly, interests and values do not always remain static (Isaacson: 1985:54). In Super's model, life is seen as a process of change, marked by multiple decision points. Career selection is not a single relatively stable choice but the cumulative result of past decisions, subject to review if the chosen career does not provide satisfaction.

The phenomenology of decision-making and career development, according to Super, is indeed the combined complexities and variables of differential psychology, self-concept theory, developmental tasks, and sociology of life stages. Primarily, Super took a multisided approach to the career development process. His theory of vocational development is considered the most comprehensive of all developmental theories (Bailey & Stadt, 1973:88) and offers valid explanations of developmental concepts that have been generally supported by numerous research projects (Osipow, 1983). The theory is highly systematic and is useful for developing objectives and strategies for career counselling and career education programmes. The developmental aspects of

Super's theory provide explanations of the various factors that influence the career choice process.

Super's concept of vocational maturity should also be considered a major contribution to career developmental theories. Conceptually, career maturity is acquired through successfully accomplishing developmental tasks within a continuous series of life stages. Career maturity on this continuum is described in terms of attitudinal and competence dimensions. Points of reference from this continuum provide relevant information for career counselling and career education objectives and strategies (Zunker, 1998:36).

The applicability of Ginzberg (1984), work together with that of Super to the complex situation in South Africa in general, and to blacks in particular, seems tenuous. The idea that people develop better understanding of themselves as they mature seems acceptable, and so does the fact that career choice is a life long process. But they fall short because they seem "naive and unrealistic, based on concepts of 'choice' irrelevant to most people" (Burns, 1986:2). This argument is illustrated by the fact that migrant workers do not choose a career, rather the career is chosen for them by the labour bureau officer (Mokaba, 1993:32). Alone, developmental models seem too limited to the idea of maturation and choice. In fact, the original study by Ginzberg (1984), (Mokaba, 1993:33) was based on upper income males who were later compared with poor

men and college women. Super's study found socio-economic status to have insignificantly low effects on maturity.

2.2.4 CAREER CHOICES

Career choices are decisions a person makes concerning his/her preferences on occupations he/she is most interested in and wants to pursue in life for a period of many years without being bored (Holland, 1997:6).

According to the Social Cognitive Career Theory (SCCT), the career choice process flows from the goals and activities that develop out of interests (Lent, Brown & Hackett, 1996:48). People are likely to set career-related goals and pursue career-related activities in the fields in which they are interested. Their performance in career-related activities can be viewed as learning experiences and form a feedback loop that influences their self-efficacy expectations and outcome expectations for particular career–related activities. Bandura (1986:14) defines self-efficacy as people's beliefs about their capabilities to perform particular tasks. Those who believe that they can perform a task successfully, are more likely to attempt a particular task and tend to perform better at it than those who do not believe they can perform the task successfully, even if they have the same ability.

Bandura (1986:52) describes four ways in which people acquire self-efficacy expectations:

- personal performance accomplishments (direct experiences of success or failure);

- vicarious learning (observing others succeed or fail);
- social or verbal persuasion (encouragement from parents, teachers, peers and others); and
- physiological arousal (heightened anxiety often leads to lower self-efficacy expectations).

Outcome expectations refer to what people believe the results of particular behaviours will be (Lent, Brown & Hackett, 1996:51). People will be more likely to attempt behaviours that they expect will lead to desirable outcomes (such as: rewards, feelings of pride or lowered anxiety), than behaviours that they will lead to undesirable outcomes (such as: failure, feelings of guilt). With regard to self-efficacy expectations, people ask: "Can I do it?" With regard to outcome expectations people ask: "Will I like the results if I do it?" Lent, Brown and Hackett (1996:52) point out that learning experiences similar to those that inform self-efficacy expectations shape people's outcome expectations.

Self-efficacy expectations and outcome expectations, thus have an indirect influence on career-related goals and activities through interests. However, they may also directly influence the career choice process in cases where career choices are made that are not congruent with interests. In such cases, career choice may be based on self-efficacy expectations and outcome expectations for jobs that are available (Lent, Brown & Hackett, 1996:52). This is especially likely to happen in contexts where there is a shortage of job opportunities, lack of

economic resources and other factors that may prevent the individual from pursuing goals related to his/her interests. In such cases, individuals have to consider what jobs are available and then assess whether they think they can do what is required and whether the outcomes will be favourable.

2.2.5 INTERESTS

Interest is an aspect of personality that can be defined as a spontaneous attraction to, or preference for certain activities, as well as a spontaneous aversion to other activities (Owen & Taljaard, 1996:396). According to Social Cognitive Career Theory, people will develop interests in activities for which they have positive self-efficacy and outcome expectations. Lent, Larkin and Brown (1989:106) point out that people become enduringly interested in activities that they feel confident in and from which they expect desirable outcomes to follow as a result of their participation in the activities. Because of their interests in certain activities, and their positive self-efficacy expectations and outcome expectations for the same activities, individuals will be likely to form goals related to continued participation in such activities.

Lent, Brown and Hackett (1996:88), emphasise that interests are tied to learning experiences. According to this point of view, interests can change throughout the lifespan depending on the learning opportunities that individuals encounter. They say however, that interests are most likely to change in adolescence (when many

new activities are encountered) and that they tend to stabilise during the adult years (Lent, Brown & Hackett, 1996:91).

Lent, Brown and Hackett (1996:91) point that the stabilisation of interests in adulthood may be because adults are not as open to new learning experiences and tend to specialise and commit themselves to more restricted fields of activity. In contrast with the traditional point of view that people develop interests in activities for which they have a strong aptitude, SCCT holds that aptitude influences interests indirectly via self-efficacy expectations. That is, if people have the aptitude to perform well in a particular task, they may feel confident about their ability to perform well (in conjunction with positive outcome expectations). This leads to them becoming interested in the activity (Lent, Brown & Hackett, 1996:93).

2.2.6 RELATIONSHIP OF VOCATIONAL INTERESTS TO CAREER CHOICE

According to Betsworth and Fouad (1997:32), interests are permanent enough and sufficiently unaffected by vocational training and experience to furnish a basis for the prediction of future behaviour. Strong (1943:381) offered four propositions in relation to the views of Betsworth and Fouad:

(a) individuals continuing in occupation A had higher measured interests in occupation A than any other occupation,

(b) individuals continuing in occupation A should have higher interests in occupation A than individuals in occupation B have in occupation A (e.g., teachers should have higher interests in teaching than engineers have in teaching),

(c) individuals continuing in occupation A should have higher interests in occupation A than individuals who change from occupation A to occupation B, and

(d) individuals changing from occupation A to occupation B should have higher interests in occupation B than in A, before the change.

Strong (1943,1955) found support for the first three propositions, but less clear support for the last proposition. Harmon, Hansen, Borgen and Hammer (1994:150), reported that between one half and two thirds of all college students enter occupations that are predictable from their earlier scores on the Strong Interest Inventory. The relationship seems to be modified by socio-economic status (McArthur, 1954), emotional stability (Brandt & Hood, 1968) and interest stability and satisfaction with college (Hansen & Swanson, 1983). Hansen and Tan (1992) supported Strong's results with newer forms of the Strong Interest Inventory.

2.2.7 FACTORS THAT INFLUENCE ACADEMIC PERFORMANCE

Every child has it's own nature and is therefore different. The child is dependent on education for his/her future, and it is in the hands of the school, teachers, career counsellors, parents, society and peers that the learner is educated. How a learner perceives the various agents of change, and the quality of experiences he/she is exposed to will influence his/her academic performance, interests and career choices.

2.2.7.1 GENDER

Historically, achievement has been a highly stereotyped activity in western culture. From childhood males and females have different experiences regarding the cultivation and expression of achievement. Families appear to be influential in establishing needs for academic, intellectual and career-orientated achievements. Both cultural and sex differences in achievement have been found to result from parents' expectations, values and emphasis on achievement (Hetherington & Parke, 1986:465). Stereotypes about males and females are common in our society. The differing parental expectations for boys and girls is reflected in their academic attainments. Parents' beliefs influence children's perceptions of their own abilities, their attitude towards achievement and their expectations for success and failure. Conditions and stereotyping begins before the child enters school (Hetherington & Parke, 1986:466).

Traditionally females were seldom encouraged to prepare for and enter high status occupations such as law, medicine, engineering and science. This is supported by research conducted by Sue Sharpe (Singh, 1999:68) into a group of mainly working-class females in London in the early 1970's. She found that the females had a set of priorities which were unlikely to encourage them to attach great importance to education. She also found that their concerns were "love, marriage, husbands and children" (Haralambos & Holborn, 1991:284). Females were not encouraged to have any training beyond high school and did not involve themselves in any occupation that required technical skills. This type of socialisation arrangement in schools and society did not motivate females to achieve much beyond high school or to acquire skills that might contribute to later success in the economy (Ornstein & Levine, 1989:391).

In many countries, such as India, Nigeria and Pakistan, fewer females complete school. This also prevails in the South African context, especially among blacks and it is due to the prevailing anticipation of girls eventually getting married and thus not contributing to the family income. Despite the higher socio-economic background of many girls, their education is adversely affected by prevailing social attitudes favouring the intellectual advancement of boys (Lee & Lockheed, 1990:213). Rice (1992:249) reports a study by Robert (1990) whose study of 6th, 7th and 8th grade adolescents led him to the conclusion that social pressures for achievement increase for boys as they move into adolescence and the pressure

on girls to establish social ties increases so that they focus on establishing social relationships rather than on success at school.

2.2.7.2 THE SCHOOL/CLASSROOM CLIMATE

Students' learning is co-determined by student age, ability and motivation; by quality and quantity of instruction and by the their perception of the psychosocial environment of the home and the classroom (Fraser, 1989:315). Students' perceptions of the learning environment influences academic performance.

Learners' perceptions of school are influenced by their perceptions of the classroom, by events taking place outside the school and by the people around them. When the goals of the school are clear, reasonably uniform and perceived as important, and when the staff is committed to them, successful school results (Avi-Itzhak & Butler-Por, 1985:14). The findings from previous research highlight the fact better that, achievement on a variety of outcome measures was consistently found in classes perceived as having greater cohesiveness, satisfaction, goal direction, and organisation and less friction (Fraser, 1989:315). A study by McDill, Meyers and Rigsby led to the conclusion that the climate that builds up in high school comes to exert an influence on academic performance over and above what would be predicted on the basis of learners' characteristics alone (Boocock, 1980:200).

The school culture demonstrates constantly to the child how it expects him to behave and what values the adults who mould the culture believe to be important. Much of one's culturally conditioned behaviour, according to Gage & Berliner (1992:162) is unconscious. The school itself reflects the attitudes and values of the community, state, nation or at least the attitudes of the middle class segment of the general population (Gordon, 1975:163). In schools with a greater rapport between parents and community members and school staff, favourable attitudes towards school prevail and achievement is enhanced.

Although each child perceives the school in his unique way, the school situation that is provided for him plays an important role in influencing his self-concept. Within the school there is a system of rules, principles and norms that define what is expected of a student. Social responsibility is defined as adherence to social rules and expectations. The promotion of socially responsible behaviour in the form of moral character, conformity to school rules and norms, co-operation and positive styles of interaction has been a tradition and a valued educational objective (Wentzel, 1991:2).

Learners who adhere to school rules and regulations find the climate of the school favourable and find a sense of acceptance within the school. Teachers prefer learners who are co-operative, responsible and mature. This contention is supported by Bredemeier (1976:193) who states that "average" learners' liked school, felt good about themselves, thought their teachers liked them and were

in fact liked by their teachers. In fact, the teacher's liking of learners as persons is strongly associated with their seeing them as conforming to the learners' role. Learners who are argumentative, assertive and who do not adhere to school rules are perceived unfavourably.

Such learners perceive themselves as unwanted and experience great difficulty in fitting into the pattern of school life. A study of a secondary modern school by David Hargreaves (Haralambos & Holbron, 1991:279) reveals that learners labelled as trouble makers tended to seek out each other's company and within their group, awarded high status to those who broke the school rules. Thus disrupting lessons, giving cheek to teachers, failing to hand in homework, cheating and playing truant all brought prestige (Haralambos & Holbron, 1991:280). Such learners become rebellious and consequently perform poorly. Paying attention and task-on-time are academically relevant components of classroom social responsibility that are consistent with and positive predictors of academic performance (Wentzel, 1991:9).

2.2.7.3 THE PEER GROUP

The human being very much wants to be "someone" and without some form of positive involvement with other people, he/she cannot become someone. The need to be accepted by others, to belong to groups and to identify with peers is a strong motive in all members of modern civilisation, even though the ways of

satisfying the motive are many and varied (Reilley & Lewis, 1983:262). During adolescence, the influence of companions has the strongest hold on the attitudes and behaviour of the child. Strong feelings of identification develop among members of the group and certain behavioural norms are maintained (Van Vuuren, Griessel, Fourie, Visser, Sohnge & Stone, 1988:297).

Wentzel (1991:9) in her article makes the assertion that acceptance by peers has been consistently related to academic achievement at all stages, with socially rejected and aggressive children being especially at risk for academic failure. The adolescent's desire for acceptance is so strong that the behavioural norms of the group are maintained at all costs. These norms are often in conflict with adults and adult approval and any motive that may have been stressed by adults prior to the period of adolescence may be rejected as they seek affiliation with their peers.

The role of the group is so important in the gratification of adolescent needs that if an adolescent is placed in a compromising situation of having to choose between values of the home and those of the peer group, he/she will probably choose those of the group (Van Vuuren, Griessel, Fourie, Visser, Songhe & Stone, 1988:379; Rice, 1992:407; Conger, 1991:355). Peer pressures are strongest upon the child who has been taught to be dependent upon the judgement of others, to under-evaluate his/her own self and own knowledge, or

who has not had clear models and images to identify with at earlier stages in his/her life (Gordon, 1975:235).

Generally, in all schools, academic achievement is perceived as being of lesser importance than, other matters. Being a star athlete; good looking or being popular with the girls are highly valued by boys. For the girls, being good looking, being a cheer-leader, debutant or the belle of the ball are viewed as more important attributes. In his study, Coleman (Boocock, 1980:218) found that when learners were asked to speculate upon their parents' preferences for them, most thought their parents would be very proud of them if they made the basketball or cheerleading team than if they were chosen by a science teacher to act as his or her assistant. Coleman goes on to add, "The reward a child gains from his parents may help reinforce the values of the adolescent culture not because the parents hold these same views but because parents want their children to be successful and esteemed by their peers" (Boocock, 1980:218).

Ballantine (1983:220) reinforces this in her claim that adolescent sub-cultures (the peer group) often place high values on athletics for males, leadership for females, but little value for either gender on academic achievement. The perception that academic achievement is not as important suggests that adolescent sub-cultures are generally deterrents to academic achievement.

It can be concluded that due to the process of industrialisation and the adolescent rebellion, the parents' role in training the adolescent has declined considerably. More and more parents of adolescents bemoan the fact that their children ignore their wise advice while listening to, and emulating their peers (Haralambos & Parke, 1986:548). More and more adolescents are finding acceptance with peers as they feel that their parents are out of touch with the times. The adolescent's perception of the role of the peer group in his/her life plays a particularly significant role. Adolescents who receive too little attention at home and who experience a lack of parental warmth and understanding may turn to the peer group for comfort and security. Peers influence each other by serving not only as reinforcers but also as social models. Adolescents acquire a wide range of knowledge and a variety of responses by observing the behaviour of their peers. Depending on the perceptions of the value of education of the peer group in general and close friends in particular, the adolescent's educational aspirations may be strengthened or weakened.

2.2.7.4 SELF-CONCEPT AND SELF-ESTEEM

Correlation studies show substantive relationships between achievement and self-concept measures (Gage & Berliner, 1992:159; Marsh, 1988:100). The evidence is accumulating to indicate that the level of school success is largely determined by the way in which one views one's self (Feeney, Christensen &

Moravcik, 1987:187; Hessong & Wessels, 1987:235; Riffel, 1991:26). The self-concept is made up of a multitude of self-conceptions.

There are, according to Rice (1992:247) four basic dimensions of self. There is the overall basic concept; the adolescent's social self; the ideal self and the individual's temporary or transitory self-concept. A fifth dimension of self is presented by Mboya (1989:43) who adds that adolescents do have a specific self-concept of academic ability and it is related to academic achievement. According to Potterbaum, Keith and Ehly (1986:140) self-concept and academic achievement cause each other in a cyclical nature. The influence of academic self-concept far exceeds global self-concept as far as academic achievement is concerned (Mboya, 1989:43).

According to Mouly (1973:85), the development of the academic self-concept involves a slow process differentiation. The child gradually and progressively learns to perceive just who he/she is and what his/her abilities are. School climate, background experiences, peer group relationships and other factors in a learner's career influences academic self-concept and vice versa (Ballantine, 1998:182). The nature of the adolescent's self-concept is dependent on how family members and teachers relate to them. It is dependent on the experiences of the individual in his/her life-world. The components of the academic self-concept include attitudes that are charged with feelings such as pride or shame, inferiority, self-esteem or self-reproach (Jersild, 1961:22).

In contrast to the descriptive nature of self-concept, self-esteem involves an additional evaluative component. The term self-esteem refers to those aspects that are evaluative of self-descriptions with respect to the degree of personal satisfaction with the self (Frisby & Tucker, 1993:146). Self-esteem is defined as what people feel about the discrepancy between the way they are (the self-image) and the way they would like to be (the ideal self) (Atherly, 1990:225). According to Rice (1992:248) self-esteem has been called "the survival of the soul"; it is the ingredient that gives dignity to human existence.

Self-esteem plays an important role in personal satisfaction and effective functioning. Research supports a positive relationship between the level of self-esteem and academic achievement (Bagley, 1989:78; Atherly, 1990:225). What determines the adolescent's self-esteem are the parents' and teachers' attitudes towards him or her. When parents judge themselves negatively, they tend to judge their children negatively and eventually the children may come to perceive themselves in the same way. On the other hand, affectionate care and attention from adults who are secure and feel good about themselves will help children to conclude that they are attractive, competent individuals (Freeney, Christensen & Moravcik, 1987:14).

It is the learner's history of success or failure that gives him/her the information with which to assess himself/herself. Learner's self-concepts are tested against

feedback they receive from important people and situations in their lives. Teacher grades and remarks are probably the most significant, the most persistent source of feedback that school children may get concerning their academic performance (Eshel & Kurman, 1990:188). Interaction with teachers and formal school grades inform every child continuously of how good he/she is academically. Research has shown that teachers can improve their learners' academic self-concept through such methods as making positive comments to them and creating an atmosphere of security in the classroom (Mboya, 1989:42).

In general the higher the grade averages, the more likely the learner is to have a high level of self-acceptance; the lower the grade averages, the more likely the learner is to have a high level of self-reproach. With regard to self there is a constant self-probing in search of strength, weakness, vulnerability and resiliency, constant self-scrutiny designed to test the individual's capacity to withstand or use what his society would make of him, ask of him and allow him (Schwitzer & Seth-Smith, 1992: 88).

2.2.7.5 SOCIO-ECONOMIC STATUS OF THE FAMILY

Socio-economic status (SES) or social class, is determined by the income, educational achievement and occupational level of the family, all of which are associated with each other. Virtually all societies are stratified according to SES and the South African black society is not exception to this. Socio-economic

status includes all facets of life such as the environmental condition of living, child-care interactions, values, attitude and expectations (Wicks-Nelson & Israel, 1984:29).

Parent-child interaction differs according to the SES of the family. Lower class parents are restrictive. This makes the child impulsive rather than reflective, to deal with immediate happenings rather than plan for the future, and to be compliant rather than consider alternatives. This behaviour, in turn, may prevent the child from succeeding in systems dominated by less restrictive middle class learners and made up of social interactions such as the school (Wicks-Nelson & Israel, 1984:31).

Low socio-economic status (SES) learners of low ability tend to respond positively to praise because of their frequent encounters with failure and their low self-concept. However, high SES learners of high academic ability are less responsive to praise that is designed essentially to make them feel good. They already feel good (Hamachek, 1990:271). Lower SES school age children tend to perform worse than middle-class children, and hence feel less self-confident about their abilities and in general, feel less in control over their own destiny (Fogel & Melson, 1988:444). This leads to a negative self-concept which has a negative effect on their studies and their lives as a whole.

Many black learners belonging to the lower SES background are subjected to deprivation with regards to the essential requirements of schooling. Because they have a valid financial setback, they often drop out of school early. If they are at school, they normally place schooling as a secondary aspect in their lives. Their normal day-to-day meals are their primary concern.

The value placed on education by lower-class children is likely to parallel that of their parents. As they may have no educational aspirations after school, they may perceive the academic nature of the school as being useless in terms of their needs. This problem is further exacerbated in that the lower-class parent, instead of being concerned with his/her child's education, focuses more attention on the child having good manners, being neat and clean, honest and obedient, behaving properly and not getting into trouble (Lindgren & Suter, 1995:109; Nye & Bernado, 1993:60).

According to Rupasinghe (Gelagedera, 1991:16) among other factors; education level of the parents, their occupational category, social class and language proficiency are associated with high and low achievement at examinations. The lower-class child approaches school unorientated toward learning but attuned to a need to getting along with the institution. School experience is defined, for him/her, as a problem of adapting to the teacher and the peer situation (Strom, 1999:38). Such a child perceives that the major function of the school is in conformity rather than mental activity. On the other hand, the upper and middle-

class children may perceive school in terms of their learning experiences and due to their earlier mental stimulation by their parents they find pleasure in learning.

2.2.8 CONCLUSION

This chapter has reviewed some of the literature which focuses on the theories of career choice and development such as personality based theories, developmental theories, career choices, interests as well as the relationship of vocational interests to career choices. Focus was also given to a number of factors considered to be associated with the academic performance of black learners.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes:

- The research design used in this study;
- The sampling strategy utilised and the demographic profile of the sample;
- Research instruments;
- The procedure followed in conducting the fieldwork; and
- Statistical treatment of the data.

3.2 RESEARCH DESIGN

"The aim of a research design is to plan and structure a given research project in such a manner that the eventual validity of the research findings is maximised" (Mouton & Marais, 1990: 33).

According to Goginsky and Collins (1996: 381) research design is the basis from which study outcomes are obtained. Without a research design the study will lack credibility. They add that, a well-designed study with results that are statistically significant is acclaimed as a contribution to the field in which it is taking place while those from a poorly designed one is considered inconclusive, even if it may be statistically significant. A research that requires numeric responses is called a quantitative research (Johnson & LaMontagne, 1993: 74) while one requiring responses that are non-numeric is a qualitative research (Polkinghorne, 1995: 6). According to Hussey & Hussey (1997) the structures of research are termed the research design. The concept of research design refers to the architecture, strategy and tactics to be used in the research (Sackett & Wennberg, 1997: 1636).

3.3 RESEARCH APPROACH

This study is a combination of the qualitative and quantitative research types. It requires analyses of numeric (quantitative) responses, which are the marks obtained by learners, the aptitude test scores and the minimum marks required by institutions for admitting learners into their chosen courses. It also requires analyses of non-numeric (qualitative) responses, which are the career choices and the institutions where their career choices will be pursued.

The representativity of the sample is a necessity, and the sample should be as large as possible (Ghauri, Gronhaug & Kristianlund, 1995). The grade 12 learners in Mamelodi high schools, who comprise the sample frame, possess the information that the study requires. As a result of the above points, the decision, which is in line with the ideas of Cresswell (1994) was made to use a case study of a sample of learners in one school, thus converting the selected sample to a convenience, non-probability sample.

3.4 RESEARCH SUBJECTS

The research subjects (or respondents) of the study were the grade 12 learners of Vukani Mawethu High School who in the year 2002 were enrolled for the Economic and Management Science group, the Human and Social Science group and the Natural Science group.

Sampling design enlightens about who the targeted respondents in the surveys are, and how they were engaged in the study (Baker, 1991), explaining the sample frame that will be used, why it should be taken as the sample frame and how the sample selection will be made. The research population was the grade 12 learners in South Africa, and the grade 12 learners in Mamelodi high schools served as the sampling frame.

The selected Grade 12 learners served as the sample in this study, whose responses were expected to provide the researcher with answers to the research questions listed in Chapter 1.

The requirements for admission to different courses as set by tertiary institutions are given in terms of minimum marks to be obtained by high school learners. The set minimum marks are called merit (M) scores. An M score is an average of marks calculated from a combination of minimum marks from subjects that are relevant prerequisites for the course to be pursued and intended to serve as criteria for accepting or rejecting students to the course. Whenever the M scores are given they are not data to be analysed, but guidelines to be used in admitting or rejecting a student to a course of study.

3.5 RESEARCH INSTRUMENTS

The research instruments used in this study comprised the following:

- Performance reports for half-yearly examinations for the three sample groups;
- A questionnaire for the careers, called career questionnaire in which each learner indicates personal information about him- or herself, the career s/he chooses, and the type of institution at which the learner wishes to pursue his/her studies;

- The Career Preference Inventory (CPI) is useful in career assessment (du Toit, 1999). The CPI helps learners to determine their career preferences or vocational interests. The inventory comprises 126 items to which the subjects have to tick 'yes' or 'no'. There is no time limit, but on average it takes approximately 40 minutes to complete the inventory;
- The Differential Aptitude Test-Form K (DAT-K) is also useful in career assessment. The complete DAT-K comprises 9 sub-tests and takes approximately 3-4 hours to complete. Each sub-test has a focus that is determined by the grade 12 subjects a learner is taking at school. As an example, a learner taking Mathematics, Physical Science and Biology chooses sub-tests 2, 3, 7 and 8 of the DAT-K, as these tests are only relevant for the Natural Science direction; and
- A copy of admission requirements from the University of Pretoria that has the M scores.

3.6 SAMPLING

The present research is confined to the population of grade 12 learners, whose career choices, academic performance and aptitudes are compared. The sample frame comprised the grade 12 learners in Mamelodi, a township in the east of Pretoria. Three samples of 12 learners each were taken from the Vukani Mawethu High School in Mamelodi, a school established by the Department of

Education in the late 1990's because of the large number of learners in other high schools. There are several reasons for choosing this school.

The choice of Vukani Mawethu High School was mainly because it had a large learner population, was easily accessible and offered a wide range of subject choice at grade 12 level. The large learner population made this school fairly representative of schools in Mamelodi in respect of the socio-economic level of learners' parents, language instruction and educator profile.

The total sample of 36 learners (equal males and females) was chosen as follows:

- One random sample of 12 learners from grade 12 class of learners who took Economic and Management Sciences (Accountancy, Business Economics, Economics and/or Mathematics).
- Another random sample of 12 learners who took Human and Social Sciences (History, Geography and Biblical Studies).
- A final sample of 12 learners who took Natural Sciences (Biology, Mathematics, and Physical Science).

The sample distribution is shown in Table below.

Table 3.1: Distribution of participants

Economic and Management Sciences $N_1 = 12$	Human and Social Sciences $N_2 = 12$	Natural Sciences $N_3 = 12$
Accountancy Business Economics Economics Mathematics	History Geography Biblical Studies	Biology Mathematics Physical Science
6 males 6 females	6 males 6 females	6 males 6 females

3.7 DATA COLLECTION

Data used in a research is categorised as primary or secondary data, where primary data consist of data that is collected first hand for the purpose at hand and secondary data is data that is already in existence somewhere, having been collected for another purpose (Kotler, Bowen & Makens, 1153-1154). Usually research uses one of the above data types, but some researches such as this

one, use both primary and secondary data.

Performance reports are available in the school records and a copy of M scores was obtained from the University of Pretoria. Both these are secondary data. For the collection of primary data, the career questionnaire, the CPI and the DAT-K were administered by the researcher with the help of a Guidance educator in the school. The M score for each subject serves as the minimum mark required for that subject in order to admit a student to a course of study. The performance reports were the marks obtained by students in June examination and used in this study to evaluate students' chances of qualifying for admission into the courses that the learners wished to pursue at tertiary level. The primary data were collected by the researcher using the CPI and the DAT-K.

3.8 DATA ANALYSES

Information gathered from the performance reports, the CPI and the DAT-K is quantitative in nature, hence appropriate for statistical analyses. Information from the careers questionnaire was subjected to some conversions and coding in an attempt to compare with the quantitative data. Consequently, some qualitative responses were transformed into quantitative forms.

The data collected were presented in the form of tables to derive the research findings. Statistical analyses used include the analysis of variance (ANOVA) to

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

4.1 INTRODUCTION

The purpose of the study is to attempt to find ways of assisting learners at school to link their potential and aptitudes with career choices. In the last chapter it was explained how the study was undertaken. This chapter presents the findings by extracting responses from the questionnaires. The findings are discussed in Chapter 5. Three groups of Grade 12 learners were surveyed, namely; the Economic and Management Science group, the Human and Social Science group, and the Natural Science group. The findings are presented separately for each group.

At the beginning of each section is a table presenting the sample of 12 learners from each group with their performances in the mid-year examinations. Their performance was presented initially in percentage form (%), and also converted to merit (M) scores, presented as "mark obtained" in the same table to make comparison easy with what the learners wish to pursue at higher learning institutions. The minimum marks required for the courses the learners wish to pursue are also presented, as well as the corresponding M scores for these

courses. The tables also indicate learners' aptitude test scores, the courses they wish to pursue after obtaining their senior certificates, the institutions at which they want to study and the courses they want to pursue. The marks obtained by learners and required for admission are in the higher grade.

The data analysis tables compare marks obtained with the marks required for entry into desired courses and institutions. Further, they compare the aptitude scores, performances, M scores obtained by learner and M scores required for the desired courses. Alpha is set at the 5% level for all the statistical analyses in the present study. Acronyms used in the tables in this chapter are presented hereunder.

Key to acronyms

Learner perform = learner performance (in %) in relevant subject
Aptitude Score = aptitude score obtained by learner
CC = career choice
MR = merit score requirement for chosen career
Mark obtained = obtained mark converted to the M score scale
Preferred Institute = institution preferred by learner
T = Technikon
U = University
TC = Technical College
Minmarkreq = minimum mark required for entry into course
Acct = course in accounting
Mkt = course in marketing
Mgt = course in management
P Art= performance arts

The data and tables present various analyses, such as t-tests, F-tests and analysis of variance (ANOVA).

4.2 ECONOMIC AND MANAGEMENT SCIENCE LEARNERS

Table 4.1: Career choices, academic performance and aptitude of learners of Economic and Management Science learners

Learner number	Learner perform	Minmarkreq	MR	Mark obtained	Aptitude Score	CC	PInst
1	15.00	35	5	0	4.00	Clerk	TC
2	16.50	35	5	2	3.62	Mgt	TC
3	22.50	40	5	0	2.75	Mgt	T
4	25.00	50	15	1	5.00	Acct	U
5	29.00	40	5	5	6.00	P Art	T
6	33.00	50	15	3	5.25	Acct	U
7	26.50	45	5	2	5.50	Mkt	T
8	29.50	40	5	1	3.00	P Art	T
9	40.00	45	8	4	3.75	Mkt	U
10	55.00	45	5	6	3.50	Acct	T
11	43.00	45	5	2	4.14	Mkt	T
12	35.50	40	5	2	5.00	Mgt	T

4.2.1 PRELIMINARY ANALYSIS

An inspection of Table 4.1 shows that the performance of all the Economic and Management Science learners, with the exception of learner number 10, is generally lower than the required minimum mark for the courses the learners wish to pursue for their chosen careers. Learners number 9, 11 and 12 are only marginally lower than the required minimum. The same observation is made with regard to the mark obtained by learner when compared with MR (M score required).

Statistical analyses of career choice, academic performance and aptitude of the Economic and Management Science learners are presented hereunder.

4.2.2 PERFORMANCE VERSUS MINIMUM MARKS REQUIRED

Table 4.2: Single factor analysis of variance for performance and minimum marks required by the Economic and Management Science learners

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Learner Perform	12	370.5	30.9	129.64		
MinMarkReq	12	510	42.5	25		
ANOVA						
Source of Variation	SS	df	M Obt	F	P-value	F crit
Between Groups	810.8	1	811	10.487	0.003775	4.3009
Within Groups	1701.1	22	77.3			
Total	**2511.9**	**23**				

The null hypothesis for Table 4.2 is that learner performance and minimum marks required for admissions into the chosen courses are identical. The critical region (region where null hypothesis is rejected) has been calculated to be $\{F \geq 4.3009\}$.

The derived value of F = 10.487 is statistically significant at the 5% level. Hence there is a significant difference between learner performance marks and minimum marks required for admission to the chosen courses.

However, the statistic does not indicate which is higher between performance scores and the minimum marks required for admission into the chosen courses, but the means suggest that performances are lower. A one-tailed t-test of comparison is in this case more appropriate for the comparison. The t-test that follows in the next table tests the alternative hypothesis that learner performances are lower than minimum marks.

4.2.3 PERFORMANCE VERSUS MINIMUM MARK REQUIRED

Table 4.3: t-test of performance vs minimum mark required

t-Test: Two-Sample Assuming Unequal Variances		
	Learner performance %	*Minimum mark required*
Mean	30.875	42.5
Variance	129.64	25
Observations	12	12
Hypothesized Mean Difference	0	
df	15	
t Stat	-3.238	
P(T<=t) one-tail	0.0028	
t Critical one-tail	1.7531	
P(T<=t) two-tail	0.0055	
t Critical two-tail	2.1315	

The null hypothesis being tested is that the learner performance (as a percentage) is lower than the minimum mark required where the learners wish to pursue future careers. The variances of the two data sets being compared are different, hence the reason for using the t-test of unequal variances. The calculated statistic gives t = –3.238.

The calculations indicate a possibility that learner performance is inferior to the minimum mark required. The appropriate statistical test from Table 4.3 gives the critical region {t ≤ – 1.7531}, which contains the calculated value of the test statistic. The statistic is significant and the null hypothesis rejected, indicating that learner performance is lower than the required minimum mark.

4.2.4 M SCORE OBTAINED VERSUS APTITUDE SCORE

Table 4.4: Single factor analysis of variance

SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
CR	12	83	6.92	14.992		
Mark obtained	12	28	2.33	3.5152		
Aptitude Score	12	51.51	4.29	1.075		
ANOVA						
Source of Variation	*SS*	*df*	*M Obt*	*F*	*P-value*	*F crit*
Between Groups	126.93	2	63.5	9.7224	0.000479	3.2849
Within Groups	215.41	33	6.53			
I	**342.33**	**35**				

The null hypothesis being tested in Table 4.4 is that the learner performance (given in terms of the M scores) is identical to the learner aptitude. The table gives the critical region as {F ≥ 3.2849}.

The value calculated for the test statistic is F = 9.7229. This value is within the critical region, and therefore the statistic is significant. The null hypothesis that

learner aptitude scores and learner performances are identical is rejected. The null hypothesis that the merit scores obtained by the learner and the learner aptitude are identical is also rejected.

Further analyses are presented hereunder to examine whether aptitude or performance is higher.

4.2.5 M SCORE REQUIRED VERSUS M SCORE OBTAINED

Table 4.5: **Comparison of means: M required vs M obtained**

t-Test: Two-Sample Assuming Unequal Variances		
	MR	*Mark Obtained*
Mean	6.9167	2.33333
Variance	14.992	3.51515
Observations	12	12
Hypothesized Mean Difference	0	
Df	16	
t Stat	3.6906	
P(T<=t) one-tail	0.001	
t Critical one-tail	1.7459	
P(T<=t) two-tail	0.002	
t Critical two-tail	2.1199	

The null hypothesis is that the M score required and the M score obtained are identical. The variances are completely different and the t-test of unequal variances is used. The value of the test statistic is t = 3.6906.

The two-tailed test has the critical region as $\{t \leq -2.1199;\ t \geq 2.1199\}$. The calculated value of the test statistic falls within the critical region. The statistic is

therefore significant. The hypothesis that the merit score obtained and the merit scores required are identical, is rejected.

Since there is also an indication that the merit score obtained are lower than the merit scores required, the one-tailed test may be used. The critical region for this test is {t ≥ 1.7459}. The calculated value of the test statistic is within the critical region. Hence we reject the null hypothesis. The conclusion is that there is an indication that the M scores obtained by the learners are lower than the merit scores required for entrance into courses for their chosen careers.

4.2.6 M SCORE REQUIRED VERSUS LEARNER APTITUDE

Table 4.6: Comparison of means: M required vs Aptitude score

t-Test: Two-Sample Assuming Unequal Variances		
	MR	*Aptitude Score*
Mean	6.9167	4.2925
Variance	14.992	1.07498
Observations	12	12
Hypothesized Mean Difference	0	
Df	13	
t Stat	2.2678	
P(T<=t) one-tail	0.0205	
t Critical one-tail	1.7709	
P(T<=t) two-tail	0.041	
t Critical two-tail	2.1604	

In this test the M scores required for the courses of the career chosen by the learners that correspond to the careers are compared with the aptitude of the learners. The variances of the two samples are completely different,

and a two-sample t-test assuming unequal variances is used. The test statistic yields t = 2.2678.

A two-tailed test has the critical region $t \leq -2.1604$; $t \geq 2.1604\}$. The calculated test statistic falls in the critical region. This leads to the conclusion that the statistic is significant. The M scores required and the learner aptitude are not identical.

However, it would appear that the M scores required are higher than the learner aptitude, which then serves as the alternate hypothesis. The critical region for this test is $\{t \geq 1.7709\}$. The statistic is significant. Hence the conclusion is that M scores required for the course that the learners wish to pursue, are higher than the aptitude scores of the learners.

In the next table the M scores are compared with aptitude scores. The first part compares them to find if they are different, without finer details. The second part compares to find which one is higher between the two, which is indicated by the alternative hypothesis.

4.2.7 M SCORE OBTAINED VERSUS APTITUDE SCORE

Table 4.7: **Comparison of means: M obtained vs Aptitude score**

t-Test: Two-Sample Assuming Unequal Variances		
	Mark Obtained	*Aptitude Score*
Mean	2.3333	4.2925
Variance	3.5152	1.07498
Observations	12	12
Hypothesized Mean Difference	0	
df	17	
t Stat	-3.168	
P(T<=t) one-tail	0.0028	
t Critical one-tail	1.7396	
P(T<=t) two-tail	0.0056	
t Critical two-tail	2.1098	

The remaining test compares the M scores the learners have obtained with the aptitude of the learners. It still assumes unequal variances and the t-test of unequal variance is used. The null hypothesis is that the M scores are identical to the learner aptitudes. The test statistic calculated gave the value $t = -3.1680$.

Considering the two-tailed test first, the corresponding critical region is given by $\{t \leq -2.1098;\ t \geq 2.1098\}$. The calculated test statistic falls in the critical region. The conclusion is that the M scores obtained and the aptitude of the learners are not identical.

Considering a left, one-sided test given by the alternative hypothesis that the M scores obtained are inferior to the learner aptitude scores, the corresponding critical region is $\{t \leq -1.7396\}$. The calculated value of the statistic is in the critical

region, and the test is significant. The null hypothesis is rejected. Therefore, there is an indication that the M scores required for the chosen courses are higher than the learner aptitude scores.

4.3 HUMAN AND SOCIAL SCIENCE LEARNERS

Table 4.8: Career choices, academic performance and aptitude of Human and Social Science learners

Learner number	Learner Perform	MinMarkReq	MR	Mark Obtained	Aptitude Score	CC	Pinst
1	37	40	5	5	3.50	Nur	T
2	35	40	5	4	7.25	Mkt	U/C
3	20	50	13	3	5.50	Law	U
4	18	50	8	2	4.00	Nur	U
5	42	50	5	9	6.25	Mat	T
6	32	40	5	2	4.75	Cler	T
7	28	50	8	1	2.75	Mat	U
8	22	50	11	0	3.50	Edu	U
9	36	40	5	4	3.50	Edu	T
10	40	40	5	5	5.25	Cler	T
11	36	40	5	3	4.50	Edu	T
12	32	40	5	2	6.50	Mkt	T

4.3.1 PRELIMINARY ANALYSIS

There is an indication that the marks obtained by the learners are lower than the marks required by the courses for the careers that the learners have chosen. This was the case with the Economic and Management Science group. It is not

clear, however, at face value, whether the seriousness of the inferiority of the scores in the Human and Social Science group is or is not more severe as in the Economic and Management Science group.

The "NoMatch" column was presented to identify the career that some learners chose for their future when in fact the school subjects they were taking would not lead to those careers. This column triggers the awareness that some of the learners have poor understanding about career decisions.

4.3.2 PERFORMANCE VERSUS MINIMUM MARKS REQUIRED

Table 4.9: Comparison of learners' performance and minimum marks required

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Learner Perform	12	378	31.5	62.091		
MinMarkReq	12	530	44.2	26.515		
ANOVA						
Source of Variation	*SS*	*df*	*Mark Obtained*	*F*	*P-value*	*F crit*
Between Groups	962.667	1	963	21.729	0.00012	4.3009
Within Groups	974.667	22	44.3			
Total	**1937.33**	**23**				

The learner performances are compared with the minimum marks required for entrance in the courses that correspond with the careers chosen by the

learners. The null hypothesis is that the marks the learners obtained and the minimum percentages required are identical. The statistical used in the investigation is an F-test.

The critical region for this test is $\{F \geq 4.3009\}$. The calculated value of the test statistic is $F = 21.729$, which falls is highly significant. Hence, the null hypothesis is rejected at the 5% level.

The conclusion is that there is no statistical evidence that indicates that the learner performance and the required performance are identical.

In the next sets of analyses the marks obtained by the learners have been converted to M scores to make comparison easier as the requirements of the courses are given as M scores at most points and only as percentages in few other instances. Further, M scores were converted to scores that would facilitate the comparison of post-matriculation requirements and the marks obtained, with the aptitude scores.

4.3.3 M SCORE OBTAINED VERSUS APTITUDE SCORE

Table 4.10: Comparison of M scores obtained and aptitude scores

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
MR	12	80	6.67	7.697		
Mark Obtained	12	40	3.33	5.5152		
Aptitude Score	12	57.25	4.77	1.9711		
ANOVA						
Source of Variation	*SS*	*df*	*Mark Obtained*	*F*	*P-value*	*F crit*
Between Groups	67.0868	2	33.5	6.6277	0.003804	3.2849
Within Groups	167.016	33	5.06			
Total	**234.102**	**35**				

The M score required for admission into the courses that correspond to the careers that the learners have chosen are compared with the aptitude score of the learners. An F-test is used in this comparison. The null hypothesis is that the two are identical.

The critical region is read from the table as {F ≥ 3.2849}. The calculated value of the test statistic, which falls in the critical region, is F = 6.6277. Therefore, the statistic is significant. The conclusion is that the aptitude scores of the learners and the M scores required by the courses that the learners hope to pursue are not identical.

4.3.4 PERFORMANCE VERSUS M SCORE REQUIRED

Table 4.11: Comparison of means: Performance vs Mark required

t-Test: Two-Sample Assuming Unequal Variances		
	Learner Perform	*MinMarkReq*
Mean	31.5	44.16666667
Variance	62.0909	26.51515152
Observations	12	12
Hypothesized Mean Difference	0	
df	19	
t Stat	-4.6615	
P(T<=t) one-tail	8.5E-05	
t Critical one-tail	1.72913	
P(T<=t) two-tail	0.00017	
t Critical two-tail	2.09302	

In Table 4.11 performance of the learners is compared with the marks required for admission into the courses that correspond with the careers that the learners have chosen. The null hypothesis is that the performance of the learners and their aptitudes are identical. Due to obviously unequal variances that were also verified by the F-test, the t-test of unequal variances is used. The test statistic is calculated as t = –4.665.

If a two-tailed test is used, the critical region is {t ≤ – 2.0930; t ≥ 2.0930}. The value of the test statistic falls in the critical region. Thus the test is significant and the null hypothesis rejected. The conclusion is that the performance of learners and the minimum performance required are not identical.

There is the suspicion that the learners' performances are inferior to the minimum marks required for admission into desired courses. The alternative hypothesis then leads to a left of the one-tailed test. The one-tailed version of the above test is now conducted. The critical region is $\{t \leq -1.729\}$.

The test statistic calculated falls in the critical region. The null hypothesis is therefore accepted. The conclusion reached is that, at the 5% significance level, performance of learners is lower than the minimum performance required for admission into courses leading to the careers that the learners have chosen.

4.3.5 M SCORE REQUIRED VERSUS M SCORE OBTAINED

Table 4.12: Comparison of means: mark required vs mark obtained

t-Test: Two-Sample Assuming Unequal Variances		
	MR	*Mark Obtained*
Mean	6.66667	3.333333333
Variance	7.69697	5.515151515
Observations	12	12
Hypothesized Mean Difference	0	
df	21	
t Stat	3.17675	
P(T<=t) one-tail	0.00227	
t Critical one-tail	1.72074	
P(T<=t) two-tail	0.00454	
t Critical two-tail	2.07961	

The marks required for a learner to gain admission into desired courses are compared with the marks the learners have obtained. The null hypothesis is that the marks required and the marks obtained are identical. A t-test of

unequal variances is used for this comparison. The value of the test statistic has been calculated as t = 3.1768.

A two-tailed test has the critical region {$t \leq -2.0796$; $t \geq 2.0796$}. The test statistic falls in the critical region and therefore, it is significant. The null hypothesis is rejected and it is concluded that at the 5% significance level, the marks that the learners have obtained are not identical to the marks required for the courses that lead to the careers that the learners have chosen.

A right, one-sided test may also be used to test the null hypothesis with the alternative hypothesis that the marks required for admission are higher than the marks that the learners have obtained. The critical region for this version of the test is {$t \leq -1.7207$}.

The calculated test statistic falls within the critical region. Therefore, it is concluded that at the 5% level of significance, the marks that are required for the learners to gain admission into the courses that correspond to the careers the learners have chosen are higher than the actual marks that the learners have obtained.

4.3.6 M SCORE REQUIRED VERSUS APTITUDE SCORE

Table 4.13: Comparison of means: M required vs Aptitude score

t-Test: Two-Sample Assuming Unequal Variances		
	MR	*Aptitude Score*
Mean	6.66667	4.770833333
Variance	7.69697	1.971117424
Observations	12	12
Hypothesized Mean Difference	0	
df	16	
t Stat	2.11213	
P(T<=t) one-tail	0.02538	
t Critical one-tail	1.74588	
P(T<=t) two-tail	0.05075	
t Critical two-tail	2.1199	

Table 4.13 tests the hypothesis that the M score required for the courses that correspond with the careers that the learners have chosen are identical with the aptitudes of the learners. It is clear from this table that variances of the two data sets are unequal, and the t-test is based on this assumption. The test statistic has been calculated as t = 2.1121.

The two-tailed test is initially assumed. The corresponding critical region is $\{t \leq -2.0796; t \geq 2.0796\}$, which does not include the calculated value of the test statistic. The statistic is therefore significant. This leads to the conclusion that the M scores required for admission into desired courses are not identical to the aptitude scores of the learners.

To derive more detail into the issue, it seems that the M required might be higher than the aptitude scores obtained by the learners. Thus, a right one-sided t-test may be used. The critical region is {t ≥ 1.7459}. This critical region, also, does not include the value of the test statistic. The statistic is thus significant, leading to the rejection of the null hypothesis. Therefore the M scores required for entry into desired courses are higher than the learners' performances.

4.3.7 M SCORE OBTAINED VERSUS APTITUDE SCORE

Table 4.14: Comparison of means: M obtained vs Aptitude score

t-Test: Two-Sample Assuming Unequal Variances		
	Mark Obtained	*Aptitude Score*
Mean	3.33333	4.770833333
Variance	5.51515	1.971117424
Observations	12	12
Hypothesized Mean Difference	0	
df	18	
t Stat	-1.82	
P(T<=t) one-tail	0.04272	
t Critical one-tail	1.73406	
P(T<=t) two-tail	0.08543	
t Critical two-tail	2.10092	

In Table 4.14 the M scores obtained by the learners are compared with their aptitude test scores. The null hypothesis is that these two scores are identical. The variances have been found to be unequal (see table) and the t-test that is based on unequal variances is used. The calculated test statistic is t = –1.82.

The critical region for the two tailed test is {$t \leq -2.1009$; $t \geq 2.1009$}, from the table. The value of the test statistic falls outside the critical region, and the statistic is not significant. The null hypothesis cannot be rejected. There is no difference between the M scores and the aptitude scores of the learners.

To explore further, the alternative hypothesis is set to state that the M scores obtained are lower than the aptitude test scores. For the one-tailed version of the test, the critical region is {$t \leq -1.7341$}, also as obtained from the table. The calculated value of the test statistic falls in the critical region.

It is concluded therefore that at the 5% significance level, the marks obtained by the learners are lower than the required marks for admission into the desired courses.

4.4 NATURAL SCIENCE LEARNERS

Table 4.15: Career choices, academic performance and aptitude of Natural Science learners

Learner number	Learner Perform	MinMarkReq	MR	Mark Obtained	Aptitude Score	CC	PInst
1	45.00	45	5	7	5.75	Math	T
2	44.50	50	8	7	7.25	Biotech	U
3	41.00	50	8	13	5.50	Chem	U
4	33.50	40	5	8	6.00	Educ	T
5	35.50	45		5	5.75	Math	T
6	64.00	50	12	12	5.75	Math	U
7	82.00	40	5	23	7.00	Eng	T
8	56.50	40	5	7	7.00	Eng	T
9	39.00	40	5	7	6.25	Nurs	T
10	40.00	45	5	8	6.50	IT	TC
11	63.50	40	5	20	7.50	Mkt	T
12	45.00	40	5	3	3.00	Health Sc	T

4.4.1 PRELIMINARY ANALYSIS

The data in Table 4.15 are not as "depressing" as in the previous two tables where it was obvious that the learner performances were inferior to the minimum marks required for admission into chosen careers.

Eye observation shows that for the Natural Science group, learner performances are higher than the minimum marks required for admission to the courses that lead to the careers chosen by the learners. However, this observation needs to be subjected to statistical analyses.

4.4.2 PERFORMANCE VERSUS MINIMUM MARKS REQUIRED

Table 4.16: Comparison of learner performance and minimum mark required

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Learner Perform	12	589.5	49.1	209.1		
MinMarkReq	12	525	43.8	18.75		
ANOVA						
Source of Variation	*SS*	*df*	*Mark Obtained*	*F*	*P-value*	*F crit*
Between Groups	173.3438	1	173	1.5216	0.230397	4.30094
Within Groups	2506.313	22	114			
Total	**2679.656**	**23**				

Learner performance is compared with the minimum mark required for admission to the course to which the learner wishes to enroll. The null hypothesis that is being tested is that the learner performance is identical to the minimum mark required for admission.

The critical region for this test is $\{F \geq 4.3009\}$. The calculated value of the test statistic is $F = 1.5216$, which lies outside the critical region. The statistic is not significant, and the null hypothesis is accepted.

4.4.3 M SCORE OBTAINED VERSUS APTITUDE SCORE

Table 4.17: Comparison of M scores and aptitude scores

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
CR	12	73	6.0833333	4.810606		
Mark Obtained	12	120	10	36.36364		
Aptitude Score	12	73.25	6.1041667	1.402936		
ANOVA						
Source of Variation	*SS*	*df*	*Mark Obtained*	*F*	*P-value*	*F crit*
Between Groups	122.07	2	61.036458	4.300646	0.021889	3.284924
Within Groups	468.35	33	14.192393			
Total	**590.42**	**35**				

The table compares M scores obtained by learners with their aptitudes. The null hypothesis is that the M scores and the aptitude scores are equal. An F-test gives the critical region {F ≥ 4.3009}. The test statistic F = 4.3006 falls in the critical region. The statistic is significant and the null hypothesis rejected. The conclusion is that the M scores are not identical to the aptitude scores.

4.4.4 PERFORMANCE VERSUS M SCORE REQUIRED

Table 4.18: Comparison of means: Performance vs Mark required

t-Test: Two-Sample Assuming Unequal Variances		
	Learner Perform	*MinMarkReq*
Mean	49.125	43.75
Variance	209.0966	18.75
Observations	12	12
Hypothesized Mean Difference	0	
df	13	
t Stat	1.233525	
P(T<=t) one-tail	0.119609	
t Critical one-tail	1.770932	
P(T<=t) two-tail	0.239218	
t Critical two-tail	2.160368	

The learner performances are compared with the minimum marks required for admission into the courses that correspond with the careers chosen by the learners. The variances are unequal, and the t-test used assumes unequal variances. The null hypothesis is that learner performances and the minimum marks required for admission are identical. The test statistic gives t = 1.2335.

The two-tailed test has critical region $\{t \leq -2.1604;\ t \geq 2.1604\}$. The test statistic is not in this region, and the statistic is not significant. The hypothesis that learner performances and minimum marks required are equal is accepted.

There is however, a slight indication that the learner performances are higher than the minimum marks required for admission into the desired courses. This leads to the right, one-tailed test to test the alternative hypothesis that learners

perform higher than the minimum marks required.

The critical region is {t ≥ 1.7709}, and also does not enclose the value of the test statistic. Again, there is no statistical evidence that the learner performances are higher than minimum marks required for admission into courses that the learners hope to pursue.

4.4.5 M SCORE REQUIRED VERSUS M SCORE OBTAINED

Table 4.19: Comparison of means: mark required vs mark obtained

t-Test: Two-Sample Assuming Unequal Variances		
	MR	*Mark Obtained*
Mean	6.083333	10
Variance	4.810606	36.36363636
Observations	12	12
Hypothesized Mean Difference	0	
df	14	
t Stat	-2.11444	
P(T<=t) one-tail	0.02645	
t Critical one-tail	1.761309	
P(T<=t) two-tail	0.0529	
t Critical two-tail	2.144789	

Comparison is made between the M scores required by the institutions for the courses that the learners wish to pursue and the M scores that the learners have obtained. The variances are different and the t-test used assumes this as well. The test statistic is t = –2.1144.

The critical region for the two-tailed test is {t ≤ –2.1448; t ≥ 2.1448}. Since the

value of the test statistic falls outside the critical region, the statistic is not significant. The null hypothesis is accepted. There is no significant difference between the M scores required and the M scores obtained by the learners.

A possible one-sided test exists though, with the alternate hypothesis that the M scores required by the learners are lower than the M scores obtained for admission into the courses. The critical region is $\{t \leq -1.7613\}$.

The value of the test statistic falls in the critical region, and hence the statistic is significant. The null hypothesis is rejected and the conclusion is that there is enough statistical evidence to believe that the learners have obtained higher scores than the scores required for admission into courses that they wish to pursue.

In the next test the M scores are compared with the learner aptitude. The first part of the test checks if there is a difference between the two data sets, and the second part explores to establish which of the two is higher.

4.4.6 M SCORE REQUIRED VERSUS APTITUDE SCORE

Table 4.20: Comparison of means: M required vs Aptitude score

t-Test: Two-Sample Assuming Unequal Variances		
	MR	*Aptitude Score*
Mean	6.083333	6.104166667
Variance	4.810606	1.402935606
Observations	12	12
Hypothesized Mean Difference	0	
df	17	
t Stat	-0.02895	
P(T<=t) one-tail	0.48862	
t Critical one-tail	1.739606	
P(T<=t) two-tail	0.97724	
t Critical two-tail	2.109819	

The M scores required for admission into institutions for courses leading to the careers chosen by the learners are compared with the learner aptitude scores. The null hypothesis is that the M scores required for admission and learner aptitude scores are identical. A t-test assuming unequal variances is used. The test statistic has been calculated as $t = -0.0290$.

The critical region for the two-tailed test is $\{t \leq -2.1098; t \geq 2.1098\}$. The value of the test statistic does not fall in the critical region, and hence, the statistic is not significant. There is no statistical evidence to believe that the M scores obtained by the learners and the aptitude scores of the learners are different.

Therefore, it seems that the M scores required for admission into the courses that lead to the chosen careers chosen are lower than the aptitude scores of the

learners. The left, one-tailed test to test the alternative hypothesis shows that the M scores required for admission are lower than the aptitude scores of the learners. The critical region for this alternative hypothesis is {t ≤ –1.7396}. The value of the test statistic falls outside the critical region and the conclusion that there is no evidence to believe that these scores differ is still valid.

4.4.7 M SCORE OBTAINED VERSUS APTITUDE SCORE

Table 4.21: Comparison of means: M obtained vs Aptitude score

t-Test: Two-Sample Assuming Unequal Variances		
	Mark Obtained	*Aptitude Score*
Mean	10	6.1042
Variance	36.3636	1.4029
Observations	12	12
Hypothesized Mean Difference	0	
df	12	
t Stat	2.1960	
P(T<=t) one-tail	0.0242	
t Critical one-tail	1.7823	
P(T<=t) two-tail	0.0485	
t Critical two-tail	2.1788	

The M scores that the learners have obtained are compared with their aptitude test scores. The variances are unequal (see Table 4.21), the t-test used in the comparison assumes unequal variances. The null hypothesis is that the M scores obtained by the learners are identical to their aptitude scores. The test statistic calculated is t = 2.1960.

The critical region for this test is {t ≤ –2.1788; t ≥ 2.1788}, which includes the

value of the test statistic. The statistic is significant and the null hypothesis is thus rejected. Hence, the M scores and the aptitude scores obtained by the learners are not identical.

Testing further, the seemingly logical alternative hypothesis that the M scores obtained are higher than the aptitude scores of the learners is proposed. The critical region is $\{t \geq 2.1788\}$, which contains the value of the test statistic. The statistic is significant and the null hypothesis is thus rejected. There is statistical evidence that the M scores obtained by these learners are higher than their aptitude scores.

4.5 DISCUSSION OF RESULTS

4.5.1 DISCUSSION OF SEPARATE GROUPS

The learners were evaluated using their aptitude scores and their mid-year examination scores against the requirements of the courses they wish to pursue after matriculation so that they can embark on their chosen careers.

The Economic and Management Science learners' M scores were lower than the minimum marks required for admission to their chosen careers. Their M scores were also lower than their aptitude scores. Also, the required M scores were higher than their aptitude scores.

The Human and Social Science learners performed lower than what they are required to obtain if they are to be admitted to the courses they wish to pursue after completing Grade 12. The M scores obtained by these learners were also lower than their aptitude scores. Also, these learners chose careers that require specific school subjects which they were not taking at school.

The marks obtained by the Natural Science learners were higher than the minimum marks required for admission to courses that will lead to their chosen careers. Also, the M scores obtained by these learners exceed their aptitude scores. There was no difference between the M score required and their aptitude scores.

In recapping, the finding contradicts past theory or expectation since entry requirements of the Natural Sciences are higher than those of other two fields of study. It was expected that the Human and Social Science learners would obtain higher marks than the entry requirements needed for their fields of interest, which was not the case. They were worse than Economic and Management Science learners were as well.

4.5.2 COMPARISON OF THE THREE GROUPS

The Economic & Management Science and the Human & Social Science learners' aptitude scores were lower than their marks. The deduction made is that these learners did not perform to the best of their ability. The fact that some learners chose careers that are not related to their school subjects implied that these learners did not consult a guidance counsellor.

The Natural Science learners on the other hand, have performed better than their aptitude scores. This implies that their aptitude on its own cannot adequately measure their potential. Other factors, such as personality and interest, need to be taken into account. This group of learners seems to be more aware about subject choice and the careers they wish to pursue after Grade 12, than the learners from the other groups studied.

In recapping the aptitude test findings, the Natural Science learners performed better as expected when compared with the other two groups of learners. The Human and Social Sciences produced the worst performance in the aptitude test as expected.

4.6 CONCLUSION

Performances and aptitude scores of the Economic & Management Science and the Human & Social Science groups were below the set requirements for admission to their chosen careers. Also, their subject choices showed inadequate knowledge with regard to requirements for different careers. The Natural Science group performed relatively well, and exceeded their aptitude scores that were also high. The subjects they were taking were relevant for the careers they chose. The group demonstrated a better understanding about careers and the related subjects than the other groups.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The objective of this final chapter is to make conclusions from the study, reflect on the contributions of each chapter, formulate recommendations and provide guidelines for further research from outstanding issues. The chapter uses the research findings to answer the research problem. The recommendations for further research will also be offered with specific focus on the development of different programmes.

5.2 REFLECTION AND HIGHLIGHTS OF THE RESEARCH PROCESS FOLLOWED

5.2.1 PLAN AND RATIONALE FOR THIS STUDY

The sketch and motivation for this study were given in Chapter one as well as the background to the study. It also presented the problem statement, the aim and objectives of the study, formulated the research hypotheses and explained the terms used in the study. The aim of the study was to understand how

secondary school learners may be assisted in making career choices consistent with their academic performances and aptitudes.

5.2.2 THE LITERATURE REVIEWED

In Chapter two, the relevant literature study related to the research problem was presented. The purpose for this was to gain as much knowledge possible regarding the investigation of this research area. An in-depth literature study on the theories of career choice was presented.

The literature study included the following:

- Trait-and-factor theory,
- Personality based theories,
- Developmental theories,
- Career choice,
- Vocational interests, and
- The relationship between vocational interests to career choices.

It was also important to mention the different factors that influence the academic performance of black secondary school learners. The different factors were investigated and identified as the following:

- Gender,
- The school / classroom climate,
- The peer group,
- The self-concept and self-esteem, and
- The socio-economic status of the family.

As the learners were in their final year (Grade 12) of high school, they found themselves in a developmental stage that required them to make choices in a number of life domains regarding the future. They also had to decide on their career directions and goals so as to prepare themselves for the world of work. Thus, a proper career choice for studies at an academic institution was important as work constitutes almost the entire life of an individual.

5.2.3 THE RESEARCH METHODOLOGY FOLLOWED

Chapter three gives an account of the research methodology undertaken. The following data collection strategies were considered:

- Learners' performance reports (June examinations),
- A career questionnaire for the learners,
- The Career Preference Inventory, and
- The Differential Aptitude Test-Form K.

The research participants consisted of grade 12 learners who were randomly divided into three groups of 12 each. The researcher took the learners from a sample frame consisting of learners in Mamelodi High Schools and made use of a case study of a sample of learners in one school (Vukani Mawethu High School). Consent to conduct the research was obtained from:

- the principal of the school,
- the learners, and
- parents.

Informal interviews were conducted with the guidance teacher being the interviewer of the selected Grade 12 learners. The questions of the research required information regarding:

- learner's approach to schoolwork,
- school-related behaviour,
- school attendance,
- learner's career knowledge, and
- learner's self-knowledge.

5.2.4 PRESENTATION OF THE FINDINGS

Chapter 4 presented the findings by analyzing responses from the research questionnaires. These findings were presented under each of the sample groups; namely, Economic and Management Sciences, Human and Social Sciences, and Natural Sciences.

5.3 CONCLUSION

The conclusion made from the study was that high school learners generally lack knowledge about decisions and career requirements beyond high school. This is blamed on the inadequacy of career guidance, especially in the schools that were previously categorised as black schools (Africans, Coloureds and Asians). Further, these schools still lack adequate resources, facilities and the culture of learning. Education lacks support from stakeholders and learners lack awareness of the potential that education has for enhancing career attainment. A detailed summary of the conclusions is presented below. The findings were summarised as follows:

Future perspectives of the learners

Learners were found to be unrealistic in their career choices because these were based neither on realistic individual important nor on proper knowledge of the admission requirements of tertiary institutions. The careers that the learners intended to follow were based on status (such as doctor, advocate, engineer, and chartered accountant) rather than on the subjects taken in Grade 12. Learners were also unable to say what their chosen careers require from an individual. It was clear that learners had poor knowledge of their chosen careers and that they had not done job analyses.

Learning culture

Learners from black communities are exposed to an unsupportive learning culture that does not endorse formal education. For many of these learners, the home environment dos not provide cognitive stimulation. There is generally a lack of provision of extra learning material in the homes of the learners.

Parental involvement

Many black parents are uneducated and cannot assist their children with educationally related tasks. As a result, these parents cannot cultivate interest and desire of learning and they regard the education of their children as the responsibility of teachers.

5.4 RECOMMENDATIONS

It is recommended that:

- The education department employ adequate career guidance experts to cover every high school learner.

- Basic career education and guidance be implemented in the education system to give learners an opportunity to consult with relevant expects hired by the department.

- All learners be given an opportunity to make informed career decisions while at school. In this way, learners will be self-motivated and be goal-oriented, thus making them effective learners.

- Educators be provided with information, relevant training, resources and skills to assist learners to make informed career decisions.

- Educators seek knowledge and set up their own career resource centres in their schools or districts. Educators should also ensure that learners:
  - are able to further their individual development through a personal career plan,
  - have access to basic career information including information on different

career paths through study,

- develop realistic and achievable career plans, and
- are encouraged to explore entrepreneurial opportunities.

- Career guidance educators be empowered to give career guidance to all learners so that the learners can have self-knowledge, career knowledge and knowledge about the world of work so that they can be able to make realistic career choices by the time they reach Grade 12.

- Grade 9 learners be guided to make correct and realistic subject choices based on their aptitudes, interests and academic performance before they enter Grade 10.

- As early as Grade 10, learners should be exposed to career exhibitions as this would place them in a position to know more about the different careers in the world of work.

- Schools be equipped with career resource centres where learners will be able to access career information with ease.

- Educators encourage parents to set examples by reading for pleasure and engaging in discussions with their children about school related tasks.

APPENDIX

CAREERS QUESTIONNAIRE

SURVEY OF LEARNER'S CAREER CHOICES AND THEIR ACADEMIC PERFORMANCE AND APTITUDE

I would like to ask you some questions about yourself and about your plans for your education and future career. You may have asked yourself whether you should gain more education or find yourself a job after passing matric (Grade 12). You have also probably thought about a future career.

Please try to answer the questions as honestly as possible. All the information you give will be treated as **CONFIDENTIAL**. This is not a test and there are no right or wrong answers.

PLEASE PRINT CLEARLY

1. Surname:---------- 2. First Name: ----------
3. Grade:---------- 4. Date of Birth: ---------- 5. Age: ----------
6. Gender: ---------- 7. Name of School: ----------

8. How many older brothers and sisters do you have?

   Brothers ---------- Sisters ----------

9. How many younger brothers and sisters do you have?

   Brothers ---------- Sisters ----------

10. What is your father's occupation? (please give details) ----------

    ---

    ---

11. What is your mother's occupation (please give details) ----------

    ---

CAREER ORIENTATION

Please fill in the following information:

12. Name in order of preference the three careers in which you are the most interested:

    a) _____

    b) _____

c) _____

13. Of the three careers, which one is the best for you?

_____

_____

_____

_____

14. Explain why you prefer the career in (no.13)

_____

_____

_____

_____

15. Which career would your parents prefer you to follow?

_____

16. If you study further, at which type of institution do you plan to study?

Please make a cross in the appropriate column.

University	
Technikon	
Technical College	
Other	
Uncertain	

a) Name of the institution _____

b) Which course will you follow? _____

c) Who will pay for your studies? _____

IN THIS SECTION, PLACE A CROSS (X) NEXT TO THE RELEVANT STATEMENT.

17. How do you rate yourself in school ability compared with your close friends?

a) I am the best

b) I am above average

c) I am average

d) I am below average

e) I am the poorest

18. How do you rate yourself in school ability compared with others in your class at school?

a) I am the best

b) I am above average

c) I am average

d) I am below average

e) I am the poorest

19. In your opinion, how good do you think your schoolwork is?

a) Excellent

b) Good

c) Average

d) Below average

e) Much below average

20.What kind of marks do you really think you are capable of obtaining?

a) Mostly 10/10

b) Mostly 7/10

c) Mostly 5/10

d) Mostly 3/10

e) Mostly 1/10

21. If you have comments please write them in the space provided

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