TOWARD ACCESS, SUCCESS AND EQUITY IN HEALTH SCIENCE EDUCATION: A KWAZULU-NATAL CASE STUDY

Dissertation by

RENE' STEWART

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the degree of Master of Occupational Therapy

Supervisor	:	Mr. David Brooks
Co-supervisors	:	Mr. Anil Bhagwanjee
	:	Ms. Robin Joubert

Department of Occupational Therapy
Faculty of Health Sciences
University of Durban-Westville
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"Contrary to popular myth on both the left and the right, poor people did not struggle in order to have equal access to mediocrity – they are passionately seeking to gain access to the best this country can offer. Their commitment to excellence is evident in their preparedness to make sacrifices to enable their children to gain access to the best educational institutions available. Policies and practices that lead to mediocrity are a betrayal of their aspirations."

Dr. Mamphela Ramphele
Vice-Chancellor
University of Cape Town
Inaugural Address
11 October 1996

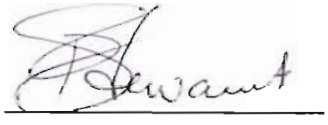
DECLARATION

Academic Registrar
University of Durban-Westville

15 February 1999

Dear Sir

I, Rene' Stewart, registration number 8727367, hereby declare that the dissertation entitled: *"Toward Access, Success and Equity in Health Science Education: A KwaZulu-Natal Case Study"* is the result of my own investigation and has not been submitted in part or in full for any other degree or to any other university.



Rene' Stewart

DEDICATION

To my parents, Les and Estelle,...

for your years of unconditional love, sacrifice and support.

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LIST OF ABBREVIATIONS

ADPs	Academic Development Programmes
ANC	African National Congress
CAD	Centre for Academic Development
CAO	Central Applications Office
CASE	Community Agency for Social Enquiry
CASME	Centre for Science and Maths Education
CEPD	Centre for Education Policy Development
CSS	Central Statistical Services
DACST	Department of Arts, Culture, Science and Technology
DBSA	Development Bank Southern Africa
DET	Department of Education and Training
DRF	Durban Functional Region
esATI	Eastern Seaboard Association of Tertiary Institutions
FAB	Financial Aid Bureau
FEC	Further Education Certificate
FRD	Foundation for Research Development
GDP	Gross Domestic Product
HBUs	Historically Black Universities
HODs	Heads of Department
HSRC	Human Science Research Council
HWUs	Historically White Universities
IDHIG	Interdisciplinary Health Group
KZN	KwaZulu-Natal
MEPU	Macro Education Policy Unit

NCES	National Centre for Education Statistics
NCHE	National Commission on Higher Education
NAEP	National Assessment of Educational Progress
NATED	National Department of Education
NEPI	National Education Policy Investigation
NSFAS	National Student Financial Aid Scheme
NQF	National Qualifications Framework
PTSA	Parent-Teacher-Student Association
RAP	Regional Access Programme
RDP	Reconstruction and Development Programme
RPL	Recognition of Prior Learning
SAAAD	South African Association for Academic Development
SAIRR	South African Institute of Race Relations
SEDP	Science Education Development Project
SEP	Science Education Project
SES	Socio-economic Status
SET	Science, Engineering and Technology
SPSS	Statistical Package for Social Scientists
SRC	Student Representative Council
UDW	University of Durban-Westville
UND	University of Natal
USAID	United States Agency for International Development

ABSTRACT

Aim: This study aims to generate recommendations for enhancing the access and success of historically disadvantaged students to health science education at UDW, based on barriers identified within diverse schooling contexts and local conditions at UDW.

Methodology: A case study approach was used to select five former DET schools within the DFR to constitute the sample of historically disadvantaged schools for this study. In order to capture the specific ecological milieu, social and cultural conditions pertaining to rural, urban and informal settlement contexts, three schools were strategically selected from each of these contexts (i.e. Sobonakhona, Ilanga and Inhlanhlayethu High schools respectively). In addition, two former DET schools that displayed relatively high achievement rates were also selected (i.e. Vukuzakhe and Zwelibanzi High schools), in order to contextually understand how barriers to positive educational outcomes might be overcome.

A multistage sampling procedure was used to sample 40 standard seven and 40 standard ten scholars from each of the selected schools (n=400) and a purposive sampling procedure was used to obtain a sample of teaching staff involved in career counselling and/or science education in each school (n=16). In addition, saturation sampling was employed to obtain a sample of second year African students in the Faculties of Health Sciences and Dentistry at UDW (n=73).

A combination of quantitative and qualitative data collection methods was employed, with questionnaires being administered to standard seven and ten scholars as well as to historically disadvantaged health science students. In addition, a total of five focus groups were conducted with teaching staff from each of the selected schools.

Results and discussion: It was evident that a complex and interwoven web of factors impacted on the access and success of historically disadvantaged students in health science education at UDW, including, *inter alia*, inadequate school instructional resources; limited community economic resources; a paucity of educational opportunities and experiences in the home environment; poverty status; low levels of self-efficacy in academic skill; inadequate school career counselling; university selection procedures with a eurocentric bias; adjustment difficulties in the transition from secondary to tertiary education; financial difficulties; a paucity of 'in-group' academic role models; inadequate ADPs and negative conditions in campus student residences.

These results are discussed and interpreted within the context of relevant empirical literature as well as a taxonomy derived from over 60 multivariate school-effects studies

undertaken in developing countries, comprising four dimensions, viz. ecology, milieu, social system and culture.

Conclusions: On the basis of the findings of this study, recommendations for enhancing the access and success of historically disadvantaged students to health science education at UDW are offered. While these recommendations pertain to a broad range of stakeholders, including the Education Ministry, the schooling sector and higher education institutions, particular attention is paid to the development of practical recruitment, selection and retention strategies to be employed by UDW and its Faculty of Health Sciences. Finally, the limitations of the study are discussed and recommendations for future research in this field are offered.

Key terms: access, success and equity; historically disadvantaged; health science education; educational outcomes.

CHAPTER ONE

Introduction

1.1 STATEMENT OF THE PROBLEM

Even a cursory examination of the literature on South African higher education reveals a moribund system structurally entrenched with race, class and gender imbalances and historically programmed to ensure the economic marginalisation of large masses of working class South Africans. Apartheid education has had particularly dire consequences in denying African[1] people (especially women) access to science-based careers, particularly careers in the natural sciences (Department of Arts, Culture, Science and Technology [DACST], 1996). By way of example, an inspection of enrolments by field of study reveals that Historically Black Universities (HBUs) enroll seven students in the humanities for every two in the natural sciences (Bhagwanjee, 1996). Given that South Africa's ten HBUs collectively enroll approximately 77% of all full-time African university students (National Commission on Higher Education [NCHE], 1996), the paramount need for these institutions to develop the science and technology skills base of disadvantaged and economically marginalised South Africans is thrown into sharp relief.

As a HBU, the University of Durban-Westville (UDW) implemented a social redress policy in 1992 (refer to appendix 2) aimed at fundamentally transforming its student profile in order to accurately reflect regional and national population demographics (Bhagwanjee, 1996a). While this policy ensured that the institution's African student population increased by 13% within a space of just three years (Swan, 1994), UDW's African student enrolment in the natural sciences remained alarmingly low (22%), particularly in the health sciences (8%) [Swan, 1996]. Further, given the difficulty UDW has experienced in sustaining appropriate academic development programmes (ADPs) for its historically disadvantaged students, a high attrition and failure rate is exhibited by this cohort, particularly in their first year of study (Bhagwanjee, 1996a).

[1] Notwithstanding the ideological roots of the legislated use of racial categorical labels like 'Black' and 'White' by the past apartheid regime in South Africa (Population Registration Act (1950), now repealed), these terms retain general descriptive value and are thus considered crucial in informing social redress policies in post-apartheid South Africa. No value judgement should be imputed by the use of racial nomenclature in this thesis.

Within this context, the Faculty of Health Sciences at UDW developed a comprehensive Transformation Programme in 1994 (Bhagwanjee et al, 1995), wherein the promotion of equity in health science education for historically disadvantaged students was identified as an urgent priority. This study comprises an integral part of the faculty's broader Transformation Programme in seeking to scientifically investigate the barriers to access and success in health science education from the perspective of historically disadvantaged stakeholders within the secondary and tertiary education sectors in KwaZulu-Natal (KZN). The remainder of this chapter provides the rationale and significance of the study, the research aims and objectives and an outline of the structure of the research report.

1.2 RATIONALE AND SIGNIFICANCE OF THE STUDY

Since the dawn of the new political dispensation, the education of the historically disadvantaged people of South Africa, particularly African people, has become a priority on the national transformation agenda (Potter, 1995). Consequently, South African education is poised at a climacteric moment where decisions regarding educational priorities, changes and policies are being made.

As it struggles to meet the development imperatives of a post-apartheid society, two of the most important challenges confronting the South African higher education sector is the quest for equity whilst simultaneously ensuring that development goals are systematically met (Ministry of Education, 1997). International experience has suggested that in order to attain a balanced approach to redressing the equity-development dilemma, the two need to be viewed as parallel goals without favouring one above the other (United States Agency for International Development [USAID], 1992). Merely increasing the participation rates of historically disadvantaged students, without simultaneous and considered planning for their academic and social development, will not implicitly guarantee greater retention and success rates (Badat et al, 1993; Bunting, 1994). The trade-off and opportunity costs of both goals thus need to be carefully evaluated (Mohamed, 1997) in developing strategies for widening participation rates whilst bridging the development gap.

One of the major contributing factors to the poor student access and success rates in tertiary education is the lack of articulation between the academic preparedness of secondary school

students with the demands of higher education programmes (Ministry of Education, 1997). It is thus crucial that the higher education sector respond to this articulation failure in a systemic manner if participation and retention rates are to be increased (NCHE, 1996).

However, not unlike other institutions in a society deeply scarred by the apartheid capital project, the South African higher education system is wracked with race, gender and institutional imbalances (Bhagwanjee, 1996). Apartheid education has had particularly dire consequences in denying African people, especially women, access to science-based careers (DACST, 1996). The result has been a critical skills shortage, evidenced by the disproportionately high percentage of semi- and unskilled individuals (76%) in the South African workforce (DACST, 1996). By way of example, the workforce participation rates for scientists and engineers in 1993 was only 1,7% of the economically active population (Foundation for Research Development [FRD], 1993).

The successful implementation of the Reconstruction and Development Programme (RDP), with regard to the goals of economic growth and employment creation, thus depends on redressing the imbalances and acute shortages in science-related professions (DACST, 1996). Adequate numbers of well-trained specialists need to emerge from the ranks of the previously oppressed if South Africa is to ever know true equality.

Within this context, UDW introduced a social redress policy in 1992, aimed at redressing historical imbalances of race, class, gender and other forms of social disadvantage. Bhagwanjee (1996a) observed that this social redress strategy ensured that UDW's African student population increased from 38% to 51% between the period 1992-1995, with the intake of former Department of Education and Training (DET) students (generally poorer African students) rising from 42% to 60%. However, despite this substantial progress, UDW's enrollment pattern for 1993 reflected that only 25% of the total student population was registered in the natural sciences (Swan, 1994) and, even more distressing, that in 1996 only 3% of UDW's African population were registered in health science degree programmes (Swan, 1996).

The transition from secondary to tertiary education is difficult for most entry-level university students, who are expected to compete in a highly achievement-oriented environment (Hoosen, 1990). This appears to be particularly true for those students who emanate from economically and educationally deprived backgrounds, whose adjustment difficulties manifest in high attrition

and failure rates (Bhagwanjee, 1996a). Furthermore, as a consequence of apartheid education, many African scholars enter UDW with serious disadvantages in terms of reading, writing and studying skills, and suffer severely as second language users of English (Stewart, 1997). Over the past decade, UDW has attempted to respond to this problem of poor student success through the introduction of academic development and support initiatives, such as tutorial and bridging programmes (Centre for Academic Development [CAD], 1996). However, with ever-decreasing funding from government (Community Agency for Social Enquiry [CASE], 1993) and in the face of a considerable annual student debt that eats into the institution's limited financial resources (Bhagwanjee, 1996a), UDW has had difficulty in implementing ADPs on a scale that addresses the enormity of educational disadvantage in South Africa.

The Faculty of Health Sciences at UDW is strategically positioned to play an instrumental role in addressing the pressing education, health and economic needs of the KZN region. Established in 1972, and working in close collaboration with the Faculty of Dentistry, the faculty is the only one of its kind in the KZN region, offering undergraduate and postgraduate professional training in the health sciences through its eight academic departments, viz. anatomy, occupational therapy, optometry, pharmacology, pharmacy, physiotherapy, social work and speech and hearing therapy (Bhagwanjee, 1996b). With the aim of transforming its teaching, service and research capacities, the faculty developed a comprehensive Transformation Programme in 1994 (Bhagwanjee et al, 1995). This broad Transformation Programme necessitated that the faculty undergo restructuring, resulting in the formation of four standing committees. In this regard, a Social Redress Committee, comprising staff representatives from all departments within the faculty, was formed with the intention of promoting equity in health science education. To this end, the Social Redress Committee was mandated to undertake key activities aimed at ensuring that student demographics within the faculty closely reflected provincial and national population demographics by race, class and gender (Bhagwanjee et al, 1995).

A key concern of the Social Redress Committee has been to assist historically disadvantaged scholars to make informed subject choices, i.e. to assist them to select school subjects that will build the cognitive and technical skills appropriate for the career of their choice in the health science field. Consequently, the faculty has participated in a number of career fairs hosted in disadvantaged communities, where information on the professional training and entry

prerequisites of the faculty was disseminated to historically disadvantaged scholars from approximately 150 former DET schools (Stewart, 1998).

However, despite these initiatives, available statistics on enrollment patterns of African students at UDW for the year 1998, revealed that only 33.5% of the faculty's total student population were African (Stewart, 1998a). While this may be construed as a negative reflection on the faculty's current recruitment initiatives, the pool of African applicants who did not satisfy the minimum faculty entry requirements in 1998 was extremely high (84.2%), largely due to a failure to obtain at least a 50% standard grade pass in a science-related subject (Stewart, 1998a). Given that in 1996, only 1 out of every 312 African scholars in former DET schools passed mathematics and physical science in standard ten (Sunday Independent, 1996), traditional faculty entry criteria that are biased towards accepting students who are high mathematics or science achievers will immediately serve to disadvantage many African applicants. Consequently, the faculty has hosted several regional workshops aimed at transforming traditional faculty admission and selection criteria in order to better promote the access of historically disadvantaged students to health science education at UDW (Stewart, 1998).

Furthermore, in order to enhance historically disadvantaged students' potential to engage effectively and successfully in health science education, member departments within the faculty have invested considerable effort in implementing discipline-specific ADPs. The aim of these programmes has largely been to assist students to develop the skills that will enhance their academic performance and thereby increase their retention rates (Bhagwanjee, 1996b). Despite this, however, an analysis of the retention rates of African health science students for the year 1998, revealed a high attrition and failure rate (71%) in the first year of study (Stewart, 1998a). This significant failure rate among first year students may, to a large extent, be a reflection of the difficulties these students experience in contending with academic adjustment [e.g. coping with demanding course schedules (Sanders, 1985), tests, assignments and practicals (Agar, 1987)], as well as individual adjustment [e.g. social adjustment (Pinto, 1985), adapting to life in student residences and coping with a lack of family social support (Beard, 1990)].

This study thus forms an integral part of the Faculty of Health Sciences' social redress programme, in attempting to enhance the faculty's current recruitment, selection and academic development strategies. It is envisaged that the results emanating from this study will be utilised by the faculty in order to:

- develop a relevant health science undergraduate recruitment programme for historically disadvantaged scholars in the KZN region;
- inform student selection criteria and procedures; and
- improve the throughput rates of historically disadvantaged students.

In shaping the future of South Africa's higher education system, educators can no longer confine themselves to implicit beliefs in perceived deficiencies of the inherited system of education (Moore, 1997). It is necessary to venture beyond these entrenched assumptions in order to address future challenges and to develop an educational milieu that empowers society's disadvantaged members to fully advance their personal, social and economic aspirations and thereby satisfy the goals of national reconstruction and development.

1.3 AIM AND OBJECTIVES OF THE STUDY

1.3.1 Aim

To facilitate the access to and success in health science education at UDW for historically disadvantaged students from the KZN community.

1.3.2 Objectives

- To gain an understanding of the mediating role of the school and university contexts in influencing the educational outcomes of historically disadvantaged students
- To determine the barriers to entry and success in health science education, from the perspective of scholars and teaching staff in historically disadvantaged schools in KZN, as well as enrolled historically disadvantaged students in the Faculties of Health Sciences and Dentistry at UDW
- To make practical recommendations aimed at enhancing the access and success of historically disadvantaged students to health science education at UDW

1.4 STRUCTURE OF THE RESEARCH REPORT

The following chapter of this thesis reviews relevant local and international empirical literature, including policy briefs and educational reports, while chapter three describes the methodological

approach and design of the study. Chapter four comprises three parts, viz. a description of the profiles of the sample groups, an analysis of the questionnaires administered to scholars and health science students and an analysis of the focus group discussion conducted with teaching staff from the selected schools. In chapter five, the data derived from the study is corroborated and interpreted, within the context of relevant theory and literature. The conclusions and recommendations, offered in chapter six, highlight the contributions and limitations of the study and offer suggestions for further research in this field of investigation.

CHAPTER TWO

Literature Review

2.1 INTRODUCTION

The challenge of achieving equity in higher education for historically disadvantaged students in South Africa is not a new issue. Over the past few years in particular, tertiary institutions, in cooperation with national government, have endeavoured to open the doors of educational opportunity to an increasingly diverse student body (Ministry of Education, 1997). While promoting equal access to higher education has been identified as a critical goal in this regard (NCHE, 1996), ensuring a supportive educational environment within which historically disadvantaged students may realise their full academic potential has been equally paramount (South African Association for Academic Development [SAAAD], 1997).

While many South African universities have publicly committed themselves to the ideals of affirmative action, very few have institutionalised plans, programmes or goals to bring about ethnic diversity in their student population (Phelps & Sullivan, 1996). Further, the focus of many redress initiatives has traditionally been skewed toward access, or the heavy recruitment and admission of historically disadvantaged students to universities, without a similar commitment and effort toward ensuring their retention and graduation (Twale et al, 1992). It is important to note, in this regard, that social redress programmes which reflect impressive student enrolment numbers, without reflecting equally cogent through-put statistics, merely pay lip service to the ideals and goals of affirmative action. Of necessity, access initiatives must thus be accompanied by strategies of support which can lead to greater retention and graduation rates, as well as the personal growth and development of historically disadvantaged sectors of society (Kappner, 1989). Effective social redress programmes should therefore reflect a broad range of systematic and coherent activities aimed at increasing the participation *and* achievement rates of historically disadvantaged students.

A comprehensive review of the literature on equity-based education reveals a three-dimensional paradigm for enhancing the quality of educational experience for historically disadvantaged students, with each dimension being of equal importance in the quest for true educational equity, viz. recruitment, admission and retention (see, for e.g., Pruitt & Isaac, 1985; Des

Ormeaux, 1990; Twale et al, 1991; Williams & Cox, 1991; Twale et al, 1992; Kapp, 1994; Ministry of Education, 1997). In order to provide a broad frame of reference for examining these issues within the South African context, a review of the local and international literature on equity-based education is preceded by a historical overview of the South African education system, as well as a synopsis of schooling in KwaZulu-Natal, in this chapter.

2.2 HISTORICAL OVERVIEW OF THE SOUTH AFRICAN EDUCATION SYSTEM

In keeping with the ideology of the apartheid era, education in South Africa was historically characterised by racial segregation and inequality (Potter, 1995). While South Africa was not unique in practising racial discrimination, apartheid was enforced in this country through carefully constructed legislation. The Population Registration Act of 1950 was the cornerstone of the most widespread, official and prolonged programme of discrimination, with other racially-exclusive legislation authorising invidious discrimination against African people (Corder, 1994), effectively locking Black South Africans into a status of hardship and cruelty.

One peculiar perversion of the apartheid system is reflected in past educational legislation that ensured a highly centralized education system, with strong state control (Parker, 1994), for the specific purpose of entrenching disunity and inequality. The most infamous of these education laws, the Bantu Education Act of 1953, laid the foundations for crippling the education of African scholars in this country (Beardall, 1995). This Act centralized the control of African schooling in the hands of the National Party Government and served to bring about the closure of the majority of church schools, that had been primarily responsible for providing a fairly high standard of education for African scholars prior to 1953 (Parker, 1994).

The National Education Policy Act of 1967 ensured that the Nationalist Government's policy of Christian National Education maintained rigid ideological control of what was taught in schools (Human Science Research Council [HSRC], 1995). The approach to learning was authoritarian, accompanied by a strong racist bias that asserted the superiority of European culture and the inferiority of African culture and people (Parker, 1994).

The 1979 Education and Training Act further ensured that the basic features of African schooling remained the same: too few classrooms and schools (Taylor & Smoor, 1992); poor educational facilities (Makaula, 1988); unacceptably high pupil-teacher ratios (Zondo, 1994); unqualified or underqualified teachers (Beardall, 1995); inadequate books, libraries and laboratories (MacDonald, 1993); inappropriate and inadequate subject choices (especially those for developing technical skills) [Marx, 1992]; and high dropout and repeater rates (Parker, 1994).

Primary education was compulsory for White, Coloured and Indian children, while, save for a few exceptions, was not compulsory for African children (Calitz, 1994). Furthermore, parents of African, Indian and Coloured children were required to pay relatively high fees to send their children to school, while until fairly recently, schooling for White children was free of charge (Parker, 1994). Thus, primary education for the majority of the population was neither free nor compulsory.

Despite this, however, there was a massive increase in the number of Africans attending school, with 5.9 million African children being enrolled in primary schools in 1991 (Central Statistical Services [CSS], 1992). A significant number of these children, however, were over-age, due to either having repeated one or more years of schooling or to late enrolment in Grade 1 (Development Bank Southern Africa [DBSA], 1993). African secondary school enrolment across the country increased by 160 percent in the early 1970s, reaching 318 568 in 1975 (Marx, 1992). In the late 1980s, 6,6 million Africans were at school, compared to 874 000 White pupils (Parker, 1994). A further 3 million African children, who should have been at school, either dropped out or were excluded and an additional 3 million had received no schooling (DBSA, 1993). To compound this problem, more than 75% of African scholars were in primary school and only one out of every 100 pupils who entered the first grade achieved a university entrance (Buckland & Fielden, 1994).

In the late 1970s, the age range of African scholars in standard 6 and 7 was 12-25 years, the majority of whom were girls (Macdonald, 1993). Furthermore, 20% of African scholars in secondary schools had interrupted their schooling for at least a year, most of whom were boys (Macdonald, 1980). The majority of the African student population were concentrated in severely overcrowded urban schools (Marx, 1992), with class sizes varying from 30-70 pupils (Randall, 1983), which was at least twice as large as class sizes in White schools (Buckland & Fielden, 1994). The decline in the proportion of the Gross Domestic Product (GDP) spent on

African education compounded this massive overcrowding problem, with a high failure rate being largely responsible for preventing upper school grades from being swamped (Biko, 1986).

In 1987/88, per capita expenditure on secondary education was approximately 5,7 times greater for every White student than for every African student (Marx, 1992); and in 1991/92, at least 4,2 times greater (Buckland & Fielden, 1994). In the late 1980s, for example, the amount spent on education per capita was R477 in the Department of Education and Training as compared with R2058 in White education (Parker, 1994). One effect of this was a dramatic disparity in African and White examination scores and considerably less opportunity for advancement by African scholars. By way of example, over the period 1984-1985, 49% of all White scholars writing the senior certificate examinations received grades high enough to qualify for a university entrance, as compared with only 18% of their African peers (CSS, 1988). In addition, while 56% of the 151 000 African scholars for the 1987 matriculation examination passed, only 16% achieved a university-entrance pass, as compared with the 66 000 White candidates, of whom 95% passed and 43% achieved a university-entrance pass (Parker, 1994).

Of even greater concern than these matriculation figures is the fact that more than 60% of African pupils dropped out of school or were excluded before they were functionally literate and numerate (Parker, 1994). The situation for these scholars was particularly abysmal. There was virtually no state provision of literacy classes and while there were a number of non-governmental literacy organisations, these were under-resourced and consequently only able to make a negligible impact (Parker, 1994).

In addition, African teachers were employed to teach African scholars (Beardall, 1995) and these teachers usually did not have the necessary training to adequately meet the requirements of their posts. In the Ciskei in 1976, for example, 49% of science teachers in secondary schools held a primary teachers' certificate and 21% a junior secondary certificate (Rogan, 1979); and in the Transkei in 1980, 31% of secondary school science teachers held a junior secondary certificate and only 22% had studied science for standard ten (Curry, 1986). Given that a matriculation certificate and a teacher's certificate (i.e. M+3) are assumed to be the minimum qualifications for a teacher, then in 1982, some 85% of African teachers were underqualified (South African Institute of Race Relations [SAIRR], 1990) and less than 50% possessed university qualifications in 1992 (Edupol, 1993). Apartheid policies prevented the proper teacher training necessary for effective teaching and 'teachers' without matriculation certificates were employed to teach

standard ten scholars, or were required to teach subjects for which they were not qualified (Beardall, 1995). This abomination was ignored, and even exacerbated when a number of Black teacher training colleges were closed in the early 1990s (Beardall, 1995).

These gross inadequacies in the African schooling system provided little opportunity for scholars to gain access to higher education (Makaula, 1988), particularly in the fields of science, engineering, technology and commerce (Mohamed, 1997). In 1992, for example, the average number of university students per thousand of the White population was 30, while for the African population it was less than 1 per thousand (Parker, 1994). This exclusionary and elite system of education in South Africa engendered a racial and class-based monopolisation of highly-skilled knowledge and training (Ngcobo et al, 1998) and also served to ensure that even those African scholars who managed to gain access to tertiary education, would have limited chances of success (Bhagwanjee, 1996). This is exemplified in the National Commission on Higher Education's (1996) analysis of university throughput rates for 1990, which revealed that Historically White University (HWU) students were twice as successful as HBU students across all degree programmes.

The chronic under-funding of African education, its deleterious effects on the academic preparedness of African students for tertiary education, and the vast disparities between HBUs and HWUs with regard to financing, facilities and capacities for teaching and research (National Education Policy Investigation [NEPI], 1992), resulted in a 'revolving door' syndrome among African students in the tertiary education sector, who exhibited high failure and attrition rates (Ministry of Education, 1997).

The quality of African education was indeed so poor that very few Africans can truly be said to have had the opportunity of proper training for various careers (Zondo, 1994), thereby limiting their ability to compete effectively on the job market (Van den Berg & Todes, 1986). This was further compounded by the fact that Africans were barred from competing with Whites for access to skilled and semi-skilled work by apartheid laws (Parker, 1994). As a consequence, the majority of jobs occupied by Africans were at the lower end of the job ranking scale, with Whites occupying the most highly paid jobs (Sachs, 1991).

In 1988, the mean average African income was in the region of R500 per month, while for Whites it was closer to R2500 per month (SAIRR, 1988). The majority of the labour force in

South Africa comprised Africans (88.9%), while individuals occupying Executive or Managerial positions were predominately White (92.4%) (Moodley, 1994). Furthermore, while 19,2% of Africans were professionals, as compared to 70% of Whites (Moodley, 1994), the majority of African people had little knowledge of the paths of professional eminence (Wagener, 1991). Consequently, the professional career paths elected by Africans were largely those of teaching, nursing and social work (Hemson, 1993), with precious few African accountants, doctors, lawyers and engineers (Zondo, 1994).

The gross inequalities of apartheid education, the appalling conditions in African schools and the increasingly bleak opportunities for employment (Marx, 1992), led to sustained resistance by African scholars and teachers, expressing their dissatisfaction through boycotts and stay-aways (Green, 1991), especially during the 1970s and 1980s. In response to this resistance and to an increasing recognition by the state that the economic future of South Africa was directly related to the quality of its educational system, there was a significant attempt to reform African education in 1990 (Parker, 1994). This reform process, however, produced few positive results. There was a collective mistrust of the Nationalist Government, whose policy of apartheid had served to create entrenched divisions and suspicions that were difficult to eliminate (Dugard, 1994).

Squeezed into their schools, African scholars grew angry, both at Whites whom they saw as oppressors and at their own parents, for not challenging that oppression (Sunday Times, 1976). Schools became the key sites of political struggle, particularly in the late 1980s, with young African people becoming politically conscientised in a manner that sparked resistance throughout the country (Morrow, 1988). Indeed, segregated education was to prove to be the most divisive factor for the youth of South Africa, with 26% of 15-20 year olds in KZN openly advocating violence as a means to end apartheid, despite the risks of state reprisal (Marx, 1992). The wave of endemic violence that accordingly engulfed this country bore testimony to the bitterness and resentment bred in the hearts of African youth, who had been dehumanised by the apartheid system (see, for e.g., De Minnaar, 1991; Bhagwanjee, 1990; Van der Spuy, 1993; Gilbert, 1995; Butchart et al, 1996; Lerer et al, 1997).

The combined effects of apartheid created a society that was divided on racial lines into separate communities, with gross economic and social disparities. Wealthy, predominantly White communities were able to maintain high standards of educational provision, while poor,

predominantly African communities struggled to improve the quality of their education (Parker, 1994). Wealth, skills and knowledge were thus locked into communities and families that had always enjoyed these privileges. Not suprisingly, therefore, those who had the fewest educational opportunities were Africans residing in rural areas (Buckland & Fielden, 1994).

As South Africa moves through its dramatic transition process, and while it is grappling with the implementation of the RDP, it cannot miraculously shake off its apartheid legacy (Jantjes, 1995). The multiple harmful political, educational and socio-economic effects of past discrimination cannot be expected to cease the moment statutory and other state-enforced discrimination come to an end (Ackermann, 1994). The effects are ongoing. Indeed, apartheid has penetrated so violently and intrusively into the lives of Black South Africans, that the damage will take many years to undo.

2.3 SCHOOLING IN KWAZULU-NATAL: A SYNOPSIS

With the increasing international emphasis on science and technology, the nature of schooling that children receive is becoming increasingly important in modern society, with only the most poorly paid and temporary jobs being available to those with a limited school education (National Department of Education [NATED], 1994; Africa, 1997.). The school thus becomes more than simply a place for learning and testing, it is also a place where future educational aspirations and achievement are fashioned (Waters, 1989).

A widely debated issue in the sociology of education is whether schools 'make a difference'. Many researchers claim that most variations in academic achievement and other educational outcomes are attributable to differences among students rather than differences among schools (see, for e.g., Ornstein, 1990; Reyes & Leonard, 1993; Caldas et al, 1995). Other researchers, while not denying that social background plays a role in students' achievement, suggest that the various social and economic resources of a school contribute to scholars' achievement above and beyond what could be expected on the basis of their social backgrounds (see, for e.g., Purkey & Smith, 1983; Jamison & Lockheed, 1985; Wenglinsky, 1997). In addition, it has been suggested that the school institution exerts a greater influence on pupil achievement within developing countries as compared to industrialized nations, after accounting for pupil background (Fuller, 1987).

This particular body of 'school effectiveness' research has led to the identification of several features that are common to 'effective' schools and to the establishment of a composite of taxonomic variables for measuring school effectiveness (see, for e.g., Tagiuri, 1968, Moos, 1974; Insel & Moos, 1974; Anderson, 1984). According to this taxonomy, the impact of the school on scholar educational outcomes may be explained according to four broad dimensions, viz. ecology, milieu, social system and culture. *Ecology* refers to the physical and material conditions of the school that facilitate pupil learning, such as instructional materials (Anderson, 1982), building characteristics (Rutter et al, 1979) and school or class size (Weber, 1971). *Milieu* refers to those variables that represent characteristics of individuals and groups within the school, such as strong educational leadership (Southworth, 1990), level of basic skills (Gaziel, 1997) teacher morale (Rutter et al, 1979) and commitment to student success (Harnish, 1987). *Social system* is the social dimension concerned with the patterns or (in)formal rules of operating and interacting in the school, such as time spent on instruction (Brookover et al, 1979), ability grouping of scholars (Weber, 1971), administrative organisation (Rutter et al, 1979) and peer relationships (Wynne, 1980). *Culture* refers to the character of the school as it reflects the values, beliefs, norms and traditions of persons within the school, such as holding high expectations for student achievement (Miller et al, 1985), creating a safe and orderly school climate (Murphy & Hallinger, 1986), emphasising continuous school improvement (Louis & Dentler, 1988) and developing a sense of shared goals (Huddle, 1986). The empirical research on school effectiveness and the interacting taxonomic variables for measuring school effectiveness provide a particularly useful theoretical framework for examining the effect of rural, urban and informal settlement school contexts on the educational achievement and aspirations of African scholars in KZN.

Over one quarter of South Africa's population reside in KZN, with approximately 47% residing in rural areas of the province (Gunthorpe, 1991). Furthermore, 84% of KZN's population are African, of which almost 60% are illiterate (Hemson, 1993). In 1995, it was estimated that 45% of the province's population were of school-going age (<18 years), with poverty forcing thousands of children, particularly males, to leave school each year (Bhagwanjee et al, 1995). Of the 3760 primary schools and 1268 secondary schools in KZN in 1996, 68% had a scholar-teacher ratio of 40:1 (Reddy, 1997), 23% had no running water supply and 63% had no electricity supply or any form of telecommunication (HSRC, 1996). In addition, while 62% of the schools had pit latrines, 10% had no sanitation facilities (Reddy, 1997). Dropout rates appear to vary widely among rural and urban school contexts, with many dropouts having attended

schools that have poor educational facilities and inadequate teaching staff - conditions that affect their performance in school and ultimately their decision to leave (Rumberger, 1987).

The rural or 'village' school tends to have an organic unity with its community, where a scholar's educational future is largely determined by the expectations of the community and the family (Hemson, 1993). The school often operates within a community where commitment to written literacy or numeracy is a historically recent event (Fuller, 1987) and teachers are required to expend enormous energy in trying to achieve basic functional literacy in their scholar population (Hemson, 1993). Pupils are socialised to respect traditional cultural values and since many scholars emanate from poor socio-economic backgrounds, survival is often given priority over education (Pretoria News, 1997). University education is usually not a feasible option, with many children being forced to struggle to earn a living rather than experience educational development (Gunthorpe, 1991). The schooling system in these areas is usually deficient in science teaching and school instructional materials (e.g. textbooks) are scarce (Wolff, 1970). A large percentage of the funding for these schools is allocated to upgrading school buildings and improving teacher salaries rather than to teaching and learning resources (Beardall, 1995). Career counselling is seldom provided at these schools, with pupils and parents often being ill-informed as to the availability, or even existence of different career paths, or of the career opportunities arising from a university education (Gunthorpe, 1991). Further, due to their poverty level and geographic location, many of the youths from these schools have never had contact with health or other professionals (Lecca & Watts, 1989).

The informal settlement school reflects a combination of an urban and rural scholar population. The organic link between the school and the community is evident but is not as pervasive as in the rural context (Hemson, 1993). A large percentage of these pupils emanate from single-parent or disintegrated families with poor financial circumstances (DBSA, 1994). Severe economic constraints usually result in increased crime and violence in families and the community (Wilson & Maxson, 1995). High rates of juvenile delinquency often prevail, evidenced by substance abuse, promiscuous sexual behaviour and hostile relationships between scholars and teachers (Griggs, 1998). These schools are more likely to have lower teacher morale, less qualified teachers (Zill et al, 1995), more discipline problems and fewer students who place a high priority on learning (Halle et al, 1997). Many scholars display a poor conception of their future aspirations and a high dropout rate serves to 'select' those scholars who have a chance of success (Hemson, 1993). Those individuals who manage to gain access to

higher education usually enter university with low academic achievement and a relatively poor sense of academic success (Waters, 1989).

The urban school is usually linked to urban residential areas, with access to the school being largely governed by the ability to pay school fees (Hemson, 1993). The emphasis of the school is on university entrance examinations and the school strongly transmits the values of achievement (Peil, 1982). Socialisation of the scholar revolves around academic and social status (Hemson, 1993). While many of these schools remain under-resourced and under-staffed, education is still valued as a major source of wealth by members of the community (Ormell, 1996). Scholars from these schools also tend to have greater access to positive educational role models, both in the community and in the home environment (Richardson, 1990).

The visible distinction between the differing school contexts in KZN is the marked difference in scholar and staff morale, school resources and school examination results (Hemson, 1993). Furthermore, the school context appears to be a reflection of the socio-economic status of the communities that they serve (Meijnen, 1986), i.e. not only do poor children emanate from economically disadvantaged home environments, but their school environments are also typically under-resourced as compared to those of more affluent persons. These limitations often result in a lower level of educational aspiration and a restriction in the academic growth of children (Des Ormeaux, 1990). The educational and occupational status of parents also appears to vary significantly across school contexts, with the educational level of parents from rural and informal settlement contexts tending to be lower than that of parents from urban contexts (Hemson, 1993). In particular, parents from the former two types of schools are more inclined to have little time, capacity or resources to provide academic guidance for their children (Lareau, 1987).

The demise of the apartheid regime and the advent of the new non-racial dispensation, has brought about an unqualified policy of racial integration in government schools (Ministry of Education, 1997). However, in light of the fact that 75% of the South African population is African and that their schools are geographically, at least, inaccessible to the majority of the White population, most schools currently attended by African pupils will remain effectively segregated for some time to come (Skuy & Vice, 1996).

2.4 EQUITY-BASED EDUCATION: A REVIEW OF ISSUES

2.4.1 Student Recruitment

There is mounting concern with regard to the limited success tertiary education institutions have experienced in attracting a critical mass of historically disadvantaged students to careers in science, engineering and technology (SET)[Mohamed, 1997]. Research indicates a range of factors that negatively affect the enrolment of historically disadvantaged students in SET fields of study, including, *inter alia*, soaring tuition costs (Strategic Planning Office, 1998), an increase in the number of African households operating below the poverty level (Buckland & Fielden, 1994), a disparate secondary education system (Parker, 1994), a lack of institutional commitment to recruitment activities (William & Cox, 1991), a paucity of programmes designed to identify and recruit disadvantaged applicants with potential (Rocha, 1989) and poorly planned and under-resourced recruitment efforts (Williams & Cox, 1991). Furthermore, while the recruitment of historically disadvantaged students arguably demands a greater commitment of human, financial and temporal resources than those associated with the recruitment of other students (Perez, 1990), many tertiary institutions do not invest much effort in devising strategies for increasing their limited and even shrinking pool of suitably qualified African applicants for SET disciplines (Mohamed, 1997).

The demand for a more egalitarian society in the new South Africa has emphasised distributive justice in education as a priority i.e. a redistributive education policy in which schooling provides an equal possibility of good results in national accreditation examinations and, by inference, an equal possibility of entry to remunerative jobs in the workplace (Potter, 1995). A key concern of an education aimed at assisting historically disadvantaged individuals into the economic mainstream would be to strongly commit to engaging in aggressive and systematic recruitment efforts.

Recruitment is defined as those activities in which an institution engages in order to ensure that a broad range of stakeholders are aware of the demands and benefits of professional training and practice (Coombes & Bennett, 1983). Recruitment is thus not merely an act of providing prospective students with the information for choice among different careers and institutions, but is a multifaceted campaign to awaken student interest to the myriad of opportunities inherent in higher education (Williams & Cox, 1991).

International experience suggests that the most effective recruitment programmes are those that target and attract disadvantaged sectors of society early in their schooling (see, for e.g., Borkowski, 1988; Kappner, 1989; Des Ormeaux, 1990; Mulder, 1991; Twale et al, 1992). These 'early recruitment' programmes are designed to serve a multitude of purposes, including (1) providing additional academic and social 'enrichment' to scholars who lack the motivation or are inadequately prepared for tertiary studies (Mulder, 1991); (2) assisting scholars to make informed career and subject choices by offering relevant career counselling (Potter, 1995); (3) creating opportunities for inter-institutional partnerships by bridging the gap between the public school and the tertiary institution (Coyle & Thurgood, 1989); and (4) promoting the development of cooperative parental support networks (Odegaard, 1997).

With regard to early recruitment programmes that focus on scholar enrichment, many assume the form of bridging courses in science and mathematics that commence in secondary school and proceed through tertiary education (Twale et al, 1992); or summer/winter programmes that offer short courses in mathematics and science aimed at complementing scholars' regular educational programme (Edwards, 1990; Mulder, 1991). Other documented enrichment programmes appear to offer informal assistance and training to scholars in the form of workshops on life skills, decision-making skills, basic language skills (Twale et al, 1991), writing skills (Moody, 1988), study skills (Twale et al, 1992) stress management and financial planning (Williams & Cox, 1991).

In particular, a growing body of literature provides support for enrichment programmes that largely focus on financial counselling for historically disadvantaged students (see, for e.g., Jones, 1980; Mulder, 1991; Colby & Foote, 1995). It is argued that while other enrichment initiatives may assist specific groups of disadvantaged students, a generic barrier to accessing higher education for most Black scholars resides in the financial obligations of tertiary studies (Mulder, 1991). The cost of tuition and books, a general inability to satisfy the additional expenses incurred by a university education (Kalamazoo Valley Community College, 1988), the complicated procedures linked to financial aid applications and the prospect of significant financial indebtedness (Makay, 1990) have been identified as particularly significant barriers to higher education for Black students. Enrichment programmes aimed at providing financial counselling for disadvantaged scholars consequently supply information and assistance that prevent these scholars from making negative decisions about their future educational outcomes based solely on the prospect of burdensome loan repayments (Mulder, 1991).

A key concern of a number of enrichment programmes also appears to be the need to devise innovative strategies aimed at reducing the dropout rates of scholars (see, for e.g., Rumberger, 1983; Rumberger, 1987; McNeal, 1997). Given the increased educational and skill prerequisites for competing in a modern economy, scholars who drop out of school lack the ability to adapt to a rapidly changing work environment and find that the relative economic disadvantage of dropping out of high school is now greater than in the past (National Academy of Science, 1984; Rumberger, 1987). Dropout prevention programmes thus include interventions such as birth control programmes for high school students aimed at preventing teenage pregnancies (Rumberger, 1987) and mentorship or peer counselling programmes where 'at-risk' scholars establish contact with historically disadvantaged university students who serve as positive role models (Moody, 1988; Kappner, 1989; Ngcobo et al, 1998).

A second major concern of early recruitment programmes is the provision of relevant and appropriate career counselling. In this regard, it is consistently reported that recruitment needs to be a continuous process (Borkowski, 1988) and must exploit a broad range of recruitment channels (Coombes & Bennett, 1983). In particular, recruitment initiatives for disadvantaged groups demand a relevant, innovative and broad-based approach (Owens et al, 1994) that empowers these students to make considered and informed career choices and not to merely follow the easiest or default option (Bullock et al, 1996). In this regard, a vast body of literature reports on programmes and strategies that aim to: empower historically disadvantaged students to have a clear conception of their future career options based on their skills and abilities (Nurmi, 1991); enhance students' enthusiasm, motivation and self-awareness about their future (Africa, 1997); and promote informed decision-making with regard to formulating short-term academic plans (such as subject choices) as well as future career options (Bullock et al, 1996). Recruitment is thus seen as an induction process whereby potential applicants are provided with sufficient information and understanding to select themselves into a degree programme and to decrease their probability of withdrawing in the early stages of a course due to unrealistic course expectations (Coombes & Bennett, 1983; Twale et al, 1992).

Early recruitment activities focusing on career counselling thus include the use of relevant mass media commonly accessed by disadvantaged scholars (e.g. radio, television, newspapers and magazines) in order to provide comprehensive information regarding the nature and requirements of specific types of professional careers (Makay, 1990; Colby & Foote, 1995), as well as to enhance the ability of a university to attract potential applicants by marketing the

institution (Mulder, 1991; Morley, 1997). Campus tours and annual university 'open days' are also frequently utilised strategies whereby prospective students and their families are afforded the opportunity to explore campus facilities (Des Ormeaux, 1990) and gather information regarding available degree programmes (Coombes & Bennett, 1983).

Many universities also participate in career days hosted at high schools or community centres and engage in high school visitations, where prospective students are provided with career information packages (Owens et al, 1994) and offered advice in selecting the prerequisite high school subjects for the career of their choice (Waters, 1989). Currently enrolled mature university students often participate in these activities in order to provide prospective applicants with a realistic and arguably less biased overview of university life (Coombes & Bennett, 1983; Perez, 1990).

Other innovative approaches include utilising non-traditional sources such as bulletin boards at community centres (Owens et al, 1994) and targeting professionals in the community who could provide relevant career information and serve as role models for students to enter a particular profession (Makay, 1990).

Given that the success of many of these early recruitment programmes arguably depends on the cooperation between the secondary and tertiary education sectors, a third major concern of early recruitment initiatives is the establishment of inter-institutional partnerships. A constructive and enduring school-university partnership is however difficult to establish and necessitates widespread 'grass-roots' commitment and support (Teitel, 1994). The historical tendency toward academic insularity and institutional self-reliance thus needs to make way for the establishment of functional and enabling linkages between multiple stakeholders in executing cost-effective and collaborative initiatives (NCHE, 1996). In fact, it is argued that those universities who do not possess an adequate relationship with a broad range of secondary schools should initially invest considerable effort in increasing the institution's visibility in the target communities (Oliver & Brown, 1988).

Inter-institutional partnerships afford the opportunity to undertake a spectrum of early recruitment activities, including the collaborative launching of a series of annual events designed to provide historically disadvantaged students and their parents with relevant institutional and academic information (Moody, 1988); and the formation of a joint constituency from the

university and school community for ensuring widespread commitment and participation in jointly planned activities (Teitel, 1994). Tertiary institutions may also provide schools with relevant recruitment resources, such as offering the service of a career advisor (Bullock et al, 1996) or providing information manuals on various types of degree programmes (Coombes & Bennett, 1983).

While school experiences are important in shaping career goals, growing recognition is given to the fact that the beliefs and attitudes of parents exert a strong influence over the educational aspirations of children (see, for e.g., Epstein, 1984; National Education Association, 1985; Ziegler, 1987; Jacobs, 1991; Jantjes, 1995). Consequently, another major concern of early recruitment programmes is the establishment of parental support networks. In this regard, educators actively strive to stimulate and empower parents to engage in educationally relevant activities for the benefit of their children's future educational outcomes (Jantjes, 1995). The most frequently cited examples of early recruitment activities geared toward encouraging parents to participate in school- and home-based educational activities, include the provision of educational workshops aimed at empowering parents to assume an active role in the planning and monitoring of their children's future academic career (Wolfendale, 1992); and establishing parent-educator committees in order to afford parents greater decision-making roles in relevant educational activities and to facilitate the direct transfer of information from the educational setting to the home environment (Lawton, 1992).

It is important to note, however, that several factors are critical in mediating the nature and degree of parental involvement, including, *inter alia*, the amount of time working parents can invest in their children's schooling (Lareau, 1987), their view of the appropriate division of labour between educators and parents (Dimmock et al, 1996), the information they possess regarding their children's schooling (Murphy, 1991), the amount of money and other material resources available in the home environment (Dale, 1993) and their social class location (Lareau, 1987). Further, although not frequently addressed in the literature, not all parental involvement in educational activities is reported as being positive (see, for e.g., Seeley, 1984; Lock & Latham, 1990; Burkhardt, 1991; Dale, 1993; Dimmock et al, 1996). For example, some doubts have been raised as to whether parental participation in fact promotes collaborative decision-making or better quality decisions (Lock & Latham, 1990) and whether all educators actively seek parental involvement in educational activities given the frequent disarticulation between parental values and school values (Fullan, 1991).

2.4.2 Student Admission

Higher education recruitment efforts are inextricably linked to institutional admission criteria (Joubert, 1997), with the mark achieved by applicants in their matriculation examination being the most important admission criterion currently utilised by South African universities (Mitchel & Fridjhon, 1987). These high school grades are commonly viewed as the objective measure on which future academic performance is predicted, thereby ensuring a high-quality student body (Borkowski, 1988). In practice, however, few systematic attempts have been made to determine the correlation between matriculation results and future performance in tertiary education (Pruitt & Isaac, 1985). Furthermore, while school performance has been accepted as a fair predictor of university success in a number of countries (Griesel, 1991), it is commonly argued that the matriculation results of African scholars from former DET schools are an inaccurate reflection of their academic potential (see, for e.g., Badsha et al, 1986; Makaula, 1988; Taylor, 1989; Teach Test Teach, 1990; Griesel, 1991; University of Natal [UND], 1995; Joubert, 1997). By way of example, of the 36 078 African pupils who wrote the 1992 matriculation examinations, 93.5% obtained at best a 'D' aggregate (50-59%) as compared to the 28 302 White scholars who wrote the examination of which 64.8% obtained at worst a 'C' aggregate (60-69%) [CSS, 1995]. In many instances, therefore, while this traditional criterion serves as a convenient filtering or screening device it is not clear that it results in the selection of only the most promising candidates and in the rejection of those who cannot succeed (Pruitt & Isaac, 1985).

In addition to matriculation examination results, a strong background in mathematics and/or science is usually a prerequisite for entry into many degree programmes, particularly in SET fields of study (Stewart, 1997a). This serves to further disadvantage many African applicants, particularly females, who often discontinue their mathematical training early in high school (Sunday Independent, 1996) due to high levels of 'maths anxiety' (Eccles, 1984) and an inability to attain a high level of mathematical competency (National Assessment of Educational Progress [NAEP], 1988). By way of example, in 1994, only 18% of African scholars in standard ten had elected to study physical science as a school subject and 33% had selected mathematics, as compared to 73% of White scholars who had elected to study mathematics and 50% who had selected physical science (CSS, 1995). Further, only one out of every 312 African pupils pass mathematics and science in matric (Sunday Independent, 1996), with South African scholars ranking amongst the most ill-equipped in the world with regard to these two particular school subjects (Pretoria News, 1997). As a result, there is currently an acute shortage of school-leavers

for directions of study requiring pass marks in mathematics and physical science (DACST, 1996).

Sternberg (1986), in his work on componential and experiential intelligence, provides a useful framework within which to conceptualise relevant admission criteria for historically disadvantaged students. According to Sternberg, componential intelligence is the ability to interpret information hierarchically and taxonomically in a well-defined and unchanging context, with individuals who perform well on standardised tests usually exhibiting this type of intelligence. Comparatively, Sternberg argues that experiential intelligence involves the ability to interpret, integrate and synthesise information in changing contexts and consequently can usually not be measured by standardised tests. Given the historical legacy of apartheid education which ensured that African scholars were exposed to inadequate and inappropriate learning opportunities at school (UND, 1995) and were prevented from adequately developing the educational skills and knowledge required by the tertiary education system (Griesel, 1991), historically disadvantaged students have been more inclined to develop and demonstrate abilities in the experiential area of intelligence as compared to 'advantaged' students (Sedlacek & Prieto, 1990). Traditional university admission criteria, wedded to an ethic of individual academic achievement (Jewson et al, 1991) and concerned largely with measuring componential intelligence (Sedlacek & Prieto, 1990), thus have less predictive utility for historically disadvantaged students as compared to other students. Consequently, there has been increasing support for the use of a more informed and broad-based approach to objectively assessing the academic potential of historically disadvantaged candidates (CASE, 1993; Kapp, 1995).

In this regard, many universities have developed alternative student selection procedures, employing a combination of traditional and non-traditional measures for assessing the academic potential of historically disadvantaged students (Sedlacek & Prieto, 1990). A review of the literature on non-traditional admission criteria reveals a number of selection measures designed to assess non-cognitive performance factors, such as positive self-concept (Odegaard, 1997), realistic self appraisal (Coombes & Bennett, 1983), educational aspirations, interpersonal skill (Perez, 1990), evidence of overcoming hardship, personal support systems (Twale et al, 1992), successful leadership experiences (Green, 1989), participation in culturally relevant extra-curricular activities and demonstrated community service (Sedlacek & Prieto, 1990). Non-traditional selection measures thus typically include personal interviews (Green, 1989), letters of

recommendation (Borkowski, 1988), volunteer work (Perez, 1990), personal essays (Coombes & Bennett, 1983) and curricula vitae (Pruitt & Isaac, 1985).

It is important to note, however, that many of these non-traditional measures have been established and utilised in the absence of empirical evidence regarding their reliability and validity in assessing future academic performance (Waters, 1989) and are open to a good deal of subjective interpretation (Pruitt & Isaac, 1985). By way of example, historically disadvantaged students may perform poorly in selection measures such as personal interviews simply because they lack the relevant interviewee experience or because they demonstrate verbal or non-verbal behaviour that does not reflect the appropriate western cultural response (Gares & Delco, 1991), thereby negatively influencing the evaluation. Further, many interview panel members possess an image of the 'ideal' candidate that usually reflects entrenched attitudes and values (Perez, 1990) or have a limited understanding of the roles and responsibilities of the interviewer in ensuring inter-rater reliability when assessing the desired characteristics of applicants (Coombes & Bennett, 1983). Interviewer bias or lack of relevant interviewer training can thus reduce the fairness and objectivity of this selection tool.

Finally, it is important to note that educators involved in student selection generally appear to fall in one of two distinct groups. The first group, who perceive that the difficulties encountered in professional training can be redressed by better selection, are typically concerned with issues such as whether applicants possess the appropriate academic and personal prerequisites for the profession (Pruitt & Isaac, 1985); whether the selection process ensures an adequate balance of applicants in the course according to gender, age, class and ethnic variables (Moody, 1988); and whether the selection measures themselves have properties of reliability and validity (Coombes & Bennett, 1983). A defining characteristic of this group is that they tend to view the selection process as distinct from the training process. The second group, who tend to perceive selection as an integral part of the entire training process, have a well-defined educational philosophy according to which the total training process is geared (Makay, 1990; Colby & Foote, 1995). The selection process is consequently viewed as an integral part of the training process rather than a palliative to training difficulties (Coombes & Bennett, 1983). As a growing body of African students enter higher education (Smit, 1994), educators concerned with the selection of historically disadvantaged students should strive to emulate the selection approach of this latter group, thereby eliminating the practice of deliberate or implicit discrimination which often masquerade as objective and fair standards for ensuring a diverse student body (Perez, 1990;

Makay, 1990). In adopting this approach, quality and diversity do not become mutually exclusive entities.

2.4.3 Student Retention

Given the reality of historically disparate schooling systems in South Africa, tertiary institutions are compelled to confront not only the consequences of unequal access to higher education but also the related imbalance in the success rates of a changing student constituency (Griesel, 1991). Extrapolating from the findings of international surveys, it has been estimated that the number of students in higher education worldwide will increase from 50 million presently to 150 million by the year 2025 (Viljoen & van Wyk, 1997). In South Africa, it has been projected that the growing demand for access to higher education will lead to 1.3 million students being registered at South African universities by the year 2010 (NATED, 1994; Smit, 1994). This massification of the higher education system, particularly by students from educationally disadvantaged backgrounds (CASE, 1993), demands that tertiary institutions create a positive educational climate within which these students may realise their full academic potential.

In the higher education system, quality has traditionally been determined, at least in part, by the admission requirements for entrance to tertiary institutions (Viljoen & van Wyk, 1997). The implication is that higher education institutions have placed significant emphasis on input statistics as opposed to output rates, resulting in a 'revolving door syndrome' among many students who cannot perform in a manner that is commensurate with institutional standards (Borkowski, 1988; Cooper & Smith, 1990). This is indeed reflected in the disproportionately high attrition rates exhibited by historically disadvantaged students across South African universities (Kapp, 1994). In light of this, and given the substantive effort involved in actively recruiting disadvantaged students, higher education institutions have invested considerable resources in developing ADPs aimed at promoting higher retention rates of these students and creating opportunities for their academic success (Owens et al, 1994).

In South Africa, academic development evolved primarily as ad-hoc support programmes aimed at easing the transition from secondary to tertiary education for historically disadvantaged students (NCHE, 1996). The underlying philosophy of these programmes was that students from educationally disadvantaged backgrounds required intensive 'catch up' instruction in order to acquire the academic skill of their White counterparts (SAAAD, 1997). A lack of experience in dealing with a culturally diverse student body led to the widespread assumption that short-

term basic skill remediation programmes would adequately impact on the retention and graduation rates of historically disadvantaged students (Des Ormeaux, 1990). ADPs consequently focussed primarily on the academic needs of students through the provision of tutorials on communication skills, critical and analytical reasoning, decision-making (Waters, 1989), writing and test preparation (Twale et al, 1992). Issues crucial to academic adjustment and success, such as cultural, personal and social needs were not addressed (Hoosen, 1990).

Implementing these ADPs under the notion of 'student deficit' served to create an impression that only historically disadvantaged students required academic support (CASE, 1993), thereby isolating these students (Green, 1989) and impeding their meaningful integration into university life (Hoosen, 1990), as well as serving to reinforce the classic Tylerist paradigm to learning whereby knowledge and skill is passed from educator to student in a linear fashion. Following Habermas (1988), this mode of learning is informed by a knowledge-constitutive interest that is technical, reified and ahistorical in design, with the implicit assumption that staff competencies and teaching-learning strategies do not need to be reviewed or contested.

In an attempt to combat this negative stigma and the traditional top-down approach to learning, recent academic development discourse has shifted away from the deficit model to an integrated approach whereby academic development is incorporated into the mainstream educational programme, thereby addressing the mutual needs and concerns of all students (SAAAD, 1997). An important implication in this approach is that all students would have access to academic support throughout their programme of studies and not merely at the beginning of their course, where developmental efforts are traditionally concentrated (Des Ormeaux, 1990). While this reconceptualisation of ADPs demands that academic support no longer be directed solely at 'under-prepared' students, the heterogeneity of students must still be taken into consideration, particularly with regard to their differing educational backgrounds, geographical environments and individual needs (Viljoen & van Wyk, 1997). More importantly, this approach demands a paradigm shift whereby educators critically review their teaching-learning strategies in order to design curricula that promote equity, emancipation and social justice, thereby serving the best interests of the target group (Grundy, 1989).

It is important to note, however, that the multiple definitions of academic development and the differing purposes for which ADPs were established, has led to a current lack of clarity and uniformity as to what constitutes academic development at the various higher education

institutions in South Africa (Kotecha, 1995). Consequently, academic development at certain institutions encompasses both student and staff development through a holistic review of teaching, learning and assessment practices (SAAAD, 1997). Some institutions are directly concerned with access programmes and bridging or foundation courses (CASE, 1993), and others focus on curriculum development and departmental ADPs, where an academic development tutor provides discipline-specific assistance (CAD, 1996).

While institutional practices may differ with regard to the manner in which academic development is implemented, there do however appear to be certain common elements for ensuring the effective retention of historically disadvantaged students. These include (1) the presence of a stated policy regarding student retention (CASE, 1993); (2) the institutionalisation of ADPs (SAAAD, 1997); (3) substantial institutional commitment and support for academic development, beginning at the level of the vice-chancellor (Richardson, 1989); (4) comprehensiveness and timelessness of services and resources (Muller & Kerbow, 1996); (5) systematic data collection, monitoring and follow-up; (6) the absence of a stigma attached to student participation in ADPs (Hoosen, 1990); and the integration of cognitive skills development with the non-cognitive needs of students (Sedlacek & Prieto, 1990).

While it is agreed that historically disadvantaged students drop out of university for a variety of reasons, the major causative factors of student attrition have been identified as financial difficulties (Jones, 1980; Morris, 1990), a lack of 'in-group' role models (Cooper & Smith, 1990; Curley & Strage, 1994) and a change in residence at a critical phase of development (Hoosen, 1990). Not suprisingly, there has been growing evidence in the literature for the importance of non-cognitive dimensions in promoting the academic success of disadvantaged students (see, for e.g., Coombes & Bennett, 1983; Sanders, 1985; Odegaard, 1997). In this regard, a number of prototypical interventions for easing the transition from secondary to tertiary education (NCHE, 1996), building self esteem (Twale et al, 1991), promoting social interaction (Des Ormeaux, 1990), fostering a positive self concept (Hoosen, 1990) and increasing motivation for academic excellence (Mulder, 1991) are frequently cited. These include orientation programmes (Colby & Foote, 1995); personal advisement and counselling (Twale et al, 1992); peer or staff mentoring (Curley & Strage, 1994); incentive scholarship programmes (Mulder, 1991); and financial support networks designed to increase the number of scholarships directed at disadvantaged students from external civic organisations and special interest groups (Sanders, 1985).

While recruiting and admitting African students in higher education is a critical dimension of an equity-based education (Cooper & Smith, 1990), they are merely the first steps in the process of empowering historically disadvantaged members of society. This is supported in the White Paper on Higher Education (Ministry of Education, 1997) where equity is viewed, on the one hand, as a critical identification and abolishment of all existing forms of unjust differentiation and, on the other hand, as a process of transformation aimed at empowering disenfranchised individuals. By providing historically disadvantaged students with appropriate opportunities for engaging in tasks that enable them to realise their real academic potential, equity and social justice issues such as the redistribution of power (Moody, 1988), the promotion of economic opportunity (Africa, 1997) and the co-existence of diversity with academic quality (NCHE, 1996; SAAAD, 1997) may be realised.

2.5 CONCLUSION

Despite the fiscal constraints of the 1990s, higher education institutions remain gateways for the success, empowerment and upward mobility of the disenfranchised members of their communities (Muller, 1996). In particular, tertiary institutions in KZN have a social responsibility to provide access to careers in higher education for a heavily disadvantaged student constituency. At a time when there is extensive educational and political commitment to SET-based education, attracting African youths to professions in the science engineering and technology has become an increasingly critical goal in South Africa (Ministry of Education, 1997). Equally paramount is the dire need to ensure that they steadily progress from one benchmark of educational success to the next, thereby promoting the emergence of a new cadre of professionals for the future.

CHAPTER THREE

Methodology

3.1 INTRODUCTION

This study aims to investigate the barriers to entry and success in health science education at UDW from the perspective of stakeholders within the secondary and tertiary education systems, viz.:

a) scholars and teaching staff from historically disadvantaged school contexts in the Durban Functional Region (DFR), as well as
b) enrolled historically disadvantaged students in the Faculties of Health Sciences and Dentistry at UDW.

In addition, the study attempts to gain a critical understanding of the impact of local schooling conditions in rural, urban and informal settlement contexts on the educational outcomes of historically disadvantaged scholars, as well as the influence of pertinent university conditions on the academic success of African health science students.

The remainder of this chapter provides the research sampling method and rationale, the data gathering instruments, the procedure and method of data analysis.

3.2 SAMPLING METHOD AND RATIONALE

3.2.1 Secondary Education System

3.2.1.1 Former Department of Education and Training Schools

On the basis of extensive consultation with identified experts within the field of education, five former DET schools within the DFR were strategically selected to constitute the sample of historically disadvantaged schools for this study. These experts were academics affiliated to the Macro Education Policy Unit (MEPU) and the Science Education Development Project (SEDP), located at UDW, and the Centre for Science and Maths Education (CASME), located at the University of Natal (Durban).

It was collectively agreed that a simple random sample of former DET schools would not guarantee an equitable inclusion or adequate representation of historically disadvantaged schools within the DFR. The rationale underlying this was that the specific conditions pertaining to rural, urban and informal settlement schools would differ considerably across the three contexts, particularly with regard to the ecological, milieu, social and cultural dimensions of the schools. It was therefore deemed important to strategically select schools from each of these contexts rather than to overgeneralise the notion of 'DET schools'. In addition, in order to provide the researcher with useful insights into school variables that might prove useful in overcoming barriers to health science education, it was further deemed necessary to select two former DET schools that displayed high achievement rates, despite the historically inferior education system for African scholars. While these schools may be dismissed as 'special schools' that do not reflect the 'real world' of education, the use of outliers (i.e. schools that consistently perform better than other schools) is frequently recommended in the literature for providing researchers with powerful insights into the relationship between school variables and educational outcomes (see, for e.g. Brookover et al, 1979; Edmonds, 1979; Austin, 1979; Clauset & Gaynor, 1981; Anderson, 1982).

A case study approach was thus used in selecting Sobonakhona High (situated in Umbumbulu), Ilanga High (situated in Clermont) and Inhlanhlayethu High (situated in Inanda) as the respective rural, urban and informal settlement schools. In addition, Vukuzakhe High and Zwelibanzi High (both situated in Umlazi) were selected on the basis that they were considered to be representative of:

a) a high achieving school that appeared to be adequately resourced (Vukuzakhe High); and
b) a high achieving school that appeared to be under-resourced (Zwelibanzi High).

While case studies have been criticised for being limited in their scope, open to bias and restricted in their generalisability to larger social aggregates (Mason & Bramble, 1978), it has been argued that findings from intensive case studies are equally generalisable to larger social situations when compared to superficial surveys (Black & Champion, 1976; Singleton et al, 1993). While the researcher neither disputes any truth in these criticisms of case studies nor denies the differences in method and perspective, she saw no major shortcoming in utilising the case study approach over other approaches in this study. The case study approach was in fact deemed to be more appropriate for the research purpose and goals. To overcome the misinformation, oversimplification and evasions that are often produced by survey and

experimental studies (Singleton et al, 1993), the researcher opted to eschew the usual mechanisms of control, forgo the need for rigorous statistical generalisation and rather attempted to understand the subjects' frame of reference with regard to the barriers to health science education. In this way, a better understanding of the essence, significance and maintenance of the subjects' attitudes and opinions could be obtained, rather than carrying preconceived notions into the field which may have borne little resemblance to the experiences of the individuals under investigation. The case study approach thus offered the promise of a richly detailed, in-depth examination of the specific social context of each of the selected schools that would arguably enhance the understanding of the subjects' interpretation of health science education.

While the findings from these case studies may not be regarded as conclusive evidence of the barriers to health science education, their potential ability to lend support to or provide refutation of theories cannot be overlooked. Through the analysis and interpretation of the case study findings, mechanisms for the enhancement of the access and success of historically disadvantaged students to health science education at UDW could be generated. This information could arguably provide suggestive leads for further investigation of particularly relevant recruitment and academic development strategies using more tightly controlled research methods.

Another major rationale for adopting the case study approach was the argument that the flexibility of this approach lends itself well to studies of dynamic and rapidly changing situations (Mason & Bramble, 1978). This is particularly relevant, given the current climate of transformation in South Africa and the rapidly changing system of education in the country. Increasing emphasis on utilising the case study approach to deal with the particularly complex problems of education has been demonstrated by the numerous anthropological studies of schools and schooling systems that have been conducted over the years (see, for e.g., Schaeffer et al, 1969; Backman, 1972; Lutz & Ramsey, 1974).

Lastly, the decision to adopt a case study approach was based on the researcher's available resources. Relative ease of accessibility to the selected schools in the DFR, as well as financial, temporal and human resource limitations, made the case study approach a logical one.

3.2.1.2 Scholars

The study population comprised all standard seven and standard ten scholars within the five selected schools (N=1983). These individuals were purposively targeted on the basis that they constituted a representation of scholars who were poised to make a subject/career choice (standard sevens) and scholars who were preparing to enter the tertiary education system (standard tens).

Following Arkin & Colton (1964), and Chetty & Bhagwanjee (1990), a sample size of 384 is sufficient to ensure approximately 5% tolerated error at the 95% confidence level for large populations. On this basis, it was decided that a sample of 400 standard seven and ten scholars would constitute a representative sample of the study population, with a degree of oversampling facilitating this process. A multistage sampling procedure was subsequently used to sample 40 standard seven and 40 standard ten scholars from each school (refer to Table 1).

Table 1:
Distribution of the population of standard seven and standard ten scholars across the five selected schools

School	*Std 7 scholars (N)*	*Std 10 scholars (N)*	*All scholars (N)*
Ilanga High	180	135	315
Inhlahlayethu High	304	160	464
Sobonakhona High	152	148	300
Vukuzakhe High	323	125	348
Zwelibanzi High	285	171	456
TOTAL	*1244*	*739*	*1983*

a) Sampling procedure for standard seven scholars

Stage 1: proportionate stratified sampling method As illustrated in Table 2, stratification according to class allocation was executed (i.e. 7A, 7B, 7C, etc.) in order to determine the proportion of each standard seven class relative to the total population of standard sevens in each school.

Table 2:
Distribution of standard seven scholars according to class allocation in Vukuzakhe High

Class allocation	*Class size (N)*	*Sample proportion relative to class size*
7A	43	0.13
7B	46	0.14
7C	46	0.14
7D	51	0.16
7E	44	0.14
7F	46	0.14
7G	47	0.15
TOTAL	*323*	*1,00*

In order to determine the composition of the sample, the sample proportion for each class was multiplied by the desired sample size (i.e. 40), as exemplified in Figure 1.

Figure 1:
Calculation of the sample composition of standard seven scholars in Vukuzakhe High

With reference to Table 2, the sample composition for standard seven scholars in Vukuzakhe High was calculated as follows:

7A :	*(0.13)(40)*	=	*5.2*	*(5)*
7B :	*(0.14)(40)*	=	*5.6*	*(6)*
7C :	*(0.14)(40)*	=	*5.6*	*(6)*
7D :	*(0.16)(40)*	=	*6.4*	*(6)*
7E :	*(0.14)(40)*	=	*5.6*	*(5)*
7F :	*(0.14)(40)*	=	*5.6*	*(6)*
7G :	*(0.15)(40)*	=	*6.0*	*(6)*
	N	***=***	***40.0***	***(40)***

This procedure ensured that the sample composition maintained the same proportionate balance pertained to the population of standard seven scholars within each school.

Stage 2: systematic sampling method In each standard seven class, the sampling interval (i) was subsequently determined by dividing the class population by the sample composition for that class, as exemplified in Figure 2.

Figure 2:
Calculation of the class interval for each standard seven class in Vukuzakhe High

With reference to Table 2, the class interval for each standard seven class in Vukuzakhe High was calculated as follows:

7A :	*43/5*	=	*8.6*	*(9)*	*i.e. select every 9th scholar*
7B :	*46/6*	=	*7.7*	*(8)*	*i.e. select every 8th scholar*
7C :	*46/6*	=	*7.6*	*(8)*	*i.e. select every 8th scholar*
7D :	*51/6*	=	*8.5*	*(9)*	*i.e. select every 9th scholar*
7E :	*44/5*	=	*8.8*	*(9)*	*i.e. select every 9th scholar*
7F :	*46/6*	=	*7.6*	*(8)*	*i.e. select every 8th scholar*
7G :	*47/6*	=	*7.8*	*(8)*	*i.e. select every 8th scholar*

The starting point for the sampling procedure was determined by randomly placing a pen on each standard seven class register. Sample members were then chosen at regular intervals using the sampling interval for each class. This two-staged sampling procedure ensured the selection of a probability sample of standard seven scholars for each school in the sampling frame.

b) Sampling procedure for standard ten scholars

Stage 1: proportionate stratified sampling method As illustrated in Table 3, stratification according to subject stream allocation was executed (i.e. commerce, science or general) in order to determine the proportion of each standard ten stream to the total population of standard tens in each school. Given that standard ten scholars had already selected their preferred subjects and accordingly entered a specific subject stream, the sample was stratified across the variable of subject stream in order to avoid sampling error that might accrue from a sample skewed across this variable. In instances where more than one class was following a particular subject stream, these classes were combined into one group.

Table 3:
Distribution of standard ten scholars according to stream allocation in Vukuzakhe High

Stream allocation by class	*Class size (N)*	*Sample proportion relative to class size*
Commerce (10A)	29	0.23
Science (10B)	31	0.25
Science (10C)	35	0.28
Science (10D)	30	0.24
TOTAL	*125*	*1.00*

In order to determine the composition of the sample, the sample proportion for each subject stream was multiplied by the desired sample size (i.e. 40), as exemplified in Figure 3.

Figure 3:
Calculation of the sample composition of standard ten scholars in Vukuzakhe High

With reference to Table 3, the sample composition for standard ten scholars in Vukuzakhe High was calculated as follows :

Commerce :	*(0.23)(40)*	=	*9.2*	*(9)*
Science :	*(0.77)(40)*	=	*30.8*	*(31)*
	N	**=**	***40.0***	***(40)***

This procedure ensured that the sample composition maintained the same proportionate balance with regard to selected subject streams as pertained to the population of standard ten scholars within each school.

Stage 2: systematic sampling method In each standard ten subject stream, the sampling interval (i) was subsequently determined by dividing the stream population by the sample composition for that stream, as exemplified in Figure 4.

Figure 4:
Calculation of the class interval for each standard ten subject stream in Vukuzakhe High

With reference to Table 3, the class interval for each standard ten stream in Vukuzakhe High was calculated as follows :

Commerce :	*29/9*	=	*3.2*	*(3)*	*i.e. select every 3rd scholar*
Science :	*96/31*	=	*3.0*	*(3)*	*i.e. select every 3rd scholar*

Two approaches were used in determining the starting point for the sampling procedure. In instances where only one standard ten class was following a particular subject stream, a random start was carried out using the class register. Sample members were then chosen at regular intervals using the sampling interval for that stream.

In instances where more than one class was following a particular subject stream, class registers were randomly assembled (e.g. 10C, 10B, 10D) and then renumbered (e.g. 1-96). The starting

point for the sampling procedure was then determined by using the first two digits from a table of random numbers. Sample members were then chosen at regular intervals using the sampling interval for that stream. This two-staged sampling procedure ensured the selection of a probability sample of standard tens for each school in the sampling frame.

3.2.1.3 Teaching staff

The study population comprised all teaching staff at each of the selected schools (N=178). Given the nature and intention of the data gathering instrument for this population, a purposive sampling procedure was used to obtain a sample comprising the school principal and four full-time teaching staff involved in career counselling and/or science education in each school (n=25).

These individuals were specifically targeted on the basis that they possessed specific knowledge, insight and experience that would be relevant to this study e.g. the form, nature and content of career counselling offered by the school; scholars' educational/ occupational plans and attitudes; scholars' course of study; the educational attitudes of families; and factors affecting scholars' pass rates (particularly in mathematics and physical science). In particular, school principals were viewed as being informed of the role of parental, familial and school governance structures within the school, as well as the influence of political and cultural factors on the school.

However, given that three school principals and seven science teachers were unavailable at the time the fieldwork was conducted, a sample size of 16 was ultimately obtained (refer to Table 4).

Table 4:
Sample composition of teaching staff across the five selected schools

School	*Principal*	*Science teacher*	*Career counsellor*	*TOTAL*
Ilanga High	1	1	1	*3*
Inhlahlayethu High	-	1	2	*3*
Sobonakhona High	-	3	1	*4*
Vukuzakhe High	-	1	1	*2*
Zwelibanzi High	1	2	1	*4*
TOTAL	*2*	*8*	*6*	*16*

3.2.2 The University of Durban-Westville

3.2.2.1 Health Science students

The study population comprised all second year African students currently enrolled in an undergraduate professional degree programme in the Faculties of Health Sciences and Dentistry at UDW, viz. dental therapy, medical science, occupational therapy, optometry, pharmacy, physiotherapy, social work and speech and hearing therapy (N=92). These students were specifically targeted on the basis that they satisfied the following criteria:

- they had undergone a period of integration into university life and thus arguably had an understanding of the problems encountered in the transition from secondary to tertiary education; and
- they were arguably not far removed from prevailing conditions in the secondary education system, particularly with regard to former DET schools.

Oral health students were excluded from the study population as the Faculty of Dentistry had only instituted its oral health diploma in 1997 and, consequently, only first year students were enrolled at the time of fieldwork. It was thus possible that their responses might have contaminated the research findings.

This was not considered a major shortcoming, however, as these students constituted a relatively small percentage of the study population (8.7%). While saturation sampling was implemented, 12 students were unavailable during the period in which fieldwork was conducted, while a further 7 students were excluded due to their participation in a pilot study of the data gathering instrument for students. The final sample, therefore, comprised 73 second year African students enrolled in undergraduate professional degree programmes in the Faculties of Health Sciences and Dentistry (refer to Table 5).

Table 5:

Sample composition of second year African students registered in undergraduate professional degree programmes in the Faculties of Health Sciences and Dentistry at UDW

Degree programme	*Composition of desired sample*	*Composition of obtained sample*
Dental Therapy	8	8
Medical Science	4	4
Occupational Therapy	3	3
Optometry	9	9
Pharmacy	18	16
Physiotherapy	9	8
Social Work	40	24
Speech and Hearing Therapy	1	1
TOTAL	*92*	*73*

3.3 DATA GATHERING INSTRUMENTS

In order to meet the objectives of this study, three data gathering instruments were deemed necessary, viz. two questionnaires (for scholars and second year health science students respectively) and one semi-structured focus group discussion (for school teaching staff).

3.3.1 The Questionnaires

3.3.1.1 Questionnaire design

Two self-administered questionnaires were designed to elicit specific information and views on the impact of the school's ecology, milieu, social system and culture on the access and success of historically disadvantaged students to health science education at UDW, as well as the effect of local university conditions. As no relevant questionnaire was found to exist locally or internationally that specifically examined these issues, the researcher designed two quantifiable questionnaires for this purpose, based on a reading of relevant empirical literature (see, for e.g., Moos, 1974; Insel & Moos, 1974; Anderson, 1982; Bradbury, 1991). While questionnaire items were chosen to explore the subjects' experiences of, and opinions on a broad range of issues, each questionnaire differed in content and design depending on the nature of information

sought from each sample group, their level of education and the researcher's familiarity with the target sample.

Questionnaire 1, for scholars (refer to appendix 3), comprised 3 Likert scale questions, 20 fixed-response questions and 11 open-ended questions. Items related mainly to family background, knowledge of the health field, academic skill (milieu variables), educational and career goals and aspirations (culture/milieu variables), exposure to school career counselling, subject choices and preferences (social system variables) and participation in external career counselling initiatives (ecology variables). Questionnaire 2, for second year health science students (refer to appendix 4), comprised 7 Likert scale questions, 17 fixed-response questions and 9 open-ended questions. Items related mainly to family background, knowledge of the health field, academic skill (milieu variables), exposure to school career counselling (social system variables), participation in community-based career fairs (ecology variables), adjustment difficulties, residential preferences, student selection procedures and academic performance (university conditions). A covering letter, briefly outlining the purpose of the study and assuring the subjects of anonymity, accompanied each questionnaire (refer to appendix 5).

The Likert scale is a sophisticated type of ordinal scale, with practical and ubiquitous value. While Babbie (1979) and Lodge (1981) have referred to some disadvantages of the Likert scale, these were not considered to be serious shortcomings as empirically and statistically, the Likert scale is more reliable than other scales of the same nature in examining and analysing attitudes and opinions (Bhagwanjee, 1990). Furthermore, the reliability of the scale increases as the number of possible alternatives are increased (Tittle & Hill, 1967). In this study, the Likert scale questions had a standard response format, assuming the form of either a five point continuum ranging from strongly agree to strongly disagree, or a three point continuum ranging from good to poor.

The fixed-response items in this study consisted of questions or statements with a fixed number of choices and respondents were asked to select the response(s) that best suited them. One of the assumptions on which fixed-response questionnaires operate, is that the researcher has sufficient knowledge of the sample under investigation in order to anticipate the types of responses that might be given (Singleton et al, 1993). A major disadvantage of this would be the potential inability of the researcher to provide the respondent with all relevant response alternatives, resulting in misleading information. To circumvent this potential problem, the

researcher included an 'other' category with certain fixed alternatives, or items were followed by a 'please specify' or ' give reasons for your choice' statement. This afforded the subjects greater response latitude rather than rendering responses which simply reinforced the mind-set of the researcher. Furthermore, the advantages of fixed-response questions were considered to outweigh this perceived disadvantage, i.e. they are easier to score and code, no writing is required of the respondent, they facilitate more rapid completion of lengthy questionnaires and certain items such as gender, age, race and years of education are more easily handled by fixed-response categories (Black & Champion, 1976).

Open-ended questions are more frequently employed when the researcher is unable to anticipate probable replies from respondents. A major disadvantage of this type of question is the difficulty entailed in classifying and/or coding responses, given that the importance and meaning each respondent attaches to his reply may be considerably different (Diamantopoulos & Schlegelmilch, 1997). Notwithstanding this, a major advantage is that the flexibility of these items may elicit unanticipated and insightful replies from respondents that could enhance the researcher's understanding of the subject matter under investigation (Black & Champion, 1976). Open-ended items in the questionnaires used in this study required the respondents to elaborate on their perceptions and opinions about issues in varying detail.

3.3.1.2 Validity testing

Content validity of the questionnaires was assured by having these instruments appraised by six independent academics identified as experts within the fields of research methodology, social redress, curriculum studies and education through their affiliation to MEPU, SEDP and the Interdisciplinary Health Group (IDHIG) located at UDW, CASME located at the University of Natal (Durban) and the Regional Access Programme (RAP) of the Eastern Seaboard Association of Tertiary Institutions (esATI).

This validity testing served the following objectives:

- to extract new content areas that might have been overlooked;
- to assess the internal consistency of items constructed; and
- to implement any changes in questionnaire design that might be deemed necessary.

As a result of the validity testing, the following alterations to the questionnaires were implemented: Likert items were refined, the sequencing of questionnaire items was altered and family socio-economic status was examined more extensively.

3.3.1.3 Pilot study

A pilot study of questionnaire 1 was undertaken on a sample of 40 standard seven and 40 standard ten scholars from a local former DET school that was not included in the study, while questionnaire 2 was piloted on a sample of 7 second year African health science students who were thus excluded from the study.

A preliminary analysis of data derived from the pilot study phase served the following objectives:

- to assess whether refusals and guarded responses presented to such an extent that they compromised data analysis and interpretation;
- to appraise the instruments generally in terms of ambiguities and specific questions that may offend the sensitivities of the respondents; and
- to implement any changes in design that were deemed necessary.

As a result of the pilot study, certain questionnaire items were rephrased, an illustrative response for certain items was included and the layout and presentation of the questionnaires was modified.

3.3.2 The Focus Group Discussion

3.3.2.1 Focus group design

A semi-structured, one hour focus group discussion was designed to assess the collective views of teaching staff at each of the selected schools (refer to appendix 6). It was anticipated that this instrument would arguably complement the results derived from the questionnaires and allow for a greater depth of analysis. In developing and framing core themes appropriate to this study, the researcher drew on experiences gleaned from the preliminary analysis of the questionnaires and recommendations made during the consultative phase with identified experts, as well as a reading of relevant empirical literature (see, for e.g., Boyatzis, 1998; Flick, 1998). The focus group discussion accordingly centred on the following core themes:

- social system: instructional programme and interpersonal relationships;
- milieu: teacher and student body characteristics;

- ecology: available school academic and recreational facilities, school fees and access to external resources; and
- culture: criminal activity, teacher expectations and emphasis on continuous school improvement.

Following Morgan (1988), focus group discussions have an advantage over interviews in that they are comparatively easier to conduct and are more cost-effective, both in terms of time and money. Furthermore, it has been demonstrated that the ideas generated in focus groups as compared with an equivalent number of individual interviews, are roughly 70% greater in number (Fern 1982, in Morgan, 1988). The salient disadvantages of focus group discussions include the decreased control that the researcher has over the data being generated, as well as the degree to which the responses of the group mirror individual views and opinions (Joubert, 1997). However these disadvantages were considered negligible in comparison to the relative advantages of this type of data gathering instrument.

3.3.2.2 Validity testing

Content validity of the focus group was assured by having this instrument appraised by two academics affiliated to the Springfield College of Education, as well as two school liaison officers affiliated to UND (Durban) and Mangosuthu Technikon.

This validity testing served the same objectives as that of the questionnaires and relevant modifications were subsequently made to the focus group schedule, i.e. a social system variable exploring school governance structures was added in order to obtain specific information pertaining to the role of Parent-Teacher-Student Associations, community leaders and Student Representative Councils within each school.

3.3.2.3 Pilot study

A pilot focus group was undertaken with five teachers from a local former DET school that was not included in the study. At the conclusion of this group, participants were requested to provide feedback regarding the manner in which the group was conducted, e.g. the ability of the group facilitator to reorient herself to newly emerging facets of a particular theme; to redirect and reconceptualise issues based on the responses to questions asked; to promote an interactive environment in the group; and the degree to which her bias slanted or restricted the course of discussion.

This constructive criticism served the following objectives:

- to appraise the manner in which group process was facilitated;
- to qualitatively appraise and enhance the group facilitator's ability in this field;
- to extract new content areas that might have been overlooked; and
- to implement any changes in design that were deemed necessary.

As a result of the pilot study, the sequencing of focus group items was modified, greater response time was allocated for each core theme and the group facilitator received training with regard to regulating responses and questions in order to obtain the desired information.

3.4 PROCEDURE

3.4.1 Phase 1: Consultation Phase

In developing a sound conceptual framework for the study, the researcher enlisted regional skill and expertise through consultation with a number of identified experts in the fields of research methodology, social redress, curriculum studies and education. Furthermore, detailed archival work was undertaken, including, *inter alia*, a detailed literature search, documentary and newspaper collation and analysis and a statistical review of student admission, failure and attrition rates in the Faculties of Health Sciences and Dentistry at UDW.

In addition, two faculty workshops were hosted at UDW in conjunction with the Faculty of Health Sciences' Social Redress Committee, with the aim of obtaining faculty input in developing an achievable and realistic research plan of action. This collaboration was deemed essential in developing a 'collective ownership' for the study, particularly since the perceived research outcomes were considered practically implementable only with the participation and cooperation of faculty members.

Subsequent to this, appointments were made with the principals of each of the selected schools, with the aim of briefing them on the purpose and perceived benefits of the study and to obtain their permission for undertaking the fieldwork. Suitable times and venues for the fieldwork phase were also negotiated. Class registers were obtained from each school at the time of consultation, as well as enlisting the assistance of one teacher in administering the questionnaire to scholars.

All scholars and teaching staff in each school were subsequently briefed on the objectives and scope of the study and all participants were promised formal feedback on the study outcomes.

3.4.2 Phase 2: Implementation Phase

3.4.2.1 School context

Once the sample composition for each school had been determined, a list of names of the relevant scholars and staff was forwarded to the principal or career counsellor in each school, who ensured that these individuals would be available at the time of fieldwork.

A research assistant, responsible for undertaking the fieldwork in each school, underwent a two-phased training programme conducted by a clinical psychologist with extensive experience in research. This entailed training in questionnaire administration and focus group facilitation. Following this training, the ability of the research assistant was qualitatively appraised through her implementation of the pilot study of the questionnaire for scholars and second year health science students, as well as the focus group discussion for teaching staff. Fieldwork was subsequently conducted over a period of one month.

a) Questionnaire administration

In each school, the relevant scholars appeared at the designated time and place where the questionnaires were distributed by the research assistant and the teacher assigned to assist with questionnaire administration. For convenience, the questionnaire was administered to both standard seven and ten scholars in one venue. Scholars were briefed on the purpose and perceived benefits of the study, assured of anonymity and given verbal instructions regarding completion of the questionnaire. The assigned teacher was instructed not to assist the subjects, except in instances where they were unsure of the meaning or intention of a particular question or statement. Questions regarding content were responded to with "Do whatever you think best". All scholars completed the questionnaire within 50 minutes and were permitted to leave the venue as they finished. All questionnaires were collected upon completion.

b) Focus group discussion

In each school, the focus group was conducted following the administration of the questionnaire to scholars. A period of 90 minutes was allocated for each focus group in one of the staff offices. A tape recorder was placed on a table, around which participants were seated. All focus groups were preceded with an outline of the purpose and perceived benefits of the

study and the procedure to be followed. Participants were given verbal instructions related to the audio-taping of the focus group in order to ensure that their voices were audibly received. This also entailed a trial run for testing the vocal volume of each participant.

The research assistant assumed a moderately non-directive approach in each group, i.e. she introduced each core theme, ensured that discussion around each theme was relatively focused, facilitated group process when necessary and answered questions regarding clarification of any theme.

3.4.2.2 Faculty context

Owing to conflicting course time-tables, it was not logistically possible to arrange a suitable common time for administering the questionnaire to all second year African students in the Faculties of Health Sciences and Dentistry. The assistance of departmental representatives on the Social Redress Committee was thus enlisted for this purpose. Each representative undertook to brief their respective students on the purpose and perceived benefits of the study and to arrange a suitable time and venue for administering the questionnaire.

The procedure undertaken was the same as the procedure utilised in administering the questionnaire to scholars. The verbal instructions given to departmental representatives were as for instructions given to teachers assisting with the administration of the questionnaire to scholars. A two-week response time for returning the questionnaire was also negotiated. All questionnaires were completed within the designated time period and were personally collected. Departmental representatives reported no difficulties with questionnaire administration, except for the unavailability of certain students at the time of fieldwork.

3.4.3 Ethical Considerations

Informed consent for participation was obtained from all subjects in this study. The data gathering instruments were not considered to be personally threatening in any way and were not aimed at evoking a negative emotional response. Furthermore, subjects were appraised of their right to withdraw from the study at any stage, if they so desired, and assured of anonymity in that they would not be identified by their individual responses. Ethical clearance for the study was also obtained from UDW's Research Committee prior to initiating fieldwork (refer to appendix 7).

3.5 METHOD OF DATA ANALYSIS

3.5.1 The Questionnaires

3.5.1.1 Preparation for data analysis

In preparing the data for analysis, editing and coding of the raw data was undertaken. A central office edit was conducted in order to identify omissions, ambiguities and errors in the responses. The extent to which these problems presented determined whether an entire questionnaire would be discarded or a particular question would be ignored in further analysis. In this respect, logically inconsistent data was identified and excluded from analysis e.g. standard ten scholars who answered questions intended only for standard sevens. Further, the identification of non-response items was undertaken in order to determine the missing values to be used in data coding.

Following data editing, a code book was established in order to provide the researcher with an explanation of the relation between the codes and the responses to the questions e.g. how responses related to variables, labels of variables, whether a particular variable was numeric or alphanumeric, etc. A coding template was then constructed, capturing the key coding instructions for each variable. This was essential owing to the varying response formats and the large number of variables contained within each questionnaire. All questionnaires were pre-coded prior to data capture in order to reduce errors resulting from incorrect data entry.

Data capturing was undertaken utilising the Statistical Package for Social Scientists (SPSS) which interfaced with the Microsoft Word programme. This statistical analysis package was selected on the basis that it possessed consumer-friendly facilities that were deemed adequate for the nature of data analysis that was undertaken (see, for e.g., Kinnear & Gray, 1995; Diamantopoulos & Schlegelmilch, 1997).

A review of the data was undertaken following data capture in order to determine any errors that may have accrued from incorrect data entry. In this regard, it was determined whether there were any discrepancies between the total number of cases in the data matrix and the sample size, i.e. whether the total number of legitimate responses and the total number of missing values were equal to the sample size. Further, the minimum and maximum values for all variables were calculated and compared against the code book in order to determine whether

any variables were 'out of range'. Finally, several questionnaires were randomly selected and compared with their corresponding entries in the data matrix.

Variable transformations were subsequently conducted in order to carry out the necessary data analysis and to facilitate data reporting. By way of example, in instances where cell sizes on five point Likert scale items were relatively small, these were transformed into three point Likert scale items.

3.5.1.2 Setting analysis objectives

In setting relevant analysis objectives, the researcher reviewed the overall aim of the study in order to ensure an explicit link between the analysis objectives and the research objectives. With regard to the **content** of the analysis, gender, social class, level of study and school context were selected as the independent variables. Consequently, the **focus** of the analysis was largely centred on making comparisons and examining inter-relationships between the variables of interest.

3.5.1.3 Method of analysis

Notwithstanding a fairly large stratified random sample of scholars (n=400) that met the criteria for 5% tolerated error and a saturation sampling of the population of health science students (n=73), several factors precluded the use of parametric statistics in the treatment of data. Paramount among these was the fact that homogeneity of variances across the respective populations could not be assured and the fact that the level of measurement for most variables under investigation were of nominal or, at best, ordinal strength. Accordingly, in addition to basic descriptive statistics (viz., means, frequency counts and percentage matrices), chi-square goodness of fit and tests of independence were performed on discrete data, where appropriate, in order to test for orthogonality of relationships between the independent and dependent variables measured. Where orthogonal relationships were indicated by chi-square tests of independence, post-hoc tests were conducted in order to determine the specific nature and direction of obtained differences.

3.5.2 The Focus Group Discussion

The audiotapes of each focus group were transcribed, *verbatim,* by a research assistant. These transcriptions were then thematically analysed by the researcher, using a system of gradual reduction of data (Boyatzis, 1998). This provided a means for presenting the data in a coherent

manner and allowed for the examination and interpretation of inter-relationships between categories of information (Flick, 1998). Each focus group's responses to particular core themes were subsequently summarised into specific categories of information. Common sub-themes under each category were then identified and systematically tabulated, as exemplified in Figure 5. This facilitated the analysis of commonalties and variances between each school.

Figure 5:
Specific categories of information and common sub-themes emerging from focus group participants' responses to core theme 1

Core theme	*Category*	*Sub-theme*
Social system	• *Instructional programme*	• *Nature of school career counselling* • *Career counselling in the health sciences* • *Subject stream selection*
	• *School governance structures*	• *Parent-Teacher-Student Associations* • *Role of community leaders* • *Student Representative Councils*
	• *Interpersonal relationships*	• *Parental involvement* • *Community-school relationships*

CHAPTER FOUR

Results

4.1 INTRODUCTION

The information yielded from a quantitative and qualitative analysis of data is presented as follows:

- The *sample profiles*, which describe the school profiles (ecology/social system variables), faculty profiles (ecology/milieu variables) and biographical profiles (milieu variables).
- The *questionnaires*, which examine four specific categories of information, viz. milieu/culture, social system, ecology and local university conditions.
- The *focus group discussions*, which examine four specific categories of information, viz. social system, milieu, culture and ecology.

4.2 SAMPLE PROFILES

4.2.1 School Profiles (ecology/social system)

4.2.1.1 Ilanga High School

Situated in Clermont, this urban context school was established in 1988. It has a scholar population of 795, who are primarily residents of the KwaDebeka and Clermont areas. With a teaching staff population of 27, Ilanga High exhibits a staff-scholar ratio of 1:29, with approximately 47 pupils per class.

School facilities include 17 classrooms and 2 under-equipped laboratories. No library or technical drawing facilities are available. No sporting grounds are available and the school thus utilises the grounds of a neighbouring hostel for its sport activities, viz. soccer, netball, volleyball and basketball. Electricity, running water and sanitation facilities are available.

Higher grade and standard grade subjects offered by the school include language subjects (Zulu, English and Afrikaans), science subjects (biology, physical science and mathematics), commerce subjects (accountancy and business economics) and general subjects (geography, history and

biblical studies). Scholars may diversify into two subject streams in standard eight, viz. a science stream or general stream. No commerce stream is available as this is offered by a neighbouring school (refer to Table 6, pp. 57).

Figure 6:
Photographic illustration of Ilanga High school

4.2.1.2 Inhlanhlayethu High School

This informal settlement context school, situated in Inanda, was established in 1988. Its scholar population of 1101 are residents of a local informal settlement community. With a teaching staff population of 36, Inhlahlayethu High exhibits a staff-scholar ratio of 1:31, with approximately 37 pupils per class.

School facilities include 30 classrooms and 3 laboratories, two of which are under-equipped and consequently serve as multifunctional classrooms. Biology and physical science classes are alternated in a single laboratory that is furnished with basic equipment. While a multifunctional sports ground and basic sporting equipment are available, these facilities are currently inadequate

for the school's sport activities, viz. soccer, netball and volleyball. While no library or technical drawing facilities are available, the school has electricity, running water and sanitation facilities.

Higher grade and standard grade subjects offered by the school include language subjects (Zulu, English and Afrikaans), science subjects (biology, physical science and mathematics) and commerce subjects (typing, accountancy, business economics and economics). No general subjects are offered by the schools, e.g. history, geography and biblical studies. Scholars may diversify into two subject streams in standard eight, viz. a science stream or commerce stream. No general stream is offered by the school (refer to Table 6, pp. 57).

Figure 7:
Photographic illustration of Inhlanhlayethu High school

4.2.1.3 Sobonakhona High School

This rural context school, situated in Umbumbulu, was established in 1985. Its scholar population of 750 are largely residents of the Umbumbulu area, with a minority of scholars emanating from Umlazi township. With a teaching staff population of 24, Sobonakhona High exhibits a staff-scholar ratio of 1:31, with approximately 50 pupils per class.

School facilities include 15 classrooms, 2 laboratories (which were vandalised and thus currently serve as staffrooms) and sports equipment for a variety of sporting activities viz. soccer, netball and volleyball. No sports grounds are available, however, necessitating the school's use of the local community sports field. No library or technical drawing facilities are available. The school has no active electricity supply and no running water facilities, with sanitation facilities assuming the form of outside pit latrines.

Higher grade and standard grade subjects offered by the school include language subjects (Zulu, English and Afrikaans), science subjects (biology, physical science and mathematics), commerce subjects (accountancy, business economics and economics) and general subjects (geography, history and biblical studies). Scholars may diversify into three subject streams in standard eight, viz. a science, commerce or general stream (refer to Table 6, pp. 57).

Figure 8:
Photographic illustration of Sobonakhona High School

4.2.1.4 Vukuzakhe High School

Situated in Umlazi, this urban context school was established in 1970 and has become somewhat famous in the region for its high achievement rates. The school's alumni performance was rated third in South Africa in 1993 and second in 1995 amongst DET schools. The scholar population of 890 are largely residents of Umlazi township, with a few scholars emanating from Sikhawini,

Ulundi and Nongoma. With a teaching staff population of 45, Vukuzakhe High exhibits a staff-scholar ratio of 1: 20, with approximately 39 pupils per class.

School facilities include 23 classrooms, 2 well-equipped laboratories, a technical drawing laboratory, a well-equipped library housing a computer room (with approximately twenty terminals) and a study centre housing a television and video cassette recorder for the viewing of educational cassettes. While a multifunctional sports ground and basic sporting equipment are available, these facilities are currently inadequate in meeting the school's sporting requirements, viz. volleyball, basketball, tabletennis, soccer, netball and karate. Electricity, running water and sanitation facilities are available

Higher grade and standard grade subjects offered by the school include language subjects (Zulu, English and Afrikaans), science subjects (biology, physical science, and mathematics), commerce subjects (economics, accountancy, agriculture, computer literacy and business economics) and general subjects (geography, history and biblical studies). Scholars may diversify into two subject streams in standard eight, viz. a science stream or commerce stream. No general stream is offered by the school (refer to Table 6, pp. 57).

Figure 9:
Photographic illustration of Vukuzakhe High school

4.2.1.5 Zwelibanzi High School

Figure 10:
Photographic illustration of Zwelibanzi High school

This school, situated in Umlazi township, was established in 1975. Despite its urban context, the school largely serves a peri-urban area with approximately 75% of its scholars emanating from a local informal settlement area. With a scholar population of 1057 and a teaching staff population of 46, Zwelibanzi High exhibits a staff-scholar ratio of 1:23, with approximately 56 pupils per class.

School facilities include 19 classrooms and 2 under-equipped laboratories, which currently serve as multifunctional classrooms as well as biology and physical science laboratories. Fairly adequate sporting equipment is available for a range of sport activities, including athletics, soccer, volleyball, netball and tennis. No sporting grounds are available, however, necessitating the school's use of a neighbouring hostel's sports ground and the use of Mangosuthu Technikon's tennis courts. While no library or technical drawing facilities are available, the school has electricity, running water and sanitation facilities.

Higher grade and standard grade subjects offered by the school include language subjects (Zulu, English and Afrikaans), science subjects (biology, physical science, physiology and mathematics), commerce subjects (accountancy, economics, and business economics) and general subjects (geography, history, fine art, music and biblical studies). Scholars may diversify into three subject streams in standard eight, viz. a science, commerce or general stream (refer to Table 6, pp. 57).

Table 6:
Summary profiles of the five selected schools

School	*Location and context*	*Date established*	*Scholar/teacher population*	*Staff-scholar ratios*	*Facilities*	*Sports*	*Subject streams*
Ilanga High	Clermont Urban context	1988	795 scholars 27 teachers	1:29 47 pupils per class	17 classrooms 2 laboratories	Soccer Netball Volleyball Basketball	Science General
Inhlanhlayethu High	Inanda Informal settlement context	1988	1101 scholars 36 teachers	1:31 37 pupils per class	30 classrooms 3 laboratories Sports ground	Soccer Netball Volleyball	Science Commerce
Sobonakhona High	Umbumbulu Rural context	1985	750 scholars 24 teachers	1:31 50 pupils per class	15 classrooms 2 laboratories	Soccer Netball Volleyball	Science Commerce General
Vukuzakhe High	Umlazi Urban context	1970	890 scholars 45 teachers	1:20 39 pupils per class	23 classrooms 2 laboratories Sports ground Library Computer centre Study centre	Soccer Netball Volleyball Basketball Tabletennis Karate	Science Commerce
Zwelibanzi High	Umlazi Urban context	1975	1057 scholars 46 teachers	1:23 56 pupils per class	19 classrooms 2 laboratories	Soccer Netball Volleyball Tennis	Science Commerce General

4.2.2 Faculty Profiles (ecology/milieu)

4.2.2.1 Faculties of Health Sciences and Dentistry[2]

Established in 1972, the Faculty of Health Sciences at UDW is unique in the KZN province. Comprising eight academic departments, the faculty offers a range of undergraduate and postgraduate professional training in the health sciences, viz. medical science, occupational therapy, optometry, pharmacy, physiotherapy, social work and speech and hearing therapy. Initially conceived as part of the Faculty of Health Sciences, the Faculty of Dentistry operates in close collaboration with the Health Science Faculty and currently offers a degree in dental therapy and a university diploma in oral health.

Collectively the faculties boast an academic staff compliment of 107, of which 64.5% (69) are Indian, 27.1% (29) are White, 6.5% (7) are African and 1.9% (2) are Coloured. The female-male ratio is 2.3:1, with an age range of 24-61 years ($\bar{x}$=37.8 years). The 653 full-time students in the faculties comprise 7.3% of UDW's total full-time student population. 72.9% (476) of the faculties' students are female while 27.1% (177) are male, with 28.3% (186) of the faculties' total full-time student population being African.

4.2.3 Biographical Profiles (milieu)

4.2.3.1 Scholars

The sample comprised 400 African scholars of which 200 (50.0%) were standard seven scholars and 200 (50.0%) were standard tens. Forty (10.0%) standard seven and 40 (10.0%) standard ten scholars emanated from each of the five selected schools, viz. Ilanga High (20.0%), Inhlanhlayethu High (20.0%), Sobonakhona High (20.0%), Vukuzakhe High (20.0%) and Zwelibanzi High (20.0%).

The age range of the sample was 12-28 years, with a mean age of 17.1 years. The age range of standard seven scholars was 12-25 years ($\bar{x}$=15.5 years), while the age range for standard ten scholars was 15-28 years ($\bar{x}$=18.7 years). 47.8% (191) of the sample were male and 52.3% (209) were female.

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[2] **Note**: this information is based on available statistics derived from (a) Bhagwanjee AM, Gray AL, Smit JA, Haffajee MR, Parekh AG & Moonilal R (1996). Research Capacity Development: Situational analysis and strategic plan. *IDHIG Research Report Series, 3(1);* (b) Swan M (Ed.) (1996). *Student statistics.* UDW: Dept. of Public Affairs; and (c) Mantis Media (1996). *UDW: A university for a changing South Africa.* UDW: Dept. of Public Affairs.

4.2.3.2 Teaching staff

The sample comprised 16 members of teaching staff from the five selected schools, of which 50.0% (8) were science teachers, 37.5% (6) were formal or informal career counsellors and 12.5% (2) were principals. The age range of the sample was 27-48 years ($\bar{x}$=32.3 years), with 62.5% (10) being male and 37.5% (6) being female. 25.0% (4) of the sample emanated from Sobonakhona High, 25.0% (4) from Zwelibanzi High, 18.8% (3) from Ilanga High, 18.8% (3) from Inhlanhlayethu High and 12.4% (2) from Vukuzakhe High.

4.2.3.3 Health science students

The sample comprised 73 second year African health science students, of which 29 (39.7%) were male and 44 (60.3%) were female. The age range of the sample was 18-28 years, with a mean age of 21.1 years. 32.9% (24) of the sample were enrolled in social work, 21.9% (16) in pharmacy, 12.3% (9) in optometry, 11.0% (8) in dental therapy, 11.0% (8) in physiotherapy, 5.5% (4) in medical science, 4.1% (3) in occupational therapy and 1.4% (1) in speech and hearing therapy.

The majority of the sample were residents of KZN (53.4%), with a small percentage emanating from the Eastern Cape (15.1%), Gauteng (13.7%), the Northern Province (8.2%) and Mpumulanga (5.5%). Very few students were residents of the Free State (1.4%), the Western Cape (1.4%) and East London (1.4%).

4.3 THE QUESTIONNAIRES

The data derived from the questionnaires administered to scholars and health science students is presented according to the following four broad categories of information:

- *Milieu :* family social class, family structure, career paths endorsed by parents, educational aspirations and goals (culture/milieu variable), source of fees for studying; knowledge of the health field and perceived level of academic skill
- *Social system :* parental involvement, school career counselling and subject selection
- *Ecology* : external career counselling initiatives and community-based career fairs
- *Local university conditions :* university selection procedures, adjustment difficulties, academic development programmes and campus residence

4.3.1 Milieu

4.3.1.1 Family social class

Table 7:
Occupational status of scholars' parents by gender
(in frequency with percent in parentheses)

Occupational status	*Mother*	*Father*	*All parents*
Unemployed	173 (45.9)	70 (24.9)	243 (36.9)
Pensioner	11 (2.9)	5 (1.8)	16 (2.4)
Informal sector	36 (9.5)	16 (5.7)	52 (7.9)
Unskilled	54 (14.3)	23 (8.2)	77 (11.7)
Semi-skilled	21 (5.6)	102 (36.3)	123 (18.7)
White-collar worker	21 (5.6)	33 (11.7)	54 (8.2)
Professional	34 (9.0)	29 (10.3)	63 (9.6)
Health professional	27 (7.2)	3 (1.1)	30 (4.6)
TOTAL	*377 (100)*	*281 (100)*	*658 (100)*

Key: green = working class; purple = middle class
Note:
1) 122 scholars indicated the absence of either their mother (13) or father (109)
2) There were 20 non-responses on this item

With reference to Table 7, the majority of the scholars' parents appeared to be working class individuals (67.7%) [i.e. unemployed (36.9%), semi-skilled workers (18.7%), unskilled workers (11.7%), informal sector workers (7.9%) and pensioners (2.4%)]. Furthermore, mothers tended to be largely unemployed (45.9%), while fathers primarily occupied semi-skilled positions (36.3%). 22.4% (147) of the scholars' parents appeared to be middle class individuals [i.e. professionals (9.6%), white-collar workers (8.2%) or health professionals (4.6%)], with a relatively even percentage of mothers (21.8%) and fathers (23.1%) occupying these positions.

In examining the socio-economic status (SES) of parents in relation to the school context, it was noted that scholars emanating from Vukuzakhe High appeared to have more parents who were middle class individuals (53.5%) as compared to scholars from the remaining schools ($\bar{x}$=14.6%) [χ; $p<.01$].

With regard to the health science students, it was observed that the majority of parents appeared to be working class individuals (62.5%), with mothers (35.6%) and fathers (32.5%) primarily occupying semi-skilled positions. It was noted that relatively few mothers were unemployed (20.8%). While 37.5% (45) of the students' parents were middle class individuals, 76.7% (23) of all health and other professional careers were occupied by mothers as compared to fathers (23.3%).

Table 8:
Siblings' occupational status by sample group
(in frequency with percent in parentheses)

Occupational status	*Scholars*	*Students*
Unemployed	123 (12.6)	13 (7.3)
Informal sector	21 (2.2)	1 (0.6)
Unskilled	19 (1.9)	2 (1.1)
Semi-skilled	32 (3.3)	6 (3.4)
Scholar	432 (44.3)	84 (47.5)
Student	255 (26.2)	38 (21.5)
White collar worker	44 (4.5)	12 (6.8)
Professional	37 (3.8)	19 (10.7)
Health professional	12 (1.2)	2 (1.1)
TOTAL	*975 (100)*	*177 (100)*

Key : green = working class; blue = studying; purple = middle class

Following Table 8, the majority of the scholars' siblings (70.5%) appeared to be embarking on some type of formal education programme [i.e. scholars (44.3%) or university students (26.2%)], with relatively few siblings occupying working class occupations (20.0%). Further, while a small percentage of the scholars' siblings appeared to occupy middle class occupations (9.5%), it was noted that siblings of scholars from Vukuzakhe High (24.3%) constituted the largest percentage of middle class siblings across the schools.

With regard to the siblings of health science students, the majority were either scholars (47.5%) or university students (21.5%), with more siblings occupying middle class occupations (18.6%) as opposed to working class occupations (12.4%) [refer to Table 8].

4.3.1.2 Family structure

While 18.5% (122) of the scholars appeared to emanate from single parent families, it was noted that more fathers had either absconded (92.2%) or were deceased (86.2%) than mothers (χ; $p<.01$) [refer to Table 9]. Although not statistically significant, it was also found that more scholars from Sobonakhona High emanated from single parent families (20.6%) as compared to scholars from the remaining schools ($\bar{x}$=14.4%).

Table 9:
Parental absence by gender[3]
(in frequency with percent in parentheses)

Parent	*Deceased*	*Absconded*
Mother	8 (13.8)	5 (7.8)
Father	**50 (86.2)	**59 (92.2)
TOTAL	*58 (100)*	*64 (100)*

**p<.01

With regard to the health science students, while 21.7% (26) of the students emanated from single parent families, in all instances it was the father who had either absconded (26.9%) or who was deceased (73.1%).

With regard to family size, an average of 2.4 siblings per household was recorded for scholars, with pupils from Sobonakhona ($\bar{x}$=3.2 siblings) and Inhlanhlayethu ($\bar{x}$=2.9 siblings) High schools emanating from larger family households than scholars from Zwelibanzi ($\bar{x}$=2.2 siblings), Vukuzakhe ($\bar{x}$=2.0 siblings) and Ilanga ($\bar{x}$=1.9 siblings) High schools. A mean of 2.4 siblings per household was recorded for health science students.

4.3.1.3 Career paths endorsed by parents

An analysis of the types of career paths endorsed by parents revealed a relatively even degree of parental support for scholars to embark on either health professional careers (47.7%) or other professional careers (52.3%). In examining parental career preferences in relation to the school context, however, significant differences were observed across the schools. Post-hoc analysis revealed that parents of scholars from Vukuzakhe High appeared to offer more support for their children to embark on health professional careers (68.2%) as compared to parents of scholars from the remaining schools ($\bar{x}$=43.1%) [χ; p<.01].

With regard to **professional career paths**, the majority of parents appeared to support a career in teaching (50.0%) or in science and commerce (30.8%), with more parental support for male scholars to embark on professional careers (63.9%) than for female scholars (41.6%) [χ; p<.01] (refer to Table 10). It was also noted that, regardless of the class background of the parent, teaching appeared to be the primary career choice of parents for both male (27.6%) and female scholars (22.4%), with parents of scholars from Inhlanhlayethu (47.9%), Sobonakhona (51.9%)

[3] * indicates a statistically significant difference for the chi-square statistic (χ) at p<.05.
** indicates a statistically significant difference fir the chi-square statistic (χ) st p<.01.

and Ilanga (85.5%) High schools offering greatest support for this career. Comparatively, parents of scholars from Zwelibanzi (42.7%) and Vukuzakhe (46.3%) High schools offered more support for careers in science and commerce (i.e. engineering, marketing and chartered accounting).

Table 10:
Career paths endorsed by parents by gender of scholars
(in frequency with percent in parentheses)

Career path	*Parents of Male scholars*	*Parents of Female scholars*	*All parents*
Professional	**207 (63.9)	137 (41.1)	344 (52.3)
Health professional	117 (36.1)	**197 (58.9)	314 (47.7)
TOTAL	*324 (100)*	*334 (100)*	*658 (100)*

**** p<.01**
Note: there were 20 non-responses on this item

With regard to **health professional career paths**, the majority of parents appeared to support careers in medicine (37.3%), nursing (32.5%) or social work (19.4%), with greater parental support for female scholars to embark on health-related careers (58.9%) than for male scholars (36.1%) [χ; $p<.01$] (refer to Table 10). It was further noted that, regardless of the class background of the parent, nursing appeared to be parents' preferred career choice for female scholars (23.6%) and medicine the career of choice for male scholars (17.5%). An interesting finding was that more middle class parents appeared to endorse health professional careers other than nursing, medicine or social work (18.4%) than was the case for working class parents (8.4%) [χ; $p<.05$].

With regard to the school context, substantially more parents of scholars from Zwelibanzi (25.0%) and Vukuzakhe (20.4%) High schools supported health professional careers other than nursing, medicine or social work, while parents of scholars from the remaining three schools offered very little support or no support at all for these careers.

4.1.3.4 Educational aspirations and goals (culture/milieu variable)

Irrespective of their level of study, gender, class background or school context, the majority of scholars indicated that they wanted to undertake tertiary studies on completing their schooling (83.0%).

Table 11:
Scholars' motives for wanting to further their education by gender
(in frequency with percent in parentheses)

Motive	*Male scholars*	*Female scholars*	*All scholars*
Earn a good salary	29 (18.6)	26 (14.8)	55 (16.6)
Provide financial support to family	70 (44.9)	90 (51.1)	160 (48.2)
Do useful work in the community	32 (20.5)	40 (22.7)	72 (21.7)
Develop useful skills	19 (12.2)	17 (9.7)	36 (10.8)
Parents' influence	6 (3.8)	3 (1.7)	9 (2.7)
TOTAL	*156 (100)*	*176 (100)*	*332 (100)*

Note: this item only included the responses of those scholars who indicated that they wanted to study further (N=332)

Following Table 11, the primary motives for wanting to study further included the need to provide financial support for family members (48.2%) and the need to do useful work in the community (21.7%). A small percentage of scholars wanted to study further for monetary benefits (16.6%) and in order to develop useful skills (10.8%). Very few scholars reported wanting to study further due to their parents' influence (2.7%). There was no statistically significant difference between these expressed motives of scholars across the variables of class, gender and level of study.

With regard to the school context, however, scholars emanating from Vukuzakhe High (21.2%) were less inclined to report the need to support family members as a primary motive for wanting to further their education as compared to scholars from the remaining schools ($\bar{x}$=54.5%) [χ; p<.01].

With regard to the health science students, altruism (78.1%) appeared to be the primary motive for wanting to pursue a career in health sciences [i.e. the need to develop useful skills to benefit their communities (41.1%) and the realisation that the country needed more health professionals (37.0%)].

Table 12:
Scholars' career path preferences by gender
(in frequency with percent in parentheses)

Career path	*Males scholars*	*Female scholars*	*All scholars*
Professional	**120 (77.5)	66 (40.0)	186 (58.1)
Health professional	35 (22.5)	**99 (60.0)	134 (41.9)
TOTAL	*155 (100)*	*165 (100)*	*320 (100)*

**p<.01
Note: there were 80 non-responses on this item

A closer examination of the *types* of career paths endorsed by scholars revealed that, regardless of their class background, more male scholars (77.5%) aspired to non health-related careers, while female scholars were more inclined to want to pursue careers in the health field (60.0%) [χ; $p<.01$] (refer to Table 12). Furthermore, while the level of interest in health professional careers did not differ significantly between standard seven (52.0%) and standard ten scholars (52.5%), scholars from Vukuzakhe High demonstrated more interest in embarking on health professional careers (68.2%) than scholars from the remaining schools ($\bar{x}$=36.2%) [χ; $p<.01$].

Table 13:
Scholars' professional career choices by school
(in frequency with percent in parentheses)

Career	*Ilanga*	*Inhlanhlayethu*	*Sobonakhona*	*Vukuzakhe*	*Zwelibanzi*
Teaching	12 (38.7)	14 (23.7)	18 (47.4)	1 (4.8)	6 (16.2)
Engineering	6 (19.4)	12 (20.3)	6 (15.8)	11 (52.4)	11 (29.7)
Chartered accounting	0 (0.0)	8 (13.6)	0 (0.0)	6 (28.5)	7 (18.9)
Marketing	4 (12.9)	12 (20.3)	3 (7.9)	2 (9.5)	4 (10.8)
Other professional	9 (29.0)	13 (22.1)	11 (28.9)	1 (4.8)	9 (24.4)
TOTAL	*31 (100)*	*59 (100)*	*38 (100)*	*21 (100)*	*37 (100)*

Note : this item only included the responses of those scholars interested in pursuing professional careers other than health professions (N=186)

With regard to **professional career paths**, more standard seven scholars demonstrated a preference for embarking on a career in teaching (21.0%) than did standard ten scholars (1.6%) [χ; $p<.01$], while more standard ten scholars wanted to pursue careers in science or commerce (38.2%) than was the case for standard seven scholars (10.8%) [χ; $p<.01$]. Furthermore, teaching appeared to be the career of choice for scholars emanating from Sobonakhona (47.4%), Ilanga (38.7%) and Inhlanhlayethu (23.7%) High schools, while scholars emanating from Vukuzakhe and Zwelibanzi High schools primarily endorsed careers in engineering ($\bar{x}$=37.9%) and chartered accounting ($\bar{x}$=22.4%)[refer to Table 13].

With regard to **health professional careers**, medicine (51.7%), nursing (37.8%), social work (36.1%) and dentistry (29.4%) were the most popular career path preferences among scholars, with female scholars largely aspiring to a career in nursing (71.1%) and male scholars being primarily interested in medicine (67.1%). Following Table 14, it was also noted that more standard ten scholars were interested in pursuing professions such as psychology [χ; $p<.05$], physiotherapy (11.0%) [χ; $p<.01$], pharmacy (15.9%) [χ; $p<.05$], dentistry (32.9%) and 'other'

health professions (25.6%) [χ; p<.01], while more standard seven scholars were interested in pursuing careers in nursing (54.1%) [χ; p<.01] and medicine (61.2%).

Table 14:
Scholars' career preferences in the health field by level of study
(in frequency with percent in parentheses)

Career	*Std 7 scholars (n=98)*	*Std 10 scholars (n=82)*	*All scholars (n=180)*
Dentistry	26 (26.5)	27 (32.9)	53 (29.4)
Nursing	**53 (54.1)	15 (18.3)	68 (37.8)
Medicine	60 (61.2)	33 (40.2)	93 (51.7)
Pharmacy	2 (2.0)	*13 (15.9)	15 (8.3)
Physiotherapy	0 (0.0)	**9 (11.0)	9 (5.0)
Psychology	2 (2.0)	*8 (9.8)	10 (5.6)
Social work	36 (36.7)	29 (35.4)	65 (36.1)
Other	6 (6.1)	**1 (25.6)	27 (15.0)

***p<.05**
****p<.01**
Note:
1) *While this item only included the responses of those scholars who were interested in pursuing a career in the Health Sciences (N=209), there were 29 non-responses on this item*
2) *Scholars were free to 'tick as many as apply' in response to this item*

With regard to the school context, while scholars across all five schools displayed a relatively strong interest in pursuing careers in medicine ($\bar{x}$=51.7%) and nursing ($\bar{x}$=37.8%), a career in social work was largely supported by scholars from Sobonakhona (43.2%) and Inhlanhlayethu (50.0%) High schools. Furthermore, scholars emanating from Zwelibanzi and Vukuzakhe High schools were more inclined to display interest in pursuing careers in physiotherapy ($\bar{x}$=13.1%) and psychology ($\bar{x}$=13.1%) than their peers from the other three schools ($\bar{x}$=1.1%) [χ; p<.01]. It was also noted that scholars from Zwelibanzi High school (54.5%) displayed more interest in 'other' health professions, such as radiography (27.2%), medical science (18.2%) and occupational therapy (9.1%), than did scholars from the other four schools (χ; p<.01).

4.3.1.5 Source of fees for studying

With reference to Table 15, the majority of the scholars indicated that they would obtain finances for their future studies from parents and relatives (49.4%) or from bursaries and scholarships (47.3%). It was noted that very few scholars indicated that they would be unable to secure pecuniary support for studying (18.1%).

Table 15:
Source of fees for studying by sample group
(in frequency with percent in parentheses)

Source	*All scholars (n=332)*	*Students (n=73)*
Parents and relatives	164 (49.4)	**50 (68.5)
Bank/university loan	42 (12.7)	**36 (49.3)
Bursary/scholarship	**157 (47.3)	20 (27.4)

****p<.01**

Note :

1) *With regard to the scholars, this item only included the responses of those who indicated that they would like to study further (N=332)*
2) *Both sample groups were free to 'tick as many as apply' in response to this item*

Further, while a significant percentage of health science students (49.3%) appeared to be accessing bank or university loans to finance their studies, scholars largely did not perceive this to be a primary avenue for accessing funding for their future studies (12.7%) [χ; p<.01]. It was also observed that a greater percentage of students were relying on family members to finance their studies (68.5%) than was projected to be the case by scholars (49.4%) [χ; p<.01]. Comparatively, scholars were more inclined to expect that they would be able to secure bursaries or scholarships for their future studies (47.3%) than was actually secured by health science students (27.4%) [χ; p<.01] (refer to Table 15).

4.3.1.6 Knowledge of the health field

a) Knowledge of health-related careers

While scholars were largely aware that UDW offered health professional training (52.3%), more standard ten scholars (63.0%) demonstrated this awareness than did standard seven scholars (41.5%) [χ; p<.01]. Furthermore, scholars from Vukuzakhe (78.8%) and Zwelibanzi (65.0%) High schools were more aware of the health professional training offered by UDW than their peers from the remaining three schools ($\bar{x}$=39.2%) [χ; p<.01].

Following Table 16, scholars appeared to lack knowledge of professions such as optometry (16.0%), psychology (12.5%), speech and hearing therapy (11.8%), physiotherapy (10.8%), medical science (8.3%) and occupational therapy (0.5%). Comparatively, relatively good knowledge was displayed by scholars with regard to careers in medicine (62.5%), social work (62.0%), nursing (61.8%), dentistry (60.0%) and pharmacy (30.8%).

Standard ten scholars demonstrated more knowledge of all health science professions (with the exception of occupational therapy) than did standard seven scholars (χ; $p<.01$), particularly pharmacy (47.0%), optometry (29.0%), psychology (23.0%) and speech and hearing therapy (21.0%). An interesting finding was that there were no statistically significant differences between male and female scholars with regard to their knowledge of health science professions.

Table 16:
Scholars' knowledge of health science professions by level of study
(in frequency with percent in parentheses)

Profession	*Std 7 scholars (n=200)*	*Std 10 scholars (n=200)*	*All scholars (n=400)*
Dentistry	93 (46.5)	**147 (73.5)	240 (60.0)
Medical Science	4 (2.0)	**29 (14.5)	33 (8.3)
Medicine	95 (47.5)	**155 (77.5)	250 (62.5)
Nursing	95 (47.5)	**152 (76.0)	247 (61.8)
Occupational Therapy	1 (0.5)	1 (0.5)	2 (0.5)
Optometry	6 (3.0)	**58 (29.0)	64 (16.0)
Pharmacy	29 (14.5)	**94 (47.0)	123 (30.8)
Physiotherapy	4 (2.0)	**39 (19.5)	43 (10.8)
Psychology	4 (2.0)	**46 (23.0)	50 (12.5)
Speech and Hearing Therapy	5 (2.5)	**42 (21.0)	47 (11.8)
Social Work	91 (45.5)	**157 (78.5)	248 (62.0)

****p<.01**

Note: This item was an open-ended question where responses were subjectively categorised by the researcher according to the scholars' knowledge of each profession

As illustrated in Table 17, scholars across the school contexts demonstrated the greatest knowledge of careers in medicine ($\bar{x}$=66.0%), social work ($\bar{x}$=63.3%), nursing ($\bar{x}$=61.8%) and dentistry ($\bar{x}$=60.0%). In addition, all health professions appeared to be better recognised by scholars from Vukuzakhe and Zwelibanzi High schools as compared to their peers from the other three schools, particularly careers in pharmacy ($\bar{x}$=45.1%), optometry ($\bar{x}$=30.7%) and psychology ($\bar{x}$=23.2%).

Table 17:
Scholars' knowledge of health science professions by school
(in frequency with percent in parentheses)

Profession	*Ilanga (n=80)*	*Inhlanhlayethu (n=80)*	*Sobonakhona (n=80)*	*Vukuzakhe (n=80)*	*Zwelibanzi (n=80)*
Dentistry	44 (55.0)	17 (21.3)	51 (63.8)	58 (72.5)	70 (87.5)
Medical Science	7 (8.8)	5 (6.3)	1 (1.3)	12 (15.0)	8 (10.0)
Medicine	55 (68.8)	27 (33.8)	52 (65.0)	60 (75.0)	70 (87.5)
Nursing	51 (63.8)	27 (33.8)	53 (66.3)	56 (70.0)	60 (75.0)
Occupational Therapy	0 (0.0)	1 (1.3)	0 (0.0)	1 (1.3)	0 (0.0)
Optometry	7 (8.8)	0 (0.0)	8 (10.0)	28 (35.0)	21 (26.3)
Pharmacy	18 (22.5)	6 (7.5)	21 (26.3)	39 (48.8)	33 (41.3)
Physiotherapy	6 (7.5)	0 (0.0)	6 (7.5)	15 (18.8)	13 (16.3)
Psychology	6 (7.5)	1 (1.3)	6 (7.5)	19 (23.8)	18 (22.5)
Speech Therapy	5 (6.3)	0 (0.0)	12 (15.0)	15 (18.8)	15 (18.8)
Social Work	57 (71.3)	24 (30.0)	47 (58.8)	58 (72.5)	67 (83.8)

Note: This item was an open-ended question where responses were subjectively categorised by the researcher according to the scholars' knowledge of each profession

b) Knowledge of subject prerequisites for entry into the health science field

Table 18:
Scholars' perceptions of the prerequisite subjects for entry into the health science field by level of study
(in frequency with percent in parentheses)

Subjects	*Standard 7 scholars (n=161)*	*Standard 10 scholars (n=198)*	*All scholars (n=359)*
Biology	116 (72.0)	178 (89.9)	294 (81.9)
Mathematics	88 (54.7)	126 (63.6)	214 (59.6)
Physical science	113 (70.2)	149 (70.7)	253 (70.5)
English	94 (47.0)	**148 (74.7)	242 (67.4)
Other	61 (37.9)	70 (35.4)	131 (36.5)

****p<.01**
Note:
1) *There were 41 non-responses on this item*
2) *Scholars were free to 'tick as many as apply' in response to this item*

Following Table 18, scholars viewed biology (81.9%) and physical science (70.5%) to be the most important subjects required for entry into the health science field. In addition, many scholars perceived English (67.4%) to be more important for entry than mathematics (59.6%), particularly standard ten scholars (χ; $p<.01$). It was interesting to note that a substantial percentage of both standard seven (37.9%) and standard ten (35.4%) scholars were of the opinion that 'other' subjects were required in order to study a career in health sciences, including history ($\bar{x}$=16.7%), Afrikaans ($\bar{x}$=8.4%), geography ($\bar{x}$=7.5%) and home economics ($\bar{x}$=3.9%). It is important to note that no statistically significant differences were observed in the responses of scholars across the school contexts.

With regard to the health science students, students' reports were equivocal with regard to those who had been aware, as scholars, that they required science-related subjects for entry into the health science field (50.7%) and those who had not (49.3%). No statistically significant difference was noted between the reports of male and female students in response to this item.

c) Knowledge of skill prerequisites for succeeding in health professional training

Table 19:
Perceived skill prerequisites for success in health science education by sample group
(in frequency with percent in parentheses)

Skill prerequisites	*Scholars (n=203)*	*Students (n=67)*
Compassion	*54 (26.6)	8 (11.9)
Physical strength	*19 (9.4)	1 (1.5)
Hard work	81 (39.9)	37 (55.2)
Fluency in English	44 (21.7)	23 (34.3)
Good interpersonal abilities	79 (38.9)	20 (29.9)
Initiative	13 (6.4)	1 (1.5)
Reading and writing skills	76 (37.4)	24 (35.8)
Time management	34 (16.7)	**22 (32.8)
Study skills	61 (30.0)	26 (38.8)
Ability to cope with stress	29 (14.3)	9 (13.4)
Listening skills	*50 (24.6)	9 (13.4)
Motivation and determination	28 (13.8)	8 (11.9)
Adaptability	40 (19.7)	7 (10.4)
Positive attitude and confidence	36 (17.7)	13 (19.4)
Academic ability	130 (64.0)	51 (76.1)
Patience	*46 (22.7)	7 (16.4)
Open communication with lecturers	9 (4.4)	**17 (25.4)
Critical thinking ability	60 (29.6)	23 (34.3)
Good work habits	18 (8.7)	13 (19.4)
Computer literacy	0 (0.0)	1 (1.5)
Creativity	19 (9.4)	4 (6.0)

***p<.05**
****p<.01**
Note :
1) Both sample groups were free to 'tick as many as apply' in response to this item
2) There were 203 non-responses on this item

Following Table 19, the skills perceived to be most important for succeeding in health science education, from the perspective of both scholars and health science students, included academic ability ($\bar{x}$=67.0%), hard work ($\bar{x}$=43.7%), good interpersonal abilities ($\bar{x}$=36.7%), reading and writing skills ($\bar{x}$=36.6%), study skills ($\bar{x}$=32.2%), critical thinking ($\bar{x}$=30.7%) and fluency in English ($\bar{x}$=24.8%). It was interesting to note that more scholars perceived compassion (26.6%), listening skills (24.6%), patience (22.7%) and physical strength (9.4%) to be important skill

prerequisites ($p<.05$), while more health science students perceived time management (32.8%) and open communication with lecturers to be crucial (25.4%) [χ; $p<.01$].

A small percentage of scholars and students perceived a positive attitude and confidence ($\bar{x}$=18.1%), good work habits ($\bar{x}$=17.8%), adaptability ($\bar{x}$=17.4%), stress management abilities ($\bar{x}$=14.1%), motivation and determination ($\bar{x}$=13.3%) to be important prerequisites for success in health science education. Very few respondents from both sample groups viewed creativity ($\bar{x}$=8.5%), initiative ($\bar{x}$=5.2%) and computer literacy ($\bar{x}$=0.4%) to be necessities for success in health sciences. It is important to note that no statistically significant differences were observed between the responses of standard seven and standard ten scholars on this item.

4.3.1.7 Perceived level of academic skill

Table 20:
Perceived level of skill by level of study
(in frequency with percent in parentheses)

Skill	*Std 7 scholars (n=200)*			*Std 10 scholars (n=200)*		
	Good	***Fair***	***Poor***	***Good***	***Fair***	***Poor***
Fluency in English	117 (58.5)	43 (21.5)	40 (20.0)	53 (26.5)	80 (40.0)	67 (33.5)
Reading and writing	130 (65.0)	65 (32.5)	5 (2.5)	75 (37.5)	81 (40.5)	44 (22.0)
Problem-solving	45 (22.5)	94 (47.0)	61 (30.5)	78 (39.0)	92 (46.0)	30(15.0)
Note-taking	68 (34.0)	85 (42.5)	47 (23.5)	55 (27.5)	100 (50.0)	45 (22.5)
Critical thinking	60 (30.0)	103 (51.5)	37 (18.5)	55 (27.5)	77 (38.5)	68 (34.0)
Mathematical skills	45 (22.5)	94 (47.0)	61 (30.5)	78 (39.0)	30 (15.0)	92 (46.0)
Scientific skills	52 (26.0)	82 (41.0)	66 (33.0)	55 (27.5)	62 (31.0)	83 (41.5)
Studying skills	69 (34.5)	82 (41.0)	49 (24.5)	76 (38.0)	104 (52.0)	20 (10.0)
Working quickly	59 (29.5)	98 (49.0)	43 (21.5)	71 (35.5)	125 (62.5)	4 (2.0)
Relating to people	102 (51.0)	49 (24.5)	49 (24.5)	121 (60.5)	61 (30.5)	18 (9.0)
Working in groups	104 (52.0)	56 (28.0)	40 (20.0)	133 (66.5)	56 (28.0)	11 (5.5)
Time management	63 (31.5)	76 (38.0)	61 (30.5)	74 (37.0)	98 (49.0)	28 (14.0)

As illustrated in Table 20, standard seven scholars were more inclined to indicate higher levels of self-efficacy in reading and writing (65.0%) and fluency in English (58.5%) than were standard ten scholars. Further, while the majority of standard seven and standard ten scholars were unable to rate their level of skill in science ($\bar{x}$=73.3%) and critical thinking ($\bar{x}$=71.3%) as being any better than 'fair', a larger percentage of standard ten scholars (41.5%) had perceptions of 'poor' skill in these areas than did standard seven scholars (33.0%). With regard to mathematical skills, it was interesting to note that standard seven scholars tended to rate their level of skill as

being 'fair' (47.0%), while standard ten scholars were more inclined to have perceptions of 'poor' skill in this area (46.0%).

There was a relatively high level of agreement among scholars with regard to their perceptions of a 'fair' level of skill in working quickly ($\bar{x}$=55.8%), problem-solving ($\bar{x}$=46.5%), studying ($\bar{x}$=46.5%), note-taking ($\bar{x}$=46.3%) and time management ($\bar{x}$=43.5%). In addition, the level of skill in working in groups ($\bar{x}$=59.3%) and relating to people ($\bar{x}$=55.8%) was largely rated as being 'good' by scholars from both levels of study.

With regard to the health science students, it was noted that the majority were unable to rate their level of skill as being any better than 'fair' in all of the identified performance areas reflected in Table 20 (Range=52.1%-69.9%). In addition, a substantial percentage of students were inclined to perceive their skill as being 'poor' in time management (35.6%), critical thinking (27.4%), mathematics (27.4%), science (27.4%) and working quickly (23.3%).

4.3.2 Social System

4.3.2.1 *Parental involvement*

With regard to the role that parents had played in career decision-making, a large percentage of scholars, irrespective of their gender or level of study, reported that their parents had been interested in discussing their future career plans (77.5%). It was also noted that this finding was consistent across single-parent and two-parent families, as well as across the school contexts. Scholars from Zwelibanzi (42.9%) and Vukuzakhe (37.0%) High schools were, however, more inclined to report that their parents had offered them guidance and useful suggestions in making their career decisions as compared to scholars from the remaining schools ($\bar{x}$=23.4%), particularly those scholars emanating from Sobonakhona High school (15.3%) [χ; $p<.01$]. In addition, female scholars (60.0%), middle class scholars (78.5%) and scholars emanating from two-parent families (75.7%) reported more useful career guidance from parents than did male scholars (34.1%), working class scholars (21.5%) and scholars emanating from single-parent families (24.6%) [χ; $p<.01$]. An interesting finding was that a large percentage of scholars across the schools indicated that their parents wanted them to find a job immediately upon leaving school ($\bar{x}$=25.9%).

While a large percentage of health science students reported that their parents had been interested in discussing their career decision (61.7%), few indicated that their parents had

offered guidance and useful suggestions (37.0%). In addition, students' emanating from two-parent families reported more support and guidance from parents (67.5%) than was the case for students emanating from single-parent families (32.5%) [χ; $p<.05$]. It was interesting to note that very few students indicated that their parents had wanted them to look for a job immediately upon leaving school (2.7%).

4.3.2.2 School career counselling

While a large percentage of both scholars (53.8%) and health science students (68.5%) reported that they had received school career counselling, it was noted that more standard ten scholars reported this to be the case (71.5%) than did standard seven scholars (36.0%) [χ; $p<.01$].

Of those scholars and health science students who had received school career counselling (N=265), the majority indicated that this had been provided on a weekly basis ($\bar{x}$=59.0%). A smaller percentage of both sample groups reported receiving career counselling on a monthly (24.5%) or annual (16.5%) basis. It was further noted that more standard ten scholars reported receiving career counselling on a weekly or monthly basis (43.3%), while more standard seven scholars reported receiving this counselling on an annual basis (41.9%) [χ; $p<.01$].

Table 21:
Opinions regarding guidance classes by sample group
(in frequency with percent in parentheses)

Categorical response	*Scholars (n=215)*			*Students (n=50)*		
	Agree	***Uncert.***	***Disagree***	***Agree***	***Uncert.***	***Disagree***
Teachers think other subjects should be done during this time	79 (36.7)	53 (24.7)	83 (38.6)	17 (34.0)	11 (22.0)	22 (44.0)
Pupils are not interested in guidance classes	39 (18.1)	86 (40.0)	90 (41.9)	16 (32.0)	9 (18.0)	25 (50.0)
Not enough information is provided on health science careers	125 (58.1)	65 (30.3)	25 (11.6)	30 (60.0)	2 (4.0)	18 (36.0)
Teacher unable to answer questions related to health sciences	112 (52.1)	94 (43.7)	9 (4.2)	26 (52.0)	9 (18.0)	15 (30.0)
Time set aside for these classes too short to be of use	98 (45.6)	72 (33.5)	45 (20.9)	23 (46.0)	10 (20.0)	17 (34.0)
Guidance classes assisted me in making my career decision	61 (28.4)	125 (58.1)	29 (13.5)	11 (22.0)	24 (48.0)	15 (30.0)

Note :

1) *This item only included the responses of those scholars (N=215) and students (N=50) who indicated that they had received school guidance counselling*
2) *Both sample groups were free to 'tick as many as apply' in response to this item*

With reference to Table 21, a substantial percentage of both health science students (44.0%) and scholars (38.6%) disagreed that teachers wanted to utilise guidance classes for teaching other subjects. However, while 50.0% (25) of the students were of the opinion that pupils were interested in career guidance, a large percentage of the scholars (40.0%) were 'uncertain' as to whether this was the case.

Both sample groups concurred that not enough information on health sciences was provided in their guidance classes ($\bar{x}$=59.1%), that their teacher had been unable to answer questions related to health science careers ($\bar{x}$=52.1%) and that the time set aside for their guidance classes had been too short to be of use ($\bar{x}$=45.7%). Furthermore, a large percentage of both scholars (58.1%) and students (48.0%) were 'uncertain' whether guidance classes had assisted them in making their career decision. It is important to note that no statistically significant differences were observed between the opinions of standard seven and standard ten scholars concerning their school guidance classes.

With regard to the school context, there was relative concordance across schools with regard to scholars' perceptions that not enough information was provided on health sciences in their guidance classes ($\bar{x}$=58.1%) and that their teacher was unable to answer questions related to health science careers ($\bar{x}$=52.1%).

4.3.2.3 Subject selection

Table 22: Scholars' science-related subject choices by gender
(in frequency with percent in parentheses)

Subject	*Male scholars (n=191)*	*Female scholars (n=209)*	*All scholars (n=400)*
Biology	110 (57.6)	*145 (69.4)	255 (63.8)
Mathematics	**159 (83.2)	139 (66.5)	**298 (74.5)
Physical science	**125 (65.4)	92 (44.0)	217 (54.3)

***p<.05**
****p<.01**

As illustrated in Table 22, while a significant percentage of scholars reported being enrolled in mathematics (74.5%) as opposed to biology (63.8%) and physical science (54.3%) [χ; p<.01], more male scholars (83.2%) had opted for this subject choice than female scholars (66.5%) [χ; p<.01]. It was also noted that more females scholars had selected biology (69.4%) [χ; p<.05] while more male scholars had selected physical science (65.4%) [χ; p<.01]. With regard to the

school context, it was noted that, with the exception of Vukuzakhe High school (75.0%), physical science was not a popular subject choice among scholars across the schools ($\bar{x}$=49.1%).

While the majority of scholars (74.5%) reported selecting science-related subjects in order to study their chosen career, a large percentage of scholars did not view these subjects as being easy (82.0%). Furthermore, while a substantial percentage of scholars indicated that they had selected these subjects on the advice of their family or teachers (38.8%), few scholars reported selecting science-related subjects because their friends were doing them (4.8%) or because they liked the teachers who taught these subjects (19.8%).

With regard to level of study, it was found that more standard ten scholars selected science-related subjects in order to study their chosen career (81.0%), while more standard seven scholars had opted for these subjects because they liked the teachers who taught these subjects (27.0%) [χ; $p<.01$].

4.3.3 Ecology

4.3.3.1 External career counselling initiatives

Table 23:
Source of health science career information by sample group
(in frequency with percent in parentheses)

Source	*Scholars (n=400)*	*Students (n=73)*
Career fairs	50 (12.5)	8 (11.0)
Clinic sister/health professional	171 (42.8)	18 (24.7)
Community organisations	15 (3.8)	1 (1.4)
Family member/friend	129 (32.3)	26 (35.6)
Guidance/class teacher	126 (31.5)	15 (20.5)
School/community library	134 (33.5)	30 (41.1)
Media	131 (32.8)	17 (23.3)

Note: Scholars were free to 'tick as many as apply' in response to this item

Following Table 23, both scholars and health science students reported receiving information on health-related careers primarily from a clinic sister or health professional in the community ($\bar{x}$=39.9%), their school or community library ($\bar{x}$=34.6%), family members or friends ($\bar{x}$=32.8%), the media ($\bar{x}$=31.3%) and their guidance or class teacher ($\bar{x}$=29.8%). Relatively few respondents from both sample groups reported receiving career information on health professions from community organisations ($\bar{x}$=3.4%) or career fairs ($\bar{x}$=12.3%).

With regard to the value of the information they had received from these sources, both scholars and health science students reported that while they had learnt what health science careers basically involved ($\bar{x}$=41.0%), not enough information had been provided on specific careers in this field ($\bar{x}$=39.8%). In addition, only a small percentage of both sample groups indicated that they had learnt where they could study health science careers ($\bar{x}$=24.3%) or what the subject and skill prerequisites were for entry into this field ($\bar{x}$=27.4%). An interesting finding was that more standard ten scholars (41.5%) reported learning what careers in the health field basically involved than did standard seven scholars (26.5%) [χ; $p<.01$].

With regard to the school context, scholars from Zwelibanzi (56.3%) and Vukuzakhe (42.5%) High schools were more inclined to report that they had learnt what careers in the health sciences basically involved than scholars from the other three schools ($\bar{x}$=23.8%) [χ; $p<.01$]. Further, more scholars from Zwelibanzi High school (40.0%) reported gaining an understanding of the subject and skill prerequisites for entry into the health field than did scholars from the remaining schools ($\bar{x}$=24.8%) [χ; $p<.05$].

4.3.3.2 Community-based career fairs

More standard ten scholars indicated that they had attended community-based career fairs (71.0%) than was the case for standard seven scholars (38.0%) [χ; $p<.01$]. In addition, more scholars from Ilanga (68.8%), Zwelibanzi (65.0%) and Vukuzakhe (63.8%) High schools reported attending career fairs than did scholars from Inhlanhlayethu (40.0%) and Sobonakhona (33.8%) High schools (χ; $p<.01$).

With regard to the health science students, responses were relatively equivocal with regard to those students who had attended community-based career fairs (52.1%) and those who had not (47.9%). The primary reasons offered by both scholars and health science students for not attending career fairs was a lack of opportunity to attend ($\bar{x}$=58.0%) and a lack of awareness of these events ($\bar{x}$=39.1%).

With reference to Table 24, while attendance at career fairs hosted by schools was largely reported by both scholars (81.7%) and health science students (68.6%), a relatively substantial percentage of both sample groups reported attending career fairs held at community clinics or halls ($\bar{x}$=31.2%). Very few scholars and students indicated that they had attended career fairs

held at churches ($\bar{x}$=1.6%) or at the Durban Exhibition Centre ($\bar{x}$=13.8%). It was interesting to note that while 35.3% (77) of the scholars indicated that they had attended career fairs hosted by universities or technikons, none of the students reported this to be the case.

Table 24:
Common career fair sites by sample group
(in frequency with percent in parentheses)

Site	*Scholars (n=218)*	*Students (n=35)*
School	178 (81.7)	24 (68.6)
Community clinic/hall	66 (30.3)	13 (37.1)
Church	2 (0.9)	2 (5.7)
University or Technikon	77 (35.3)	0 (0.0)
Durban Exhibition Centre	30 (13.8)	5 (13.2)

Note :
1) *This item only included the responses of those scholars (N=218) and students (N=35) who indicated that they had attended a career day*
2) *Both sample groups were free to 'tick as many as apply' in response to this item*

As illustrated in Table 25, the majority of both scholars (60.1%) and health science students (60.0%) did not believe that pupils were uninterested in attending career fairs. Further, there was a high level of agreement between both sample groups with regard to the perception that insufficient information on health science careers was provided at these fairs ($\bar{x}$=54.5%). While a large percentage of students indicated that the career information had been presented in a manner that was easy to understand (71.4%), only 46.8% (102) of the scholars indicated this to be the case. It was encouraging to note that the majority of both sample groups were of the opinion that career fairs had assisted them in making their career decisions ($\bar{x}$=56.7%). It is important to note that there were no statistically significant differences between the responses of standard seven and standard ten scholars on this item.

Table 25:
Opinions regarding career days by sample group
(in frequency with percent in parentheses)

Categorical response	*Scholars (n=218)*			*Students (n=35)*		
	Agree	***Uncert.***	***Disagree***	***Agree***	***Uncert.***	***Disagree***
Pupils are disinterested in attending career fairs	38 (17.4)	49 (22.5)	131 (60.1)	10 (28.6)	4 (11.4)	21 (60.0)
Not enough information provided on health science careers	117 (53.7)	59 (27.1)	42 (19.2)	21 (60.0)	3 (8.6)	11 (31.4)
Information presented in a manner that was not easy to understand	61 (28.0)	55 (25.2)	102 (46.8)	4 (11.5)	6 (17.1)	25 (71.4)
Career fairs assisted me in making my career decision	129 (59.2)	53 (24.3)	36 (16.5)	19 (54.2)	8 (22.9)	8 (22.9)

Note :
1) This item only included the responses of those scholars (N=218) and students (N=35) who indicated that they had attended a career day
2) Both sample groups were free to 'tick as many as apply' in response to this item

4.3.4 Local University Conditions

4.3.4.1 University selection procedures

A relatively large percentage of health science students (45.2%) were 'uncertain' whether the selection procedures utilised by UDW restricted the access of historically disadvantaged students to health science professional training. The primary reason offered by respondents in this category was the perception that only a relatively small percentage of disadvantaged applicants are actually accepted into health science degree programmes (84.8%).

Reasons provided by those endorsing the view that the access of historically disadvantaged students was restricted (19.2%) included, *inter alia*, the view that student selection was based solely on academic merit (57.1%) and the use of a second language (i.e. English) during the interview procedure which served to disadvantage prospective students (42.9%). The rationale provided by those who believed that there was equity in access to the health professional training (35.6%) was the use of affirmative action policies which reserved course places specifically for historically disadvantaged applicants (100%). It is important to note that there were no statistically significant differences between the responses of male and female students in response to this item.

Table 26:
Students' opinions regarding the interview procedure utilised in their selection
(in frequency with percent in parentheses)

Categorical response	*Students (n=54)*		
	Agree	***Uncertain***	***Disagree***
The interview panel was intimidating	28 (51.9)	5 (9.3)	21 (38.8)
I was well-prepared for the interview	22 (40.8)	24 (44.4)	8 (14.8)
Most staff involved in my selection were racist	5 (9.3)	28 (51.9)	21 (38.8)
I was afraid to ask questions	28 (51.9)	10 (18.5)	16 (29.6)

Note : this item only included the responses of those students who indicated that they had undergone an interview process (N=54)

Following Table 26, with regard to those students who indicated that they had undergone an interview process in order to gain access to health science professional training (N=54), the majority agreed that the interview panel had been intimidating (51.9%) and that they had been afraid to ask questions (51.9%). Furthermore, a large percentage of students were 'uncertain' as to whether most staff involved in their selection had been racist (51.9%) and only 40.8% (22) were able to endorse the view that they had been well-prepared for the interview.

Table 27:
Students' opinions regarding the biographical questionnaires utilised in their selection
(in frequency with percent in parentheses)

Categorical response	*Students (n=73)*		
	Agree	***Uncertain***	***Disagree***
Some of the questions asked in the form were unclear	17 (23.3)	14 (19.2)	42 (57.5)
Most of the questions asked in the form were fair	53 (72.6)	11 (15.1)	9 (12.3)
Some of the questions asked in the form were irrelevant	19 (26.1)	22 (30.1)	32 (43.8)
The English used in the form was easy to understand	56 (76.7)	10 (13.7)	7 (9.6)

Following Table 27, with regard to students' opinions concerning the departmental biographical questionnaires utilised in their selection, the majority agreed that the questions asked were clear (57.5%) and fair (72.6%) and were formulated in a manner that was easy to comprehend (76.7%). It was interesting to note, however, that 26.1% (19) of the students were of the view that certain questions asked were irrelevant, with 30.1% (22) being 'uncertain' as to whether this was the case.

4.3.4.2 Adjustment difficulties

While a significant percentage of the health science students (67.1%) indicated that they were experiencing adjustment difficulties accruing from the transition from secondary to tertiary

education (χ; $p<.01$), no statistically significant difference was noted between the reports of male and female students. Of those students (32.9%) who indicated that they were not experiencing adjustment difficulties, peer support (50.0%), family support (50.0%) and perseverance (41.7%) were viewed as being the primary reasons for adapting to university life. It was interesting to note that only 20.8% (5) of the respondents in this category attributed their ease of adjustment to the assistance they received from campus student support services.

Table 28:
Students' opinions regarding the nature of their adjustment difficulties
(in frequency with percent in parentheses)

Categorical response	*Agree*	*Uncertain*	*Disagree*
Financial worries that affect studying	46 (93.9)	1 (2.0)	2 (4.1)
Difficulty in passing courses	41 (83.7)	1 (2.0)	7 (14.3)
Difficulty adapting to university teaching methods	17 (34.7)	11 (22.4)	21 (42.9)
Difficulty in coping with course workload	22 (44.9)	14 (28.6)	13 (26.5)
Lecturers unwilling to assist with academic/social problems	3 (6.1)	17 (34.7)	29 (59.2)
Campus student politics that disrupt studies	31 (63.2)	9 (18.4)	9 (18.4)
Schooling inadequate in preparing me for university studies	42 (85.7)	3 (6.1)	4 (8.2)
Difficulty in keeping up with other students in class	28 (57.1)	11 (22.4)	10 (20.5)
At a disadvantage in class as English is my second language	27 (55.2)	11 (22.4)	11 (22.4)
Difficulty integrating theory with practice	30 (61.2)	13 (26.5)	6 (12.3)

Note : this item only included the responses of those students who indicated that they had experienced adjustment difficulties (N=49)

With reference to Table 28, of those students who indicated that they were experiencing adjustment difficulties (N=49), the majority reported that they experienced financial worries which affected their studying (93.9%), their schooling had been inadequate in preparing them for university studies (85.7%), they were not passing their courses (83.7%), campus student politics was disrupting their studies (63.2%), they had difficulty in integrating theory with practice (61.2%), they had difficulty in keeping pace with other students in class (57.2%) and they were disadvantaged in class as second language users of English (55.2%).

While the majority of students indicated that lecturers were willing to assist them with academic or social problems (59.2%), it was interesting to note that a large percentage (34.7%) were 'uncertain' as to whether this was the case. Further, a substantial percentage of students were unable to endorse the view that they were coping with their course workload (73.5%) or that they had adapted to university teaching methods (57.1%).

4.3.4.3 Academic development programmes

A significant percentage of the health science students reported that they had participated in ADPs (76.7%) [χ; $p<.01$], with more female students (81.8%) reporting this to be the case than male students (69.0%).

The primary reasons offered by those students who had not participated in ADPs (23.3%) included, *inter alia*, a lack of awareness of ADPs (70.6%), the perceived negative stigma assigned to those students who participate in these programmes (58.9%) and the perception that they did not require academic or psycho-social assistance (41.2%).

Table 29:
Students' opinions regarding academic development programmes
(in frequency with percent in parentheses)

Categorical response	*Agree*	*Uncertain*	*Disagree*
Academic development tutors are unskilled	8 (14.3)	21 (37.5)	27 (48.2)
ADPs have enhanced my understanding of my coursework	46 (82.1)	8 (14.3)	2 (3.6)
ADPs are a waste of time as no credits given for work done	29 (51.8)	17 (30.4)	10 (17.8)
ADPs are a waste of time as they are unrelated to coursework	4 (7.1)	9 (16.1)	43 (76.8)
My morale is boosted as I am now passing my course	7 (12.5)	7 (12.5)	42 (75.0)
ADPs have helped me to develop useful skills	33 (58.9)	14 (25.0)	9 (16.1)
ADPs are scheduled at inconvenient times	25 (44.6)	6 (10.8)	25 (44.6)

Note : this item only included the responses of those students who indicated that they had participated in academic development programmes (N=56)

As illustrated in Table 29, of those students who had participated in ADPs (N=56), the majority endorsed the view that these programmes had enhanced their understanding of their coursework (82.1%), was related to their coursework (76.8%) and had assisted them in developing useful skills (58.9%). It was interesting to note, however, that a large percentage of the students were of the opinion that participation in ADPs had not boosted their morale as they were still unable to pass their courses (75.0%) and that participation in academic development was time ill-spent as no course credits were awarded for work undertaken in these programmes (51.8%). It was noted that students' opinions were equivocal with regard to whether ADPs were scheduled at inconvenient times (44.6%).

4.3.3.4 Campus residences

It was noted that a greater percentage of health science students lived in campus residences (57.5%) as compared to private residences (42.5%). The primary rationale offered by those health science students who were not living in campus residences included the inability to pay

residence fees (67.7%) and failure in one or more courses which excluded them from residence (51.6%).

Table 30:
Students' opinions regarding campus student residences
(in frequency with percent in parentheses)

Categorical response	*Agree*	*Uncertain*	*Disagree*
Unsafe in residence	27 (64.3)	11 (26.2)	4 (9.5)
Better studying conditions in residence than at home	42 (100)	0 (0.0)	0 (0.0)
Too noisy in residence	26 (61.9)	9 (21.4)	7 (16.7)
Peer support is readily available	20 (47.6)	16 (38.1)	6 (14.3)
Student demonstrations disrupt studies easily	23 (54.8)	13 (30.9)	6 (14.3)
Greater levels of independence	31 (73.8)	8 (19.0)	3 (7.2)
Easy access to available on-campus facilities	32 (76.2)	9 (21.4)	1 (2.4)

Note : this item only included the responses of those students who indicated that they resided in campus student residence (N=42)

Following Table 30, of those health science students who lived in campus residences (N=42), the majority were of the opinion that it afforded them more optimal studying conditions than in the home environment (100%), allowed them easier access to on-campus facilities (76.2%) and afforded them greater levels of independence (73.8%). Despite this, however, the majority of students also endorsed the view that it was unsafe in student residences (64.3%), that noise levels were high (61.9%) and that their studies were more easily disrupted by student politics (54.8%). It was interesting to note that a large percentage of students were 'uncertain' as to whether peer support was readily available in campus residences (38.1%).

4.4 THE FOCUS GROUP DISCUSSION

The information derived from the focus group discussions conducted with teaching staff in the five selected schools is presented as follows:

- *Social system* : instructional programme, school governance structures and interpersonal relationships
- *Milieu* : teacher characteristics and student body characteristics
- *Culture*: criminal activity, teacher expectations and emphasis on continuous school improvement
- *Ecology* : academic and recreational facilities, school fees and access to external resources

4.4.1 Social System

4.4.1.1 Instructional programme

a) Nature of career counselling

Table 31:
Nature of career counselling offered across the five selected schools

School	*Formal guidance periods*	*Career Fairs*	*School liaison officers*	*Former scholars*	*Career guidance literature*
Ilanga High	-	Yes	Yes	-	-
Inhlahlayethu High	-	Yes	Yes	-	Yes
Sobonakhona High	-	Yes	Yes	-	-
Vukuzakhe High	-	Yes	Yes	Yes	Yes
Zwelibanzi High	-	Yes	Yes	Yes	-

As evidenced in Table 31, career counselling was not offered as a formal part of the mainstream syllabus in any of the schools. An apparent lack of time in the school curriculum and personnel shortages have largely resulted in career counselling being offered on an ad-hoc basis, usually during scholars' free periods or lunch breaks. Participants were of the view that this resulted in more emphasis being placed on career counselling for senior scholars, with junior scholars consequently having to make uninformed subject choices.

Participants indicated that the general nature of career counselling offered by their school included:

- basic information pertaining to a range of vocational options;
- limited information on available bursary programmes;
- subject prerequisites for entry into various career fields; and
- procedures to be followed in completing application or bursary forms.

Additional information on studying strategies, portfolio-writing, university admission procedures and the potential problems experienced in the transition from secondary to tertiary education was offered by Vukuzakhe and Zwelibanzi High schools. Inhlanhlayethu and Vukuzakhe High participants further indicated that they possessed relevant career guidance literature for their scholars' use.

While all of the participants indicated that their scholars had attended a career fair at some point in time, school resource limitations served to ensure that these opportunities were primarily afforded to senior scholars. It was further reported that all scholars had previous contact with school liaison officers affiliated to certain tertiary institutions, who provided information pertaining to available degree programmes and campus facilities. In this regard, it was of concern to note that UDW had reportedly not had previous contact with any of the schools.

Vukuzakhe and Zwelibanzi High participants indicated that they have utilised their alumni, engaged in tertiary studies or involved in professional careers, to provide informal career counselling when possible. These participants were of the view that alumni served as positive role models as scholars identified readily with them.

b) Career counselling in the health sciences

Participants across the five selected schools generally reported that no comprehensive information on health science professional training had been offered by their schools, largely due to a lack of awareness amongst career counsellors with regard to what these professions entailed. Inhlanhlayethu High participants, however, indicated that several of their scholars had received informal health science career counselling through contact with health science students from UDW who resided in their community.

c) Subject stream selection

There was general consensus among participants that their scholars' tended to harbour negative attitudes towards science-related subjects, viewing these subjects as being difficult. Notwithstanding this, it was still reported that most scholars elected to continue with these subjects into their senior years, even attempting them on the higher grade.

Furthermore, participants from four of the schools indicated that specific attempts had been made to overcome scholars' particular aversion towards *mathematics* by making this a compulsory subject in subject streams other than the science stream, i.e. in Inhlanhlayethu, Sobonakhona and Vukuzakhe High schools, scholars must take mathematics as a compulsory subject in the commerce stream and in Zwelibanzi High school scholars must choose between mathematics and Afrikaans in the commerce or general streams (refer to Table 32).

Table 32:
Subject stream combinations across the five selected schools

School	*Science stream*	*Commerce stream*	*General stream*
Ilanga High	English, Zulu, biology, physical science, *mathematics*, business economics	–	English, Zulu, business economics/Afrikaans, history, biology, biblical studies OR English, Zulu, history, accountancy/Afrikaans, geography, biology
Inhlanhlayethu High	Zulu, English, biology, *mathematics*, physical science, accountancy	Zulu, English, Afrikaans, accountancy, *mathematics*, business economics OR English, Zulu, Afrikaans, economics, typing and accountancy	–
Sobonakhona High	English, Zulu, physical science, biology, *mathematics*, geography	English, Zulu, Afrikaans, accountancy, *mathematics*, business, economics	English, Zulu, geography, history, biology, business economics/Afrikaans
Vukuzakhe High	English, Zulu, *mathematics*, physical science, biology, technical drawing OR English, Zulu, *mathematics*, physical science, biology, Afrikaans OR English, Zulu, *mathematics*, physical science, biology, agriculture	English, Zulu, accountancy, *mathematics*, economics, business economics	–
Zwelibanzi High	Zulu, English, biology, physical science, *mathematics*, geography/Afrikaans	Zulu, English, accountancy, business economics, economics, *mathematics*/Afrikaans	Zulu, English, geography, history, biology/physiology, *mathematics*/Afrikaans

All participants indicated that concerted effort was undertaken by teachers to channel their scholars into appropriate subject streams based on teacher assessments and recommendations. In addition, Inhlanhlayethu and Vukuzakhe High participants reported that they utilised auxiliary strategies in order to assist their scholars in selecting a subject stream most suited to their abilities, viz.:

- enlisting the assistance of the HSRC in performing aptitude tests amongst standard seven scholars (Inhlanhlayethu High school); and
- developing a comprehensive curriculum package which clearly outlines subject stream choices and subject combinations (Vukuzakhe High school).

4.4.1.2 School governance structures

Table 33:
School governance structures across the five selected schools

School	*PTSA*	*Community leaders*	*SRC*
Ilanga High	Yes	-	Yes
Inhlanhlayethu High	Yes	Yes	Yes
Sobonakhona High	Yes	Yes	-
Vukuzakhe High	Yes	-	-
Zwelibanzi High	Yes	-	Yes

a) Parent-Teacher-Student Associations

As evidenced in Table 33, participants across the five selected schools indicated that Parent-Teacher-Student Associations (PTSAs) had been established within their broader school contexts and comprised of democratically elected parents, teachers and scholars. Working within the guidelines of the Education Department, these PTSAs apparently have the ability to make fundamental decisions regarding the functioning of the school, e.g. the enforcement of rules, starting times for classes, duration of tuition periods, school fees, etc.

b) Community leaders

With the exception of two of the schools, no active role of the community in school matters other than the involvement of parents on the PTSA, was reported by the participants. Inhlanhlayethu and Sobonakhona High participants, however, reported that their PTSAs are required to consult with community leaders, who apparently have the ability to make executive decisions regarding school matters (refer to Table 33). These participants reported that this was often problematic, particularly when the decisions made by community leaders were not in keeping with the general wishes of the PTSA.

c) Student Representative Councils

Ilanga, Inhlanhlayethu and Zwelibanzi High school participants indicated that they had democratically elected Student Representative Councils (SRC) in place, who hold regular meetings with teachers. Scholars' complaints are channelled through the SRC to teaching staff; and participants were of the view that this system functioned effectively. While Vukuzakhe High participants indicated that their school still had a prefect system in operation, this was to be phased out and replaced by an SRC elected by the student body. Sobonakhona High participants indicated that their school utilised class monitors or secretaries to deal with scholars' complaints, largely because an SRC was viewed to be too disruptive in the school environment (refer to Table 33).

4.4.1.3 Interpersonal relationships

a) Parental involvement

While participants across all five schools indicated that individual consultations with parents were arranged when discussion regarding a particular scholar's academic or behavioural problems was required, Vukuzakhe High participants reported that this contact was often parent-initiated. With the exception of Sobonakhona High school, participants were of the view that parents were cooperative and supportive at parent-teacher meetings. Furthermore, Vukuzakhe and Zwelibanzi High participants indicated that their schools hosted 'parents' evenings', affording parents the opportunity to meet teaching staff and to be updated on the academic performance of their children. These events were apparently well attended.

Participants across all five schools reported that parents exerted a strong influence on the career choices of scholars. Vukuzakhe High participants, in particular, indicated that most parents appeared to have a positive influence on their children's career choices by offering useful suggestions and advice. Participants across the five schools were, however, generally of the opinion that poor family socio-economic circumstances compelled certain parents to force their children to abandon their studies in order to supplement the family's income.

b) Community-school relationships

With the exception of one school, participants reported no significant impact of community-based cultural or political factors on the functioning of the school. Sobonakhona High participants, however, were of the opinion that conflicting political ideologies within the

surrounding school district created significant complications for the functioning of the school, viz.:

- the interference of local political parties in the admission of scholars, whereby scholars with vested political interest (who were also viewed as poor achievers) are forced into the school; and
- political intervention in the planning of school events, which transformed minor decisions (such as where combined school events are held) into major contentious issues.

4.4.2 Milieu

4.4.2.1 Teacher characteristics

a) Career counsellor posts

While formal career counsellor posts existed at Ilanga, Inhlanhlayethu and Vukuzakhe High schools, career counsellors within these schools performed teaching functions as well. In Sobonakhona and Zwelibanzi High schools, informal career counselling is offered by class teachers, largely in standard nine and ten classes. Participants were generally of the view that career counsellors within their schools were overburdened with heavy workloads and suffered from burnout.

b) Attitudes towards career counselling

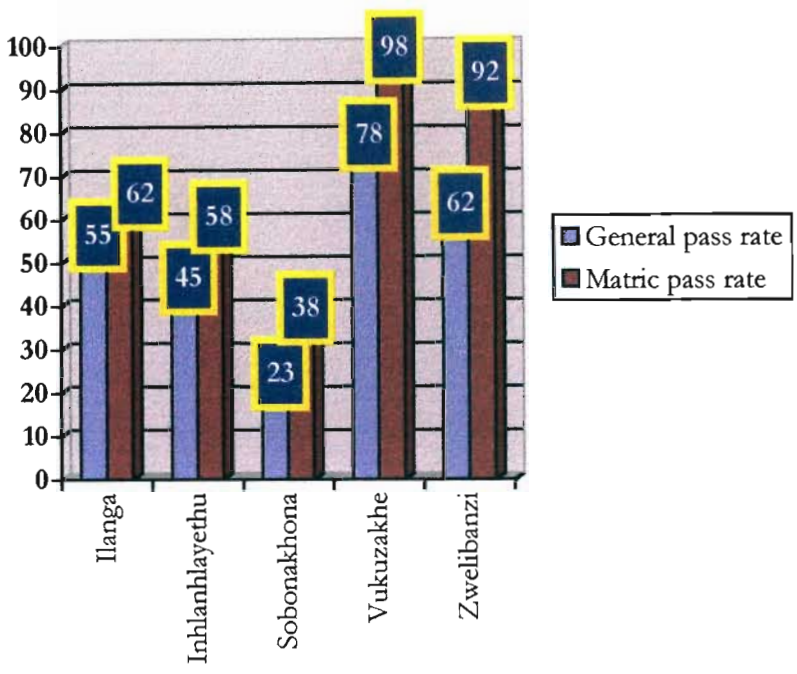
Participants across the five selected schools generally agreed that career counselling forms a vital part of a scholar's education as it enables informed subject and career choices to be made and facilitates exposure to a broad range of vocational options. Despite this, however, only Vukuzakhe High participants reported a keen interest by their scholars in pursuing career paths other than those which appear to be traditionally pursued by African scholars (viz., social work, nursing and teaching). These 'non-traditional' career paths included vocations in the fields of pharmacy, engineering and marketing.

4.4.2.2 Student body characteristics

a) Scholastic performance and academic skill

As evidenced in Figure 11, all participants reported a consistently higher matriculant pass rate as compared to a general pass rate in other grades. Furthermore, no major difference was reported in the pass rate of scholars whose subjects were undertaken on the higher grade as compared with those whose subjects were undertaken on the standard grade.

Figure 11:
General and matriculant scholar pass rates across the five selected schools for the period 1996-1997



The generic factors which appeared to be impacting upon the pass rate of scholars within the schools were identified as:

- A shortage of books, resulting in one textbook being utilised between approximately 10-12 scholars. Participants were of the view that this forced scholars to rely heavily on notes given to them in class, which appeared to be inadequate in facilitating the passing of examinations.
- A shortage of laboratory equipment, limiting the demonstration and conducting of science experiments. Participants were of the view that this was particularly problematic, since the newly instituted national matriculation examination requires scholars to have knowledge of a range of science experiments.
- Staff shortages, resulting in teachers being overworked and consequently experiencing burnout and demotivation.
- Large classes, with high pupil-teacher ratios, which do not afford teachers the opportunity to provide sufficient individual attention to scholars who are struggling with their work.
- Teenage pregnancies, substance-abuse problems and poor socio-economic family circumstances which impacted not only on scholastic performance, but also resulted in certain scholars abandoning their studies.

In addition to these factors, Sobonakhona High participants attributed the school's poor scholastic performance to:

- A poor family support system, whereby many scholars emanate from disintegrated families.
- A significant criminal element in school, where disciplinary measures are difficult to institute.
- An unstable political context, where scholars with vested political interest often appear to be poor academic achievers.
- Uncertainty regarding teachers' personal safety, making it difficult to conduct extra classes for scholars after official school hours.
- Significant travelling distances between the school and home environment, preventing many scholars from attending extra lessons on weekends or during holidays.

The generic strategies which the schools have utilised in order to increase their pass rates were identified as:

- The introduction of compulsory study periods in the school syllabi, largely for senior scholars, in an attempt to provide scholars with better studying conditions than might be afforded in their home environment.
- The provision of extra tuition classes in the afternoons, on weekends or during holidays, albeit largely for senior scholars.
- Efficient administration of the school whereby teachers improvise with the scarce resources at their disposal, e.g. sharing textbooks and stationery and obtaining instructional materials from better-resourced schools.
- Fostering a consistent work ethos throughout the year in order to facilitate the learning process.

In addition to these strategies, Inhlanhlayethu and Vukuzakhe High participants indicated that they have attempted to increase their pass rates by:

- utilising a system of 'team teaching', whereby several teachers specialise in different aspects of the same subject (Inhlanhlayethu High); and
- enlisting the voluntary assistance of external educators to assist individual scholars with 'problematic' subjects such as mathematics (Vukuzakhe High).

b) Scholar attrition

Table 34:
Attrition rates and factors impacting on scholar attrition across the five selected schools

School	*Attrition rate*	*Causative factors*
Ilanga High	3-5%	Teenage pregnancies Poor socio-economic circumstances
Inhlanhlayethu High	5-10%	Teenage pregnancies Substance abuse Poor socio-economic circumstances
Sobonakhona High	10-15%	Teenage pregnancies Substance abuse Poor socio-economic circumstances Unstable school context
Vukuzakhe High	1-2%	Teenage pregnancies
Zwelibanzi High	3-5%	Teenage pregnancies Substance abuse Poor socio-economic circumstances

With reference to Table 34, while all of the participants were of the view that teenage pregnancy was the most significant causative factor of attrition among female scholars in their schools, poor socio-economic home circumstances was largely reported to impact on attrition rates of the general student body, i.e. certain scholars are compelled to abandon their studies and seek employment in order to supplement their families' income. Substance abuse was identified as a significant factor contributing to scholar attrition in three of the schools (i.e., Inhlanhlayethu, Sobonakhona and Zwelibanzi High schools). It was interesting to discover that only Sobonakhona High participants reported that instability, due to political tensions and criminal activity within the school, appeared to be a significant factor causing scholars to abandon their studies.

4.4.3 Culture

4.4.3.1 Criminal activity

With the exception of Sobonakhona High school, participants reported that no major incidents of crime were committed by scholars within their school (with the exception of a few reported incidents of petty theft, such as scholars stealing pens, chalk, etc.). Scholars are apparently never expelled but punitive measures are enforced to discipline school offenders, e.g. suspension from

school for a limited time period or cleaning of the school grounds. Sobonakhona High participants, however, indicated that a significant criminal element prevailed within their school, with several scholars openly wielding firearms and other weapons on the school premises. Disciplinary measures appear to be difficult to institute at this school and scholars are never expelled, due to teachers' fear of external political intervention. Furthermore, these participants indicated that their school had suffered significant vandalism in the past, including the loss of its electricity supply in 1995, which has not as yet been restored.

4.4.3.2 Teacher expectations

Participants across the schools were generally of the view that they held high expectations for the academic achievement of their scholars and thus encouraged their pupils to pursue subjects on the higher grade as opposed to the standard grade, thereby enabling them to obtain a matriculation exemption. In particular, participants from Vukuzakhe and Zwelibanzi High schools indicated that their schools undertook concerted effort to alter scholars' beliefs that higher grade subjects can only be successfully undertaken by academically superior achievers. Extra tuition classes in subjects perceived to be problematic by scholars was one reported strategy in this regard.

4.4.3.3 Emphasis on continuous school improvement

Participants across all five schools expressed a strong view that better linkages needed to be established with tertiary institutions in the interest of continuous school improvement. In this regard, however, participants generally did not view the role of tertiary institutions as being more substantive than assisting with the provision of school resources, i.e. the possibility of tertiary institutions offering continuing education for teachers or hosting university career days was not raised.

4.4.4 Ecology

4.4.4.1 Academic and recreational facilities

With the exception of Vukuzakhe High school, participants reported a significant lack of school facilities including:

- Under-equipped laboratories which consequently served as multifunctional classrooms or staffrooms.
- No library or technical drawing facilities
- Sporting facilities that are inadequate in meeting the schools' current sporting requirements.

4.4.4.2 School fees

Table 35:
Annual school fees across the five selected schools

School	*School fees per annum*
Ilanga High	R50 per scholar
Inhlanhlayethu High	R40 per scholar
Sobonakhona High	R50 per household
Vukuzakhe High	R275 per scholar
Zwelibanzi High	R50 per scholar

With the exception of Vukuzakhe High school, participants reported that their current school fees were inadequate in meeting the school's resource requirements. Sobonakhona High participants were of the opinion that this was particularly problematic since their school fees were charged per household, regardless of the number of scholars per family that attended the school (refer to Table 35). Owing to the poor socio-economic circumstances of parents, participants were generally of the view that their school fees could not be significantly increased.

4.4.4.3 Access to external resources

Ilanga and Vukuzakhe High schools participants were the only staff to report receiving assistance from external sources viz.:

- Donations of physics equipment from CASME and the Science Education Project (SEP), located at UND (Durban) [Ilanga High school];
- Donations of stationery from Pinetown Girls' High school (Ilanga High school);
- Funding from the FRD, enabling the purchase of computers and audio-visual equipment as well as library and technical drawing facilities (Vukuzakhe High school); and
- Obtaining donations from the companies where parents are employed (Vukuzakhe High school).

CHAPTER FIVE

Discussion

5.1 INTRODUCTION: A FRAMEWORK FOR DISCUSSION

The increasing demand for a highly skilled workforce in a competitive world economy (Mohamed, 1997); the growing economic interdependence between South Africa and other nations (Ministry of Education, 1997); and the prospects for a satisfying life that increasingly hinge on a high quality education (Holmes Group, 1990) have profoundly influenced society's demands on public schools to deliver a cadre of well-educated and market-oriented youth (DACST, 1996). Inherent in adequately preparing young adults to gain access to and succeed in jobs that require high levels of technical skill, is the need for a critical understanding of the varying contexts in which educational aspirations and outcomes are fashioned. This demands more than the mere identification of factors that operate to either hinder or facilitate entry and success in fields such as science and technology, but includes a holistic examination of the local conditions under which these factors exert their influence. A commonly leveled criticism against educational researchers is their readiness to undertake large national surveys in order to allow broad inferences, whilst neglecting more careful analysis of the influence of the educational context on scholar educational attainment and aspirations (Fuller, 1987; Walzer, 1995). While it is not denied that the identification of generic educational, social and economic issues are of general heuristic value in advancing social redress initiatives aimed at historically disadvantaged individuals, this is a somewhat oversimplified 'black box' approach which does not provide critical insights into the interactive life of a school (Glasman & Biniaminov, 1981; Anderson, 1982).

No two schools are alike in every respect and it has been argued that the extent to which schools differ in their social, physical and material contexts, they will also differ in their educational outcomes (Anderson, 1982). Certain schools, for example, are as poor as the students that they serve. They receive less money per pupil, pay lower salaries, attract less-qualified teachers, have fewer learning resources and unpleasant working conditions (Lomtey & Swanson, 1989; Holmes Group, 1990). Some schools are swamped by the stresses and circumstances of their students – poverty, substance abuse, homelessness, hunger, high student

mobility and high incidences of violence (Holmes Group, 1990; Stewart, 1991). Others have a high reputation and stand out as having motivated teachers, good instructional resources and good examination results (Peil, 1982). Gaining a critical understanding of the mediating role of the school in influencing scholar educational outcomes is seen to be particularly relevant in this study, given the rural-urban distribution of the selected schools, the use of outliers (i.e. high-achieving schools) and the diversity of social, economic and material conditions seen to be pertaining to each school context.

The literature is marked by a lack of consensus regarding the definition of an 'effective school' (Gaziel, 1987) and a vast combination of interacting variables that may impact on student educational outcomes have been cited (Tornatzky et al, 1980). Following the taxonomy derived from more than 60 multivariate school-effects studies undertaken in developing countries (see, for e.g., Tagiuri, 1968; Moos, 1974; Insel & Moos, 1974; Brookover et al, 1979; Edmonds, 1979; Anderson, 1982; Austin & Garber, 1985; Fuller, 1987; Coleman & Hoffer, 1987; Holland & Andre, 1987; Lee et al, 1993), the influence of the school context on scholar educational aspirations and attainment, particularly in the field of health sciences, are explained according to four broad dimensions, viz. ecology, milieu, social system and culture.

Furthermore, specific access and success issues accruing directly from the insights gleaned from the health science students in this study are conceptualised and interpreted within the context of local conditions pertaining to the university, viz. university selection procedures, adjustment difficulties arising from the transition from secondary to tertiary education, academic development programmes and prevailing conditions in university residences.

This chapter accordingly provides a discussion of salient issues arising from the results and is structured as follows:

- the influence of the school ecology, milieu, social system and culture on scholar educational aspirations and outcomes;
- the influence of local university conditions on equity in health science education for historically disadvantaged students; and
- concluding statements that set the stage for recommendations aimed at enhancing the access and success of historically disadvantaged students to health science education at UDW, in chapter six.

5.2 SCHOOL CONTEXT: THE EFFECT ON EDUCATIONAL OUTCOMES

5.2.1 Ecology

Ecology refers to the physical and material variables of the school that impact on scholar educational outcomes. In this regard, building characteristics, school and class size, academic and recreational facilities and access to external resources were seen to be particularly pertinent ecology variables in this study.

5.2.1.1 Building characteristics

While the two high-achieving schools in this study (i.e. Vukuzakhe and Zwelibanzi High schools) have been in existence relatively longer ($\bar{x}$=24 years) than the remaining three schools ($\bar{x}$=11 years), no relationship between age of buildings and student educational outcomes has been reported in the literature (see, for e.g. McDill & Rigsby, 1973; Rutter et al, 1979). The positive condition, care and maintenance of school buildings and classrooms have, however, been strongly associated with higher levels of student achievement (see, for e.g., Rutter et al, 1979; Phi Delta Kappa, 1980).

As revealed by the photographic illustrations of the five selected schools (see chapter 4), the school building and classrooms in the urban schools (i.e. Ilanga, Vukuzakhe and Zwelibanzi High schools) appear to be far better maintained than those in the rural (i.e. Sobonakhona High school) and informal settlement school contexts (i.e. Inhlanhlayethu High school). This may arguably be related to available district-level school budgets and funds accessed from school fees, i.e. school districts with pupils from less affluent backgrounds tend to have the least amount of money for school capital outlays (Wenglinsky, 1997). Thus, while a positive relationship between school expenditure and scholar performance has been found in developing countries (see, for e.g., Heyneman & Loxley, 1983; Psacharopolous & Loxley, 1986), the conundrum of school spending is that the least amount of capital outlays appear to occur in precisely those school districts in need of it the most. Sobonakhona High school appears to be a particular case in point, which, for the past three years, has not had the fiscal capacity to restore its electricity supply - a factor shown to have an important influence on student motivation for learning (Arriagada, 1983).

5.2.1.2 School and class size

Despite evidence that smaller schools do not have significantly better educational outcomes than larger schools (Morales & Pinellsiles, 1977; Duke and Perry, 1978) and that, within normal ranges, the presence of fewer students per classroom holds no consistent effect on student achievement (Fuller, 1987), it is important to note that the use of size as a variable is dubious. Definitions of what constitutes 'large' and 'small' are poorly defined in the literature and appear to be contingent on the frame of reference of the researcher. Furthermore, 'normal ranges' of school and class size (largely determined by conditions in industrialised countries), are frequently exceeded in developing nations (Fuller, 1986). Notwithstanding this, evidence gathered from developing countries (see, for e.g., Beebout, 1972; Jamison, 1982; Psacharopoulos & Loxley, 1986), reveals that teacher-pupil ratios in Inhlanhlayethu (1:37) and Vukuzakhe (1:39) High schools appear to fall below the mean classroom-learner ratio found in poorer nations (1:44), while teacher-pupil ratios in Ilanga (1:47), Sobonakhona (1:50) and Zwelibanzi (1:56) High schools are located above this mean. While this is not considered to be a definitive measure of threshold school or class size, the substantive issue being raised here is that the number of students per classroom, under the responsibility of one teacher, exerts a significant influence on student educational outcomes (Bourke, 1986; Finn & Achilles, 1990). In this regard, teachers in Ilanga, Sobonakhona and Zwelibanzi High schools, who are responsible for a large number of students, are arguably likely to experience greater levels of stress and burnout as compared to teachers in the remaining two schools.

Following Hartley & Swanson (1984), where large pupil-teacher ratios exist, teachers tend to be demoralised as they have high workload stress and experience difficulty in establishing effective teacher-pupil relationships. Conversely, where lower pupil-teacher ratios exist, staff and scholar morale and enthusiasm tends to be higher as workload stress is reduced and scholars are able to receive greater individual attention (Wenglinsky, 1997). It is important to note, however, that staff burnout, demotivation and an inability to provide sufficient individual attention to scholars was reported by teachers across all five schools. This is understandable, given that the pupil-teacher ratios that exist across all the schools studied arguably fall outside what might be considered 'normal ranges'.

5.2.1.3 Academic and Recreational Facilities

The positive impact of instructional and recreational facilities on educational outcomes has consistently been reported in studies undertaken in developing countries, such as Columbia

(Heyneman & Loxley, 1983), Brazil (Armitage et al, 1986), Uganda (Heyneman & Jamison, 1980) and Thailand (Lockheed et al, 1986).

a) Textbooks

Across the five selected schools in this study, a shortage of textbooks was reported by teaching staff as being an important factor impacting on scholar educational outcomes. This is in keeping with research conducted in developing countries, where the availability and use of textbooks has been significantly related to higher levels of scholar achievement (see, for e.g., Schiefelbein & Farrell, 1973; Heyneman & Jamison, 1980), particularly in science and mathematics (Lockheed et al, 1986). Furthermore, it is argued that the influence of textbook availability on educational outcomes appears to be stronger within rural schools and among scholars from lower income families (Fuller, 1987). In rural Brazil, for example, scholars were three times more likely to succeed in their studies if they were afforded the opportunity to utilise two or more textbooks (Wolff, 1970). This influence of textbook availability on rural scholar performance may, in part, account for the relatively poor academic showing of pupils from Sobonakhona High school as compared to the academic performance of pupils from the other four schools.

It was also noted that only two of the schools (i.e. Inhlanhlayethu and Vukuzakhe High schools) possessed relevant career guidance literature for use by their scholars. The availability of this instructional resource places these schools at a relative advantage to the other three schools, as their scholars are afforded the opportunity to make more informed career decisions, based on a wider range of career information available to them.

b) School library

A school library is another instructional resource that has been significantly related to educational outcomes, with scholars who have access to library facilities performing at higher levels than those who do not, particularly in reading and mathematics (Heyneman & Loxley, 1983; Armitage et al, 1986). The presence of a well-equipped library, housing a computer room and audio-visual equipment, thus arguably places scholars from Vukuzakhe High school at a relative advantage to scholars from the remaining four schools, which have no library facilities. This is particularly relevant, given that in certain developing countries the *mere presence* of a school library has been positively related to a school's overall achievement level (Heyneman & Jamison, 1980; Heyneman & Loxley, 1983; Loxley, 1984).

c) Laboratories and laboratory equipment

The effect of the presence and use of school laboratories and laboratory equipment on educational outcomes remains a controversial issue in the literature. While these resources have been related to higher educational outcomes in developing countries such as India, Thailand and Iran (Fuller, 1987), a large-scale Latin American study found no significant relationship with pupil performance (Heyneman & Loxley, 1983). Notwithstanding this, there was general consensus among the teachers in this study that a shortage of laboratory equipment was an important factor impacting on scholars' science achievement. It was seen to impact particularly on scholar performance in the national matriculation examinations, where all pupils are expected to have had the same science exposure regardless of their school resources. This immediately places schools with better-equipped laboratories, such as Vukuzakhe High school, at an advantage to other schools whose under-equipped laboratories often serve as multifunctional classrooms or staffrooms, as was reported to be the case by teachers from the other schools in this study.

d) Extra-curricular activities

Relevant empirical studies indicate that scholar participation in extra-curricular activities influences adolescent development in a positive way, including higher levels of self-esteem (Crain et al, 1982), improved social relationships (Scott & Damico, 1983), a positive school attitude (Crain, 1981), higher levels of educational aspiration and attainment (Otto & Alwin, 1977) and lower delinquency rates (Landers & Landers, 1978). While a range of sport activities were offered by the schools in this study, it is important to note that sport facilities were reported to be inadequate in meeting the school's sporting requirements by teachers across all five schools. In particular, three of the schools (i.e. Ilanga, Sobonakhona and Zwelibanzi High schools) did not house sports fields within their school grounds, arguably impacting on the range of opportunities available to their scholars for participating in sport activities.

Across the schools researched, extra-curricular activities assumed the form of physical sports, with a greater range of sport activities being offered by the urban schools (i.e. Ilanga, Vukuzakhe and Zwelibanzi High schools) as compared to the rural and informal settlement schools (i.e. Sobonakhona and Inhlanhlayethu High schools). This is of importance in that the degree of involvement in extra-curricular activities (i.e. participation in two or more sports) has been significantly correlated with educational outcomes (Otto & Alwin, 1977). Furthermore, it is argued that the effects of sport participation are generally greater on adolescents from lower

socio-economic status (SES) families and rural communities, with lower SES scholars who participate in sports being more likely to have university aspirations than those who do not (Spady, 1971; Eitzen, 1975). Limited school budgets and poor access to external economic resources arguably influence the range of sport activities that may be offered by the schools in this study, particularly those schools in the rural and informal settlement contexts.

5.2.1.4 Access to external resources

a) Community economic resources

Traditionally, schools have been funded by government subsidies, school fees and, to a lesser extent, by the larger community such as industry, private foundations and alumni (Halle et al, 1997). Tighter public spending policies have, however, resulted in a redistribution of responsibility for the resourcing of schools (Dimmock et al, 1996), with consequent ramifications for parents in terms of providing greater financial contributions toward school maintenance, environmental improvement and additional learning resources (Hemson, 1993). This is problematic in that it implies an expectation that all local communities and parents will be able to contribute equally to the human, physical and financial resources of the school, regardless of the prosperity of the school district (Dimmock et al, 1996). It is important to note, however, that the mean SES of a school district is strongly associated with its economic resources (National Centre for Education Statistics [NCES], 1995), with schools with a predominantly low SES population tending to have fewer economic resources than those with a higher SES population (Wenglinsky, 1997). This immediately places schools in more prosperous areas at an advantage to those schools in less affluent areas. In this regard, Vukuzakhe High school, situated within an urban context and serving a community with a relatively higher SES than that of the other four schools, has thus been able to rely on partial school funding from community members, either through donations or through its annual school fees (R275) which are significantly higher than the school fees of the other four schools ($\bar{x}$=R48). This school's alumni rating has also resulted in Vukuzakhe High receiving funding from the FRD, enabling the purchase of computers, audio-visual equipment and other instructional materials, factors associated with higher scholar educational outcomes (Jamison et al, 1981; Heyneman et al, 1983).

While raising school fees or generating additional funding at a community level were not reported to be feasible options by the majority of teachers in this study, the external resources accessed by Ilanga High school appear to be realistic avenues for the other schools to pursue

(i.e. the donation of equipment and stationery from non-governmental organisations and other better-resourced schools).

b) Educational support

While the involvement of external parties in instruction has been positively related to pupil academic success (Weber, 1971), it was noted that only one school (i.e. Vukuzakhe High) reported enlisting the assistance of external educators for providing additional instruction in mathematics. As this assistance was provided on a voluntary basis, this strategy appears to be one that could be readily utilised by the other schools for enhancing pupil achievement in mathematics and other subjects perceived to be problematic for scholars.

c) External career counselling

With regard to external career counselling initiatives, it was noted that only one of the schools (i.e. Inhlanhlayethu High) reported enlisting the assistance of external organisations in their career counselling efforts (i.e. the assistance of the HSRC in conducting aptitude tests among scholars). This is undoubtedly a beneficial strategy that could be utilised by the other schools in order to provide realistic guidance to scholars in their subject selection and career choices, based on a reliable appraisal of their abilities and interests. Furthermore, while peer career counselling holds reported benefits in terms of positive role modelling (Bottery & Siu, 1996; Ngcobo et al, 1998), only three of the schools (i.e. Inhlanhlayethu, Vukuzakhe and Zwelibanzi High schools) had enlisted the assistance of their alumni in providing career information at their schools.

While teachers across the schools reported encouraging their pupils to attend community-based career fairs, not all scholars were afforded the opportunity to attend these events, particularly scholars from the rural (66.32%) and informal settlement (60.0%) schools (i.e. Sobonakhona and Inhlanhlayethu High schools). This is arguably due to a lack of financial and human resources in non-urban school districts (Bernard, 1991) which places constraints on these schools with regard to providing transportation for pupils to career fair sites.

The finding that a large percentage of standard seven scholars (62.0%) had not attended career fairs was of particular concern, as insufficient career information provided to pupils in the early years of their secondary schooling will result in uninformed subject selection decisions being made (Meece et al, 1990). This, in turn, will determine their future educational and career options (Bullock et al, 1996).

With regard to the perceived benefits of career fair participation, it is important to note that the majority of both scholars (53.7%) and health science students (60.0%) indicated that insufficient information on health science careers was provided at career fairs. While this suggests that career fair counsellors are providing ineffective career information in the health field, it also implies that those tertiary institutions offering health professional training have had limited active participation at these events. It was thus not suprising to discover that that very few scholars (12.5%) and health science students (11.0%) reported community-based career fairs to be a primary source for accessing information on health science careers. In addition, it was of concern that more than half of the scholars (53.2%) indicated that they had experienced difficulty in understanding the information presented at career fairs, suggesting that the health and other career information that they were exposed to was largely inaccessible and of little practical value.

The finding that the majority of scholars and health science students primarily attended career fairs hosted at schools ($\bar{x}$=75.2%) or community clinics and halls ($\bar{x}$=33.7%) provides useful insight into the most strategic sites to be targeted by tertiary institutions for disseminating information on health professional training. Furthermore, while none of the health science students reported attending career fairs at tertiary institutions, a substantial percentage of scholars reported this to be the case (35.3%), suggesting an increasing commitment by the tertiary education sector toward providing career counselling opportunities for scholars from disadvantaged communities in the KZN region.

While clinic sisters and health professionals in the local community appeared to have played an important role in providing health career information to both scholars (42.8%) and health science students (24.7%) in this study, this information seemed to be largely inadequate in nature, particularly with regard to the scope of careers in the health field. Given that African people tend to be largely employed in government health services in careers such as nursing and social work (Hemson, 1993), it is plausible that career information obtained by scholars from health professionals in African communities is primarily restricted to these fields of expertise. In this context, it was thus not suprising that many scholars in this study aspired to careers in nursing and social work.

School and community libraries ($\bar{x}$=34.6%) and the media ($\bar{x}$=31.3%) also appeared to be commonly utilised sources of health career information by scholars and health science students

in this study. This suggest that tertiary institutions involved in health professional training should target relevant mass media, as well as furnish local libraries with career literature, in order to ensure that disadvantaged scholars have access to comprehensive information on careers in the health field. This is in keeping with the findings of Rozier et al (1992) which demonstrated that 54% of all scholars receive career information primarily from printed materials.

5.2.2 Milieu

Milieu refers to those variables that represent characteristics of individuals and groups within the school. In this study, teacher characteristics and student body characteristics were seen to be particularly pertinent milieu variables impacting on educational outcomes.

5.2.2.1 Teacher characteristics

a) Teacher motivation

Teachers' attitudes toward their work, their levels of job satisfaction and self-efficacy have been positively correlated with the educational outcomes of scholars (Twitchin & Demuth, 1985; Van Morrow, 1990). It was thus distressing to discover that teachers across the five schools reported significant levels of burnout and demotivation accruing from high workload levels, staff shortages, large pupil-teacher ratios and a lack of instructional resources. This undoubtedly impacts on their enthusiasm and capacity to engage in non-academic activities, such as career counselling, i.e. overburdened teachers must attempt to provide this service during their free periods or lunch breaks, serving to further increase their levels of stress and burnout. This is in keeping with the literature where role overload (e.g. simultaneously fulfilling teaching and career counselling roles) and excessive extra duties have been identified as strong contributors to teacher stress (Wylie, 1992; Manthei et al, 1996).

This situation is further compounded for those teachers from Sobonakhona High school, who are operating within a school environment that has high incidences of reported violence among scholars. In fact, most research cites pupil recalcitrance as one of the most common sources of teacher stress (see, for e.g., Manthei & Solman, 1988; Manthei et al, 1996). Furthermore, teachers from Sobonakhona High school appear to be ill-equipped to deal with aggressive scholars, living in fear for their personal safety, which arguably results in teacher alienation and disengagement, factors shown to be negatively related to educational outcomes (Miller, 1968).

b) Career counselling skills

While (in)formal career counsellors were present across all five schools, these staff members appeared to have taken on an area of expertise for which they are not fully equipped. This is evidenced by the reported lack of awareness and knowledge among school career counsellors with regard to health professional careers. This is of particular concern in that a paucity of health science career information in the school context will ultimately impact on the available pool of African applicants for health professional training in the future (Waters, 1989).

Following Schafer & Mufson (1993), school career counsellors should fulfill a number of fundamental role expectations, including providing career counselling services; conducting pupil assessments through the use of standardised tests; acting as a liaison between parents and teachers; participating in decisions regarding the instructional curriculum; and conducting research and evaluation regarding the school guidance programme. This is of importance in this study in that work overload, burnout, demotivation, high pupil-teacher ratios and a paucity of formal career counselling skills have arguably served to ensure that teachers across the schools have been unable to fulfill these role expectations adequately. This, in turn, undoubtedly impacts on the nature and quality of career counselling afforded to scholars across the school contexts.

It was encouraging to note, however, that teachers reported undertaking concerted effort to channel their students into appropriate subject streams based on relevant teacher assessments and recommendations. This demonstrates a level of teacher commitment and concern for the academic future of scholars, which have been shown to be important factors in enhancing pupil educational outcomes (Phi Delta Kappa, 1980). This is further exemplified by teachers from Inhlanhlayethu, Vukuzakhe and Zwelibanzi High schools, who have displayed effort in enlisting the assistance of external career counselling initiatives for the benefit of their scholars (i.e. aptitude testing by the HSRC and peer counselling initiatives).

5.2.2.2 Student body characteristics

a) Family social class

Since the mid-1960s, social scientists have recognised the importance of an individual's family SES as a powerful predictor of educational and occupational achievement (Caldas & Bankston, 1997). In particular, the performance of children in school, whether measured by their cognitive skills, their age-grade progress or their dropout rate, has been consistently linked to parental

socio-economic characteristics (see, for e.g., Morgan, 1983; Straits, 1987; Caldas & Bankston, 1997).

The difficulties of measuring social class are, however, well known, with a number of indicators being cited in the literature for assessing this variable. These include family size (Jantjes, 1995), parental level of education (Brisson et al, 1987), birth order of the child in question (Jantjes, 1995), family income (Kalinowski & Sloanek, 1980), occupational prestige (Brisson et al, 1987), prestige of suburb of residence (Quine & Lancaster, 1989) and life chance opportunities (Evans, 1997). According to the Class Inequality Model (Evans, 1997), which offers class-related explanations for levels of occupational attainment, *occupational category* and *status* were considered to be valid indicators of social class in this study. Following this model, therefore, white collar workers, health and other professionals were categorised as middle class individuals, while semi-skilled, unskilled and informal sector workers, pensioners and unemployed persons were categorised as working class individuals in this study.

It was noted that while the majority of the scholars' parents in this study were working class individuals (67.7%), a large percentage were either unemployed (36.9%) or engaged in manual occupations (30.4%), thereby suggesting relatively low levels of educational attainment. Comparatively, the middle class parents, most of whom were parents of scholars from Vukuzakhe High school (53.5%), had attained an education at the secondary level (i.e. white collar workers) or, in some instances, at a tertiary level (i.e. health and other professionals). The point being made here is that the educational level of parents is related to their children's educational aspirations and outcomes, with children of well-educated parents (such as those scholars from Vukuzakhe High) being at a scholastic advantage to their peers, particularly with regard to the quality of language used in the home environment (Peil, 1982) and parental assistance with homework (Halle et al, 1997). In addition to assisting their children to succeed in school, middle class parents also provide positive role models which encourage their children to aspire to professional or other high status careers (Peil, 1982). This is indeed evidenced by the occupational aspirations of scholars from Vukuzakhe High school, who tended to be more interested in embarking on careers in the health field or in engineering and chartered accounting than scholars from the other four schools.

While some researchers subscribe to the Culture-of-Poverty thesis (Lareau, 1987), which suggests that working class families do not value education as highly as middle class families, the

findings of this study seem to suggest otherwise. All parents, regardless of their class background, appeared to hold high aspirations and expectations for their children's eventual educational attainment, i.e. parental support for scholars to embark on either health professional (47.7%) or other professional careers (52.3%). Furthermore, these parental aspirations did not appear to differ markedly in the *level* of achievement they hoped their children would attain, i.e. careers in teaching, nursing, medicine and social work received popular support from both working and middle class parents. It was noted, however, that parents of scholars from the high-achieving schools (i.e. Vukuzakhe and Zwelibanzi High schools) offered more support for careers in engineering, chartered accounting, marketing and 'other' health professions than did parents of scholars from the remaining schools; and more middle class parents tended to endorse careers other than nursing, medicine or social work than was the case for working class parents. Following Career Theory research (Rozier et al, 1992), these parents may arguably have a greater awareness of the range of available career opportunities and thus aspire for their children to enter careers other than those government services in which African people are historically concentrated (Hemson, 1993).

While working and middle class parents in this study tended to share a common educational press for their children, it is important to note that social class location serves to ensure that differing material and intellectual resources are available to these parents for creating opportunities for their children's upward mobility and for providing educational experiences in the home environment (Myers et al, 1987). By way of example, middle class parents have more educational skill (Halle et al, 1997); are in a better position to provide academic guidance (Muller & Kerbow, 1993); are able to provide a supportive home environment with good studying conditions; and have more disposable income for educational resources (Hemson, 1993). Comparatively, working class parents often do not have the same access to educational experiences; are limited in their ability to act as educational role models (Bloom, 1981); and are unsure of how to act in the best interests of their children with regard to school-related tasks (Hemson, 1993). This immediately places scholars from Vukuzakhe High school at an advantage to their peers, in that their parents are arguably able to provide more effective achievement-fostering behaviours in the home due to their level of educational skill and their access to educational resources. The family thus becomes an important agent in the transmission of educational inequality (Kuo & Hauser, 1995), i.e. it is not the social status of parents *per se* that impacts on children's educational outcomes, but, as a result of this status, parents have differing

access to the educational system. It is not surprising, therefore, that middle class children are eleven times more likely to attend university than working class children (Potter, 1995).

It has also been argued that working class parents often have difficulty in gaining access to the necessary funds to allow their children to realise their educational aspirations (Hemson, 1993), i.e. the poverty status in working class homes arguably leads to considerable family pressure for children to leave school and seek employment in order to supplement the household income. In this context, it was thus not suprising that many scholars in this study perceived that their parents or relatives would be unable to finance their future studies (50.6%) and that their parents would want them to find a job immediately on completing their schooling (25.9%). It is also important to note that the finding that a substantial percentage of health science students were relying on family members to finance their studies (68.5%) suggests that certain patterns of life in working class homes, such as kinship and communal ties (Lareau, 1987), have resulted in these families receiving financial aid from sources outside the immediate family (e.g. relatives and community organisations). Following Peil (1982), higher levels of assistance from the larger community are present among low SES families as opposed to high SES families, who tend to have more disposable income to devote to educational enterprises (Hemson, 1993).

Despite the strong relationship between family social class and children's educational outcomes (Jantjes, 1995) and the multiple constraints accruing from poverty in working class homes (Potter, 1995), it is important to note that many working class parents are able to successfully foster the academic achievement of their children (Zimmerman & Arunkumar, 1994). This is reflected by the large percentage of health science students in this study (62.5%) who had managed to gain access to the tertiary education system despite their working class backgrounds. Thus, while it is argued that educational resiliency among disadvantaged youth resides in the ability of their parents to combine their high expectations with *actions* to promote that success (Halle et al, 1997), the constraints on educational resources within working class homes suggest that the maintenance of a *positive attitude* regarding the academic ability of their children is perhaps a more important parental characteristic associated with the educational outcomes of working class children. This is supported by the growing body of evidence which has related parents' beliefs in their children's academic abilities with children's academic achievement, self-perceptions of ability and educational expectancies (see, for e.g., Rumberger, 1987; Jacobs, 1991).

The finding that the majority of the scholars' siblings were either school students (44.3%) or university students (26.2%), suggests that working class parents in this study have recognised the importance of providing an educational future for their children. This is further reflected by the large percentage of siblings of health science students (69.0%) who were engaged in some type of formal education programme despite their working class backgrounds. Thus, notwithstanding the financial constraints that spiraling higher education costs place on families from poorer socio-economic contexts (Bhagwanjee, 1996a), the educational background of the siblings in this study appears to indicate a relatively high level of upward socio-economic mobility as a function of educational accreditation. In this context, siblings engaged in university studies and occupying middle class positions arguably act as positive academic role models by virtue of their access to and success in the educational system.

Given that mother's employment has a positive effect on children's educational outcomes, particularly in low SES families (Heyns, 1982), it was distressing to discover that almost half of the scholars' mothers were unemployed in this study (45.9%). Furthermore, the *level* of mothers' educational attainment has also been positively associated with pupils' educational outcomes (Myers et al, 1987), which immediately places scholars from middle class homes in this study (i.e. scholars from Vukuzakhe High) at a relative advantage to scholars from working class homes, in that middle class mothers have attained relatively high levels of occupational and educational status (i.e. white collar workers, health and other professionals). This influence of mother's employment and educational status on educational outcomes is further reflected in the families of the health science students in this study, who exhibit relatively low levels of mother unemployment (20.8%) and a domination of mothers in health and other professional careers (76.7%). In particular, mothers who occupied health professional careers arguably served as positive role models for the health science students, thereby influencing their aspirations to enter a health-related career.

b) Family structure

The effect of family structure and cohesion on educational outcomes has been studied extensively, with occupational success being greater for children raised in two-parent families than for those raised in single-parent families (see, for e.g., Duncan & Duncan, 1969; Milne et al, 1986; Astone & McLanahan, 1991). This is of particular concern in that a substantial percentage of scholars in this study emanated from single-parent families (18.5%). These scholars arguably experience higher levels of poverty due to reduced family income (Bogue, 1985), which results

in lower levels of educational attainment (Goldman & Wong, 1994), i.e. family poverty status leads to increased family pressure for scholars to abandon their studies in order to supplement the family's income. Furthermore, the notion that children from two-parent families tend to exhibit higher educational outcomes than children from singe-parent families (Astone & McLanahan, 1991) is reflected by the overwhelming majority of enrolled health science students in this study (78.3%) who emanated from an intact family structure.

It was also noted that among the single-parent families of both scholars and health science students, it is was primarily the father who was absent, with mothers being the household heads. This is of relevance in that studies on single-parent families have found higher rates of delinquency (Shinn, 1978; DiPrete, 1981) and lower levels of academic achievement (Milne et al, 1986) among children in single-parent families in which the father, rather than the mother, was absent. This may partially account for the increased levels of crime and poor academic performance exhibited by scholars from Sobonakhona High school, who were more inclined to emanate from single-parent families as compared to their peers from the other four schools.

Family size has often been related to educational outcomes, with the negative effect of a larger number of siblings on the educational attainment of Black scholars being well established (see, for e.g., Kuo & Hauser, 1995). Consequently, those scholars from the rural and informal settlement schools (i.e. Sobonakhona and Inhlanhlayethu High schools), who emanated from larger family households as compared to their peers from the other three schools, arguably experience overcrowding in the home environment and a dilution of family resources (i.e. less financial resources and parental time and energy to invest per child), factors shown to impact negatively on scholar educational outcomes (Mare, 1980, Straits, 1987).

c) Academic skill

With regard to scholars' general level of academic skill, teachers across all five schools reported a higher matriculant pass rate as compared to the pass rate for other grades. Given that a school's academic performance is generally judged on the basis of its annual matriculation examination results (Bibby & Peil, 1974; Bottery & Sui, 1996), greater effort is arguably invested in enhancing the academic performance of senior scholars, as was evidenced in this study by the compulsory study periods and provision of extra tuition classes for standard nine and ten scholars.

Notwithstanding this, there was a general tendency for scholars in this study to hold relatively low estimations of their basic academic skills (i.e. problem-solving, critical thinking, reading and writing, note-taking and the ability to work quickly), as well as their general learning strategies (i.e. studying and time management). This is of concern in that children from disadvantaged backgrounds are more likely to show academic motivation and persistence towards schoolwork if they perceive themselves as capable and successful in school subjects, regardless of the accuracy of their assessments (Halle et al, 1997).

Given the recently sobering results of the Third International Mathematics and Science Study (Pretoria News, 1997), which indicated that South African scholars rank amongst the most ill-equipped in the world with regard to mathematics and science performance, it was not suprising to discover that scholars in this study had relatively low levels of self-efficacy in their mathematics and science ability. Furthermore, it has been argued that scholars' perceptions of their academic ability positively influences their expectations for future success which, in turn, predicts achievement-related outcomes (Meece et al, 1990). By way of example, scholars who have a history of poor achievement in mathematics, may develop negative motivation patterns (Borkowski et al, 1988) and higher levels of maths anxiety (Betz & Hackett, 1983) which impact on their subsequent mathematics performance. In this context, and given the reports by teachers across all five schools with regard to scholars' negative attitudes towards science-related subjects, it is likely that scholars in this study have experienced a history of limited success in mathematics and science, thereby impacting on their levels of self-efficacy and achievement in these subjects. This is corroborated by the finding that a large majority of scholars perceived science-related subjects to be difficult (82.0%).

It is also important to note that scholars' reports of anxiety related to mathematics increase over the early to late adolescent years (Meece et al, 1990), since the value pupils attach to mathematics increases as they progress through school and become more aware of the importance of mathematics in gaining access to various careers (Wigfield & Meece, 1988). This may partly account for the tendency for standard ten scholars in this study to be more critical of their mathematical skill as compared to standard seven scholars, as they arguably place greater value on achieving good grades in mathematics in order to gain access to the career of their choice.

The development of cognitive operations suitable to the kind of problem-solving situations encountered from late adolescence onwards is largely dependent on the availability of appropriate learning opportunities (Piaget, 1977), particularly in the home environment (Feuerstein, 1980). Given the disparities in material and economic conditions of existence that prevail in working and middle class homes, children will tend to develop competencies and skills which are commensurate with the learning opportunities afforded by the particular home environment (Griesel, 1991). Thus, while the majority of both scholars and health science students held relatively low self-perceptions of their level of skill in the areas of critical thinking and problem-solving, it is important to note that both sample groups emanated largely from working class homes ($\bar{x}$=65.1%). Consequently, the nature of learning opportunities that occur in these homes is arguably restricted by the level of parental educational skill, i.e. providing academic guidance to children in subjects which require problem-solving and critical thinking, such as physical science and mathematics, becomes increasingly difficult for parents who have experienced a limited formal education (Potter, 1995). Put simply, children are limited in their ability to learn from individuals who, themselves, have not had the opportunity to learn.

It was encouraging to note that scholars generally exhibited a tendency to rate their level of interpersonal skill as being good (i.e. working in groups and relating to people). This is of particular relevance since health science professions tend to attract individuals who are interested in working directly with people (Madigan, 1985) and who exhibit confidence in their interpersonal skills (Holmstrom, 1975).

It is argued that as children get older, more information becomes available to them on which to base their judgments regarding their strengths and weaknesses (Bullock et al, 1996), such as ability groupings and consistent grading received in subjects (Jacobs, 1991). In this context, the disparities observed in perceived level of academic skill between standard seven and standard ten scholars in certain performance areas may be due to consistent feedback they received regarding their academic ability which, in turn, impacted on their level of self-efficacy as they progressed through their schooling. This is vindicated by the finding that the majority of health science students in this study were unable to rate their academic ability as being any better than 'fair'. This, of course, also implies that the students' perceptions of academic inadequacy derive from an inability of the schooling system to provide them with the necessary skills to engage effectively in university tasks (Bradbury, 1991).

d) Scholar attrition

While teachers across the schools reported attrition rates among female scholars to be largely as a function of teenage pregnancies, the poor SES of scholars appeared to be the most common factor impacting on their academic future, i.e. for many of the scholars, survival takes precedence over education in that they are forced to abandon their studies in order to seek employment to supplement their family's income. Given the relatively large percentage of unemployed parents across the schools (36.9%) and the frequent absence of the male breadwinner in many instances, this was not a suprising finding. It is important to note, however, that the incidences of scholar attrition due to low SES, were mainly reported by teachers from those schools which served rural or peri-urban communities and had scholars who emanated from larger family households (i.e. Inhlanhlayethu and Sobonakhona High school). This is in keeping with the literature where family poverty status (Caldas & Bankston, 1997), being a member of a large family household (Straits, 1987) and family pressure to work (Ngcobo et al, 1998) have been closely related to attrition among non-urban scholars.

Furthermore, children who are exposed to violent environments, such as those scholars from Sobonakhona High school, tend to exhibit decreased self esteem (Engle et al, 1996) and are at greater risk of dropping out of school (Morris, 1990), abusing substances (Elliot et al, 1985) and adopting highly aggressive behaviour (Gibson, 1989) [such as the reported incidents of physical fighting, vandalism and weapon possession among scholars from Sobonakhona High school]. This arguably has an impact on overall scholar morale and attributes to a sense of academic futility, as reflected in the high failure rate (77%) of the general student body in this school.

e) Educational aspirations

An important finding was that regardless of their level of study, gender, class background or school context, the majority of scholars (83.0%) were motivated to further their studies into adulthood. This is in keeping with the literature which suggests that most adolescents are well-motivated by broad expectations of the future (Bullock et al, 1996).

It was further noted that altruistic intentions appeared to be the primary motives for scholars wanting to embark on tertiary education studies [i.e. the need to provide financial support to their families (48.2%) and the desire to do useful work in the community (21.7%)]. The emphasis on providing financial support for family members was not a suprising finding given the low socio-economic background of many of the scholars, which has arguably led to family

expectations that they will contribute financially to the household. In the South African context, it has been argued that working class people perceive education as a panacea for their economic burdens and thus hold high expectations that higher education will open doors to economic rewards (Potter, 1995). It was thus understandable that scholars from Vukuzakhe High school were less inclined to report the need to support their family as a primary motive for wanting to further their education than scholars from the other schools, i.e. since these scholars tended to emanate from middle class homes, it is likely that they experienced lower financial constraints within the home environment than their peers from the other schools.

Given that individuals attracted to the health field tend to be highly altruistic in their intent to contribute to the welfare of others and are relatively unconcerned about receiving high financial reward (Madigan, 1985), it was important that to note that many scholars (83.4%) did not seem to be motivated to study further by elitist intentions (i.e. the desire to further studies for monetary gain), rather placing emphasis on serving their communities after graduation. This press for altruism is further exemplified in the motives of the health science students, who indicated the desire to serve their communities (41.1%) and to contribute to national development (37.0%) as being their prime motives for embarking on a career in the health field.

The finding that teaching, medicine, nursing and social work were popular career path preferences among scholars in this study reflects not only the influence of parental career path preferences on scholars, but also suggests that scholars have a superficial knowledge of careers which is limited largely to those government services commonly occupied by African people (Hemson, 1993).

It was also noted that more standard seven scholars were inclined to aspire to careers in teaching, nursing and medicine, while more standard ten scholars tended to endorse careers in science and commerce and 'other' health professions. This was not a suprising finding, given that time constraints in the school syllabi have resulted in greater emphasis being placed on career counselling for senior scholars as opposed to junior scholars, as well as school resource limitations that have led to more opportunities being afforded to senior scholars to attend community-based career fairs. The tendency for standard seven scholars to support 'traditional' careers in government services is thus arguably as a function of their limited awareness of the available range of career opportunities in health and other professions. It is important to note, however, that few scholars are committed to a career path at a junior level of study (Peil, 1982)

and thus greater exposure to career counselling in the future could possibly lead to an alteration in their career aspirations.

It is argued that children are influenced in their career aspirations by the sex-stereotyped attitudes of their parents with regard to gender-appropriate occupations (Whitehead, 1996). It was thus important to note that parents in this study appeared to hold gender stereotypes regarding appropriate 'masculine' and 'feminine' occupations for their children, i.e. more parental support for females to embark on health professional careers (i.e. 'sympathetic', 'emotional' and 'social' careers) and for males to embark on other professional careers (i.e. 'assertive', 'rational', and 'problem-solving' careers). In other words, female scholars are placed into integrative-expressive roles and male scholars into adaptive-instrumental roles (Jacobs, 1991; Whitehead, 1994), based on their parents' sex-stereotyped attitudes towards occupations. In addition, parents convey their educational expectations to their children by providing messages concerning their beliefs regarding gender appropriate occupations which, in turn, influence the child's subsequent occupational attitudes and aspirations (Rumberger, 1987). This is evidenced by the large percentage of scholars in this study who appeared to support their parents' occupational stereotypes, with female scholars largely aspiring to health professional careers (60.0%) and male scholars aspiring to other professional careers (77.5%).

Furthermore, in the health field, female scholars largely supported a career in nursing while male scholars aspired to a career in medicine. These respective career aspirations of male and female scholars will arguably allow them to fulfill their traditional sex roles, i.e. female scholars may aspire to a career in nursing as it allows them flexibility to cope with gender-appropriate roles, such as child-rearing and domestic activities (Peil, 1982).

An important finding was that scholars from the high-achieving schools (i.e. Vukuzakhe and Zwelibanzi High schools) were more inclined to aspire to careers in science and commerce and health professions other than medicine, nursing and social work, than their peers from the other three schools. Given that parents of scholars from these two schools tended to offer more support for these careers than other parents, it is possible that scholars from Vukuzakhe and Zwelibanzi High schools received greater exposure to career information in the home environment or a family member may have served as a positive role model. This is supported by Peil (1982), who argued that high-achieving children tend to receive more encouragement to branch into careers commensurate with their talents and interests than low-achieving children.

It is also important to note that teachers from Vukuzakhe and Zwelibanzi High schools reported that several of their scholars had received peer career counselling from alumni, which has arguably served to broaden their view of available career opportunities. Thus, both at home and at school, scholars from the high-achieving schools may have been exposed to a relatively broader spectrum of career information than their peers from the other three schools.

f) Knowledge of the health field

Given that most scholars appeared to lack knowledge of health professions other than medicine (62.5%), social work (62.0%), nursing (61.8%) and dentistry (60.05), it was not suprising that these career paths tended to be popular choices among scholars. Scholars' lack of knowledge regarding careers such as medical science, occupational therapy, optometry, psychology and speech and hearing therapy may arguably be due to the fact that they have experienced limited contact with these health professionals in their local community. Given the historical concentration of African people in 'traditional' government health services (Hemson, 1993), scholars are more likely to have had personal contact with nurses, doctors, social workers and dentists and consequently know more about these professions. Furthermore, the lower levels of general knowledge regarding health professions among standard seven scholars may be attributed to the fact that they had received less school career counselling (64.0%) and had fewer opportunities to attend community-based career fairs (62.0%) than was the case for standard ten scholars.

While a large percentage of scholars (47.7%) demonstrated a lack of awareness that UDW offered professional training in the health sciences, it is important to note that teachers across the school contexts reported that UDW had not had previous contact with any of the schools. This suggests that UDW needs to invest greater resources in marketing its courses to disadvantaged schools in the KZN region in order to increase its visibility in these target communities. This is particularly relevant since the establishment of inter-institutional partnerships and mutual cooperation between secondary and tertiary education sectors have been cited as crucial factors impacting on effective scholar recruitment (Teitel, 1994).

Given that mathematics is a mandatory subject for entry into health science degree programmes at UDW (Stewart, 1997a), it was distressing to note that a large percentage of scholars (40.4%) did not perceive this subject to be an entry prerequisite, ranking it below biology, physical science and English. In addition, subjects such as history, Afrikaans, geography and home

economics were perceived to be prerequisites for studying careers in the health sciences by a substantial percentage of scholars from both levels of study ($\bar{x}$=36.7%). This suggests that scholars have received inadequate health career information within their particular school and community contexts, which may arguably result in subject selection decisions being made that could preclude them from gaining entry to health science degree programmes. While biology and physical science are important subjects for entry into the health field, scholars in this study who indicated this to be the case may have been providing a spur-of-the-moment justification, given the obvious link between these subjects with the human body and health.

The finding that almost half of the health science students (49.3%) in this study had been unaware as scholars that they required science-related subjects for entry into the health field, suggests that they had made their subject selection decisions on the basis of personal talent or interest, rather than by consciously selecting those subjects which would afford them to access to health professional training.

The literature reveals a combination of academic and learning skills that are of importance for engaging effectively in university studies, including motivation (Sedlacek & Prieto, 1990), academic ability (Stewart, 1997), persistence, responsibility (Caldas & Ginther, 1996), critical thinking (Bradbury, 1991), study skills, time management skills, adaptability and stress management skills (Whitman et al, 1986). It was noted that scholars in this study tended to rate academic ability (64.0%) and basic academic skills [e.g. reading and writing (37.4%), critical thinking (29.6%) and fluency in English (21.7%)] as being more important for succeeding in health science education than basic learning strategies [e.g. time management (16.7%) and good work habits (8.7%)]. Furthermore, many scholars rated a positive attitude (81.9%), adaptability (82.6%), stress management abilities (85.9%) and motivation (86.7%) to be unimportant skills. This is of particular concern in that these scholars may not recognise the importance of developing a broad range of skills for coping with the negative stressors of university life, which could lead to future adjustment difficulties in the transition from secondary to tertiary education. This is corroborated by the finding that while health science students generally concurred with scholars in rating a positive attitude, good work habits, adaptability, stress management and motivation as being unimportant skills for success in health science education, a large percentage of these students (67.1%) were in fact experiencing adjustment difficulties at university.

A particularly distressing finding was that computer literacy was not viewed as being essential for success in health science education by both sample groups ($\bar{x}$=99.3%). This is of concern in that the ever-increasing technological demands on South African society has created the expectation that tertiary education institutions will produce graduates who are equipped with high levels of technological literacy (Charles, 1997).

The disparities observed between the responses of health science students and scholars in the rating of certain skill prerequisites for success in health science education may arguably be due to their differing educational frame of reference. Health science students, engaged in tertiary studies, are likely to have a greater understanding of the task demands of university life and thus rate hard work, time management and open communication with lecturers as being important for academic success. Comparatively, scholars, who do not have the benefit of these insights, are more likely to identify skills that they perceive to be of importance in 'people-oriented' health professions, such as listening skills, patience and compassion.

5.2.3 Social System

Social system is concerned with the patterns or (in)formal rules of operating and interacting in the school. In this regard, school governance structures, the instructional programme and interpersonal relationships were seen to be particularly relevant social system variables impacting on educational outcomes in this study.

5.2.3.1 School governance structures

A democratically elected PTSA, with the mandate to make collective decisions regarding the functioning of the school, was reported to be in existence by teachers across all five schools. This participatory system of decision-making is of particular significance since collective bargaining opportunities for all sub-groups within a school have been shown to be important for creating a positive school atmosphere in which students can achieve (Vyskocil & Goens, 1979; Wynne, 1980; Dlamini, 1995). It is important to note, however, that the level of shared decision-making across the schools appeared to vary according to the school context. The rules that define management practices within the rural and informal settlement schools (i.e. Sobonakhona and Inhlanhlayethu High schools) appear to be strongly tied to the social norms of the local community, i.e. local community leaders appear to have the ability to make executive decisions regarding school matters, often independent of the wishes of the PTSA. This arguably erodes qualities of trust and respect within the management structure, factors seen to be

imperative for enhanced teacher and pupil performance (Silberman, 1970; Anglin, 1979; Ellet & Walberg, 1979).

While teachers from only three of the schools reported the existence of a SRC (i.e. Ilanga, Inhlanhlayethu and Zwelibanzi High schools), most teachers in this study appeared to view the SRC as a beneficial student structure within the school. Teachers from Sobonakhona High school, however, tended to hold a negative view of a SRC, arguably out of concern for creating additional management problems for the school through the empowerment of an 'unruly' student body. This is unfortunate since providing students with the freedom to participate in school matters generally tends to lead to improved behaviour (Cox, 1978), an increased sense of responsibility (Duke & Perry, 1978) and acceptance of school norms (Rutter et al, 1979).

5.2.3.2 Instructional programme

a) Mainstream curriculum

In an attempt to enhance their scholar pass rates, all schools offered compulsory study periods in their mainstream school syllabi, albeit largely for senior scholars. This is of importance since additional time afforded to scholars for self-instruction has been positively related to increased educational outcomes (Brookover et al, 1979). Furthermore, given that the nature of secondary educational programmes influence students' educational aspirations (Anderson & Tissier, 1973) and tertiary education plans (McDill & Rigsby, 1973), it was encouraging to discover that all five schools offered a science subject stream, enabling access to science-related careers later in life. In particular, it was noted that the subject set combinations in the science streams across all schools afforded access to health science professional training.

With regard to subject selection, gender differences in subject choices have been well documented (see, for e.g., Kelly, 1986; Archer & Macrae, 1991; Whitehead, 1996), with evidence to suggest that certain subjects are perceived as being more appropriate for one sex than the other due to their relationship with gender stereotypes in society (Whitehead, 1996). Following Parsons & Bale (1955), the sexual division of labour, based on crucial differences between males and females (such as childbearing), has tended to place males into the adaptive-instrumental role (i.e. manipulation of the environment) and females into the integrative-expressive role (i.e. the maintenance of good interpersonal relationships). Thus, males, who have to manipulate the environment, are stereotypically seen as assertive, rational, logical competent, good at problem-solving and interested in the world of phenomena (Bern, 1974). Women, on the other hand,

who have to ensure good social relationships, are stereotypically seen as sympathetic, emotional, aware of others' feelings, tactful and interested in people (Whitehead, 1994).

The relationship between these different personality traits and scholars' subject choices is fairly obvious. Economics, physical science and mathematics are the cornerstones of scientific thinking and are seen to be concerned with phenomena, rationality and logic, making them more suitable for males (Tocci & Engelhard, 1991; Whitehead, 1996). Comparatively, history, biology, languages, art and music are seen to be concerned with people, intuition and the exploration of human emotions, making them highly suitable subjects for females (Hemson, 1993; Whitehead, 1996). It was thus not suprising that more male scholars in this study were enrolled in mathematics (63.8%) and physical science (66.5%), while more female scholars tended to be enrolled in biology (69.4%). This is of particular concern since the subjects that scholars choose to enroll in have a significant impact on their future educational and occupational options (Wigfield & Meece, 1988; Hemson, 1993), with mathematics tending to be of more value than other subjects in this regard (Whitehead, 1996). Consequently, many scholars in this study, particularly female scholars, are restricting their future educational and career options by discontinuing their mathematical training early in high school. By way of example, in 1992, only one half of African scholars in South Africa who attempted to obtain a university admission qualification had a subject set that included one commercial subject (e.g. economics, business economics, accounting and domestic science) or a science subject other than biology (Calitz, 1994).

It was interesting to note that while scholars viewed science-related subjects as being difficult (82.0%), most seemed to recognise the importance of these subjects for their future educational and career opportunities (74.5%). This is in keeping with relevant empirical literature, which demonstrates that scholars tend to view science subjects as being more important in career terms than non-science subjects (see, for e.g., American Policy Unit, 1988). Standard ten scholars were, however, more inclined to report studying science-related subjects in order to gain access to their future career than standard seven scholars. This was not a suprising finding given the argument that subjects selected at a junior level are traditionally chosen on the basis of personal interest or on what has proved easy in the past, rather than on what will build the cognitive and technical skills appropriate for their future career path (Potter, 1995).

While a number of standard seven scholars appeared to have selected science-related subjects because they liked the teachers who taught these subjects (27.0%), it is important to note that, in general, very few scholars displayed an external locus of control in making their subject selection decisions [i.e. they did not choose science subjects due to peer pressure (95.2%) or because they liked the subject teachers (80.2%)]. This is of particular importance since scholars with an internal locus of control are more likely to aspire to their own long-term goals and hence select subjects that have greater economic application in the market place (e.g. mathematics and physical science) [Kapp, 1994; Whitehead, 1996].

b) Career counselling

While formal career counsellors were present at three of the schools (i.e. Ilanga, Inhlanhlayethu and Vukuzakhe High schools), career counselling was not offered as a part of the mainstream curriculum in any of the schools. By offering career counselling on an ad-hoc basis, scholars may arguably view this non-academic activity as being trivial and inessential, thereby not comprehending its importance in assisting them to make critical decisions that will impact on their future life opportunities. This is corroborated by the finding that a large percentage of both scholars (58.1%) and health science students (48.0%) were uncertain of the role that school guidance classes had played in assisting them to make their career decisions.

Reports by teachers across all five schools that time constraints in the school syllabi hindered the provision of school career counselling services, were supported by the finding that almost half of the scholars (41.0%) received school career counselling on a monthly or annual basis. Of particular concern was that significantly fewer standard seven scholars (36.0%) reported receiving school career counselling than did standard ten scholars (71.5%). Given that these junior scholars are poised to make subject selection decisions based on the information available to them, limited exposure to career counselling at school will arguably result in uninformed subject selection decisions being made. This, in turn, will determine their future educational and career options and ultimately impact on the available pool of African applicants for health science careers in the future.

While teachers reported that career counselling services offered by their schools included information on a range of career options, financial aid counselling and information on subject prerequisites, no comprehensive information on health science careers had been offered to scholars across the school contexts. It was thus not suprising that a large percentage of scholars

indicated that inadequate information on health science careers was provided in their guidance classes (58.1%) and that their teacher had been ill-equipped to deal with questions related to careers in the health field (52.1%). In this context, it was understandable that scholars tended to demonstrate a superficial knowledge of health science careers (mainly confined to a number of popular careers in the field), as well as a limited understanding of the subject and skill prerequisites for entry into the health field.

An important finding was that the health science students in this study tended to concur with scholars regarding their opinions on school career counselling, particularly in terms of its limited value in providing insights into the health field. This suggests that school career counselling played a relatively minor role in influencing the career decisions of health science students, with health career information being most likely acquired from other sources, e.g. health professionals in the community, family members, career fairs and the media.

While both scholars and health science students appeared to have been motivated to participate in school career counselling ($\bar{x}$=46.0%), time constraints served to ensure that these classes were largely too short to be of use ($\bar{x}$=45.7%). This highlights the need to integrate school career counselling into the mainstream educational programme in order to ensure that scholars may benefit maximally from this important school service. Following Bullock et al (1996), formalised career guidance services enhance student motivation and empowerment by enabling them to gain a clear understanding of their vocational options, as well as their personal skills and abilities.

5.2.3.3 Interpersonal relationships

a) Parental involvement

From a sociological standpoint, the school is a system of social relationships between family, teachers, students and peers that is critical in influencing the attainment of educational goals (McDill & Rigsby, 1973; Rutter et al, 1979; Lareau, 1987). In particular, enhanced school-family relationships has been viewed as a priority in promoting educational achievement, i.e. when positive school-family relationships exist, students are seen to perform better (Anderson, 1982; Lareau, 1987; Epstein, 1987). It was thus encouraging to discover that teachers across the school contexts reported undertaking to provide opportunities for parents to communicate concerns regarding their children. It was noted, however, that the manner in which teachers actively promoted parental involvement varied between the school sites, with this difference being apparent both in terms of the quality and quantity of interaction. By way of example, while

teachers across the schools held individual consultations with parents, which were generally viewed as being constructive in nature, *parent-initiated* contact was only reported by teachers from Vukuzakhe High school. This is in keeping with the literature where middle class parents (such as many of the parents from Vukuzakhe High school) appear to contact teachers at much higher rates than working class parents in order to discuss their children's academic progress (Lareau, 1987).

Furthermore, given that high-achieving schools tend to have greater levels of parental involvement than low-achieving schools (Brookover & Lezotte, 1979; Phi Delta Kappa, 1980), it was not suprising to discover that the opportunities offered to parents to participate in their children's education were much greater at the high-achieving schools (i.e. Vukuzakhe and Zwelibanzi High schools) as compared to the other three schools in this study. Parents were afforded opportunities to participate in school events such as 'parents' evenings' at both schools, which arguably provides a constructive means for teachers to meet parents and to stimulate them to become active partners in their children's academic careers. Teachers from Vukuzakhe and Zwelibanzi High schools thus seem to have adopted a broad multi-dimensional approach to parental involvement, viewing parents' contributions as being more than merely providing insights into scholars' academic and behavioural problems, as is usually the case with individual parental consultations (Dimmock et al, 1996). In this manner, parents are empowered to develop their strengths and insights in the interest of their children and the school (Jantjes, 1995).

It is important to note that parental involvement was not viewed as being positive across all school contexts. In Sobonakhona High school, teachers and parents did not appear to have common outlooks and there seemed to be a strong mutual alienation between the school and home contexts, as was evidenced by the reported lack of parental cooperation and interest during parent-teacher consultations. This may arguably be due to the limited amount of time these working class parents have to invest in their children's education (Lareau, 1987), consequently viewing the educational development of their children as being the primary responsibility of the teacher as opposed to a shared enterprise requiring their intervention (Dimmock et al, 1996).

It is further argued that lower income, less educated and single parents tend to be less involved in their children's education than higher income, better educated and married parents (see, for

e.g., Lareau, 1987; Epstein, 1990, Grolnick et al, 1997). Economic hardship (McLloyd, 1990), stress (Forgatch et al, 1988) and beliefs of low self-efficacy (Hoover-Dempsey et al, 1992) generally appear to undermine parenting practices in the former instance more than in the latter (McLloyd, 1990). This argument is corroborated by the finding that, in this study, scholars from middle class homes and two-parent families reported receiving more useful educational guidance and support from their parents than did scholars from working class homes and single-parent families. A similar finding was observed with the health science students, who were significantly more inclined to report receiving support and guidance from parents when they emanated from intact family structures (67.5%) as opposed to when they came from single-parent families (32.5%). It was also noted that scholars from the high-achieving schools (i.e. Vukuzakhe and Zwelibanzi High schools) reported receiving more useful career guidance and suggestions from parents than scholars from the other three schools. Given that these parents were generally more aware of a broader range of health and other professional careers, they are arguably better-equipped to provide their children with more comprehensive career information than parents of scholars from the other schools.

An interesting finding was that female scholars (65.9%) were more inclined to report receiving support and guidance from parents than was the case for males scholars (34.1%). This is in keeping with the argument that parents, particularly mothers, believe that their daughters are more vulnerable than their sons and thus tend to be more responsive and attentive to the needs of their female offspring (Chase-Lansdale, 1991).

b) Community-school relationships

As with other social relationships, family-school interactions carry the imprint of the larger social context (Lareau, 1987), with scholar educational outcomes being greater when a positive rapport exists between the school and the broader community (Phi Delta Kappa, 1980; Quaglia et al, 1990). With the exception of the rural and informal settlement schools, the relationship between the schools and their communities in this study was primarily as a function of parent-teacher interactions and parental involvement in the PTSA. In Inhlanhlayethu and Sobonakhona High schools, however, an organic link appeared to exist between the school and the community, with local community leaders exerting a strong influence over school management practices. Furthermore, in Sobonakhona High school, local community intervention in certain school affairs, such as student admissions and community-based school events, appeared to be particularly disruptive and driven by the conflicting ideologies of local

political formations. In this instance, therefore, the school appeared to mirror fractures and tensions in the wider social milieu, with a negative effect on scholar educational outcomes.

c) Teacher-pupil relationships

With regard to teacher-pupil relationships, it was noted that teachers across all five schools appeared to exhibit concern for the academic future of their scholars. This was evidenced by the provision of extra tuition classes for scholars over weekends, after school hours and during school holidays, as well as by the effort exhibited by teachers in attempting to channel scholars into appropriate subject streams. This is of relevance in that teacher commitment has been strongly related to scholars' academic performance and educational outcomes (see, for e.g., Brookover & Lezotte, 1979; Phi Delta Kappa, 1980). In addition, it was noted that teachers appeared to be sensitive to the factors impacting on the pass rates of scholars in their school, such as low family SES and inadequate school instructional materials. This is of importance in that scholars are more likely to seek assistance in dealing with academic and personal problems when they feel valued by their teachers (Rutter et al, 1979).

It is important to note, however, that the level of teacher-pupil rapport across the school contexts appeared to vary, with teachers from Sobonakhona High school seemingly experiencing difficulty in establishing effective relationships with their pupils. This was evidenced by the reports of teachers from this school with regard to their difficulty in conducting extra tuition classes after school hours and enforcing school disciplinary measures, due to fear for their personal safety. This is of particular concern since good relations between teachers and pupils tend to foster higher levels of scholar academic achievement (Lee et al, 1993; Wenglinsky, 1997).

d) Peer relationships

Given that cooperative teacher-teacher relationships have been identified as an important factor for promoting the academic success of scholars (Lightfoot, 1983), it was encouraging to discover that teachers across the schools reported sharing instructional materials, such as textbooks and stationery, in attempts to enhance scholar achievement. In particular, a high cooperative emphasis was demonstrated by teachers from Inhlanhlayethu High school, who have developed a system of 'team teaching' for the benefit of their pupils. This is of importance in that schools with high levels of teacher collegiality tend to be more successful in building school character (Wynne, 1980), enhancing teachers' self-efficacy beliefs (Epstein & Mac Iver,

1989) and eliminating teacher isolation (Warren & Payne, 1997), factors shown to be positively related to scholar educational outcomes (see, for e.g. Miller, 1968; Twitchin & Demuth, 1985).

Relevant research on children and adolescents has repeatedly shown that peer groups influence child and adolescent behaviour in a wide variety of ways (see, for e.g., Kilburn, 1993; Walter et al, 1993; Bankston, 1995; Caldas & Bankston, 1997), with shared beliefs, habits and peer pressure being the most important mechanisms by which peer groups affect individual behaviour (Reyes & Leonard, 1993; Bankston, 1995). By way of example, substance abuse within a peer group seems to be one of the strongest predictors of substance abuse on the part of the individual adolescent (Bankston, 1995), a factor which arguably impacts on the academic achievement of scholars. This is indeed evidenced by the reports of teachers from three of the schools (i.e. Inhlanhlayethu, Sobonakhona and Zwelibanzi High schools) who indicated substance abuse to be one of the major contributors to scholar attrition in their schools.

The poverty status of the peer population is another factor which has been related to the educational outcomes of scholars. There is a general tendency for poor scholars to attend schools with a high percentage of equally less affluent peers, who bring the disadvantages associated with poverty to the school environment (Caldas & Bankston, 1997), such as poor literacy skills, poor study habits, financial difficulties, inadequate emotional and social support and low self-efficacy (Des Ormeaux, 1990). Given that these traits of the peer group tend to place the individual adolescent 'at risk' of failure (Des Ormeaux, 1990), it was of concern that many scholars in this study appeared to emanate from low SES families, which is arguably reflective of the SES of the general student body. Conversely, attending a school with classmates who emanate from higher SES backgrounds tends to positively raise the individual scholars' academic achievement (Potter, 1995), which immediately places scholars from Vukuzakhe High school at an advantage to their peers from the other four schools, since these scholars tended to largely emanate from more affluent homes.

It is also important to note that relationships within a peer group that are marked by violent behaviour result in the individual adolescent learning to utilise physical force as a primary means of problem-solving (Gay et al, 1992). Furthermore, when violence becomes prevalent in the school environment, pupils' schoolwork tends to suffer and scholars become academically discouraged and more likely to fail in school (Houck & Maxson, 1996). This may partly account for the high failure rate (77%) of the general student body in Sobonakhona High school, who

are either exposed to relatively high levels of violence in the school environment or engage in violent behaviour themselves.

The influence of peers on the individual scholar is not only direct, but indirect as well, through the perceptions that teachers and administrators may have of the peer groups that the scholar associates with (Caldas & Bankston, 1997). These perceptions, whether based on past experience or perceived stereotypes, may consciously or unconsciously influence how teachers react to student groups. By way of example, if the teacher's attitude is that a particular pupil group is, in her estimation, academically weak, she may 'dumb down' her curriculum and lower her expectations, an approach that is likely to result in negative outcomes for the individual pupil within the group (Caldas & Bankston, 1997). Teacher's negative perceptions and low expectations for the group may, in turn, eventually influence how the individual scholar perceives his or her own capabilities (Steele, 1995). In this context, it is important to note that teachers from Sobonakhona High school tended to hold a negative view of certain groups within the general student body, perceiving them to be under-achievers, unruly and resistant to authority. These perceptions arguably result in negative outcomes for the individual scholar associated with the group, such as poor academic performance.

5.2.4 Culture

Culture refers to those variables that reflect the norms, beliefs and values of persons within the school and, as such, involves nearly every aspect of the organisations' operations. Culture, therefore, is the social energy that provides meaning and direction for individuals within the school (Moody, 1988). In this regard, teacher expectations, rewards and punishment, educational goals and emphasis on continuous school improvement were seen to be important culture variables in this study

5.2.4.1 Teacher Expectations

A recurring theme in the literature associated with the educational outcomes of children is the level of expectation that teachers hold for their scholars' academic performance (see, for e.g., Weber, 1971; Brookover & Lezotte, 1979; Rutter et al, 1979; Edmonds, 1979; Phi Delta Kappa, 1980; Fang, 1996). Following Rosental & Jacobson (1968), this teacher expectation may be viewed as a 'self-fulfilling prophecy' which operates to reinforce the academically strong pupil and discourage the academically weak pupil, i.e. scholars may succeed or fail based on the expectations and predictions teachers hold regarding their abilities (Myers et al, 1987; Hemson,

1993). This is of concern in that teachers from Sobonakhona High school tended to hold the view that certain groups of scholars within the school were underachievers. These scholars may have arguably internalised teachers' perceptions that they are 'bad' pupils and consequently perform in an academically inferior fashion.

Without exception, the research portrays the high-achieving school as one in which the staff manifest attitudes of confidence that scholars will be able to succeed academically (see, for e.g., Edmonds & Fredericksen, 1978; Brookover et al, 1979). The higher academic performance of scholars in the high-achieving schools in this study (i.e. Vukuzakhe and Zwelibanzi High schools) as compared to that of scholars from the other three schools, may thus be partly as a function of the high expectations that teachers in these schools hold for scholars' academic abilities.

It is further argued that scholars use the consistent feedback they receive from their teachers, as well as their grades, in order to measure their success or failure in school (Gay et al, 1992). This is of importance in that scholars who perceive that they are failing in school, and are uncritical of the external evaluations they receive from teachers, tend to exhibit non-normative behaviour (Myers et al, 1987), such as misbehaviour, rebellion and delinquency (Pink, 1979). The high failure rate of scholars and the negative expectations of teachers for the academic success of pupils from Sobonakhona High school, may thus serve to reinforce the incidences of crime, vandalism, physical fighting and weapon possession in this school.

5.2.4.2 Rewards and punishment

Schools that recognise pupils' accomplishments tend to have higher levels of achievement, with reward and praise in high-achieving schools being frequent and public (Rutter et al, 1979; Wynne, 1980; Van Morrow, 1990). By way of example, rewards for scholars' accomplishments in Vukuzakhe High school are reflected in the funding received from the FRD for the schools' alumni rating, which in turn has been used to reward scholars with educational facilities, such as computers, books and audio-visual equipment. This system of rewarding pupils will arguably serve to further motivate them to positive academic outcomes (Holland & Andre, 1987), i.e. scholars from Vukuzakhe High school may be motivated to achieve in the knowledge that their academic efforts could result in enhanced school facilities and resources (Holland & Andre, 1987).

The corollary, of course, is that for schools which have a social climate in which education and scholarliness is less valued, there will be a greater likelihood of scholars dropping out of school, as well as generally less interest in school among the student body (Pittman, 1991). By way of example, in the non-urban schools in this study (i.e. Inhlanhlayethu and Sobonakhona High schools), the low SES of scholars seems to have led to parents perceiving greater economic value in their children leaving school early in order to supplement the family's income, as opposed to completing or furthering their education. This may, in part, account for the higher attrition rates and lower academic performance among scholars from these schools as opposed to scholars from the other three schools.

It is further argued that consistency in administering punishment and applying disciplinary rules is positively related to the educational outcomes of scholars (see, for e.g., Breckenridge, 1976; Wynne, 1980; Phi Delta Kappa, 1980), with evidence to suggest that poor academic performance among scholars is generally a function of a lack of discipline in the school (Myers et al, 1987). While disciplinary measures across the schools in this study appeared to assume the form of a number of micro-penalties such as light physical punishment (i.e. cleaning the school grounds) or minor deprivations (i.e. suspension from school for a limited period of time), the degree to which enforcement of school rules was consistently carried out appeared to differ in certain school contexts. The maintenance of discipline and application of punishment appeared to be difficult for teaching staff from the rural school (i.e. Sobonakhona High school), with scholars resisting authority and teachers seeming to be powerless to break the peer group culture of rejecting school norms. This is of concern in that those scholars who are presented with distinct and explicit expectations regarding their code of conduct tend to perform better academically than those who do not (Tal, 1978). This may thus partly account for the poorer academic performance of scholars in Sobonakhona High school as compared to their peers from the other four schools.

Furthermore, it is important to note that the ability to enforce clear and concise disciplinary measures in order to regulate pupils' conduct tends to be dependent upon the school's wider social framework (Cilliers, 1988). Given their fear of local political party intervention, it is thus not suprising that teachers from Sobonakhona High school reported being disempowered in their ability to enforce school rules, i.e. there appears to be a lack of recognition of teachers as legitimate authority figures in this school by sectors of the broader community.

5.2.4.3 Educational goals

Most human behaviour is goal-directed (Ford, 1992), with researchers concurring that individuals set or respond to goals in terms of their self perceptions, values and social contexts (see, for e.g., Locke, 1991; Ames, 1992). Most educationalists and developmentalists agree that adolescence is a critical period for the formulation of personal goals, particularly occupational goals, with directions taken at this phase of life having important long-term implications (see, for e.g., Nurmi, 1991; Durkin, 1995; Carroll et al, 1997). In this study, while scholars across all five schools appeared to attach importance to the attainment of educational and career goals, the extent to which they are able to embrace these goals appears to be related to their social class location (Myers et al, 1987), i.e. scholars from low SES homes seem to experience considerably more family pressure to leave school early in order to contribute to the household income than is the case for scholars from higher SES homes. Thus, despite the common value attached to educational and career goals among scholars, pupils from middle class homes (i.e. primarily those scholars from Vukuzakhe High school) are arguably more likely to pursue long-term educational goals, while their working class peers (particularly those scholars from Inhlanhlayethu and Sobonakhona High schools) may not view an educational future beyond high school as a feasible option.

5.2.4.4 Emphasis on continuous school improvement

While creating opportunities for the academic, personal and instructional development of staff has been positively related to the educational outcomes of scholars (see, for e.g., NCHE, 1996; Pierce & Hunsaker, 1996), limited budgets for staff development create significant problems for schools with regard to implementing comprehensive plans for teacher empowerment (Criswell & Lotven, 1992). While a lack of opportunities for training and career development has been cited as a major source of teacher stress (Cox & Brockley, 1984), it is important to note that teachers in this study did not perceive the establishment of linkages with tertiary institutions to be more substantive than assisting with the provision of school resources. This is of concern in that harnessing the collective intellectual and material resources of public schools and universities creates powerful opportunities for promoting the ongoing professional development of teachers, as well as for strengthening the teaching methods, curricula and student services of universities by connecting these practices to the realities of the schooling context (Holmes Group, 1990).

5.3 UNIVERSITY CONTEXT: IMPACT OF LOCAL CONDITIONS

5.3.1 University Selection Procedures

While admission to professional degree programmes at South African tertiary institutions is determined largely by the mark achieved by applicants in their matriculation examination (Mitchel & Fridjhon, 1987), it is important to note that the historically inferior education of African scholars in ex-DET schools (Marx, 1992) has served to ensure that poor performance in the national matriculation examination has become the norm among African pupils in South Africa (Sunday Independent, 1996a). The utilisation of a system which selects students on the basis of the highest matriculation points will thus immediately serve to disadvantage African applicants, whose matriculation results are rarely an accurate reflection of their academic abilities and potential (see, for e.g., Griesel, 1991; Joubert, 1997). It was thus not suprising that the majority of health science students in this study (64.4%) were unable to endorse the view that there was equity in access to health professional training at UDW, particularly when student selection was seen to be based primarily on academic merit (57.1%).

While a large percentage of health science students (84.8%) were of the view that the limited presence of African students in health science degree programmes was as a function of restrictive student selection procedures, it is important to note that entry in health professional degree programmes at UDW requires a strong background in mathematics and/or physical science (Stewart, 1997a). Given that only one out of every 312 African pupils pass mathematics and physical science in matric (Sunday Independent, 1996), there is currently an acute shortage of African school-leavers who possess the necessary science-related subjects for entry into science-oriented professions (DACST, 1996). It is thus not suprising that a large discrepancy exists between the number of African applicants for entry into health science degree programmes at UDW and the number who are finally accepted (Stewart, 1998a). While this brings into sharp relief the need for scholar enrichment programmes in mathematics and physical science in order to increase the pool of suitably qualified African applicants for health professional training in the future, it also raises a more substantive issue in terms of whether other subjects may be considered suitable for entry into health science degree programmes. While it is argued that mathematics and physical science provide individuals with superior analytical and problem-solving skills, it is important to note that there is currently little empirical evidence to support this argument (Joubert, 1997). There have thus been increasing calls for the consolidation of a broader range of subjects for entry into the health field which may prove to

be valid indicators of scholars' analytical thinking and problem-solving abilities (see, for e.g., Ngcobo et al, 1998).

While aptitude tests (i.e., tests which measure students' specific intellectual or reasoning abilities) are utilised by a small minority of departments in the Faculty of Health Sciences at UDW (Stewart, 1997a), it is important to note that the use of aptitude testing in the assessment of students' manifest academic ability appears to be an increasingly dominant selection method utilised by tertiary institutions (Griesel, 1991). Following Sternberg (1986), standardised tests have their most predictive utility in the measurement of componential intelligence as opposed to experiential intelligence, with historically disadvantaged scholars tending to be more inclined to develop and demonstrate abilities in the experiential area of intelligence as compared to 'advantaged' students (Sedlacek & Prieto, 1990). Individuals who have thus been exposed to limited educational opportunities will consequently obtain lower scores on standardised tests than those individuals who have not been as disadvantaged (Griesel, 1991), raising immediate concerns regarding the predictive utility of these measures in assessing the future academic success of historically disadvantaged students and their potential for change and development (see, for e.g., Cronbach, 1975; Slack & Porter, 1980; Miller, 1991). Traditional overdependence on standardised tests in the enrollment of undergraduate students must thus give way for a more informed use and understanding of the value of these tests (Borkowski, 1988). In this context, the performance score obtained by African applicants on aptitude tests utilised by certain academic departments of the Faculty of Health Sciences may not bear a significant correlation with their subsequent academic performance and should consequently be interpreted with caution and supplemented with other student selection measures.

While national policies of social redress have ensured that some form of affirmative action is being implemented in the selection of students at most South African tertiary institutions (African National Congress [ANC], 1994), it is interesting to note that only one third of the health science students in this study believed that there was equity in access to health professional training at UDW as a direct function of these affirmative action policies. This suggests that there is a general lack of awareness among students with regard to the nature and role of affirmative action policies within the Faculty of Health Sciences at UDW, which, in turn, would arguably serve to enhance their perception that student selection practices within the institution restrict the access of historically disadvantaged students.

In assessing the suitability of historically disadvantaged students for specific courses of study, it is widely argued that traditional student selection measures should be supplemented by non-traditional measures (see, for e.g., CASE, 1993; Sedlacek & Prieto, 1990; Odegaard, 1997), with interviews and biographical questionnaires being viewed as particularly useful tools in this regard (see, for e.g., King, 1988; Glick, 1994; Emmet, 1993). In this study, while a large majority of health science students reported undergoing an interview process as part of their selection procedure (74.0%), more than half of these students appeared to hold negative perceptions of their personal interview. Given the argument that African applicants tend to lack relevant interviewee experience (Joubert, 1997), it was not suprising to discover that 59.2% of the health science students were unable to endorse the view that they had been well-prepared for their interview.

Furthermore, given that only 1.5% of the Faculty of Health Sciences' academic staff complement is African (Bhagwanjee, 1996a; Swan, 1996), the health science students in this study were of a different ethnic group to the majority of interviewers who comprised their panel. Their perceptions of intimidation (51.9%) and lack of confidence in the racial impartiality of the interview team (61.2%) may thus stem, at least in part, from a difficulty in identifying with the individuals who conducted their interview, who themselves may have been influenced and biased by their own socio-cultural circumstances (Joubert, 1997). This highlights the need to re-examine the composition of student selection panels within the Faculty of Health Sciences in order to ensure that there is adequate representation by African individuals (clinical or academic) on these interview teams. This will arguably result in African applicants perceiving greater support during the interview process due to their easier identification with individuals from their own ethnic group (Ngcobo et al, 1998), thereby reducing their fear of asking questions during the interview and mediating feelings of intimidation and perceptions of racism.

While biographical questionnaires usually comprise only one component of the admission process, a consumer-friendly and well-structured biographical questionnaire can provide the selection team with a key source of information regarding the prospective student (Emmet, 1993; Joubert, 1997). In this regard, it is important to note that health science students in this study appeared to hold a positive regard for the biographical questionnaires utilised in their selection. While a large percentage of the students were unable to endorse the view that all questions asked were relevant (56.2%), it is important to note that biographical questionnaires

often yield important information about the personal background of the student (Sedlacek & Prieto, 1990), which all applicants may not necessarily perceive as being important.

5.3.2 Adjustment Difficulties

It is widely argued that the retention of historically disadvantaged students is, in many instances, dependent on their ease of transition from school to university life (see, for e.g., Colby & Foote, 1995; NCHE, 1996). It was thus of immediate concern that the majority of health science students in this study (67.1%) reported that they had experienced adjustment difficulties accruing from their transition from secondary to tertiary education. In particular, emanating from an educationally disadvantaged background was viewed to be a significant factor impacting on their academic preparedness for tertiary studies (85.7%). This historical inability of former DET schools to adequately equip African scholars with the basic academic and learning skills for tertiary education (Makaula, 1988; Marx, 1992) is ostensibly reflected in the students' references to their difficulty with passing their courses (83.7%), integrating theory with practice (61.2%), keeping pace with other students in class (57.2%), using their second language (English) adequately (55.2%), coping with their course workload (44.9%) and adapting to university teaching methods (34.7%).

The argument that financial difficulties impinge centrally on the university experience of historically disadvantaged students (Bradbury, 1991; Mulder, 1991; Colby & Foote, 1995), was corroborated by the finding that the most overwhelmingly negative effect for students embarking on university study was the financial pressure which this placed on their families (93.6%). Given that the majority of health science students emanated from working class homes (62.5%), the decision to study arguably created significant economic strain on the household in terms of the immediate loss of a potential breadwinner to the family (Bradbury, 1991). Thus, while attaining a professional undergraduate education would enable these students to make substantial financial contributions to the family household in the future, this appears to have done little to alleviate their current pressure to assist their family financially. Furthermore, given that a large majority of the students' families were financing their studies (68.5%), this pressure may be compounded by guilt feelings with regard to the immediate social and material cost of their education. This places pressure, in turn, for tertiary institutions to develop comprehensive financial aid programmes and financial aid counselling services for historically disadvantaged students and their families, such as enlisting greater private endowments (e.g. scholarships and

grants) and investigating the feasibility of implementing university work-study programmes (Obiakor, 1992).

Students have played a considerable role in the transformation of universities in South Africa, with the courses of action for extracting concessions from education authorities usually including strikes, boycotts of lectures, sit-ins and, in some cases, violence and destruction of property (Dlamini, 1995). Furthermore, students have deemed the democratic decision-making process for arriving at a particular course of action to be of such paramount importance that all other functions involving students are expected to cease during this time, including examinations and other academic or professional programmes of the institution (O'Connell, 1991). Unfortunately, the by-product of this has often meant that education is adversely affected (Dlamini, 1995). This is corroborated by the finding that 63.2% of the health science students in this study reported adjustment difficulties accruing from campus student politics that disrupted their studies (63.2%).

It is argued that interaction between faculty staff and students is one of the most important determinants of the retention of students (Arellano-Romero & Eggler, 1987), with the presence of historically disadvantaged faculty members being the best predictor of the academic and social integration of historically disadvantaged students (Linthicum, 1989; Owens et al, 1994). However, while it is argued that the presence of Black faculty members will enhance the retention and graduation efforts of Black students (see, for e.g., Richardson, 1989; Curley & Strage, 1994), evidence indicates that there are relatively few Black faculty members on many campuses (Olivas, 1988). The finding that one third of the students in this study were 'uncertain' whether their lecturers were willing to assist them with their personal or academic problems, may thus partly be as a function of limited opportunities to interact with staff members of the same ethnic group in the faculty. This is of particular concern as the assignment of Black faculty members as advisors, mentors and role models to historically disadvantaged students has been identified as critical in fostering a positive and caring academic environment in which these students may achieve (Twale et al, 1992; Owens et al, 1994).

While student support services are viewed as essential for increasing the retention rates of historically disadvantaged students (Arellano-Romero & Eggler, 1987), on-campus student support services did not appear to play a major role in easing students' adjustment to university life in this study (20.8%). This could be due to the fact that these services are arguably

inadequate, or poorly marketed, or some combination thereof. This highlights the need to improve these services and to concurrently embark on public relation exercises, such as disseminating pamphlets and mounting displays in student residences, in order to heighten student awareness of the services provided for them on campus.

5.3.3 Academic Development Programmes

Given the argument that the provision of additional positive educational opportunities for students from educationally disadvantaged backgrounds will enhance their retention (Owens et al, 1994), academic success (Moody, 1988) and self-esteem (Twale et al, 1992), it was encouraging to discover that the majority of health science students in this study reported participating in ADPs (76.7%).

While the knowledge production effects of participation in ADPs appeared to be beneficial for students in terms of coursework comprehension and skill development, students were critical of the fact that academic development tutorials were not part of mainstream academic activities. The disadvantage, from the students' perspective, is that these tutorials are time-wasting as they are not directly related to passing exams or gaining academic credits. This is of concern in that work that is perceived to be additional and marginal in relation to the demands of mainstream academic courses is likely to generate additional workload stress for students (Bradbury, 1991). This highlights the need for academic development courses to become an integral part of student educational development and not merely an 'add-on' activity separate from their mainstream educational development (UND, 1995). The allocation of state and institutional funds in the area of academic development should consequently focus on the mainstreaming of strategies for effectively promoting the retention of historically disadvantaged students. While mainstreaming ADPs could prove to be a costly enterprise, it will arguably serve to create a climate in which students believe that the institution is committed to enabling them to succeed (Borkowski, 1988), thereby impacting positively on educational outcomes.

An important finding was that a lack of participation in ADPs by health science students (23.3%) did not appear to be primarily due to a paucity of need for academic and psycho-social assistance, but rather as a function of their lack of awareness of academic development services or because they did not want to be labelled as students who cannot effectively cope with university studies. This raises two important concerns. Firstly, the lack of awareness among students with regard to academic development services suggests that staff may not be

committed to academic support as an integral and necessary function within the institution (Pavlich & Orkin, 1992), arguably resulting in academic development initiatives being offered in an ineffective and fragmented manner. This highlights the need to restructure and coordinate academic development services in order to prevent their duplication (Ngcobo et al, 1998); to prioritise needs and activities in order to effectively utilise available institutional resources and funding (Pavlich & Orkin, 1992); and to regularly and continuously monitor the impact of these programme in order to implement relevant and necessary changes (SAAAD, 1997). To restructure and coordinate all the existing academic development activities and services of an institution is, however, not an easy or expedient task. It demands cooperation and effective communication between the various departments and units providing this service, as well as clarity regarding the specific roles of all stakeholders involved in the total academic support and development function of the institution (Pavlich & Orkin, 1992).

Secondly, the perceived negative stigma assigned to those students who participate in ADPs is arguably as a function of academic support that is primarily directed at historically disadvantaged students, thereby serving to isolate these students from 'advantaged' ones (Ngcobo et al, 1998). This highlights the need for a paradigm shift in transforming academic development from a narrow focus on 'under-prepared' students, to approaches that address the mutual needs and concerns of all students throughout their programme of study (Ministry of Education, 1997; Ngcobo et al, 1998).

5.3.4 Campus Residences

An important finding was that while only slightly more than half of the health science students in this study lived in campus residences, the remaining students did not appear to live in private residences out of personal choice, i.e. inadequate finances and exclusion due to poor academic performance prevented them from gaining entry to campus residences. While students identified a number of perceived benefits accruing from residing on campus (i.e., better studying conditions, access to on-campus facilities and personal independence), these were off-set by several disadvantages such as uncertainty regarding personal safety, high noise levels and disruptive on-campus student politics. Given the ongoing student disruptions and boycotts at UDW during the last few years and the reported incidents of rape and abduction in residences (Gowar, 1997), this was not a suprising finding. This clearly highlights the urgent need for University Management to address the negative conditions prevailing in campus student residences, particularly since these conditions appear to have a negative impact on academic

activities and, consequently, the academic success of historically disadvantaged students (Ngcobo et al, 1998).

5.4 CONCLUSION

It is clear from the preceding discussion that the task of building equity in health science education at UDW cannot be addressed simply by generating intra-institutional strategies that ignore the wider context and milieu in which higher education institutions operate. Immediate and sustainable interventions that address the very real problems residing in the ecology, milieu, social system and culture of schools in KZN are critical in order that the plight of historically disadvantaged communities, and indeed higher education institutions themselves, are not entrenched and perpetuated.

Recruiting, admitting and retaining students from disadvantaged communities is, however, a complex process and there are no 'quick-fix' solutions. In particular, the historically poor academic showing of African students (Caldas & Bankston, 1997) cannot be eliminated by 'social change' that is aimed at assuaging the guilt of minority groups in South Africa (Owens et al, 1994). While a passive compliance with policy changes and implicit 'tokenism' agreeably opens up educational opportunities for sectors of historically disadvantaged students, it also places African people in a predicament where they cannot escape from continually having to prove their worth or avoid being used as a symbol of the good intentions of Whites. Applying the principles of affirmative action in this context culminates in resentment and negative labelling, where minority groups believe that they experience reverse discrimination and that disadvantaged collectives are pushed ahead even when not qualified (Makay, 1990). Successful redress programmes must thus of necessity be founded on a genuine social commitment and a renewed sense of activism and direction by all members of the educational establishment (Perez, 1990) toward promoting the economic empowerment of the Black communities of this country.

Within this context, the final chapter of this study offers a range of recommendations, pertinent to a cross-section of sectors and stakeholders, for enhancing the access and success of historically disadvantaged students to health science education. Particular attention is given to the development of practical strategies to be employed by UDW and its Faculty of Health

Sciences. Finally, the limitations of this study are discussed and recommendations for future research in this field are offered.

CHAPTER SIX
Conclusions and Recommendations

6.1 INTRODUCTION

The objectives of this study were to generate practical recommendations for enhancing the access and success of historically disadvantaged students to health science education at UDW, based on identified barriers pertaining to diverse schooling contexts and local conditions at UDW.

With regard to the school context, it is evident that a wide array of factors pertaining to the ecology, milieu, social system and culture of rural, urban and informal settlement schools impact negatively on the educational outcomes for historically disadvantaged scholars. These factors include, *inter alia*:

- significant levels of staff burnout and demotivation accruing from high workload levels, staff shortages, large pupil-teacher ratios and a paucity of instructional materials, particularly libraries, textbooks, stationery and laboratories
- a paucity of community economic resources and external educational support
- large family households resulting in a dilution of material and educational resources in the home environment
- a tendency for parents to exhibit low educational and occupational status as well as relatively high levels of unemployment
- a paucity of educational skill available to parents for providing educational opportunities and academic guidance to their children in the home environment
- relatively high levels of scholar attrition due to poor family socio-economic circumstances
- a tendency for scholars to hold low estimations of their basic academic skills and general learning strategies
- school career counselling that is largely ineffective in meeting the educational needs of scholars, particularly junior scholars
- a paucity of formal career counselling skills among school career counsellors, particularly with regard to a lack of knowledge of careers in the health science field.

In addition, the picture that emerges of schools in rural and informal settlement communities (i.e. Sobonakhona and Inhlanhlayethu High schools) is one of limited school resources, less available money to spend per pupil, poorly maintained school buildings, widespread poverty which forces scholars to abandon their studies in order to supplement the family income and a strong organic link between the school and the community, with local community leaders exerting a strong influence over school management practices. In particular, the rural school in this study appears to be home to a large number of scholars who emanate from single-parent families and exhibit high levels of risk-taking behaviour, evidenced by weapon possession, physical fighting and hostile relationships between scholars and teachers. In addition, teachers from this school tend to hold low expectations for pupils' academic performance, experience difficulty in implementing school disciplinary measures and frequently live in fear for their personal safety. A strong mutual alienation between the school and home environments is evident, with parents being inclined to have little time, capacity or resources to provide academic guidance for their children.

Notwithstanding the prevailing adverse conditions across the school contexts, two schools, in particular, have demonstrated high levels of resiliency by succeeding to achieve positive educational outcomes among their scholars (i.e. Vukuzakhe and Zwelibanzi High schools). While higher social class location agreeably plays a significant role in the material and educational resources available to scholars from Vukuzakhe High, Zwelibanzi High school, operating in a similar environment to that of the other three schools, demonstrates how educational leadership, commitment and innovation can serve as powerful catalysts for effecting positive educational outcomes among historically disadvantaged scholars.

With regard to local conditions in the university context, a number of salient factors appear to exert an important influence on the access and success of historically disadvantaged students to health science education, including, *inter alia*:

- university selection procedures that are not sufficiently sensitive to the educational backgrounds of historically disadvantaged students
- substantive student adjustment difficulties accruing from financial constraints and educationally disadvantaged backgrounds
- a paucity of historically disadvantaged staff members who may serve as positive role models and mentors
- limited academic and social assistance from student support services

- ADPs that are largely inadequate in meeting the academic and social needs of historically disadvantaged students
- negative conditions prevailing in campus student residences that impact on the academic success of historically disadvantaged students.

In this study, the diverse nature of the barriers to the access and success of historically disadvantaged students to health science education presented a daunting challenge in offering recommendations for redressing this complex problem. In critically reflecting on the issues arising from this study and in considering their implications for social redress strategies, three important factors had to be taken into consideration. Firstly, it was crucial to remain mindful of the fact that a vast difference exists between ensuring non-discrimination in the recruitment, selection and retention of historically disadvantaged students and in implementing comprehensive social redress strategies aimed at promoting the empowerment and upward mobility of disadvantaged sectors of society. In this regard, it was important not to become entrapped in liberalist conceptions of equity that are embedded in notions of 'fairness' and 'justice', conceiving talent and ability as individual attributes separate from the wider social context (Morley, 1997). Liberal equity rhetoric, when applied to policy, focuses on procedures and rules ostensibly aimed at guaranteeing 'fair-play', without seeking to intervene directly in the structural, institutional, psycho-social and socio-economic barriers to equity (Twale et al, 1991; Rassool, 1995). The danger of following a liberalist ideology, therefore, is that considerable emphasis would be placed on overcoming barriers to equity palliatively rather than on eliminating them.

Secondly, while providing recommendations for enhancing equity in health science education at UDW was a primary objective of this study, it was evident that the issues arising from this study had broader implications for the access and success of historically disadvantaged students to higher education in general. It was equally clear that recommendations for enhancing the access and success of historically disadvantaged students to health science education could not be made in abstraction from these broader equity issues facing higher education in general. Thus, recommendations are consequently offered not only with regard to those that have direct implications for equity in health science education, but also those that have general heuristic value for enhancing the participation and success rates of historically disadvantaged students in higher education in general.

Thirdly, it was evident that in order to develop equity plans and strategies that are sustainable, recommendations generated from this study needed to be intersectoral in nature. Thus, extensive social partnerships across a wide array of institutions and sectors in society are required in order to promote a rational use of available resources, reduce overlap and duplication in programme provision, increase institutional capacity and enhance responsiveness to regional and national educational needs. In this regard, the issues arising from this study were seen to have particularly important implications for the Education Ministry, the schooling sector and tertiary education institutions, all of whom need to assume active roles in developing and implementing strategies aimed at enhancing educational equity for historically disadvantaged students in the KZN region. The following section accordingly offers salient recommendations pertinent to each of these sectors, based on the barriers identified in this study.

6.2 IMPLICATIONS AND RECOMMENDATIONS: SOCIAL REDRESS STRATEGIES

6.2.1 Education Ministry

6.2.1.1 Resource allocation

Notwithstanding current national resource constraints in meeting the massive infrastructural backlog and demand for health care, housing, job creation, sanitation, electricity and access to clean water, education remains the key to national development and the tool for responding to the swift changes of a fickle global economy. It is thus imperative that education be viewed as a long-term investment in South African society and becomes central to a broader government policy that invests in people as the productive and creative core of the economy.

In this context, there is an urgent need for the Education Ministry to devise effective and creative strategies for resolving the challenges faced in improving the quality of schooling for South African youth. Key areas to be targeted, arising from the findings of this study, appear to reside in the upgrading and maintenance of school buildings; the provision of adequate water, electricity and sanitation facilities; the provision of adequate instructional materials and facilities, such as laboratories and laboratory equipment, libraries, textbooks and stationery; the provision and upgrading of recreational facilities; and the allocation of adequate human resources. Given current national resource constraints and the government's commitment to fiscal discipline (Ministry of Education, 1997), resources should be allocated and managed strategically for

maximum benefit, focussing on the most under-resourced schools, such as those in rural and informal settlement communities, as a matter of priority (e.g. Sobonakhona and Inhlanhlayethu High schools). In addition, a continuous programme of national evaluation is required in order to monitor and improve the efficacy with which these resources are deployed.

6.2.1.2 Human resource development

This study has revealed a range of problems with regard to the human resource component of the public schooling system. These include, *inter alia*, relatively large pupil-teacher ratios, a paucity of specialist career counselling posts and skills, low teacher morale, high levels of burnout and, in certain instances, fear for personal safety. These findings generally reflect the current context of schooling in KZN which is characterised by a breakdown of discipline and high levels of risk-taking behaviour, gangsterism and violence, often directed at teachers (Daily News, 1999), widespread turmoil generated by the redeployment and retrenchment of teachers (Daily News, 1999a), an abundance of 'ghost' teachers on the provincial pay roll (Daily News, 1999b), teacher shortages in areas such as mathematics and science (NCHE, 1996) and increasingly high failure rates among matriculant scholars (Sunday Times,1999), collectively resulting in the axing of the MEC for Education in KZN, Dr Vincent Zulu, in February 1999 (Daily News, 1999c).

In the interest of improving teacher capacity, morale and job satisfaction, an urgent priority for the Ministry of Education would be to develop and implement strategic plans for the skills development of the current cohort of teachers, thereby developing a workforce equipped to assist scholars to gain access to higher education and to meet the needs of a changing labour market. Addressing the paucity of appropriately qualified science and mathematics teachers by weighting teacher uptakes towards mathematics and science education is particularly crucial given the need to increase the science and technology skills base of society. In this regard, it is critical that the Ministry provide incentives to institutions of higher learning in order to enlist their full participation in this enterprise. Further, a rapid closure on the issue of the redeployment of teachers is required, with urgent and serious consideration for the context-specific human resource requirements of schools, i.e. urgent mobilisation of person power to non-urban schools with high pupil-teacher ratios (e.g. Sobonakhona and Inhlanhlayethu High schools). Although not arising directly from the findings of this study, it should also be noted that concerted effort on behalf of the Ministry to expunge 'ghost' teachers from the provincial

pay roll would also free more resources for increasing teacher salaries and/or employing more teachers.

6.2.1.3 School career counselling

This study has highlighted how a paucity of human resources, a lack of formal career counselling skills among teachers and curriculum time constraints have served to ensure that school career counselling has been largely ineffective in equipping scholars across school contexts with the knowledge to make informed subject and career selection decisions. In particular, the absence of any comprehensive career counselling in the health sciences holds dire consequences for future post-secondary enrolment trends in this field of study. The implications of this situation for the Ministry of Education is two-fold. Firstly, there is an urgent need for career counselling to be incorporated into the essential school curriculum in order to ensure that scholars at all levels of study are better informed of the range of available career options and of the importance of their subject selection decisions in determining their future life opportunities. Secondly, there is an urgent need to invest in the creation of formal career counsellor posts occupied by appropriately skilled individuals who are capable of fulfilling their role expectations adequately. Ideally, school career counsellors should be supported by individuals with specialist skills, such as social workers (e.g. the provision of family and financial counselling) and educational psychologists (e.g. the provision of aptitude testing). Given the current resource constraints, a short-term intervention may be the placement of social work and educational psychology students at schools in order to provide a relatively cost-effective service. This would, however, require considerable intersectoral collaboration in order to avoid duplication of work and to ensure that schools benefit maximally from this initiative.

6.2.1.4 School governance structures

Following the national goal of democratisation, participatory systems of decision-making provide a mechanism whereby all sub-groups within a school are afforded the opportunity to share power and responsibilities (Ministry of Education, 1997). As evidenced in this study, however, the nature of cooperative school governance and levels of accountability appear to differ across school contexts with a strong, often contradictory influence of community structures in the management practices of schools in non-urban areas (e.g. Sobonakhona and Inhlanhlayethu High schools). Thus, while cooperative school governance structures, such as PTSAs, offer a mechanism for sharing decision-making power and for promoting the constructive participation of stakeholders, particularly parents and students, this is not always

the case in practice. Thus, context-specific negative effects accruing from the participation of community leaders or organisations with vested ideological interests need to be considered and mediated.

In this regard, a uniform national policy regarding school governance structures is required, clearly delineating the nature and function of the PTSA as a crucial decision-making body in the school. Clear guidelines regarding roles, responsibilities and accountability of stakeholders, as well as regulatory frameworks for sharing and balancing power and utilising resources at their disposal is particularly demanded. This implies that decision-making processes will be open and transparent, with all stakeholders having access to relevant information and being able to assess arguments and actions rationally. This form of cooperative governance arguably also offers a potent vehicle for proactive and constructive parental involvement, whereby parents may be empowered to assume an active role in their children's educational future.

6.2.1.5 Student financial aid

A central issue arising from this study is the lack of adequate financial resources which serves as a formidable barrier for historically disadvantaged scholars both in gaining initial access to higher education and, once admitted, in meeting the tuition and living costs of tertiary study. The provision of adequate funding for financially disadvantaged students is thus clearly a key concern in enhancing the access and retention of these students in the tertiary education system. This brings into sharp relief the need for new policies and systems of institutional finance in which student financial aid schemes are a critical subsidisable component. By allocating earmarked public funds (i.e. funds which are allocated to higher education institutions for a specific purpose) for sustainable student financial aid programmes or by developing and implementing national student financial aid policies, the Education Ministry can make great strides in actively promoting equity in higher education.

In this regard, the government's strategy of allocating earmarked funds for institutional redress based on equity profiles of institutional enrolments and associated throughput rates (Ministry of Education, 1997) will serve to encourage higher education institutions to admit poor students and to ensure that they succeed. Furthermore, the National Student Financial Aid Scheme (NSFAS), to which central government has committed itself (NCHE, 1996; Ministry of Education, 1997), is of critical importance in attaining equity in a transformed higher education system. Of importance, however, is that the NSFAS should be closely linked to policy objectives

and national human resource needs. By way of example, as reflected in the report of the NCHE (1996), student financial support in high priority fields of study, such as science and technology, should be favoured not only to encourage tertiary institutions to increase their number of students in these fields, but also to address the current paucity of highly-skilled African graduates in these areas. In addition, effective mechanisms for recovering these subsidised loans to financially disadvantaged students need to be established in the interest of developing sustainable student financial aid programmes.

6.2.1.6 Distance education and bridging/preparatory programmes

This study clearly demonstrates an array of deficiencies in the ecology, milieu, social system and culture of schools in diverse contexts (i.e. rural, urban and informal settlement communities), resulting in negative educational outcomes that preclude access to higher education for a large majority of scholars. Taken collectively, the results of this study demonstrate fundamental flaws in the public schooling system for historically disadvantaged communities in KZN. Thus, while national strategies to enhance the access and success of historically disadvantaged students who have met the basic criteria for entry to higher education institutions are necessary and laudable, urgent attention is required to redress the plight of the large body of scholars who, due to high attrition and failure rates, are underprepared for tertiary studies.

In this regard, there are two fundamental areas of concern arising from the White Paper on Higher Education. Firstly, the White Paper does not provide direct incentives to encourage higher education institutions to adopt bridging/preparatory programmes for underprepared students or to generate and sustain creative strategies that provide alternate access routes to the tertiary education system. By this omission, the White Paper vindicates the historical approach to funding of higher education in South Africa, i.e. that only mainstream instructional activities (e.g. formal teaching, research and library services) are in the public interest and that activities such as preparatory/bridging programmes, community instruction and student health services generate 'private' benefit and are thus outside the domain of state responsibility (NCHE, 1996). In the face of an obvious public failure of the schooling system, this approach implies an abrogation of public responsibility for the victims of disadvantage and the entrenchment of an elitist education system that caters primarily for those scholars who can survive the public school system.

Secondly, while the White Paper recognises that distance education, within the context of the National Qualifications Framework (NQF), has a crucial role to play in broadening access to higher education for underprepared and adult learners, it does not provide direct incentives that encourage contact and distance education institutions to collaborate in designing and implementing innovative distance education programmes in an efficient, effective and appropriate manner. This unfortunate omission does little to satisfy the immediate educational needs of the current cohort of underprepared learners and thereby precludes their fullest participation in the South African economy.

Student Admissions:

While the White Paper on Higher Education has committed the state to establishing a 'National Higher Education Information and Admission Service' to facilitate the administration of student applications, satisfy the information needs of applicants and reduce the cost of application by prospective students (Ministry of Education, 1997), the formidable challenge of designing and implementing this kind of national service renders this a long-term strategy. In the short to middle term, the Ministry has not provided direct incentives for higher education institutions to implement such programmes regionally, e.g. the proposed Central Applications Office (CAO) of esATI. In the absence of direct institutional incentives or initial start-up capital for such initiatives, which in the long term are envisaged to be self-sustaining, tertiary institutions may be discouraged from acting in the best interests of their students due to financial and political barriers.

6.2.2 Schooling Sector

6.2.2.1 School-family relationships

The benefits accruing from active parental involvement in the educational activities of the school are reflected in the enhanced school-family relationships that exist in the high-achieving schools in this study (i.e. Vukuzakhe and Zwelibanzi High schools). Educators from these schools appear to have adopted a multi-dimensional approach to parental involvement and view the role of parents in the school as being instrumental as opposed to reactive. This suggests that schools need to shift from viewing parents' roles as being primarily restricted to providing insights into scholars' behavioural or academic problems to viewing the educational development of scholars as a shared enterprise between parents and educators. In this way, parents, particularly working class parents, may be empowered to develop their strengths, interest and levels of self-efficacy for the benefit of their children and the school. Creative and

constructive strategies, such as those utilised by the high achieving schools in this study, thus need to be developed for enhancing school-family relationships, for ensuring a successful sharing of accountability, responsibility and power and for promoting positive educational outcomes.

In this regard, two major mechanisms appear to be useful for promoting active parental participation in school- and home-based educational activities. Firstly, the PTSA should be promoted by all stakeholders as a valid and necessary structure within the school, thereby serving as a powerful vehicle for enhancing relationships between parents, scholars and teachers and for promoting a collective ownership and sense of responsibility for the school. Furthermore, the PTSA should be viewed as being more than a forum for raising disputes or discussing mundane school management issues; it should also serve as an engine room for coordinated and systematic school planning and evaluation and for generating practical action plans to advance educational goals. Secondly, creative and constructive strategies need to be devised and implemented for empowering parents to provide greater support and educational guidance to their children, particularly in the home environment. Key activity areas, as reflected in this study, include, *inter alia*, 'parents' evenings', school open days and enlisting parental participation in school events such as school career fairs.

6.2.2.2 Fundraising strategies

The paucity of economic resources available to the schools in less affluent areas in this study clearly indicates the need for schools and their broader communities to devise creative fundraising mechanisms that will generate additional material resources for the school. While raising school fees or generating additional funds at a community level were not feasible income-generating options in the context of this study, securing donations of laboratory equipment, stationery and textbooks from non-governmental organisations, other better-resourced schools or private foundations seem to be strategies that may be readily adopted by schools. Furthermore, involving parents, community structures or organisations, alumni, teachers and scholars themselves in collaborative fundraising initiatives will arguably lead to a widespread and effective community network for securing resources for school maintenance, environmental improvement and additional learning resources.

6.2.2.3 Career counselling

The paucity of trained school career counsellors, the ad-hoc nature of school career counselling and curriculum time constraints have collectively served to ensure that school career counselling is largely ineffective in meeting the career information needs of historically disadvantaged scholars in this study, particularly junior scholars. While it is clear that the Education Ministry has primary responsibility for redressing this situation, this is arguably a long-term strategy that will not satisfy the immediate career counselling needs of schools. Arising from the findings of this study, key initiatives that may be undertaken in the short-term include, *inter alia*, involving alumni in peer career counselling; enlisting the assistance and cooperation of organisations such as the HSRC in conducting aptitude testing among scholars; utilising the expertise of local community health workers in providing career counselling in the health field; seizing the initiative to invite tertiary institutions to the school to provide career talks, particularly in 'unfamiliar' fields such as health sciences; and hosting career fairs at schools which could be funded by participant exhibitors. Furthermore, in the interest of assisting scholars to make informed subject and career selection decisions, there is a clear need for educators to recognise the importance of affording junior scholars career counselling opportunities as opposed to primarily focusing their efforts on scholars in senior levels of study. In this regard, while attendance at community career fairs understandably poses a number of logistical problems for schools, many of the aforementioned strategies are cost-effective initiatives that may be readily made available to scholars at all levels of study.

6.2.2.4 Educator leadership and commitment

Despite the adverse conditions that pertain across the schools in this study, there was clear evidence of commitment, initiative and innovative leadership, in one form or another, among the educators in these schools, e.g. channeling scholars into appropriate subject streams based on teacher assessments, undertaking to consult with parents regarding scholars' educational activities, hosting 'parents' evenings', enlisting the assistance of external parties for career counselling or formal instruction, utilising systems of 'team teaching' and sharing school resources such as stationery and textbooks. It is instructive to note however that evidence of educator leadership and commitment was displayed at much higher frequencies in the two high-achieving schools in this study than in the other three schools. This clearly suggests that the collective commitment and energy of educators can do much to advance the academic achievement of scholars. One means of raising teacher energy and enthusiasm, and thereby their commitment to the school and scholarly activities, resides in the provision of ongoing

opportunities for their own development and empowerment. In the context of tighter public spending policies and limited school budgets, it is imperative that schools collaborate with tertiary education institutions in order to harness their collective intellectual and material resources for promoting the ongoing personal development of teachers.

6.2.2.5 Rewards and punishments

While only one school in this study appeared to be operating within an unstable and often hostile school environment (i.e. Sobonakhona High school), it is important to note that a lack of order and high incidences of risk-taking behaviour appear to be commonplace among public schools in KZN (Daily News, 1999). While a clearly defined and enforced disciplinary system is agreeably essential for bringing order to schools, the resolution of crime and violence does not reside in punitive measures alone. Comprehensive school policies aimed at promoting the safety and well-being of both scholars and teachers are demanded, e.g. mandatory weapon searches, active liaison with police, the presence of a school fence, clearly defined codes of conduct and violence prevention programmes that are institutionalised into the school curriculum and emphasise non-violent methods of problem-solving. Furthermore, educators need to recognise the power of positive reinforcement in effecting behaviour change, providing praise and reward to pupils for positive behavioural or academic efforts. By way of example, pupils may be rewarded for effort displayed throughout the year even though this effort may not have culminated in good grades, i.e. effort and not merely academic achievement should be rewarded and praised.

6.2.3 Tertiary Education Institutions

The recruitment, selection and retention of historically disadvantaged students in health science education are inseparable, symbiotic activities, each being of equal importance in the quest for true educational equity. This section accordingly offers conclusions and recommendations, based on the findings of this study, according to this three-dimensional equity paradigm.

6.2.3.1 Recruitment

A stark finding arising from this study is the paucity of health science career information within diverse school settings. Equally evident is the limited practical value of health career information provided to historically disadvantaged scholars at community-based career fairs. Collectively, these findings highlight the need for the Faculty of Health Sciences to devise and implement creative strategies for actively recruiting historically disadvantaged students and for marketing

UDW's health science degree programmes. In addition, the dwindling number of undergraduate enrolments across South African universities (CEPD, 1997) is a compelling incentive for the Faculty to actively engage in activities that will serve to attract disadvantaged sectors of society to health science education. Based on the findings of this study, active recruitment strategies that may be utilised by the faculty include, *inter alia:*

- Hosting on-campus open days for historically disadvantaged scholars and their parents in order to familiarise them with the faculty and the institution, to demystify health science careers and to explain the application procedure. In this regard, while the Faculty has engaged in ad-hoc school tours and visits, these have not been coordinated across member departments and have largely focused on isolated departmental information. What is needed is a multifaceted campaign to enhance scholars' awareness and understanding of a broad range of health science degree programmes.

- Developing undergraduate recruitment brochures and pamphlets tailored to meet the specific needs and concerns of historically disadvantaged students, particularly regarding information on course content, entry prerequisites and financial aid. In this regard, it is important to note that the Social Redress Committee of the Faculty of Health Sciences recently compiled a comprehensive career information booklet (Stewart, 1998b), derived from a preliminary analysis of the findings of this study, which is currently being distributed to all former DET schools in KZN. This booklet contains consumer-friendly information on available degree programmes, entry and skill prerequisites, course content, available job opportunities, pertinent training institutions and contact personnel. In addition, information on available bursary programmes and alternate access routes to tertiary education (e.g. the Regional Access Programme) is provided.

- Utilising currently enrolled historically disadvantaged health science students, the Health Science Students' Society and alumni as active members of the faculty's recruitment team. It is likely that these individuals would serve as positive role models for scholars and present career information in a manner that is easy to comprehend. While the faculty has made positive steps in this regard by involving senior health science students in the 1998 Faculty Career Day for former DET schools in the DFR, this study suggests that the faculty should aim to facilitate student involvement in career counselling initiatives outside the university context, e.g. career fairs held at schools and community clinics or halls. This would arguably

serve to ensure that faculty participation in career fairs renders a concerted attempt to serve the real needs of scholars.

- Given that a substantial percentage of scholars and health science students obtained their health career information from the local media, this resource should also be utilised for ensuring widespread dissemination of information on health science education and for enhancing UDW's visibility in target communities, particularly rural and informal settlement communities. Media resources such as newspapers, magazines and radio may serve as particularly useful vehicles in this regard.

- The faculty's ability to attract potential applicants may also be enhanced by utilising non-traditional means of recruitment. Establishing cooperative relationships with health professionals in local communities, organised across a wide array of health services, could prove to be a particularly beneficial strategy in this regard. These individuals could serve both as disseminators of relevant health science career information as well as role models for students pursuing careers in this field.

- Given that the majority of scholars and health science students in this study emanated from working class homes, where parents are arguably limited in their ability to act as educational role models or to provide academic guidance, the faculty may have a useful role to play in providing parental support and educational programmes. By way of example, annual parent workshops may serve as beneficial recruitment mechanisms by broadening parents' awareness of health science careers beyond those that are popular, exploring how parents can assume more active roles in planning and monitoring their children's academic careers, providing career information packages on available degree programmes and providing information on the types of available financial aid programmes.

The paucity of formal career counselling skills and lack of knowledge regarding health science careers among career counsellors across all school contexts in this study, clearly highlights the need for the faculty to establish closer working relationships with school career counsellors in the interest of uplifting their knowledge and skills base. The effectiveness of this strategy, however, is dependent upon close collaboration between the Faculty of Health Sciences, the Faculty of Education and UDW's Career Counselling and Development Unit in equipping counsellors with information specific to health science education as well as the general

counselling skills with which to transmit this information successfully to scholars. In this regard, preliminary analysis of data from this study led to the hosting of a workshop for teachers involved in career counselling in former DET schools in the DFR. Hosted by the Faculty of Health Sciences' Social Redress Committee, in close collaboration with the Faculty of Education (UDW), RAP and UDW's Career Counselling and Development Unit and Financial Aid Bureau (FAB), this workshop was attended by teachers from 52 former DET schools. The workshop was important in laying the groundwork for ongoing partnerships with these schools and served as a forum for generating discussion items for future workshops, including establishing formal school career counselling programmes, developing parent education programmes, developing community-based recruitment networks and devising fundraising strategies (Social Redress Committee, 1998). The second of these series of workshops is to be hosted by the Social Redress Committee in April 1999.

The generally poor academic performance of scholars in this study and their reduced levels of self-efficacy in subjects such as physical science and mathematics (subjects crucial for entry into health science degree programmes) demand that UDW, together with other relevant constituencies, create opportunities for scholars from disadvantaged communities to improve their chances of university entrance and success. In this endeavour, UDW has developed an ambitious project, the 'Upward-Bound University Wide Academic Enrichment and Social Life Skills Development Programme' (Strategic Planning Office, 1998), where historically disadvantaged standard eight to standard ten scholars, who demonstrate academic potential, will be identified and systematically prepared for university education. This project, primarily targeting scholars interested in SET disciplines, is designed to offer academic enrichment and development, social and life skills development and career advisement and counselling through university summer and winter programmes and tutor-led programmes at schools. In addition, once these scholars have gained access to university, the project will provide basic skills development for those who still fall significantly below expected levels of performance, through modules designed to enhance proficiency in language usage and computational and critical thinking competencies.

While this project is undoubtedly a commendable enterprise, it raises two issues of concern. Firstly, the project does not outline how it intends to cooperate with programmes currently established to assess students' potential or readiness to engage in tertiary studies and to provide students' with challenging learning opportunities that prepare them for the demands of

university study. In the context of scarce national resources and the emphasis of the White Paper on Higher Education on regional cooperation, it would arguably be more effective to pool the collective expertise, experience and resources of esATI member institutions in the implementation of academic and social enrichment programmes for underprepared learners.

Secondly, the project does not adequately address how its short- to middle-term objectives of developing the basic knowledge and social life skills of historically disadvantaged secondary school students will be sustained over the long term. That is, limited financial and institutional resources dictate that the long term strategies of projects such as Upward Bound should be to attain a redundancy of university involvement within the secondary schooling setting through providing intensive in-service development of secondary school teachers, thereby equipping them with the skills and competencies to prepare their scholars for university study. This demands that enrichment programmes for secondary school students should be complemented by comprehensive and systematic enrichment programmes for teachers within these schools.

The high failure and attrition rates of scholars reflected in this study clearly indicate the need for institutions of higher learning to establish and support programmes that provide alternate access routes to the tertiary education system. In the absence of state funding for bridging/preparatory programmes (Strategic Planning Office, 1998), there is an urgent need for UDW and, more specifically, the Faculty of Health Sciences, to collaborate with the RAP and Materials Development Unit initiatives of the esATI. In the short term, RAPs' 'Introduction to Social Studies' access course, particularly the nursing module, could be flexibly applied to assess students' potential or readiness to embark on studies within the health science field. In the middle term, the Faculty needs to liaise with the Materials Development Unit in order to negotiate faculty input in the development and formulation of a health science bridging module. It is important to note that the Social Redress Committee of the Faculty of Health Sciences has networked extensively with RAP over the past two years, through a series of consultations and faculty workshops, culminating in a formal proposal to the Executive Committee of the Faculty for the formalisation of a partnership between RAP and the member departments of the Faculty of Health Sciences. In this regard, a systematic action plan has been proposed for conceptualising, planning, implementing and evaluating a series of mutually beneficial activities (Stewart & Jackson, 1998). This, however, merely represents the start of a system of collaboration that needs to be nurtured and supported in order to deliver a real increase in the number of historically disadvantaged students who gain entry into the Faculty.

6.2.3.2 Selection

In this study, health science students' perceived lack of equity in access to health professional training at UDW appeared to stem from the faculty's strong dependence on traditional student selection measures as their initial screening criteria, i.e. academic merit and science-related subject prerequisites, particularly physical science and mathematics. While these criteria serve as convenient filtering or screening devices, they arguably deny access to a large cohort of historically disadvantaged students whose matriculation results are rarely a reflection of their academic potential (Joubert, 1997) and who display low levels of mathematics and science competency (Sunday Independent, 1996). It should also be noted that while a matriculation exemption is the current statutory minimum requirement for entry into higher degree programmes, future entry into higher education programmes will be a pass on the proposed Further Education Certificate (FEC) or its NQF equivalents (Ministry of Education, 1997). Traditional overdependence on the matriculation exemption thus needs to give way to selection criteria that are more sensitive to the educational backgrounds of potential students and that incorporate the recognition of prior learning (RPL) as an essential component.

In this regard, it is important to note that a comprehensive audit of health science departmental entry and selection criteria, undertaken by the faculty's Social Redress Committee in 1997 (Stewart, 1997a), resulted in the development of a uniform faculty selection framework aimed at enhancing the access of historically disadvantaged students to health science education at UDW. This framework, incorporating affirmative action criteria such as educational background, race, gender, disability, geographic location, socio-economic status and exposure to prior learning, was utilised by member departments for the 1998 student admissions. Subsequent evaluation revealed that while there was a substantial increase from 1997 with regard to the number of African applicants accepted into health science degree programmes (37.0%), entry-level African student enrolment for 1998 remained relatively low (33.5%) with several departments being unable to satisfy their 60.0% affirmative action target (Stewart, 1998a). The limited success of the revised selection process, as reported by academic departments, was due to their difficulty in objectively assessing prior learning, in gaining departmental consensus on the definition of a 'disadvantaged' student, in their reluctance to look beyond mathematics and science as subject prerequisites for entry and to dissension among staff in recognising students who had been taught and tested by RAP as being eligible for selection. This clearly highlights the need for greater transparency and accountability among academic departments with regard to the nature and role of affirmative action criteria utilised in their student selection, the rationale for not

considering subjects other than mathematics and physical science to be valid indicators of problem-solving and analytical thinking, reasons for not meeting their affirmative action quotas and strategic plans for remedying this situation.

While aptitude testing is only utilised by a small minority of academic departments within the Faculty of Health Sciences, the questionable predictive utility of these tests in assessing the academic potential of historically disadvantaged students is clearly of concern. This suggests that departments utilising standardised tests in the selection of their historically disadvantaged students need to carefully evaluate the potential benefits and disadvantages of using these tests and to interpret them with caution. One solution would be to complement the use of standardised tests with other student selection measures, e.g. entry-level interviews.

An important finding was that the majority of health science students in this study held a negative view of subjective measures utilised in their selection, i.e. the interview. Their perceptions of intimidation and lack of confidence in the racial impartiality of interviewers clearly highlights the need for a reexamination of the composition of departmental student selection panels within the Faculty of Health Sciences. Interviewers should be sensitive to culturally-mediated differences in the behaviour of applicants and should also be self-conscious with regard to their own cultural bias and expectations. Interviewers should seek to create an atmosphere that makes applicants feel at ease and comfortable to express themselves. One means for achieving this would be to ensure African representation on the panel, preferably from both genders. Given the current paucity of African academic staff within the faculty, the inclusion of senior African students on the panel should be considered, as it is likely that applicants would identify strongly with these individuals, thereby reducing their anxiety and fear of asking questions during the interview and mediating feelings of intimidation and perceptions of racism. In addition, each question that is to be asked during the interview should be carefully reviewed by the entire committee in order to ensure that selected questions allow the applicant sufficient opportunity to demonstrate ability in non-cognitive performance areas such as self-appraisal, ability to overcome hardship, leadership experiences, participation in culturally relevant extra-curricular activities and community service.

One means of enhancing the accessibility of tertiary education to historically disadvantaged students would be to reduce the cost of their application for admission. One mechanism for achieving this is the CAO project of the esATI, which is moving into the operational phase and

is expected to process 50 000 applications for admission to the tertiary institutions of KZN. While student applications agreeably generate funds for tertiary institutions, it should also be noted that, on average, R566 285 per annum is spent per tertiary institution on the application process (Deloitte Touche Tohmatsu International, 1996). The proposed initial once-off financial investment in the CAO of R500 000 per esATI member institution thus presents potentially substantial long-term savings to the institution, while substantially reducing application costs for students.

6.2.3.3 Retention

Extrapolating from the findings of this study, academic and social adjustment difficulties accruing from the transition from secondary to tertiary education appear to be significant barriers to the retention of historically disadvantaged students in health science education. These adjustment difficulties suggest that the general orientation programme provided for entry-level students during their first week on campus does not adequately facilitate their integration into university life. Greater awareness of on-campus student support services that may ease the adjustment to university life thus appears to be indicated, particularly financial aid, academic support and personal and environmental support services. Developing a comprehensive and effective multi-faceted campaign aimed at heightening students' awareness of these services would undoubtedly demand participation and collaboration amongst a broad range of stakeholder, including academic departments, the SRC, the FAB and the CAD at UDW. Furthermore, in order to ensure that student support services are adequately addressing the academic, social and environmental needs of historically disadvantaged students, students should be afforded the opportunity to participate in shaping the nature, content and management of these services.

Students' references to their difficulty in integrating theory with practice and in adapting to university teaching methods clearly highlight the urgency for designing and implementing staff development courses aimed at equipping academics with innovative teaching and evaluation skills that will meet the specific educational needs of historically disadvantaged students. Historically, universities in developing countries have tended to adopt and institutionalise the teaching methods of the industrialised west, without appropriate adaptation to the educational needs of their own students (Kapp, 1995). The current transformation of the higher education system has, however, led to increased pressure on tertiary institutions for the use of more active learning approaches within contextualised reality-based curricula (Kapp, 1994). Effective

teaching is increasingly being recognised as a primary activity in its own right, with the role of the university teacher moving towards that of facilitator of learning rather than disseminator of knowledge. With teaching now being accepted as a professional component of true scholarship, the professional preparation and development of academics for their teaching role is crucial, with emphasis being placed on teaching for active (instead of passive) learning, formative (instead of summative) approaches to assessment, the use of continuous evaluation (instead of examinations only) and cooperative experiential learning strategies as opposed to didactic top-down teaching strategies (McKeachie, 1994).

The finding that a substantial number of the students in this study were unable to endorse the view that their lecturers were willing to assist them with personal or academic problems may be as a result of the paucity of historically disadvantaged staff members within the Faculty of Health Sciences. That is, students may not see themselves and their concerns adequately represented in the demographic staff profile of the faculty and consequently experience difficulty in identifying with or approaching academic staff members who are of a different ethnic group to themselves. The underrepresentation of African academic staff members within the Faculty of Health Sciences is clearly of great concern, not only in terms of national staff equity targets but also with regard to the relative absence of staff who may serve as positive role models for historically disadvantaged students, offer personal or academic counselling services and identify with the problems that they experience. This highlights the urgent need for embarking on aggressive and systematic staff recruitment campaigns aimed at transforming the faculty's demographic staff profile.

In this regard, the newly inaugurated Vice Chancellor of UDW, Professor Maphule Ramashala, has, through UDW's three year rolling plan, committed the institution to achieving national equity targets over the next ten years. Given the scarcity of appropriately qualified African academics and the competition encountered from affirmative action programmes in the public and private sectors (Strategic Planning Office, 1998), UDW has invested approximately R3.5 million in the creation of 27 development posts during 1999. As part of an internal capacity building initiative, promising African postgraduate students, particularly in SET fields of study will be targeted and offered associate lectureships while studying. Upon completing their postgraduate studies, these individuals will have the opportunity of taking up tenured lectureship positions.

In addition to the proposed staff equity strategies in the three year rolling plan, general development and training of staff members in multiculturalism is required in order that all staff may gain a greater understanding of the specific needs of various students, challenge all students to excel in the context of their personal needs, goals and values and accord all students respect and meaningful assistance. Further to this, the peer mentorship programmes presently coordinated by the SRC and CAD at UDW are important vehicles for easing historically disadvantaged students' adjustment to university life and for providing counselling in areas such as time management, goal-oriented study habits, life skills and examination preparation.

An overwhelmingly negative effect for students embarking on health science education in this study was the financial pressure which this placed on their families. Guilt feelings and financial worries accruing from the social and material cost of their education for their families arguably impacts pervasively on their university experience and affects their ability to focus adequately on their studies. While this clearly highlights the important role of UDW's FAB in providing comprehensive financial aid and counselling services to historically disadvantaged students and their families, in the present context of limited real growth in public expenditure, there is an urgent need for UDW to mobilise greater private endowments for the educational activities of financially disadvantaged students.

In this regard, UDW can play a catalytic role by increasing its number of formal partnerships with the business sector and by encouraging them to play a more active role in enhancing equity in higher education. In particular, harnessing more private resources for health science education may be realised through scholarships, service bursaries, donations, loans and sponsorships from pharmaceutical companies, companies producing hospital and medical products as well as health professional associations. In this endeavour, however, the business sector should be encouraged to 'adopt' students throughout their programme of studies in order to comprehensively cater for their academic, personal and environmental needs (e.g. tuition, accommodation and books) as opposed to providing once-off financial assistance.

An important finding of this study was that students perceived their participation in ADPs to be additional and marginal in relation to the demands of their mainstream academic courses and this generated additional workload stress. This highlights the current emphasis of the White Paper on Higher Education on transforming academic development from a narrow focus on access and bridging programmes to integrating academic development approaches into

mainstream educational programmes. It should be noted that, in practice, many of the ADPs offered at tertiary institutions still focus on direct teaching, usually in the form of bridging and tutorial programmes and alternative first year courses (SAAAD, 1997). In the interest of meeting national equity and development goals, there is thus an urgent need to focus earmarked state and institutional funding on the restructuring of the mainstream undergraduate curriculum to incorporate academic development. Academic development would thus be integral to the full programme of study, thereby serving the needs and concerns of all students and doing much to limit the stigma assigned to those students who traditionally participate in ADPs. Furthermore, given national resource constraints and the insecure financial base for academic development, tertiary institutions need to develop mechanisms for regularly and systematically monitoring the contribution of these programmes to enhancing student retention. In this regard, the development of comprehensive institutional databases, tailored specifically to programme goals, could provide statistical indicators of success in meeting equity targets. By way of example, gender, class and race profiles across input, throughput and attrition rates of students could result in a systematic and coherent feedback system for informing ADPs in a continuous fashion.

The finding that a large majority of health science students in this study reported difficulty in passing their courses is arguably a reflection of their underpreparedness for tertiary studies. In the interest of enhancing student retention and educational outcomes, institutions of higher learning thus need to invest resources in developing and implementing courses that will provide a sound foundation of knowledge, concepts and skills as a basis for further study. One mechanism for achieving this would be to offer extended degree programmes where students have access to zero-level courses that operate below that of the traditional first year degree. Placement mechanisms would however need to be established in order to identify those students who are in need of zero-level courses and those who are able to proceed directly to the next level of study.

Given that the majority of health science students in this study resided in campus student residences, the negative conditions prevailing in these residences should clearly be of concern for UDW Management. While increasing security measures and institutionalising codes of conduct may do much to address these problems in the short term, a macro-university strategy for the general upliftment of living conditions in student residences is demanded in the longer term. In this regard, Professor Maphule Ramashala has proposed that a 'Living-Learning

Centre', funded by the business sector, be developed for residence students at UDW, integrating subsistence with health care, social activities, library and computer facilities.

6.2.4 Summary

In conclusion, the recommendations offered in this study for enhancing the access and success of historically disadvantaged students to higher education in general and health science education in particular demand broad-based stakeholder support and participation. In particular, the degree to which UDW and, more specifically, the Faculty of Health Sciences are concerned with and assume active roles in the social redress initiatives proposed in this chapter will have important implications for the future success in recruiting, admitting and retaining historically disadvantaged students in health science education at UDW.

In creating an institutional environment supportive of social redress initiatives, it is crucial for social redress programmes to be central to the university's mission and to receive widespread institutional support, perseverance and commitment. In this regard, it is important to note that UDW's Vice Chancellor, Professor Maphule Ramashala, through UDW's recently published three year rolling plan (Strategic Planning Office, 1998), has demonstrated an explicit institutional commitment to meeting national student and staff equity targets. However, while leaders, such as Professor Ramashala, serve as formidable forces for transformation and change in moving the university toward a vision of institutional diversity and excellence, it is important to note that social redress programmes, no matter how well planned, do not drive themselves. Institutional plans for enhancing the access and success of historically disadvantaged students to higher education must, of necessity, be rooted in a culture of change that permeates and is reflected throughout all constituencies of the institution (Muller, 1996). In other words, if the institutional social redress plan is to stand a reasonable chance of success it must be fully supported by the entire university, thereby enabling all stakeholders to attribute measurable progress to their own efforts.

Furthermore, the status and recognition awarded to individuals who are actively involved in institutional social redress initiatives are of importance in ensuring the success of these programmes. In this regard, individuals typically engaged in social redress activities within the Faculty of Health Sciences at UDW have historically been female faculty members occupying junior lecturer or lecturer positions (Bhagwanjee, 1996b). The relative absence of participation of male and/or senior faculty members in the faculty's social redress programme may arguably

be due to the lack of correlation of these programmes with academic reward. That is, the historical nature of measures for staff promotion (i.e. research output) have precluded the use of active participation in social redress activities as a criterion for measuring staff member productivity and, consequently, such activities may be viewed by faculty as being professionally insignificant. Time spent on such activities effectively reduces the time available for other scholarly pursuits that are more directly related to career enhancement, power and prestige. By modifying the university's reward structure and by developing and institutionalising policies that view social redress activities as a valued part of staff workload and a significant indicator of university service, university management can do much to create a cadre of faculty members willing to participate in both faculty and institutional equity programmes.

6.3 LIMITATIONS OF THE STUDY

This study should be interpreted within the context of several factors that constrain the reliability and validity of the findings. Given that absolute validity is unattainable in scientific research (Cronbach, 1946), the following critique is crucial in defining the *degree* of validity of study outcomes.

6.3.1 Sampling Considerations

6.3.1.1 Representativeness of sample(s)

With regard to the school sample, individual schools were selected as case studies of particular socio-economic contexts (viz. rural, urban and informal settlement) or levels of performance (viz. high-achieving schools). While this case study approach has several advantages (as outlined on pp. 31-33), it cannot be assumed that a specific school is absolutely representative of its particular context. Thus, for instance, Ilanga High, while located in an urban area, might very well have pupils from neighbouring non-urban communities. Further, it should not be assumed that the findings of these case studies are generalisable to other similar contexts, as the socio-economic and cultural specificities in one 'urban' area, for instance, might differ considerably from the next.

Finally, caution should be exercised in extrapolating the findings related to UDW to other tertiary institutions. Notwithstanding generic commonalities across higher education institutions,

particularly in terms of HBUs in the province of KZN, specific conditions might very well differ across these institutions.

6.3.1.2 Sampling homogeneity

Given the scope and resources available for this study, several difficult choices had to be made in determining the sampling frame. Thus, in studying the school context, the Education Ministry and school psychological services were deliberately excluded from the sampling frame, as were pupils from standards six, eight and nine. Similarly, with regard to the university context, only historically disadvantaged students within the Faculties of Health Sciences and Dentistry were included, while academic staff, management and stakeholders from other SET faculties at UDW were not. Further, other universities in the province and, importantly, staff of the RAP, were also excluded from the study population.

While the selected sampling frame was considered appropriate given the objectives of this study (viz. school teachers, standard seven and ten scholars and historically disadvantaged students in the Faculties of Health Sciences and Dentistry at UDW), the effect of excluding other possible constituencies is to produce statistical homogeneity (or regression towards the mean) by not considering outliers from a given constituency, and indeed, the potentially differing viewpoints of others.

6.3.1.3 Sample size

While the sample size in the case of scholars (n=400) and health science students (n=73) may be considered appropriate in terms of statistical power (Diamantopoulos & Schlegelmilch, 1997), the sample size of teachers and principals participating in the focus group discussions (n=16) fell short of expectations (n=25) due to work commitments that precluded the intended participation of some subjects.

6.3.2 Instrumentation Effects

6.3.2.1 Validity and reliability

Both the questionnaires as well as the focus group discussion were devised on the basis of a close reading of the literature and consultation with relevant experts. All instruments were pretested for content validity and were amended on the basis of pilot studies that were conducted. Notwithstanding these efforts to ensure content validity, neither construct nor predictive validity of the instruments were obtained, nor were any statistical tests for reliability

carried out. While these decisions are justifiable given the scope and resources available for the study, the resulting lack of statistical indices of reliability and validity of measurement instruments need to be taken into account when interpreting the data.

6.3.2.2 The questionnaires

Questionnaires are generally subject to weaknesses accruing from various sources (viz., social desirability, anonymity, socio-economic and educational differentials, response sets, etc.) [Black & Champion, 1976]. Given the nature of the subject under investigation in this study, subjects may have experienced some questions as being particularly personal, revealing or threatening (e.g. questions related to scholars' self-efficacy in academic skills and questions related to the nature of adjustment difficulties experienced by health science students). Such questions could have been particularly prone to socially appropriate responses in this study.

Secondly, the Likert scale and fixed-response format utilised for most of the questions in both questionnaires generated data of no more than ordinal strength. This precluded the use of parametric statistics, notwithstanding the relatively large sample size of the data sets. The effect was to limit the analysis of data to linear, additive non-parametric interpretation and to accordingly lose out on the multivariate interactions between variables.

6.3.2.3 The focus group discussion

Focus groups generally suffer several well-established shortcomings, including, in particular, socially desirable responses, the effects of groupthink and dominance of the group by more verbal and assertive members (Boyatzis, 1998; Flick, 1998). An added confounding variable in this study was the presence of the school principal in some of the focus groups but not in others, due to the unavailability of some principals at short notice. The effect of the presence of an authority figure was thus uneven across the groups. These shortcomings should be borne in mind when interpreting the findings of the qualitative component of this study.

6.3.3 Researcher Effects

In keeping with the most common form of social science research conducted in the modern age, this study was based on inductive logic, i.e. generalising from samples with varying degrees of representativeness to parent populations (Black & Champion, 1976). Two particular challenges that confronted the researcher in this enterprise need to be highlighted.

In the first instance, a number of samples were drawn from several distinct populations (viz., school contexts, school teachers, scholars and university students), with the resulting findings being interpreted collectively and extrapolated in terms of their relevance to health science education at UDW in particular. Notwithstanding the use of statistical probability tests for the quantitative segment of the data, the overall scientific approach of the researcher was to rely on enumerative inductive logic, a form of 'scientific common sense' well described by Theodorson & Theodorson (1969). The point being made here is that the combined use of qualitative and quantitative interpretation across multiple data sets were not subject to the rigorous randomised controls characteristic of analytic scientific induction.

The second and related challenge concerns the nature of the data that was collected. Notwithstanding the fact that some of the variables studied were discrete in nature (e.g. pass rates, academic and recreational resources, biographical and demographic variables), the majority of variables studied comprised continuous subjective phenomena (e.g. behavioural intentions, self-efficacy, attitudes, perceptions and beliefs). The difficulties and pitfalls confronting social scientists in interpreting subjective data and in extrapolating actual behaviour from attitudes, intentions and other subjective measurements have been extensively studied and documented (e.g. Ajzen & Fishbein, 1980). It should also be borne in mind that decisions related to the coding of quantitative data, the generation of thematic categories for analysis of the qualitative data and indeed the theory-based generation of the taxonomy for understanding the school system, are all subjective decisions, albeit justified, which were made by the researcher. This suggests the need for caution in overgeneralising the findings of this study.

6.3.4 Conclusion

Considerable effort was made by the researcher to bear all of the above limitations in mind when crafting and conducting the study and in interpreting the findings. Overall, a balanced qualitative and quantitative methodology was employed, and data was subjected to rigorous and methodical analysis and interpreted through a process of enumerative inductive logic. In the final analysis, however, the findings of this study require repeated testing, preferably on a larger scale and through alternative paradigms, in order to assure generalisability.

6.4 RECOMMENDATIONS FOR FUTURE RESEARCH

An immediate priority is to feedback the outcomes of this study to the direct participants (viz., the five schools and UDW) in order to test the validity of specific findings. This feedback process would form an ideal follow-up study that lends itself to participatory research approaches. Anticipated outcomes of such a project would be to secure stakeholder ownership of the broad social redress project and to begin the process of developing interventions, based on the findings of this study. This action-research project would facilitate the inclusion of a broader set of stakeholders whose participation would be crucial to the success of planned interventions, e.g. the Education Ministry, RAP, school psychological services, etc.

Secondly, large-scale studies of schools in varying contexts, with larger sample sizes and more stakeholders included, would be important in establishing the generalisability of the findings of this study. Given sufficient resources and broader scope, it would be useful to employ a combination of innovative methodologies for this project, e.g. participant observation, discourse analysis, large-scale surveys.

An interesting possibility is the implementation of deductive research initiatives to investigate the effects of each category in the school taxonomy on educational outcomes. Such theoretically-driven research could focus on a broad set of outcomes (e.g., pass rates, levels of school violence, levels of risk-taking behaviour) that would add value to our understanding of systemic school effects on scholar attrition, learning and socialisation. This data set could prove crucial in informing holistic and sustainable social redress interventions.

The relative success of some schools in producing positive educational outcomes despite adverse conditions (e.g. Zwelibanzi High school) strongly indicates the need for further research in this arena. Such research should be directed at elucidating fully the determinants of these successful educational outcomes and devising mechanisms for their diffusion across the schools in the province.

With regard to UDW, it is clear from this study that university management has demonstrated a commitment to social redress by developing equity policies and targets, and that at least one faculty has begun to develop and implement strategies to improve the access and success of students from historically disadvantaged communities. The scale of this study, however,

precluded the inclusion of all relevant institutional stakeholders, including management, staff, other SET faculties and the SRC. A comprehensive and in-depth institutional audit of social redress policies and practices, that is inclusive of all university constituencies and that considers all elements of the systems-taxonomy used in this study, would be strongly indicated. This research project, if conducted in a participatory fashion, could serve as an important vehicle to galvanise stakeholder support and to develop a practical action plan for improving recruitment, selection and retention practices in the best interests of historically disadvantaged communities. Further, ongoing research must be planned for in order to monitor and evaluate interventions continuously.

In discharging such a project, it is important to draw in educational institutions included in the esATI consortium in order to pool limited resources in developing a comprehensive social redress plan catering for the broad cross-section of people in the KZN region. As with the school context, institutional success stories need to be fully researched and diffused in order that other institutions might benefit maximally.

However, given the historical tendency for competition and elitism among higher education institutions (Bhagwanjee, 1996), research into the factors bedevilling cooperation in this endeavour would be crucial in order to ensure that social redress plans are tangible rather than stillborn. Finally, this inter-institutional research project should investigate fully the efficacy of existing alternate access routes to higher education (e.g. the RAP and other distance learning projects) as a matter of priority.

A major challenge experienced by the researcher in conducting this study was the task of familiarising herself with the significantly different paradigms and discourses of various disciplines that were considered crucial to this project (e.g. education, natural sciences, sociology, psychology). It is thus patently clear that the research recommended here would require the establishment of transdisciplinary research teams to do justice to research goals. It is also crucial that such research be inter-institutional and intersectoral if planned interventions into a broad social problem are to be successfully implemented and managed. In this regard, particular attention should be paid to the need for media and advocacy research as a tool to market and diffuse innovations in social redress practices to relevant stakeholders, including policy-makers and civil society.

6.5 CONCLUSION

As South Africa moves into the 21st century, with all of its projected turbulence and uncertainty (Bendana, 1996), it is confronted with the formidable challenge of locating itself within a highly competitive and technologically advanced international economy. Successful national development, within the context of the global village, is dependent, at least in part, on the nation's ability to rapidly develop and retain high-level competencies and expertise in its populace (Bhagwanjee, 1996a). In this context, increasing concern is being expressed by central government for the multitudes of African youth who lack the education and skills to participate fully in the South African economy (Ministry of Education, 1997). Operating in the face of widespread illiteracy, alarmingly elevated school drop-out and failure rates (Pretoria News, 1997), increasing unemployment, seriously declining undergraduate enrolment (CEPD, 1997) and a heavily skewed student orientation towards the humanities as opposed to science and technology (DACST, 1996), the New South Africa faces a daunting challenge in escaping the shackles of subservience to industrialised western economies.

One response has been a surge of demand for institutions of higher learning to produce African graduates equipped with high-level skill, knowledge and training, particularly in the disciplines of science, engineering and technology (Mohamed, 1997). The past few years in particular have witnessed a proliferation of policy papers, reports, books and commissions aimed at addressing the range of factors that act as barriers to the participation and success of historically disadvantaged individuals in higher education. This plethora of publications has comprehensively articulated the educational problems facing this country and has advanced a range of action strategies planned around a vision of transformation which reconciles the immediate need to overcome underdevelopment as a whole with the longer term objective of unlocking the social and economic potential of South Africa's people in the interest of building sustainable economic growth.

This study clearly indicates that a complex and interwoven web of factors impact on the access and success of historically disadvantaged students to higher education in general and health science education in particular. It is equally evident that success in redressing this situation demands a holistic approach marked by the collective will and effort of a broad range of stakeholders, including the state, secondary and tertiary education institutions, business and industry, educators, families and students themselves. It follows that independent tinkering with

isolated elements of this complex problem, no matter how well intentioned, will yield limited success. What is required is a unifying social contract that generates practical strategies and solutions that are relevant to our own local contexts and needs and that recognises the opportunities inherent in the current educational impasse in developing a nation that is globally competitive and successful. Indeed, the current diversity and contestation within our educational system should be viewed as a vehicle for learning and progress that is unavailable to many other nations, rather than simply as a source of conflict with predetermined negative outcomes.

REFERENCES

Ackermann, L (1994). The preamble of the Universal Declaration of Human Rights. In: M. Robertson (Ed.), **Human rights for South Africans.** United Kingdom: Oxford University Press.

Africa, H.P. (1997). **The challenge: To reach far more people with fewer resources**. Paper presented at the FOTIM workshop on a flexible learning system, Technikon SA Conference Centre, Johannesburg, 21 August.

African National Congress [ANC] (1994). **The Reconstruction and Development Programme**. Johannesburg (ANC Office): Umanyano Publishers.

Ajzen, I. & Fishbein, M. (1980). **Understanding attitudes and predicting social behaviour**. Englewood Cliffs, NJ: Prentice Hall.

Ames, C. (1992). Classrooms: Goals, structures and student motivation. **Journal of Educational Psychology, 84**: 261-271.

Anderson, C.S. (1982). The search for school climate: A review of the research. **Review of Educational Research, 52**(3): 368-420.

Anderson, B.D. & Tissier, R.M. (1973). Social class, school bureaucratisation and educational aspiration. **Educational Administration Quarterly, 9**(2): 34-49.

Anglin, L.W. (1979). Teacher roles and alternative school organisations. **Educational Forum, 43**: 439-452.

American Policy Unit (1988). **Science at age 15: A review of the AOU survey findings, 1980-84**. London: HMSO.

Archer, J. & Macrae, M. (1991). Gender perceptions of school subjects among 10-11 year olds. **British Journal of Educational Psychology, 61**: 99-103.

Arellano-Romero, O. & Eggler, J. (1987). **Recruitment, retention and innovative instructional strategies for culturally diverse minority college students: A review of literature**. Santa Barbara City College, CA: Office of Instruction

Arkin, H. & Colton, R.R. (1964). **Tables for statisticians**. New York: Harper and Row.

Armitage, J.; Batista, J.; Harbison, R.W.; & Helio, R. (1986). **School quality and achievement in rural Brazil**. Washington, DC: The World Bank, Education and Training Department.

Arriagada, A. (1983). **Determinants of sixth grade student achievement in Peru**. Washington DC: The World Bank, Education Department.

Astone, N.M. & McLanahan, S.S. (1991). Family structure, parental practices and high school completion. **American Sociological Review, 56**: 309-320.

Austin, G.R. (1979). Exemplary schools and the search for effectiveness. **Educational Leadership, 37**: 10-12.

Austin, G.R. & Garber, H. [Eds.] (1980). **Research on exemplary schools**. New York: Academic Press.

Babbie, E. (1979). **The practice of social research**. New York: Wadsworth.

Backman, M.E. (1972). Patterns of mental abilities: Ethnics, socio-economic and sex. **American Educational Research Journal, 9**: 1-12.

Badat, S.; Barends, A.; & Wolpe, A. (1993). **The post-secondary education system: Towards policy formulation for equity and development**. University of the Western Cape: Education Policy Unit.

Badsha, A.; Williams, A.; & Yeld, N. (1987). **Alternative admissions research project. A work in progress report**. Paper presented at the ASP Conference, Rhodes University, Grahamstown, 15 December.

Bankston, C.L. (1995). Vietnamese ethnicity and adolescent substance abuse: Evidence for a community-level approach. **Deviant Behaviour, 16**: 59-79.

Beard, P.N.G. (1990). **Student admissions: Quo Vadis?** Paper presented at the Admissions Policy Conference, University of Durban-Westville, KwaZulu-Natal, 18 March.

Beardall, J. (1995). Teacher appraisal and professional accountability in South African education. **Perspectives in Education, 16**(2): 365-372.

Beebout, H. (1972). **The production surface for academic achievement: An economic study of the Malaysian secondary education**. Doctoral dissertation, University of Wisconsin, Madison.

Bem, S.L. (1974). The measurement of psychological androgyny. **Journal of Counselling and Clinical Psychology, 42**: 155-169.

Bendana, A. (1996). **Power lines: US domination in the new global order**. Northampton, MA: Interlink Publishing

Bernard, B. (1991). **Fostering resiliency in children: Protective factors in the family, school and community**. Portland, OR: Northwest Regional Educational Laboratory.

Betz, N.E. & Hackett, G. (1983). The relationship of mathematics self-efficacy expectations to the selection of science-based college majors. **Journal of Vocational Behaviour, 23**: 329-345.

Bhagwanjee, A.M. (1990). **Perceptions of and attitudes toward political violence: A preliminary study of the Edendale community**. M.A.(Clin.Psy.) dissertation, University of Durban-Westville, KwaZulu-Natal.

Bhagwanjee, A.M. (1996). The policy-practice dialectic: Towards a strategic approach for the development of a skills base for science and technology at HBUs. In: A.M. Bhagwanjee, A.L. Gray, J.A. Smit, M.R. Haffajee, A.G. Parekh & R. Moonilal (Eds.), **Research capacity development: Situational analysis and strategic plan (pp.6-18)**. University of Durban-Westville (IDHIG): Lazerprint. .

Bhagwanjee, A.M. (1996a). Unifying policy and practice: A case for research capacity development at the University of Durban-Westville. In: A.M. Bhagwanjee, A.L. Gray, J.A. Smit, M.R. Haffajee, A.G. Parekh & R. Moonilal (Eds.), **Research capacity development: Situational analysis and strategic plan (pp. 19-34)**. University of Durban-Westville (IDHIG): Lazerprint.

Bhagwanjee, A.M. (1996b). An overview of the Faculty Transformation Programme. In: A.M. Bhagwanjee, A.L. Gray, J.A. Smit, M.R. Haffajee, A.G. Parekh & R. Moonilal (Eds.), **Research capacity development: Situational analysis and strategic plan (pp. 36-42)**. University of Durban-Westville (IDHIG): Lazerprint.

Bhagwanjee, A.M.; Smit, J.A.; Gray, A.L.; Moodley, V.R.; & Haffajee, M.R. (1995). **Meeting South African health and education imperatives: A model for institutional reconstruction and development**. KwaZulu-Natal: University of Durban-Westville, IDHIG.

Bibby, J. & Peil, M. (1974). Secondary education in Ghana: Private enterprise and social selection. **Sociology of Education, 47**: 399-418.

Biko, S. (1986). **I write what I like**. New York: Harper & Row.

Black, J.A. & Champion, D.J. (1976). **Methods and issues in social research**. New York: John Wiley & Sons, Inc.

Bloom, B. (1981). **All our children learning: A primer for parents, teachers and other educators**. New York: McGraw Hill.

Bogue, D.J. (1985). **The population of the United States: Historical trends and future projections.** New York: Free Press.

Borkowski, J.; Weyhing, R.; & Carr M. (1988). Effects of attributional retraining on strategy-based reading comprehension in learning disabled students. **Journal of Educational Psychology, 80**: 46-53.

Borkowski, F.T. (1988). The university presidents' role in establishing an institutional climate to encourage minority participation in higher education. **Peabody Journal of Education, 66**: 32-45.

Bottery, M. & Sui, S. (1996). Empowerment, participation and democracy? The Hong Kong 'Big Sisters' guidance programme. **Compare, 26**(1): 61-72.

Bourke, S. (1986). How smaller is better: Some relationships between class size, teaching practices and student achievement. **American Educational Research Journal, 23**: 558-571.

Boyatzis, R.E. (1998). **Thematic analysis**. London : Sage Publications.

Bradbury, J. (1991). **A profile of the UND: a record of the experiences of TTT students**. University of Natal: Teach Test Teach Programme.

Breckenridge, E. (1976). Improving school climate. **Phi Delta Kappan, 58**: 314-318.

Brisson, C.; Loomis, D.; & Pearce, N. (1987). Is social class standardisation appropriate in occupational studies? **Journal of Epidemiological Community Health, 41**(4): 290-294.

Brookover, W.B.; Beady, C.; Flood, P.; Schweitzer, J.; & Wisenbaker, J. (1979). **School social systems and student achievement: Schools can make a difference.** New York: JF Bergin.

Brookover, W.B. & Lezotte, L.W. (1979). **Changes in school characteristics coincident with changes in student achievement.** Michigan State University: Institute for Research on Teaching.

Buckland, P. & Fielden, J. (1994). **Public expenditure on education in South Africa, 1987/88 to 1991/92: An analysis of data**. Johannesburg: Centre for Education Policy Development.

Bullock, K.; Harris, A.; & Jamieson, I. (1996). Personal development plans and equal opportunities. **Educational Research, 38**(1): 21-35.

Bunting, I.A. (1994). **A legacy of inequality**. Unpublished material, University of Cape Town: Faculty of Education.

Burkhardt, G. (1991). Parent power in UK schools: The increased role and responsibilities of school governors. **Unicorn, 17**: 172-175.

Butchart, A.; Peden, M.; Bass, D.; du Toit, N.; & Lerer, L. (1996). **Injury in South Africa**. Tygerberg: Medical Research Council.

Caldas, G.P. & Ginther, D.W. (1996). Differences in learning styles of low socio-economic status for low and high achievers. **Education, 117**(1): 141-147.

Caldas, S.J. & Bankston, C. (1997). Effect of school population socioeconomic status on individual academic achievement. **Journal of Educational Research, 90**(5): 269-277.

Calitz, F. (1994). **The South African dilemma**. Paper presented at the 20th Annual IAEA Conference, New Zealand, 18-20 October.

Carroll, A.; Durkin, K.; Hattie, J.; & Houghton, S. (1997). Goal setting among adolescents: A comparison of delinquent, at-risk, and not-at-risk youth. **Journal of Educational Psychology, 89**(3): 441-450.

Central Statistical Services [CSS] (1988). **South African statistics.** Pretoria: CSS.

Central Statistical Services [CSS] (1992). **Statistical news release**. Pretoria: CSS.

Central Statistical Services [CSS] (1995). **RSA: Summary of statistics**. Pretoria: CSS.

Centre for Academic Development [CAD] (1996). **Proposed structure for continuation of academic development faculty programmes**. University of Durban-Westville: CAD.

Centre for Education Policy Development [CEPD] (1997). **CEPD Submission on the Green Paper on Higher Education**. Johannesburg: CEPD

Charles, H.J. (1997). **Exploring the concept of flexible learning systems: The developing worlds' perspective**. Paper presented at the FOTIM workshop on a flexible learning system, Technikon SA Conference Centre, Johannesburg, 21 August.

Chase-Lansdale, P.L.; Micheal, S.; & Desai, A. (1991). Parent involvement: Contributions of teacher efficacy, school SES and other school characteristics. **American Educational Research Journal, 24**: 417-435.

Chetty, T.D. & Bhagwanjee, A.M. (1990). Attitudes toward leisure and the desegregation of recreational facilities: A social survey. **South African Journal of Sociology, 21**(2): 81-89.

Cilliers, C.D. (1988). Effektiewe en verantwoordbare dissiplinering van kinders: Implikasies vir ouers en onderwysers. **Suid Afrikaanse Tydskrif, 8**(3): 176-183.

Clauset, K.H. & Gaynor, A.K. (1981). **The dynamics of effective and ineffective schooling: a preliminary report of a system dynamics policy study**. Paper presented at the annual meeting of the American Educational Research Association, Los Angeles, 16 April.

Colby, A. & Foote, E. (1995). Creating and maintaining a diverse faculty. **New Directions for Community Colleges, 87**: 81-89.

Coleman, J.S. & Hoffer, T. (1987). **Public and private high schools**. New York: Basic Books.

Community Agency for Social Enquiry [CASE] (1993). **Diversity and quality: Academic development at South African tertiary institutions**. A comparative case study by CASE for the Ford Foundation, Pretoria.

Coombes, P. & Bennett, M.J. (1983). Student recruitment and selection in occupational therapy. **Australian Journal of Occupational Therapy, 30**(1): 29-35.

Cooper, R. & Smith, L. (1990). Achieving a diverse faculty. **AAHE Bulletin**, 10-12.

Corder, H. (1994).The right to equality before the law. In: M. Robertson (Ed.), **Human rights for South Africans**. United Kingdom: Oxford University Press.

Cox, T. & Brockley, T. (1984). The experience and effects of stress in teachers. **British Educational Research Journal, 10**(1): 83-87.

Cox, W.B. (1987). Crime and punishment on campus: An inner city case. **Adolescence, 13**: 339-348.

Coyle, S. & Thurgood, D. (1989). **Summary report 1987: Doctorate recipients from United States universities**. Washington DC: National Academy Press.

Crain, R.L. (1981). Making desegregation work: Extra-curricular activities. **Urban Review, 13**: 121-126.

Crain, R.L.; Mahard, R.E.; & Narat, R.E. (1982). **Making desegregation work: How schools create social climates**. Cambridge, MA: Ballinger

Criswell, J.M. & Lotven, B.A. (1992). Teacher empowerment in a rural setting: Fact versus fantasy. **Education, 113**(3): 457-464.

Cronbach, L.J. (1946). Response sets and test validity. **Educational Psychological Measurement, 7**: 475-494.

Cronbach, L.J. (1975). Five decades of public controversy over mental testing. **American Psychologist, 1**: 1-15.

Curley, R.G. & Strage, A.A. (1994). Instructional support and demands: Helping educators help students meet increasing academic standards. **Education, 117**(1): 128-132.

Curry, N.O. (1986). **The Science Education Project in the Transkei**. Masters thesis in Applied Science, Western Australia Institute of Technology, Transkei.

Daily News (1999). **Endemic violence in KZN schools**, January 16: 2.

Daily News (1999a). **Widespread turmoil over teacher redeployment**, January 18: 3.

Daily News (1999b). **'Ghost teachers' on our provincial payroll**, January 23: 5.

Daily News (1999c). **Dr Vincent Zulu axed over public schooling crisis**, February 10: 1.

Dale, R. (1993). New Zealand: Constituting school-centered leadership. In: S. Crump (Ed.), **School-centered leadership (pp. 33-42)**. Australia: Thomas Nelson.

Deloitte Touche Tohmatsu International (1996). **The Central Applications Office of KwaZulu-Natal (executive summary)**. Johannesburg: Deloitte & Touche.

De Minnaar, A. (1991). **Conflict and violence in KwaZulu-Natal: Historical perspectives**. Pretoria: Human Sciences Research Council.

Department of Arts, Culture, Science and Technology [DACST] (1996). **White Paper on Science and Technology: Preparing for the 21st century**. Cape Town: CTP Book Printers.

Des Ormeaux, S. (1990). GAIN: A successful recruitment and retention programme for disadvantaged students. **Journal of Nursing Education, 29**(9): 412-415.

Development Bank Southern Africa [DBSA] (1993). **Primary and secondary education in South Africa: Data, policy issues, indicators and scenarios**. Pretoria: DBSA.

Diamantopoulos, A. & Schlegelmilch, B.B. (1997). **Taking the fear out of data analysis**. London: Harcourt Brace & Company Limited.

Dimmock, C.A.J.; O'Donaghue, T.A.; & Robb, A.S. (1996). Parental involvement in schooling: An emerging research agenda. **Compare, 26**(1): 5-20.

DiPrete, T. (1981). **Discipline and order in American High schools. Report to the National Centre for Education Statistics**. Washington DC: National Centre for Education Statistics.

Dlamini, C.R.M. (1995). The transformation of South African Universities. **South African Journal of Higher Education, 9**(1): 39-46.

Dugard, J. (1994). The right to human dignity. In: M. Robertson (Ed.), **Human rights for South Africans**. United Kingdom: Oxford University Press.

Duke, D.L. & Perry, C. (1978). Can alternative schools succeed where Benjamin Spock, Spiro Agnew and B.F. Skinner have failed? **Adolescence, 13**: 375-392.

Duncan, B. & Duncan, O.D. (1969). Family stability and occupational success. **Social Problems, 16**: 286-301.

Durkin, K. (1995). **Developmental social psychology: From infancy to old age**. Cambridge, MA: Blackwell.

Eccles, J.E. (1984). Sex differences in mathematics participation. In: M. Steinkamp (Ed.) **Advances in motivation and achievement (pp. 64-71)**. Greenwich: JAI Press.

Edmonds, R. (1979). Effective schools for the urban poor. **Educational Leadership, 37**(1): 15-24.

Edmonds, R.R. & Fredericksen, J.R. (1978). **Search for effective schools: The identification and analysis of city schools that are instructionally effective for poor children**. Harvard University: Centre for Urban Studies.

Edupol (1993). **Teacher salaries in South Africa: A policy perspective**. Johannesburg: The Urban Foundation.

Eitzen, D.S. (1975). Athletics in the status system of male adolescents: A replication of Coleman's 'The Adolescent Society'. **Adolescence, 10**(38): 267-276.

Ellett, C.D. & Walberg, H.J. (1979). Principals' competency, environment and outcomes. In: H.J. Walberg (Ed.), **Educational environments and effects (pp. 113-124)**. California: McCutchan.

Elliot, D.S.; Huizing, A.D.; & Ageton, S.S. (1985). **Explaining delinquency and drug use.** California: Sage.

Emmet, R. (1993). A descriptive analysis of medical school application forms. **Journal of Academic Medicine, 68** : 564-569.

Engle, P.L.; Castle, S.; & Menon, P. (1996). Child development: Vulnerability and resilience. **Social Science and Medicine, 43**(5): 621-635.

Epstein, J.L. (1984). **Effects of teacher practices and parent involvement in student achievement.** Paper presented at the annual meetings of the American Educational Research Association, New Orleans, 12 September.

Epstein, J.L. (1987). Parent involvement: What research says to administrators. **Education and Urban Society, 19**: 119-136.

Epstein, J.L. & MacIver, D.J. (1989). **Education in the middle grades: Overview of a national survey of practices and trends.** Baltimore, MD: Johns Hopkins University Centre for Research on Elementary and Middle schools.

Epstein, J.L. (1990). Contextual, cognitive and adolescent factories associated with parenting in adolescence**. Journal of Youth and Adolescence, 25**: 33-54.

Evans, G. (1997). Political ideology and popular beliefs about class and opportunity: Evidence from a survey experiment. **British Journal of Sociology, 48**(3): 450-470.

Fang, Z. (1996). A review of research on teacher beliefs and practices. **Educational Research, 38**(1): 47-65.

Feuerstein, R. (1980). **Instrumental enrichment**. Baltimore: University Park Press.

Finn, J.D. & Achilles, C.M. (1990). Answers and questions about class size: A statewide experiment. **American Educational Research Journal, 27**(3): 557-577.

Flick, U. (1998). **An introduction to qualitative research**. London: Sage Publications.

Ford, M.E. (1992). **Motivating humans : Goals, emotions and personal agency beliefs**. Newbury Park: Sage.

Foundation for Research Development [FRD] (1993). **South African science and technology indicators**. Pretoria: Directorate for Science and Technology Policy.

Fullan, M.G. (1991). **The new meaning of educational change**. London: Cassell

Fuller, B. (1986). Is primary school quality eroding in the Third World? **Comparative Education Review, 30**: 491-507.

Fuller, B. (1987). What school factors raise achievement in Third World? **Review of Educational Research, 57**(3): 255-292.

Gares, D.V. & Delco, E.A. (1991). Ten steps to successful minority hiring and retention. **New Directions for Community Colleges, 74**: 103-108.

Gay, J.E.; Ruieth, T.; & Williams, R.B. (1992). The negative side effects of retention, academic competition and punishment. **Education, 113**(3): 434-438.

Gaziel, H.H. (1997). Impact of school culture on effectiveness of secondary schools with disadvantaged students. **The Journal of Educational Research, 90**(5): 310-318.

Gibson, K. (1989). Children in political violence. **Social Science and Medicine, 28**(7): 659-667.

Gilbert, L. (1995). Urban violence and health: South Africa 1995. **Social Science and Medicine, 43**(5): 873-886.

Glasman, N.S. & Biniaminov, I. (1981). Input-output analyses of schools. **Review of Educational Research, 51**: 509-540.

Glick, S. (1994). Selection of medical students: The Beer Sheva perspective. **Journal of Medical Research, 28**: 265-270.

Goldman, C.S. & Wong, E.H. (1994). Stress and the college students. **Education, 117**(4): 604-610.

Gowar, H. [Ed.] (1997). **Campus Kwiks**. University of Durban-Westville: Department of Public Affairs.

Green, M.F. (1991). The politics of education. **The American Enterprise, 18:** 12-13.

Green, M.F. [Ed.] (1989). **Minorities on campus: A handbook for enhancing diversity**. Washington DC: American Council on Education.

Griesel, H. (1991). **Access to university: A review of selection procedures**. Report prepared for the Student Selection Committee, University of Natal, KwaZulu-Natal.

Griggs, R. (1998). A culture of learning about drugs, thugs and guns. **Children First, 2**: 7-11.

Grolnick, W.S. & Slowiaczek, M.L. (1994). Parent's involvement in children's schooling: A multi-dimensional conceptualization and motivational model. **Child Development, 64**: 237-252.

Grolnick, W.S.; Benjet, C.; Kurowski, C.O.; & Apostoleris, N.H. (1997). Predictors of parent involvement in children's schooling. **Journal of Educational Psychology, 89**(3): 538-548.

Grundy, S. (1989). Beyond professionalism. In: W. Carr (Ed.), **Quality in teaching: Arguments for a reflective profession (pp. 79-99)**. London: Falmer Press.

Gunthorpe, J. (1991). **Community building and university access**. Paper prepared for the Student Selection Committee, University of Natal, KwaZulu-Natal.

Habermas, J. (1988). **Theory and practice**. Cambridge : Polity Press.

Halle, T.G.; Kurtz-Costes, B.; & Mahoney, J.L. (1997). Family influences on school achievement in low-income, African American children. **Journal of Educational Psychology, 89**(3): 527-537.

Hartley, M. & Swanson, E. (1984). **Achievement and wastage: An analysis of the retention of basic skills in primary education.** Washington DC: The World Bank, Development Research Branch.

Hemson, D. (1993). **Education: What kind of future?** University of Durban-Westville: Department of Sociology.

Heyneman, S. & Jamison, D. (1980). Student learning in Uganda: Textbook availability and other factors. **Comparative Education Review, 24**: 206-220.

Heyneman, S. & Loxley, W. (1983). The effect of primary school quality on academic achievement across twenty-nine high and low-income countries. **American Journal of Sociology, 88**: 1162-1194.

Heyneman, S.; Jamison, D.; & Montenegro, X. (1983). Textbooks in the Philippines: Evaluation of the pedagogical impact of a nationwide investment. **Educational Evaluation and Policy Analysis, 6**: 139-150.

Heyns, B. (1982). The influence of parents: Work on children's school achievements. In: S.B. Kamerman & C. Hayes (Eds.), **Families that work: Children in a changing world (pp. 98-1117)**. Washington, DC: National Academy Press.

Holland, A. & Andre, T. (1987). Participation in extracurricular activities in secondary schools: What is known, what needs to be known? **Review of Educational Research, 57**(4), 437-466.

Holmes Group (1990). **Tomorrow's schools: Principles for the design of professional development schools**. The Holmes Group Inc.: United States of America.

Holmstrom, E.I. (1975). Promising prospects: Students choosing therapy as a career. **American Journal of Occupational Therapy, 29**: 608-614.

Hoosen, S. (1990). **An investigation of the effectiveness of groupwork with first year university students**. M.Med.Sci. (Social Work) dissertation, University of Durban-Westville.

Hoover-Dempsey, K.V.; Bassler, O.C.; & Brissie, J.S. (1992). Explorations of parent-school relations. **American Educational Research Journal, 85**: 287-294.

Houck, J.W. & Maxson, S. (1996). The role of teachers and the schools in assisting children who live with violence. **Education, 117**(4): 522-529.

Huddle, H.E. (1986). Creating a successful secondary school. **NASSP Bulletin, 70**: 64-69.

Human Science Research Council [HSRC] (1995). **Ways of seeing the National Qualifications Framework**. Cape Town: RGN Publishers.

Human Science Research Council [HSRC] (1996). **School/college register needs survey**. Cape Town: Education Foundation.

Insel, P.M. & Moos, R.H. (1974). Psychological environments: Expanding the scope of human ecology. **American Psychologist, 29**: 179-188.

Jacobs, J.E. (1991). Influence of gender stereotypes on parent and child mathematics attitudes. **Journal of Educational Psychology, 83**(4): 518-527.

Jamison, D.T. & Lockheed, M.E. (1985). **Participation in schooling: Determinants and learning outcomes in Nepal**. Washington DC: The World Bank, Education and Training Department.

Jamison, D.T.; Searle, B.; Galda, K.; & Heyneman, S. (1981). Improving elementary mathematics education in Nicaragua: An experimental study of the impact of textbooks and radio on achievement. **Journal of Educational Psychology, 73**(4): 556-567.

Jantjes, E. (1995). The influence of the home environment and parental support on school achievement. **Perspectives in Education, 16**(2): 289-304.

Jewson, N.; Mason, D.; Bowen, R.; Mulvaney, K.; & Parmey, S. (1990). Universities and their ethnic minorities: The public face. **New Community, 17**: 183-199.

Jones, J.B. (1980). **Administration, funding, faculty recruitment and staff development in teacher education**. Proceedings of the National Invitational Conference on Problems, Issues and Strategies related to the Preparation and Survival of Black Public School Teachers, Norfolk, Virginia, 18 June.

Joubert, R.W.E. (1997). **An evaluation of the criteria and procedures used for selection of Occupational Therapy students at South African universities**. M.OT dissertation, University of Durban-Westville.

Kalamazoo Valley Community College. (1988). **Minorities at Kalamazoo Valley Community College**. Michigan: Kalamazoo Valley Community College.

Kalinowski, A. & Sloanek, K. (1980). Home environmental influences on school achievement. In: K. Sloanek & M. O'Brien (Eds.), **The state of research on selected alterable variables in education (pp. 20-40)**. Chicago: University of Chicago.

Kapp, C. (1994). **Some perspectives on problems and approaches to solutions in higher education in South Africa.** Paper presented at the 9th SAARDHE Congress at the Breakwater Campus, Cape Town, 13-15 June.

Kapp, C. (1995). **An overview of some international and national trends in higher education: Implications and issues for South Africa**. Paper presented at the 22nd Annual Congress of the Physiology Society of Southern Africa, Cape Town, 16-17 April.

Kappner, A.S. (1989). Black Americans and educational leadership. **Educational Record, 21**: 18-21.

Kelly, A. (1986). The development of girls' and boys' attitudes to science: A longitudinal study. **European Journal of Science Education,** 8: 319-412.

Kilburn, J.C. (1993). **I'm so happy to have educated friends: Using network characteristics to predict individual's circumstances and beliefs.** Paper presented at the 1993 International Sunbelt Network Conference, Tampa, Florida, 14-17 May.

King, A. (1988). Selection of students for occupational therapy. **British Journal of Occupational Therapy, 51**(8): 265-266.

Kinnear P.R. & Gray, C.D. (1995). **SPSS for windows made simple**. United Kingdom: Taylor & Francis.

Kolstad, A.J. & Owings, J.A. (1986). **High school dropouts who change their minds about school.** Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, 14 April.

Kotecha, P. (1995). **A national profile of academic development and bridging programmes: Issues, trends and policy considerations**. Prepared for the NCHE Technical Committee on student access, support and development, South Africa, Pretoria.

Kuo, H.D. & Hauser, R.M. (1995). Trends in family effects on the education of Black and White brothers. **Sociology of Education, 66**: 136-160.

Landers, D.M. & Landers, D.M. (1978). Socialization via interscholastic athletics: Its effects on delinquency. **Sociology of Education, 51**: 299-303.

Lareau, A. (1987). Social class differences in family-school relationships: The importance of cultural capital. **Sociology of Education, 60**: 73-85.

Lawton, S.B. (1992). Why restructure? An international survey of the roots of reform. **Journal of Education Policy, 7**: 139-154.

Lecca, P. & Watts, T. (1989). **Pathways for minorities into the health professions**. Lanham, MD: University Press of America.

Lee, V.E.; Bryk, A.S.; & Smith, J.B. (1993). The organisation of effective secondary schools. **Review of Research in Education, 19**: 171-267.

Lerer L.B.; Matzopoulos, R.G. & Phillips, R. (1997). Violence and injury mortality in the Cape Town Metropole. **South African Medical Journal, 87**(3): 298-301.

Linthicum, D.S. (1989). **The dry pipeline: Increasing the flow of minority faculty**. Paper presented at the League for Innovation in the Community College Conference 'Leadership 2000', San Francisco, California, 11-14 June.

Locke, E.A. (1991). Goal theory vs Control theory: Contrasting approaches to understanding work motivation. **Motivation and Emotion, 15**: 9-28.

Locke, E.A. & Latham, G.P. (1990). **The theory of goal setting and task performance**. New Jersey: Prentice Hall.

Lockheed, M.; Vail, S.; & Fuller, B. (1986). How textbooks affect achievement in developing countries: Evidence from Thailand. **Educational Evaluation and Policy Analysis, 8**: 379-392.

Lodge, M. (1981). **Magnitude scaling**. California: Sage University Press.

Lomtey, K. & Swanson, A.D. (1989). Urban and rural schools research: Implications for school governance. **Education and Urban Society, 21**:436-454.

Louis, K. & Dentler, R. (1988). Knowledge use and school improvement. **Curriculum Inquiry: 18**: 33-62.

Loxley, W. (1984). **Quality of schooling in the Kalahari**. Paper presented at the annual meeting of the Comparative and International Education Society, Houston, Texas, 18 April.

Lutz, F. & Ramsey, M.A. (1974). The use of anthropological field methods in education. **Educational Researcher, 3**(10): 5-8.

MacDonald, M.A. (1980). **The response of Ciskei pupils to the Science Education Project**. Ciskei: Science Education Project.

MacDonald, M.A. (1993). **Commitments and constraints: Evaluation of the Science Education Project in South Africa, 1976-1988**. Cape Town: Oxford University Press.

Madigan, M.J. (1985). Characteristics of students in occupational therapy education programmes. **American Journal of Occupational Therapy, 39**: 41-48.

Makaula, N. (1988). **Are students changing?** Paper presented at the ASP Conference, University of Cape Town, 8-10 December.

Makay, J.J. (1990). Strategies for recruiting women and minority faculty in communication. **ACA Bulletin, 37**: 81-88.

Manthei, R. & Solman, R. (1988). Teacher stress and negative outcomes in Canterbury State schools. **New Zealand Journal of Educational Studies, 23**: 145-163.

Manthei, R.; Gilmore, A.; Tuck, B.; & Adair, V. (1996). Teacher stress in intermediate schools. **Educational Research, 38**(1): 3-19.

Mare, R.D. (1980). Social background and school continuation decisions. **Journal of the American Statistical Association, 75**: 295-305.

Marx, A.W. (1992). **Lessons of struggle: South African internal opposition, 1960-1990**. Cape Town: Oxford University Press.

Mason, E.J. & Bramble, W.J. (1978). **Understanding and conducting research: Applications in education and the behavioural sciences**. New York: McGraw-Hill Book Company.

McDill, E.L. & Rigsby, L.C. (1973). **Structure and process in secondary schools: The academic impact of educational climates**. Baltimore, MD: John Hopkins University Press.

McKeachie, W.J. (1994). **Observations made in final report**. Paper presented at the 19th Conference on Improving University Teaching, Washington DC, 18-21 July.

McLloyd, V.C. (1990). The impact of economic hardship on Black families and children: Psychological distress, parenting and socioemotional development. **Child Development, 61**: 311-346.

McNeal, R.B. (1997). Are students being pulled out of school? The effect of adolescent employment on dropping out. **Sociology of Education, 70**: 206-220.

Meece, J.L.; Wigfield, A.; & Eccles, J.S. (1990). Predictors of math anxiety and its influence on young adolescents' course enrollment intentions and performance in mathematics. **Journal of Educational Psychology, 82**(1): 60-70.

Meijnen, G.W. (1986). Unequal educational opportunities and effective schools. In: J.L. Vanderwolf & J.J. Hox (Eds.), **Questioning the quality of education (pp. 29-61).** Lisse, Holland: Swets & Zietlinger.

Miller, H.E. (1968). **An investigation of organisational climate as a variable in pupil achievement among 29 elementary schools in an urban school district**. Doctoral dissertation, University of Minnesota.

Miller, R. (1991). **Evaluation report on the teach-test-teach programme (1989-1990).** University of Natal: Teach Test Teach Programme.

Miller, S.K.; Cohen, S.R.; & Sayre, K.A. (1985). Significant achievement gains using the effective schools model. **Educational Leadership, 43**: 38-42.

Milne, A.; Myers, D.; Rosenthal, S.; & Ginsburg, A. (1986). Single parents, working mothers and the educational achievement of school children. **Sociology of Education, 59**: 125-139.

Ministry of Education. (1997). **The White Paper on higher education**. South Africa: Pretoria (No. 17944, Vol. 382).

Mitchell, G. & Fridjhon, P. (1987). Matriculation examinations and university performance. **Suid Afrikaanse Tydskrif vir Wetenskap, 83**: 555-560.

Mohamed, N. (1997). **Equity and redress in the Green Paper on higher education**. Paper presented at the National Conference on the Higher Education Green Paper, Braamfontein, 14-16 February.

Moody, C.D. (1988). Strategies for improving the representation of minority faculty in research universities. **Peabody Journal of Education, 66**: 77-90.

Moodley, I (1994). The right to equal pay for equal work. In: M. Robertson (Ed.), **Human rights for South Africans**. United Kingdom: Oxford University Press.

Moody, C.D. (1988). Strategies for improving the representation of minority faculty in research communities. **Peabody Journal of Education, 66**(1): 77-90.

Moore, D. (1997). **A flexible learning system for higher education in South Africa**. Paper presented at the FOTIM workshop on a flexible learning system, Technikon SA Conference Centre, Johannesburg, 21 August.

Moos, R.H. (1974). Systems for the assessment and classification of human environments: An overview. In: R.H. Moos & P.M. Insel (Eds.), **Issues in social ecology (pp. 54-65).** California: National Press Books.

Morales, J. & Pinellsiles, A. (1977). **The determinant factors and the costs of schooling in Bolivia**. Bolivinia: La Paz Universidad Catolica.

Morgan, W.R. (1983). Learning and student life: Quality or public and privet school youth. **Sociology of Education, 56**: 187-202.

Morgan, D. (1988). **Focus groups as qualitative research. Qualitative research methods series 16.** Newbury Park: Sage University Press.

Morley, L. (1997). Change and equity in higher education. **British Journal of Sociology of Education, 18**(2): 231-242.

Morris, R.C. (1990). How a school system can begin to deal with at-risk students. **Education, 112**(1): 157-102.

Morrow, W.E. (1988). Democratic schooling and the continental nuisance. **South African Journal of Education,** 8(3): 247-254.

Mulder, A.E. (1991). Minority student recruitment. **New Directions for Community Colleges, 19**: 31-37.

Muller, C. & Kerbow, D. (1993). Parent involvement in the home, school and community. In: B. Schneider & J.S. Coleman (Eds.), **Parents, their children and schools (pp. 13-42).** Boulder, CO: Westview Press.

Muller, G.H. (1996). Gateways to success: Urban community colleges and administrative diversity. **New Directions for Community Colleges, 94** : 57-66.

Murphy, P.J. (1991). Collaborative school management: Implications of school leaders. **NASSP Bulletin, 75**(537): 63-66.

Murphy, J. & Hallinger, P. (1985). Effective high schools: What are the common characteristics? **NASSP Bulletin: 69**: 18-22.

Myers, D.E.; Milne, A.M.; Baker, K.; & Ginsburg, A. (1987). Student discipline and high school performance. **Sociology of Education, 60**: 18-33.

National Academy of Science (1984). **High schools and the changing workplace: The employers' view**. Report of the panel of secondary school education for the changing workplace, Washington, DC, National Academy Press.

National Assessment of Educational Progress [NAEP] (1988). **The mathematics report card: Are we measuring up?** Princeton, NJ: Educational Testing Service.

National Centre for Education Statistics [NCES] (1995). **Disparities in public school district spending: 1989-1990.** Washington DC: US Government Printing Office.

National Commission on Higher Education [NCHE] (1996). **Framework for Transformation**. Cape Town: CTP Book Printers.

National Department of Education (NATED) (1994). **Education realities in South Africa**. Pretoria: NATED.

National Education Association (1985). **Teacher-parent relationship programme, 1984-1985 status report**. Washington, DC: National Education Association.

National Education Policy Investigation [NEPI] (1992). **Post-secondary education**. Cape Town: Oxford University Press.

Ngcobo, N.; Kobo, Y.; Stewart, R.; & Bhagwanjee, A.M. (1998). Towards access and success in occupational therapy education: A consumer-based evaluation of social redress strategies. **South African Journal of Occupational Therapy, 28**(2): 7-10.

Nurmi, J.E. (1991). How do adolescents see their future? A review of the development of future orientation and planning. **Developmental Review, 11**: 1-59.

O'Connell, B. (1991). Education and transformation: A view from the ground. In: E. Unterhalter (Ed.), **Apartheid education and popular struggles, (pp. 132-133)**. Cape Town: Oxford University Press.

Obiakor, F.E. (1992). **Multiculturalism in higher education: A myth or reality?** Paper presented at the Multicultural Fair, Chattanooga, February 6.

Odegaard, C. (1977). **Minorities in medicine, from receptive passivity to positive action, 1966-1976**. New York: Josiah May Jr. Foundation.

Oliver, J. & Brown, L.B. (1988). The development and implementation of a minority recruitment plan: Process, strategy and results. **Journal of Social Work Education, 24**: 175-185.

Ormell, C. (1996). Eight metaphors of education. **Educational Research, 38**(1): 67-75.

Ornstein, A.C. (1990). Class, race and achievement. **The Education Digest, 55**: 11-14.

Otto, L.B. & Alwin, D.F. (1977). Athletics, aspirations and attainment. **Sociology of Education, 42**: 102-113.

Owens, J.S.; Reis, F.W.; & Hall, K.M. (1994). Bridging the gap: Recruitment and retention of minority faculty members. **New Directions for Community Colleges, 87** : 57-64

Parker, B. (1994). The right to education. In: M. Robertson. (Ed.), **Human rights for South Africans**. United Kingdom: Oxford University Press.

Parsons, T. & Bales, R.F. (1985). **Family socialisation and interaction process**. London: Free Press.

Pavlich, G. & Orkin, M. [Eds.] (1992). **Diversity and quality : Academic development at South African tertiary institutions**. A comparative case study conducted by CASE for the Ford Foundation, South Africa, Pretoria.

Peil, M. (1982). African secondary students and their societies. **Comparative Education, 18**(2): 157-174.

Perez, M. (1990). Recruiting leaders: How the process works and how it fails. **Liberal Education, 76**: 14-19.

Phi Delta Kappa (1980). **Why do some urban schools succeed? The Phi Delta Kappa study of exceptional urban elementary schools**. Indianapolis: Phi Delta Kappa.

Piaget, J. (1977). **The development of thought**. Oxford: Basil Blackwell.

Pierce, D. & Hunsaker, T.W. (1996). Professional development for the teacher, of the teacher and by the teacher. **Education, 117**(1): 101-105.

Pink, W.T. (1979). **An exploration of relationships between academic failure, student social conflict and school-related attitudes.** Washington DC: National Institute of Education.

Pittman, R.B. (1991). Social factors, enrollment in vocational/technical courses, and high school dropout rates. **Journal of Educational Research, 84**(5): 288-295.

Potter, J. (1995). Does Walzer's theory of Complex Equality illuminate current issues in South African education? **Perspectives in Education, 16**(2): 319-328.

Pretoria News (1997). **South African education in dire straits**, 12 July : 8.

Pruitt, A.S. & Isaac, P.D. (1985). Discrimination in recruitment, admission and retention of minority graduate students. **Journal of Negro Education, 54**(4): 526-536.

Psacharopoulos, G. & Loxley, W. (1986). **Diversified secondary education and development.** London: Oxford University Press.

Purkey, S.C. & Smith, M.S. (1973). Effective schools: A review. **Elementary School Journal, 83**: 427-450.

Quaglia, R.; Marion, S.F.; & McIntire, W.G. (1990). The relationship of teacher satisfaction to perceptions of school organisation, teacher empowerment, work conditions and community status. **Education, 112**(2): 206-216.

Quine, S. & Lancaster, P.A. (1989). Indicators of social class: Relationship between prestige of occupation and suburb of residence. **Community Health Studies, 13**(4): 510-518.

Randall, P. [Ed.] (1983). **Survey of race relations in South Africa, 1982**. Johannesburg: South African Institute of Race Relations.

Rassool, N. (1995). Black women as 'other' in the academy. In: L. Morley & V. Walsh (Eds.), **Feminist academics: Creative agents for change (pp. 22-41).** London: Taylor and Francis.

Reddy, P. (1997). **Health promoting schools in South Africa: A critical look at environmental determinants**. Medical Research Council: Health Promotion Research and Development Office.

Reyes, O. & Leonard, J.A. (1993). Pilot study examining factors associated with academic success for Hispanic high school students. **Journal of Youth and Adolescence, 22**: 57-71.

Richardson, R.C. (1990). **Institutional climate and minority achievement**. Denver: Education Commission of the States.

Rocha, R. (1989). Strategies for recruiting minority faculty. **New Directions for Community Colleges, 13**: 32-37.

Rogan, A.B. (1979). **Research report on language study in eight Ciskei secondary schools**. Ciskei: Science Education Project.

Rosenthal, R. & Jacobson, L. (1968). **Pygmalion in the classroom**. New York: Holt, Rinehart & Winston.

Rozier, C.K.; Gilkeson, G.E.; & Hamilton, B.L. (1992). Why students chose occupational therapy as a career. **American Journal of Occupational Therapy, 46**(7): 626-631.

Rumberger, R.W. (1983). Dropping out of high school: The influence of race, sex and family background. **American Educational Research Journal, 20**: 199-220.

Rumberger, R.W. (1987). High school dropouts: A review of issues and evidence. **Review of Educational Research, 57**(2): 101-121.

Rutter, M.; Maughan, B.; Mortimore, P.; Ouston, J.; & Smith, A. (1979). **Fifteen thousand hours: Secondary schools and their effects on children**. London: Open Books.

Sachs, A. (1991). **Protecting human rights in a new South Africa: Contemporary South African debates**. Cape Town: Oxford University Press.

Sanders, M.R. (1985). What can we learn from two-and-a-half decades of American research on ASPs? **Aspects, 6**: 84-89.

Schafer, W.D. & Mufson, D. (1993). **Assessment literacy for school counsellors**. Paper presented at the American Counselling Association Convention, Washington DC, 18 March.

Schaffer, B.; Harris, A.; & Greenbaum, M. (1969). The treatment of socially oriented underachievers: A case study. **Journal of School Psychology, 7**(4): 70-73.

Schiefelbein, E. & Farrell, J. (1973). **Factors influencing academic performance among Chilean primary students.** Santiago: Centro de Investigaciones y Desarrollo de la Educacion.

Scott, E.S. & Damico, S.B. (1983). Extracurricular activities and inter-racial contact. **Integrated Education, 21**: 140-142.

Sedlacek, W.E. & Prieto, D.O. (1990). Predicting minority students' success in medical school. **Academic Medicine, 12**: 161-166.

Seeley, D. (1984). Home-school partnership. **Phi Delta Kappan, 65**: 383-393.

Shinn, M. (1978). Father absence and children's cognitive development. **Psychological Bulletin, 85**: 295-324.

Silberman, C.E. (1970). **Crisis in the classroom**. New York: Random House.

Singleton, R.A.; Straits, B.C.; & Straits, M.M. (1993). **Approaches to social research (2nd ed.)**. New York: Oxford University Press.

Skuy, M. & Vice, H. (1996). Attitudes of White teachers towards racial integration of schools in South Africa. **Educational Research, 38**(2): 135-146.

Slack, W.V. & Porter, D. (1980). The scholastic aptitude test: A critical appraisal. **Harvard Educational Review, 50**(2): 154-175.

Smit, P.J. (1994). **The South African tertiary education system**. Paper presented at the CUP Conference, KwaZulu-Natal, 24 July.

Social Redress Committee (1998). **Career counselling in former DET schools.** Proceedings of the 1st Regional Guidance Counsellors Workshop, University of Durban-Westville, Comsa Lounge, 6 August.

South African Association for Academic Development [SAAAD] (1997). **Academic development and strategic change in higher education.** A SAAAD needs assessment and audit project, Pretoria.

South African Institute of Race Relations (SAIRR). (1984). **Topical briefing**, May 7.

South African Institute of Race Relations (SAIRR). (1990). **The 1988/89 yearbook of the South African Institute of Race Relations**. Johannesburg: SAIRR.

Southworth, G. (1990). Leadership, headship and effective schools. **School Organisation, 10**: 3-16.

Spady, W.G. (1971). Status, achievement and motivation in the American high school. **School Review, 79**: 379-403.

Spatz-Widom, C. (1990). The cycle of violence. **Science, 244**: 160-166

Steele, C.M. (1995). Stereotype threat and the intellectual test performance of African Americans. **Journal of Personality and Social Psychology, 69**(5): 797-811.

Sternberg, R.J. (1986). What would better intelligence tests look like? In: College Entrance Examination Board (Eds.), **Measures in the college admissions process (pp. 146-150)**. Dalbridge: HMO.

Stewart, J.W. (1991). **Report of the Bremer rural youth issue conference**. Wisconsin: University of Wisconsin.

Stewart, R. (1997). Access and recruitment project makes headway. **UDW Varsity Voice, 1**(3): 2.

Stewart, R. (1997a). **Proposed student selection framework for the Faculty of Health Sciences**. Report of the Social Redress Committee, University of Durban-Westville, Faculty of Health Sciences.

Stewart, R. (1998). **Annual report of the Social Redress Committee**. University of Durban-Westville: Faculty of Health Sciences.

Stewart, R. (1998a). **Student intake statistics**. University of Durban-Westville: Faculty of Health Sciences.

Stewart, R. [Ed.] (1998b). **Health science career information booklet 1998: An undergraduate recruitment initiative of the Faculty of Health Sciences**. University of Durban-Westville: Lazerprint.

Stewart, R. & Jackson, C. (1998). **The RAP-Health Sciences linkage**. Proposal to Faculty Exco for the formalisation of a partnership between RAP and the Faculty of Health Sciences, University of Durban-Westville, Faculty of Health Sciences.

Straits, B.C. (1987). Residence, migration and school progress. **Sociology of Education, 60**: 34-43.

Strategic Planning Office (1998). **Three year rolling plan of the University of Durban-Westville**. KwaZulu-Natal: University of Durban-Westville, Strategic Planning Office.

Sunday Independent (1996). **Tackling race and gender biases in science**. Higher Education Review, June 16: 6.

Sunday Independent (1996a). **Critical to analyse transformation concept: Education's dilemma**. Higher Education Review, October 14: 5

Sunday Times. (1976). **Black anger starts young,** June 13: 3.

Swan, M. [Ed.] (1994). **The year at UDW, 1993**. University of Durban-Westville: Department of Public Affairs.

Swan, M. [Ed.] (1996). **Student statistics**. University of Durban-Westville: Department of Public affairs.

Tagiuri, R. (1968). The concept of organisational climate. In: R. Tagiuri & G.H. Litwin (Eds.), **Organisational climate: Exploration of a concept (pp. 7-18)**. Harvard University: Division of Research, Graduate School of Business Administration.

Tal, A. (1978). **Learning conditions, personality factors and achievement among urban and kibbutz high schools**. Masters dissertation, Tel Aviv University, Israel.

Taylor, D.C. & Smoor, J.P. (1992). **Approaches to the construction of school infrastructure in South Africa : A World Bank consultancy report**. Washington DC: The World Bank.

Taylor, J.M. (1989). **Alternatives to matric results for fair selection of first year engineering students**. Contract report for Engineering faculty of the University of Natal, HSRC, Natal Regional Office.

Teach Test Teach (1990). **A guide for community groupings, prospective students and others interested in the T-T-T selection and educational development programme.** University of Natal: Teach Test Teach Programme.

Teitel, L. (1994). Can school-university partnerships lead to the simultaneous renewal of schools and teacher education? **Journal of Teacher Education, 45**(4): 245-252.

Theodorson, T & Theodorson, A. [Eds.] (1969). **A modern dictionary of sociology**. New York: TY Crowell.

Tittle, C.R. & Hill, R.J. (1967). Attitude measurements and prediction of behaviour. **Sociometry, 30**: 6-9.

Tocci, C.M. & Engelhard, G. (1991). Achievement, parental support and gender differences in attitudes toward mathematics. **Journal of Educational Research, 84**(5): 280-286.

Tornatzky, L.G.; Brookover, W.B.; Hathaway, D.V.; Miller, S.K.; & Passalacqua, J. (1980). Changing school climate: A case study in implementation. **Urban Education, 15**: 49-64.

Twale, D.; Douvanis, C.; & Sekula, F.J. (1991). **Affirmative action at professional schools: Improving the recruitment, admissions and retention strategies for women and minorities**. Paper presented at the 4th Annual International Conference for Women in Higher Education, Hilton Head, 23 September.

Twale, D.J.; Douvanis, C.J.; & Sekula, F.J. (1992). Affirmative action strategies and professional schools: Case illustrations of exemplary programmes. **Higher Education, 24**:177-192.

Twitchin, J. & Demuth, C. (1985). **Multicultural education**. London: British Broadcasting Corporation.

United States Agency for International Development [USAID] (1992). **South Africa: Tertiary education assessment**. South Africa: Oxford University Press.

University of Natal [UND] (1995). **Harnessing an institutional initiative for regional access**. A submission to the Eastern Seaboard Association of Tertiary Institutions, University of Natal.

Van den Berg, O. & Todes, M. (1986). In-service teacher education in Cape Teachers' Professional Association: Educational innovation in apartheid society. **Cambridge Journal of Education, 16**(3): 163-170.

Van der Spuy, J. (1993). Violence in perspective. **Trauma Review, 1**(2): 1.

Van Morrow, L. (1990) Teachers' descriptions of experiences with their own teachers that made a significant impact on their lives. **Education, 112**(1): 96-102.

Viljoen, A.J. & Van Wyk, LA (1997). **The telematic learning systems of the Potchefstroom University for Christian Higher Education.** Paper presented at the FOTIM workshop on a flexible learning system, Technikon SA Conference Centre, Johannesburg, 21 August.

Vyskocil, J.R. & Goens, G.A. (1979). Collective bargaining and supervision: A matter of climate. **Educational Leadership: 37**: 175-177.

Wagener, U. (1991). How to increase the number of minority Ph.Ds. **Planning for Higher Education, 19**: 1-7.

Walter, H.J.; Vaughn, R.D.; & Cohall, A.T. (1993). Comparison of three theoretical models of substance abuse among urban minority high school students. **Journal of the American Academy of Child and Adolescent Psychiatry, 32**: 975-981.

Walzer, M. (1995). Education, democratic citizenship and multiculturalism. **Journal of Philosophy of Education, 29**(2): 181-188.

Warren, L.L. & Payne, B.D. (1997). Impact of middle grades' organisation on teacher efficacy and environmental perceptions. **The Journal of Educational Research, 90**(5): 301-308.

Waters, M.M. (1989). An agenda for educating black teachers. **The Educational Forum, 53**(3): 267-279.

Weber, G. (1971). **Inner city children can be taught to read: Four successful schools**. Washington, DC: Council for Basic Education.

Wenglinsky, H. (1997). How money matters: The effect of school district spending on academic achievement. **Sociology of Education, 70** : 221-237.

Whitehead, J.M. (1994). Academically successful school girls: A case of sex-role transcendence. **Research Papers in Education, 9**: 53-80.

Whitehead, J.M. (1996). Sex stereotypes, gender identity and subject choice at A-level. **Educational Research, 38**(2): 147-160.

Whitman, N.A.; Spendlove, D.C.; & Clark, C.H. (1986). **Increasing students' learning: A faculty guide to reducing stress among students**. George Washington University: Association for the Study of Higher Education.

Wigfield, A. & Meece, J. (1988). Math anxiety in elementary and secondary school students. **Journal of Educational Psychology, 80**: 210-216.

Williams, R.A. & Cox, M.A. (1991). Minority student recruitment: A Connecticut Model. **New Directions for Community Colleges, 74** : 39-46.

Wilson, H.J. & Maxson, S. (1995). The role of teachers and the schools in assisting children who live with violence. **Education, 117**(4): 522-529.

Wolfendale, S. (1992). **Empowering parents and teachers; working for children**. London: Cassell.

Wolff, L. (1970). **Why children fail in first grade in Rio Grande do Sul: Implications for policy and research**. Washington DC: US Agency for International Development.

Wylie, C. (1992). **The impact of tomorrow's schools in primary schools and intermediates: 1991 survey report**. New Zealand: New Zealand Council for Educational Research.

Wynne, E.A. (1980). **Looking at schools: Good, bad and indifferent**. Lexington: DC Health.

Ziegler, S. (1987). **The effects of parent involvement on children's academic achievement: the significance of home/school links**. Toronto Board of Education: Library Services Department.

Zill, N.; Collins, M.; West, J.; & Hausken, E.G. (1995). **A look at kindergartners in the United States**. Washington DC: Government Printing Office.

Zimmerman, M.A. & Arunkumar, R. (1994). Resiliency and its implications for schools and policy. **Society for Research in Child Development Social Policy Report, 8**: 1-17.

Zondo, R (1994). The right to work. In: M. Robertson (Ed.), **Human rights for South Africans**. United Kingdom: Oxford University Press.

APPENDIX 1
Operational definitions

AFRICAN: refers to members of indigenous African ethnic groups residing in South Africa. By virtue of the historical oppression of African people in South Africa, this term is also considered to be synonymous with the term 'historically disadvantaged'.

DEPARTMENT OF EDUCATION AND TRAINING (DET) SCHOOLS: refers to those schools that historically catered exclusively for scholars from African ethnic groups, by virtue of the Bantu Education Act (1953), until the establishment of a unitary Department of Education in 1994.

DURBAN FUNCTIONAL REGION: refers to Region F in terms of the newly established political boundaries in the province of KwaZulu-Natal.

HEALTH SCIENCE EDUCATION: refers to the undergraduate professional training offered by the Faculties of Health Sciences and Dentistry at UDW, viz. dental therapy, medical science, occupational therapy, optometry, pharmacy, physiotherapy, social work and speech and hearing therapy.

HISTORICALLY BLACK UNIVERSITIES: refers to those universities established during the apartheid era which primarily accommodated students of race groups other than White. Theses institutions were historically underfunded and under-resourced as compared to HWUs and were intended to segregate race groups by being race-specific, i.e. the University of Fort Hare, the University of Bophuthatswana, Vista University, the University of the North, the University of the Transkei, Venda University, the University of Zululand and the Medical University of South Africa were intended for African students, while the University of Durban-Westville (originally known as the University College for Indian South Africans) and the University of the Western Cape were intended for Indian and Coloured students respectively.

HISTORICALLY DISADVANTAGED: refers to those individuals who, under the apartheid system, were disenfranchised and were subjected to segregation and discrimination and received

an educationally inferior education. In the context of this study, 'historically disadvantaged' refers to African people.

HISTORICALLY WHITE UNIVERSITIES: refers to those universities established during the apartheid era which primarily accommodated White students. These universities were historically more advantaged and better-resourced than HBUs and include the University of Cape Town, Rhodes University, the University of Natal, the University of the Witwatersrand, the University of the Free State, Potchefstroom University, the University of Port Elizabeth, Rand Afrikaans University, the University of Pretoria and the University of Stellenbosch.

NATURAL SCIENCES: as defined in the report of the National Commission on Higher Education (1996), natural sciences include science, engineering, health sciences and dentistry.

PARENT-TEACHER-STUDENT ASSOCIATIONS: refers to a school governance structure comprising of democratically elected parents, teachers and scholars. PTSAs have the mandate to make fundamental decisions regarding school management practices, following the White Paper on Higher Education (1997).

SCIENCE, ENGINEERING AND TECHNOLOGY: refers to those academic disciplines that utilise a scientific method to generate knowledge and practical applications, such as products, services, processes, systems or devices, that are socially relevant and appropriate (DACST, 1996).

SUBJECT STREAMS: refers to a combination of subject choices that afford a scholar access to either a commerce (i.e. accountancy, economics, business economics, mathematics), science (i.e. biology, physical science and mathematics) or general (history, geography, biology) subject stream.

APPENDIX 2

UDW's Social Redress Policy of 1992

Given the history of discrimination, inequity and injustice in our society, it is necessary to adopt measures of redress in order to establish a just and equitable social order. In its Mission Statement, the University has committed itself to 'the pursuit of appropriate affirmative action policies necessary to redress historical imbalances of race, class, gender and any other forms of social disadvantage'. As part of a process of institutional restructuring and transformation, and in furtherance of the goals of the Mission Statement, UDW adopted a Social Redress Policy based on the following principles and processes:

- The Social Redress Policy will focus on race, gender and class equity

- The policy will apply in three broad categories: admission, employment and community outreach. Comprehensive strategies in each of these areas will be developed as soon as possible

- The policy on student admissions seeks to provide equitable access in order to reflect the regional and national population distribution within the country. The policy will also strive to attain a more representative distribution throughout all faculties

- In addition to all other criteria for employment, considerations of race, gender and class equity will be taken into account in the appointment of all staff; similar criteria will be used in the promotion and development of existing staff

- Discussion between the university and representatives of the community, labour and educational structures about how the programme of the University is to be integrated with the development needs of the region will be initiated

- The policy will be implemented with immediate effect and be subject to review within 5 years.

APPENDIX 3

Questionnaire for scholars

QUESTIONNAIRE 1: FOR SCHOLARS

1. Name of school _____

2. Age _____ (years)

3. Gender

	1: Male		2: Female

4. Standard

	1: Seven		2: Ten

5. Please state what the following members of your family do for a living:

FAMILY MEMBER	TYPE OF JOB/ STUDIES
Father	
Mother	
Brother/sister 1	
2	
3	
4	
5	
6	
7	

6. What are you planning to do when you finish your schooling?
(TICK ONE ONLY)

	1 : Study further		2 : Find a job		3 : I don't know

7. If you want to study further, please tell us why?
(TICK THE STATEMENT THAT APPLIES TO YOU <u>THE MOST</u>. TICK <u>ONE</u> ONLY)

	1. I want to study further in order to earn a good salary
	2. I want to study further in order to pay for my brother's or sister's studies
	3. I want to study further in order to support my family
	4. I want to study further in order to do work that will help my community
	5. I want to study further to learn useful skills
	6. My parents want me to study further
	7. I want to study further in order to participate in student politics
	8. Other **(explain)**

8. If you studied further, what career would you like to follow?

_____

9. If you studied further, where do you think you would study?
(YOU MAY TICK MORE THAN ONE ANSWER IF NECESSARY)

	1. University
	2. Technikon
	3. Teachers' College
	4. Nursing College
	5. Other **(explain)**

10. If you studied further, where would you get money for your studies?
(YOU MAY TICK MORE THAN ONE ANSWER IF NECESSARY)

	1. My parents
	2. A relative
	3. Bank loan
	4. Student bursary
	5. University loan
	6. I don't know
	7. I will not be able to get money to study further
	8. Other **(explain)**

11. If you studied further, would you like to stay at the campus student residence?

	1 : YES		2 : NO		3 : I don't know

12. Give a reason/s for your answer above

_____

_____

_____

_____

_____

13. What do you understand by the term "Health Sciences"?

_____

_____

_____

14. Which of the following institutions/organisations in KwaZulu-Natal do you think offer training for people who want to work in the Health field?
(TICK AS MANY AS APPLY)

	1. University of Durban-Westville
	2. University of Natal (Durban)
	3. University of Natal (Pietermaritzburg)
	4. Natal Technikon
	5. M. L. Sultan Technikon
	6. Mangosuthu Technikon
	7. Edgewood College
	8. Springfield College
	9. University of Zululand
	10. I have no idea
	11. Other **(explain)**

15. Which of the following careers have you heard of in the field of Health Sciences?
(TICK AS MANY AS APPLY)

	1. Physiotherapy		7. Nursing
	2. Occupational Therapy		8. Psychology
	3. Social Work		9. Optometry
	4. Pharmacy		10. Dentistry
	5. Medical Science		11. Speech and Hearing Therapy
	6. Medicine		12. None of these

16. Where did you learn/hear about these careers in Health Sciences?
(TICK AS MANY AS APPLY)

	1. School/community library
	2. Guidance teacher
	3. Career day
	4. Family member **(state which)**
	5. Community group **(state which)**
	6. TV/Magazine/Newspaper **(state which)**
	7. Friend
	8. Clinic sister
	9. Health professional in the community
	10. Other **(explain)**

17. What is your opinion about the career information that you got from the sources above?
(TICK AS MANY AS APPLY)

	1. I have never received any information on careers in Health Sciences
	2. It was good because I learnt what careers in Health Sciences involve
	3. It was poor because not enough information was given on specific careers in Health Sciences
	4. It was poor because the information was given in a language that I have difficulty understanding
	5. It was poor because the information provided did not tell me what subjects or skills I needed in order to study a career in Health Sciences
	6. It was good because I learnt where I could study a career in Health Sciences
	7. It was good because I learnt what subjects and skills I need to study a career in Health Sciences
	8. Other **(explain)**

18. State briefly what you think the following people do for a living:

1 : Physiotherapist -
2 : Occupational Therapist -
3 : Social Worker -
4 : Pharmacist -
5 : Medical Scientist -
6 : Psychologist -
7 : Optometrist -
8 : Speech and Hearing Therapist -
9 : Dentist -
10 : Doctor -
11 : Nurse -

19. Would you like to study a career in Health Sciences?

	1 : YES		2: NO		3 : I don't know

20. If YES, state your top 3 career choices in order of preference:

1. _____

2. _____

3. _____

21. What is your family's role in helping you decide on a career choice?
(TICK AS MANY AS APPLY)

	1. I have never discussed my career choice with my family
	2. My family want me to look for a job when I finish school
	3. My family offer guidance and useful suggestions
	4. My family support me in my career choice
	5. My family discourage me because they want me to follow a career that is different from the one I have chosen
	6. My family are not interested in discussing my career choice
	7. Other **(explain)**

22. What career does your family think you should study?

_____

_____

PLEASE NOTE:
QUESTIONS 23 AND 24 ARE FOR STANDARD 7 PUPILS ONLY

---

23. What school subjects are you planning to choose in Standard Eight?
(TICK AS MANY AS APPLY)

	1. Biology		10. Home Economics
	2. Mathematics		11. History
	3. Physical Science		12. English
	4. Agriculture		13. Afrikaans
	5. Geography		14. Zulu
	6. Accountancy		15. Biblical Studies
	7. Technical Drawing		16. Art
	8. Economics		17. Other **(explain)**
	9. Business Economics		

24. Why are you planning to choose these subjects?
(TICK AS MANY AS APPLY)

	1. I don't know
	2. I will need these subjects to study my chosen career
	3. My teacher advised me to choose these subjects
	4. My friends are choosing these subjects
	5. My family want me to choose these subjects
	6. They are easy subjects
	7. My school only offers these subjects
	8. I like the teachers who teach these subjects
	9. Other **(explain)**

PLEASE NOTE:
QUESTIONS 25 AND 26 ARE FOR STANDARD 10 PUPILS ONLY

---

25. Why did you choose the school subjects you are currently doing?
(TICK AS MANY AS APPLY)

	1. I don't know
	2. I will need these subjects to study my chosen career
	3. My teacher advised me to choose these subjects
	4. My friends are doing these subjects
	5. My parents wanted me to do these subjects
	6. I like the teachers who teach these subjects
	7. My school only offer these subjects
	8. They are easy subjects
	9. Other **(explain)**

26. List the school subjects you are presently doing, showing whether you are doing them on higher grade (HG) or standard grade (SG).

Subject	HG	SG
1.		
2.		
3.		
4.		
5.		
6.		
7.		

PLEASE NOTE:
BOTH STANDARD 7 AND STANDARD 10 PUPILS MUST ANSWER QUESTIONS FROM THIS POINT FORWARD

---

27. What school subjects do you think are necessary in order to study Health Sciences?
(TICK AS MANY AS APPLY)

	1. Biology		7. Geography
	2. Mathematics		8. History
	3. Physical Science		9. Art
	4. English		10. Home economics
	5. Afrikaans		11. I don't know
	6. Accountancy		12. Other **(explain)**

28. What skills do you think will be most useful in order to study Health Sciences?

e.g. The ability to work quickly

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

29. Who is presently providing you with the <u>most useful</u> career guidance?
(TICK ONE ONLY)

	1. Guidance teacher
	2. School principal
	3. Other teacher/s **(state which)**
	4. Family member **(state which)**
	5. Other **(explain)**

30. Do you have a guidance teacher at school?

	1 : YES			2 : NO

31. If YES, what is your opinion about guidance classes at school?

Rate your response to each statement according to the following scale:
1 = Strongly agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly disagree
(PLEASE MAKE SURE YOU RATE EVERY STATEMENT)

	1. Teachers think we should rather do other subjects during this time
	2. Teachers were very interested in having guidance classes
	3. Pupils at my school are not interested in having guidance classes
	4. Guidance classes are not useful because the guidance teacher does not tell us about careers in Health Sciences
	5. Guidance classes are useful because the guidance teacher told us what subjects and skills are needed to study a career in Health Sciences
	6. Guidance classes are useful because they have helped me to make a good choice about the type of career I would like to follow
	7. The time set aside for these classes is too short for it to be useful
	8. Guidance classes are not useful because the guidance teacher is unable to answer questions related to following a career in Health Sciences

32. How often do you receive guidance classes at school?
(TICK ONE ONLY)

	1. Once a week
	2. Once a month
	3. I don't receive guidance classes at school
	4. Other **(explain)**

33. Have you ever attended a Career Day/s?

	1 : YES		2 : NO

34. If NO, why not?

_____

_____

_____

35. If YES, what is your opinion about Career Day/s ?

Rate your response to each statement according to the following scale:
1 = Strongly agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly disagree
(PLEASE MAKE SURE YOU RATE EVERY STATEMENT)

	1. Career Days are not useful because not enough information on different types of careers is provided
	2. Career Days are not useful because the information is given in a language I have difficulty understanding
	3. I am not interested in any of the careers that are presented at these Career Days
	4. Career Days are not useful because the information provided does not tell us what subjects or skills are needed in order to follow a career in Health Sciences
	5. I feel at a disadvantage because Career Days are hardly ever held in my school district
	6. Career days are useful because they have helped me to make a good choice about the type of career I want to follow

36. Where are Career Days usually held in your area?
(TICK AS MANY AS APPLY)

	1. School
	2. University
	3. Community clinic
	4. I don't know
	5. Other **(explain)**

37. What is your level of ability in the following skills?

Please rate your response to each statement according to the following scale:
1 = Good
2 = Fair
3 = Poor
(PLEASE MAKE SURE YOU RATE EVERY STATEMENT)

SKILLS	RATING
1. Use of the English language	
2. Reading and writing skills	
3. Problem-solving skills	
4. Note-taking skills	
5. Ability to think critically	
6. Mathematical skills	
7. Scientific skills	
8. Study skills	
9. Ability to work quickly	
10. Ability to relate to people	
11. Ability to work in groups	
12. Ability to manage your time effectively	

Thank you for taking time to answer this questionnaire

APPENDIX 5

Questionnaire for health science students

QUESTIONNAIRE 2 : FOR HEALTH SCIENCE STUDENTS

1. Degree programme _____

2. Age _____ (years)

3. Gender

	1 : Male

	2 : Female

4. Home province _____

5. What do the following members of your family do for a living?

FAMILY MEMBER	TYPE OF OCCUPATION/ STUDIES
Mother	
Father	
Brother/ Sister 1	
2	
3	
4	
5	
6	
7	

6. Why did you choose to come to University?
(TICK THE STATEMENT THAT APPLIES TO YOU <u>THE MOST</u>. TICK <u>ONE</u> ONLY)

	1. To earn a good salary when I graduate
	2. To finance my brother's or sister's studies when I graduate
	3. To support my family when I graduate
	4. To do useful work in the community
	5. To develop useful skills
	6. My parents wanted me to come to University
	7. To participate in student politics
	8. Other **(specify)**

7. Why did you choose to study a career in Health Sciences?
(TICK THE STATEMENT THAT APPLIES TO YOU <u>THE MOST</u>. TICK <u>ONE</u> ONLY.)

	1. I will earn a good salary
	2. I thought I would be good at this career
	3. My school guidance teacher advised me to choose this career
	4. My parents wanted me to follow this career
	5. I will be able to do useful work in my community when I graduate
	6. I realised that our country needed more health professionals
	7. Other **(specify)**

8. How do you feel about your career choice?
(TICK AS MANY AS APPLY)

	1. I feel demotivated because it is difficult for me to pass my courses
	2. I am dissatisfied because the career is not what I thought it would be
	3. I feel that certain subjects in the course are irrelevant
	4. I feel satisfied because I discovered that this is a well-paying profession
	5. I feel satisfied because I discovered that it is going to be easy for me to find a job when I graduate
	6. I am content with my decision because I have learnt new skills that will benefit my community when I graduate
	7. I am only studying this career to please my parents
	8. I am content with my decision because I am passing my courses
	9. Other **(specify)**

9. Where did you first hear/ learn about the specific career you have chosen to study?
(TICK AS MANY AS APPLY)

	1. School / community library
	2. School guidance teacher
	3. Career day
	4. Family member **(state which)**
	5. Community group **(state which)**
	6. TV/ Newspaper/ Magazine **(state which)**
	7. A friend
	8. Clinic sister
	9. Health professionals in the community
	10. Other **(specify)**

10. How do you feel about the career information you received from these sources? **(TICK AS MANY AS APPLY)**

	1. I have never received any information on my chosen career
	2. It was good because I learnt what my chosen career involved
	3. It was inadequate because not enough information on my chosen career was provided
	4. It was poor because the information was provided in a language that I had difficulty understanding
	5. It was poor because the information provided did not tell me what subjects or skills I needed in order to study my chosen career at University
	6. It was good because I learnt where I could study my chosen career
	7. It was good because I learnt what subjects and skills I needed in order to study my chosen career at University
	8. Other **(specify)**

11. What was your family's role in helping you decide on your chosen career? **(TICK AS MANY AS APPLY)**

	1. I never discussed my career choice with my family
	2. My family wanted me to look for a job when I left school
	3. My family offered guidance and useful suggestions
	4. My family supported my career choice
	5. My family discouraged me because they wanted me to follow a career that was different from the one I had chosen
	6. My family was disinterested in my career decision
	7. Other **(specify)**

12. What career did your family want you to follow?

_____

_____

13. How would you describe the selection procedure you underwent in order to gain entry into your current degree?

Rate your response according to the following scale:
1 = Strongly agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly disagree
(PLEASE MAKE SURE YOU THAT YOU RATE EVERY STATEMENT).

	1. I felt that the interview panel was intimidating
	2. Some of the questions asked in the interview/application form were unclear
	3. The questions asked in the interview/application form were fair
	4. I think some of the questions asked in the interview/application form were irrelevant
	5. The English used in the interview/application form was easy to understand
	6. I was afraid to ask questions during the interview
	7. I was well prepared for the interview
	8. Most staff members involved in my selection were racist
	9. It was unfair as I did not have the opportunity to undergo an interview

14. Do you think that the interview / selection procedure you underwent restricts the access of Black students into your current degree?

	1 : YES		2 : NO		3 : I don't know

15. Give reasons for your answer above.

_____

_____

_____

_____

16. What skills do you think are most useful for you to pass the degree that you are currently registered for?

e.g. the ability to work quickly.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

17. Where are you mainly obtaining your University fees?
(YOU MAY TICK MORE THAN ONE ANSWER IF NECESSARY)

	1. My parents
	2. A relative
	3. Bank loan
	4. Student bursary
	5. University loan
	6. Other **(specify)**

18. Do you stay in the student residence on campus?

	1 : YES

	2 : NO

19. If NO, why not?

_____

_____

_____

_____

20. If YES, what is your opinion about the conditions in student residence?

Rate your response according to the following scale:
1 = Strongly agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly disagree
(PLEASE MAKE SURE THAT YOU RATE <u>EVERY</u> STATEMENT).

	1. It is unsafe in the residence
	2. It is conducive to studying
	3. It is too noisy
	4. Peer support and assistance is readily available
	5. My studies are more easily disrupted by student demonstrations
	6. It allows me to be independent
	7. It is convenient for use of on-campus facilities

21. As a scholar, *before you made your subject choice*, did you know that you had to choose Mathematics, Physical Science or Biology in order to study Health Sciences at University?

	1 : YES		2 : NO

22. Who has provided you with the most useful career guidance?
(TICK ONE ONLY)

	1. Guidance teacher
	2. School principal
	3. Other teacher/s **(state which)**
	4. Family member **(state which)**
	5. Other **(specify)**

23. Did you have a guidance teacher at school?

	1 : YES		2 : NO

24. If YES, what is your opinion about the guidance classes you received at school?

Rate your response to each statement according to the following scale:
1 = Strongly agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly disagree
(PLEASE MAKE SURE THAT YOU RATE EVERY STATEMENT).

	1. Teachers felt that we should rather do other subjects during this time
	2. Teachers were very interested in having guidance classes
	3. Pupils at my school were not interested in having guidance classes
	4. Guidance classes were not useful because the guidance teacher did not give us enough information on careers in the Health Science
	5. Guidance classes were useful because the guidance teacher told us what subjects and skills are needed to study a career in Health Sciences
	6. Guidance classes were useful because they helped me to make a good decision about what type of career I wanted to follow
	7. The time set aside for these classes was too short for it to be useful
	8. Guidance classes were not useful because the guidance teacher couldn't answer questions related to my current career choice

25. How often did you receive guidance classes at school?
(TICK ONE ONLY)

	1. Once per week
	2. Once per month
	3. I never received guidance classes at school
	4. Other **(specify)**

26. Did you ever attend a Career Day/s as a high school student?

	1 : YES		2 : NO

27. If NO, why not?

_____

_____

_____

28. If YES, what is your opinion about Career Day/s?

Rate your response to each statement according to the following scale:
1 = Strongly agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly disagree
(PLEASE MAKE SURE THAT YOU RATE <u>EVERY</u> STATEMENT).

	1. Career Days were not useful because not enough information on Health Science careers was provided
	2. Career Days were not useful because the information was provided in a language I had difficulty understanding
	3. I was not interested in any of the careers that were presented at these Career Days
	4. Career Days were not useful because the information provided did not tell me what subjects or skills I needed in order to pursue a career in Health Sciences
	5. I felt at a disadvantage because Career Days were hardly ever held in my school district
	6. Career Days were useful because they helped me to make a good decision about studying my chosen career

29. Where were Career Days usually held in your area?
(TICK AS MANY AS APPLY)

	1. School
	2. University
	3. Community clinic
	4. I don't know
	5. Other **(specify)**

30. Have you had any difficulty in adjusting to University life?

	1 : YES		2 : NO

31. If NO, what has helped you adjust to University life?

_____

_____

_____

32. If YES, what difficulties are you experiencing?

Rate your response to each statement according to the following scale :
1 = Strongly agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly disagree
(PLEASE MAKE SURE THAT YOU RATE EVERY STATEMENT).

	1. My studies are placing intolerable financial strain on my parents
	2. I am having difficulty in passing my courses
	3. I am having difficulty in adjusting to the teaching methods used at University
	4. I am having difficulty in coping with the course workload
	5. The lecturers are unwilling to help me with problems I am experiencing with my course
	6. Student politics are disrupting my studies
	7. My schooling was inadequate in preparing me to cope with University studies
	8. I am having difficulty in keeping up with the other students in class
	9. I feel I am at a disadvantage in class, as English is my 2nd language
	10. I am having difficulty in integrating theory with practice

33. Have you ever participated in the Academic Development Programme (ADP) on campus or in your department?

	1 : YES

	2 : NO

34. If NO, why not?

_____

_____

_____

35. If YES, what is your opinion about the ADP on campus?

Rate your response to each statement according to the following scale :
1 = Strongly agree
2 = Agree
3 = Uncertain
4 = Disagree
5 = Strongly disagree
(PLEASE MAKE SURE THAT YOU RATE EVERY STATEMENT).

	1. It is inadequate because the tutors are unskilled
	2. It is good because the tutorials have helped me to understand my course better
	3. It is a waste of time because students do not get any credits for the work they do in ADP
	4. It is inadequate because the tutorials are unrelated to my course
	5. It boosted my morale as I am now passing my courses
	6. The tutors are often rotated, resulting in little consistency in the tutorials
	7. It is good because I have developed useful skills e.g. reading, writing, verbal presentation, etc.
	8. The tutorials are scheduled at inconvenient times, leaving students little time to cope with their regular educational programme

36. What is your level of ability in the following skills?

Rate your response to each statement according to the following scale :
1 = Good
2 = Fair
3 = Poor
(PLEASE MAKE SURE YOU THAT YOU RATE EVERY STATEMENT).

SKILLS	RATING
1. Use of the English language	
2. Reading and writing skills	
3. Problem-solving skills	
4. Note-taking skills	
5. Ability to think critically	
6. Mathematical skills	
7. Skills in the Basic Sciences	
8. Study skills	
9. Ability to work quickly	
10. Ability to relate to people	
11. Ability to work in groups	
12. Time management skills	

Thank you for taking time to answer this questionnaire

APPENDIX 5

Covering letters accompanying the questionnaires for scholars and health science students

SOCIAL REDRESS RESEARCH PROJECT
Faculty of Health Sciences
University of Durban-Westville

Dear scholar,

Thank you for helping us, the Faculty of Health Sciences of the University of Durban-Westville (UDW), with our Social Redress Research Project.

The reason for this study is to determine the factors that might help historically disadvantaged scholars enter UDW and successfully study a career in the health sciences. The information you provide in this questionnaire is important because it will help us to assist scholars, like yourself, to have a better understanding of health science careers, stand a better chance of getting accepted into health science courses at UDW and receive the support you may require to succeed in your studies.

You will remain anonymous in answering this questionnaire and we thus encourage you to be open and honest as you can when you answer the questions. The results of this study will be made available to your school in the near future.

Thank you for taking part in the study.

Yours sincerely,

Rene' Stewart
Chair: Social Redress Committee
Faculty of Health Sciences
UDW

SOCIAL REDRESS RESEARCH PROJECT
Faculty of Health Sciences
University of Durban-Westville

Dear student

Thank you for assisting us, the Faculty of Health Sciences of the University of Durban-Westville (UDW), with our Social Redress Research Project. The purpose of this study is to determine the factors that will enhance the access and success of historically disadvantaged students to health science education at UDW. Your participation in this study is vital, as your input will help us to determine the strategies for ensuring more effective recruitment measures and academic support for our disadvantaged students.

You will remain anonymous in answering this questionnaire and we thus encourage you to be as open honest as you can in your answers. Should you be interested in obtaining more information about this study, please contact Rene' Stewart on 2044950. The results of this study will be made available to the Faculties of Health Sciences and Dentistry in the near future.

Thank you for your participation.

Yours sincerely,

Rene' Stewart
Chair: Social Redress Committee
Faculty of Health Sciences

APPENDIX 6

Semi-structured focus group schedule for teaching staff

FOCUS GROUP SCHEDULE FOR HIGH SCHOOL TEACHERS

1. ***Social system***

Areas of information to be covered:

- Instructional programme, e.g. nature and content of general career guidance offered by the school; nature and content of information offered to scholars on health science education; scholars' attitudes towards science-related subjects; assistance offered to scholars when making subject stream choices; special programmes or afternoon classes conducted to assist scholars with schoolwork
- Home-school relationships, e.g. nature of contact with parents; parental involvement; role of family in scholars' subject and career choices; 'stumbling blocks' encountered in dealing with family members
- School governance structures, e.g. role of the PTSA; role of community leaders
- Peer relationships, e.g. teacher collegiality; teacher-pupil relationships

2. ***Milieu***

Areas of information to be covered:

- Student body characteristics, e.g. success and attrition rates; strategies employed to improve pass rates or assist scholars who are battling with their schoolwork; factors affecting student pass rates or contributing to attrition rates
- Teacher characteristics, e.g. morale; levels of burnout

3. ***Ecology***

Areas of information to be covered:

- School facilities, e.g. instructional and recreational facilities, such as sports grounds, libraries, textbooks, laboratories
- School profiles

4. ***Culture***

Areas of information to be covered:

- Nature and effects of crime within the school
- Impact of politics upon the school and scholastic performance
- Attitudes toward the ongoing professional development of teachers
- Teacher expectations for the academic achievement of scholars

APPENDIX 7

Ethical consent obtained from UDW's Research Committee