

https://dspace.org/

Predictors of success for African black physiotherapy students in South Africa

Mambo-Kekana, Nonceba Priscilla

2009-11-12T13:43:30Z
http://hdl.handle.net/10539/7442

Downloaded from a DSpace repository. https://dspace.org/

PREDICTORS OF SUCCESS FOR AFRICAN BLACK PHYSIOTHERAPY STUDENTS IN SOUTH AFRICA

Nonceba Priscilla Mbambo

A dissertation submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in the Faculty of Health Sciences, University of the Witwatersrand

Johannesburg, 2008

DECLARATION

I, Nonceba Priscilla Mbambo, declare that this thesis is my own work. It is being submitted for the degree of Doctor of Philosophy in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.

…….

……..day of ……., 2008

DEDICATION

To my late parents, for being good role models both as individuals and as parents.

ABSTRACT

The research reported in this thesis investigated factors that predict academic success of African black physiotherapy students. The first part of the literature review focused on higher education and access into higher education. It refers to the National Plan on Higher Education and the international debate around widening access. Significance within the international literature is that while there has been rapid expansion in higher education numbers there has not been a parallel increase in participation by underrepresented groups.

Most of the literature found on predictors of success indicates that high school performance and aptitude tests are predictors of success. It also indicates that the predictive strength of these variables reduces when race is taken into consideration and in physiotherapy it reduces in the clinical years of study. Non-cognitive variables have also been found to predict success. Although many quantitative studies on prediction of academic success have been performed, it was noted in the literature analysis that there is minimal investigation of predictors of success that have been done in the physiotherapy profession. No recent studies were found that pertain to physiotherapy specifically, and the few studies available were found not to have taken race differences into consideration. Throughout South Africa universities that have physiotherapy programmes admit students on the basis of their high school performance. Some of them use other criteria such as involvement in sports, leadership qualities and community involvement. Moreover, most African black students do not have the opportunity to fulfill these criteria and therefore other factors that may predict academic success were investigated.

One hundred and twenty eight graduates (66 black and 62 white) who graduated between 2000 – 2005 from eight universities and six Heads of Physiotherapy Departments participated in the research. For the purposes of this study, graduates who completed the degree in four years or four and a half years were defined as successful and those that completed in five years and above were defined as unsuccessful. The graduates responded to a questionnaire which had two sections: Section A had closed ended questions and Section B had open ended questions. Face-to-face, in-depth interviews were conducted with Heads of Departments using semi-structured interview schedule.

The data were subjected first to simple descriptive statistical analysis. These analyses revealed that 59% of blacks were successful compared to 90% of whites and that there were more successful females than males. The average time taken to complete physiotherapy degree is 5 years for blacks and 4 years for white; black students were less likely to succeed in

physiotherapy programmes. Frequency analysis was done using Chi square test and the results showed an association between race and success (X^2 = 16.29; p < 0.01). Logistic regression was done and the results revealed that high school performance was not a predictor of success for black students and that sharing a residence room (OR = 3.09; p = 0.05), obtaining information about university support systems from classmates (OR = 6.25; p < 0.05), feeling part of the group of classmates (OR = 3.23; p < 0.05) and choosing physiotherapy as the first choice of career (OR = .33; p < 0.05) were predictors of success of black physiotherapy students. These results indicate that a supportive learning environment is conducive for black students' academic success

Responses to the open ended questions were collated for each question and then analysed using content analysis as described by Mayan (2002). Themes that emerged with regards to student success indicate that according to the respondents, a student who is determined to succeed and become a physiotherapist, who has the support they need (particularly finance and family), and favourable learning environment will be successful in their studies. Themes that emerged regarding factors that are barriers to students' academic success were: lack of academic discipline, academic problems, psychosocial difficulties, poor learning environment. A question was raised regarding reasons of students leaving the physiotherapy programme before completion. The responses represent secondary data because it was difficult to locate students who had left physiotherapy programmes. The most cited reasons were multiple failures resulting in academic exclusion, and decision to change career.

The interviews with the Heads of Department were transcribed verbatim. These transcripts were then subjected to data-reducing procedures described by Tesch (1990). Firstly the analysis confirmed that black students take an average of 5 years to complete the degree and that the failure occurred mainly in first two years of study. The analysis also revealed that there were few (2 – 10) black students admitted into physiotherapy each year particularly at the Historically White Universities although there were additional criteria that sought to widen access for black students. Secondly, themes that emerged regarding factors that are perceived to contribute to students' academic success indicated that a successful student is a student who has adequate knowledge about the physiotherapy profession, has academic discipline, has all the relevant support needed and is integrated well with classmates. On the other hand, a student who is inadequately prepared for higher education, has poor proficiency of language of instruction, lacks financial support and has difficult social circumstances, will not be successful in his or her studies. The HODs indicated that there are support systems put in place within their departments and the university at large. The support is academic, financial and psychosocial.

The results of this study have shown that black students are less likely to be successful than white students, and that average time taken to complete the degree is 5 years. According to Graves (2008), in America the gap between black and white graduation rates still exists and it has been found that many colleges and universities graduate black students at significantly lower rates than white students. The immediate reaction to this result in the South African context would be that the reason for this outcome is that most black students are admitted with lower high school performance. The results in this study did indeed show that the distribution of aggregate and per-subject marks was lower for black respondents than for white respondents, and that at these lower ranges there were equal chances of success and failure. In other words, in dealing with black physiotherapy students, one must look beyond the matric results to identify factors that predict success. Uncertainty about the validity of matric as a predictor of further performance has long existed for low-scoring, disadvantaged students from the previous Department of Education and Training's, black only educational systems. The rapidly changing South African situation complicates the use and evaluation of the use of matric results for selection. A supportive learning environment has proved to be important for success of African black physiotherapy students.

ACKNOWLEDGEMENTS

I wish to acknowledge the assistance of those who participated in the research. They were, the physiotherapy graduates of 1998 – 2005 and Heads of Physiotherapy Departments.

I am particularly indebted to people who read and commented on early draft of the thesis or parts of it. Hellen Myezwa, Physiotherapy Lecturer, University of the Witwatersrand held my hand through the challenging times and gave me the intellectual stimulation and Prof Rosemary Crouch, Mellon Foundation research Mentor, University of the Witwatersrand. Each gave their time and energy generously. Witness Mudzi was generous with his time in undertaking the independent coding of qualitative data and I am thankful for that.

I am very thankful for the assistance and guidance of my supervisors. Associate Professor Judy Bruce, Nursing Department, University of the Witwatersrand, provided substantial support in conceptualizing the study and refinement of the study. Professor Alan Rothberg, School of Therapeutic Sciences, University of the Witwatersrand, assisted in many areas, particularly with refinement of the statistical analyses. They both contributed their enthusiasm and experience in dealing with students' throughput issues.

I am thankful for support from many sources, the University of the Witwatersrand, National Research Foundation and South African Society of Physiotherapy for financial assistance, the staff of the Physiotherapy Department, University of the Witwatersrand for giving me the time and space, my family and friends for believing in me.

I owe by far my greatest debt to my sons, Nikelo and Karabo for coping throughout the years with minimal attention from me and my husband Maesela for immeasurable support and encouragement.

TABLE OF CONTENTS

		Page
	Declaration……..	ii
	Dedication…….....	iii
	Abstract……	iv
	Acknowledgements……	vii
	Table of Contents…….....	viii
	List of Tables……...	xiv
	List of Figures …….	xvii
1.	**Chapter 1: Introduction**……..	1
1.1	Introduction……..	1
1.2	Physiotherapy as a Profession ……	2
1.3	Physiotherapy Education in South Africa……	4
1.4	National Human Resources for Health Plan……..	8
1.5	Higher Education in South Africa……..	12
1.6	Success in Physiotherapy Programmes ……	16
1.7	Purpose of the Study……..	18
1.8	Objectives……	19
1.9	Significance of the Study ……..	19
1.10	Statement of the Problem…….....	19
1.11	Research Questions…….....	20
1.12	Operational Definitions…….....	20
2.	**Chapter 2: Literature Review** ……..	22
2.1	Introduction……..	22
2.2	Higher Education and Access……..	23
2.3	Academic Success……..	26
2.4	Predictors of Academic Success……..	28
2.4.1	Cognitive Predictors ……..	29

Page

2.4.2	Non Cognitive Predictors……..	31
2.4.2.1	Finance and Parental Education……..	32
2.4.2.2	Personal Experiences ……...	32
2.4.2.3	Psychosocial factors. ……	34
2.4.2.4	Career Choice/Development……	35
2.4.2.5	Selection Criteria/Admissions Policies……	36
2.4.3	Cognitive and Non-Cognitive Predictors…….	39
2.4.4	Selection of the institution	40
2.5	Conclusion……...	40
2.5.1	Methods Available to Address the Problem of Predicting Success……	40
2.5.2	Deficiencies in Knowledge……	40
2.5.3	Current Status of Knowledge Relating to the Topic……..	41
2.5.4	Justification for the New Investigation of the Topic……...	41
2.5.5	South African Model of Physiotherapy Training Trends……...	41
3.	**Chapter 3: Methodology** ……...	43
3.1	Introduction……..	43
3.2	Research Design……	43
3.2.1	Nature of Mixed Methods……..	43
3.2.2	Data Collection Strategy of the Mixed Method……..	44
3.2.2.1	Implementation Sequence…….	44
3.2.2.2	Priority……..	45
3.2.2.3	Integration……	45
3.3	Development of the Questionnaire for Graduates…….	45
3.3.1	Validity……..	45
3.3.2	Content Validity…….....	45
3.3.3	Responses to the Draft Questionnaire……	47
3.3.4	Pilot Study…….....	48
3.3.4.1	Response…….....	49
3.3.5	Internal Consistency Reliability…….	50
3.3.6	Final Questionnaire…….....	51

Page

3.4	Integrity of the Qualitative Method……..	53
3.4.1	Trustworthiness and Rigour……..	53
3.5	Procedure for Data Collection……..	54
3.5.1	Questionnaire…….....	54
3.5.2	Interviews…….....	55
3.6	Ethical Considerations……..	55
3.7	Statistical Considerations……..	56
3.7.1	Population…….....	56
3.7.2	Study Samples…….....	56
3.7.3	Statistical Analysis…….....	57
3.7.3.1	Quantitative Data…….....	57
3.7.3.2	Qualitative Data…….....	57
3.7.3.2.1	Open-Ended Questions…….	57
3.7.3.2.2	Interviews…….....	59
4.	**Chapter 4: Results - Quantitative Data**……..	60
4.1	Introduction……..	60
4.2	Response Rate……	61
4.3	Descriptive Statistics……..	61
4.4	Frequency Distributions…….	62
4.4.1	Matriculation Aggregate Symbol……..	62
4.4.2	High School Subjects……...	63
4.4.3	Matriculation Aggregate Symbol versus Success…….	64
4.5	Frequency Analysis of All Respondents ……	65
4.5.1	High School Performance…….	66
4.5.2	High School Education……..	67
4.5.3	Career Choice…….....	68
4.5.4	Socioeconomic Background…….	70
4.5.5	University Experience……	71
4.5.6	Summary of Variables that have Association with Success in the Total Group……...	74
4.6	Frequency Analysis by Race ……...	75
4.6.1	High School Performance…….....	75

Page

4.6.2	High School Education……..	77
4.6.3	Career Choice……..	78
4.6.4	Socioeconomic Background……..	81
4.6.5	University Experience……	83
4.6.5.1	Available Support Systems at the University……..	83
4.7	Regression Analysis……	86
5.	**Chapter 5: Results – Graduates' Perceptions of Academic Success**	90
5.1	Introduction……..	90
5.2	Definition of Academic Success……...	90
5.3	Determinants of Success……..	91
5.3.1	Analysis of Responses……..	92
5.4	Barriers to Success……	94
5.5	Reasons for Leaving the Programme……..	96
5.6	Reasons for Not Leaving the Programme……..	98
5.7	University Experiences……..	99
5.7.1	Integration……	99
5.7.2	Challenges……...	100
5.7.3	Highlights……..	101
6.	**Chapter 6: Results – Head of Departments' Perceptions of Academic Success**	103
6.1	Introduction……..	103
6.1.1	Content……..	103
6.2	Data Analysis……..	103
6.3	Findings……	104
6.3.1	Selection and Duration of Study……...	104
6.3.2	Factors Facilitating Success……..	105
6.3.3	Factors Hindering Success……...	105
6.3.4	Support Systems……..	106
6.4	Verification of Findings……..	107

Page

6.4.1	Independent Parallel Coding…….....	107
6.4.2	Member Checking ……	108
6.4.3	Audit Trail……	109
7.	**Chapter 7: Discussion of Findings**……..	113
7.1	Introduction ……	113
7.2	Academic Success……..	117
7.2.1	Definition of Academic Success……...	117
7.2.2	Status of Academic Success……	117
7.2.2.1	Black versus White Students Academic Success.…….....	118
7.2.3	Access into Physiotherapy Training……	121
7.3	Prediction of Academic Success……..	123
7.3.1	Cognitive Factors……	123
7.3.1.1	Matric Aggregate versus Academic Success……..	124
7.3.1.2	Biology and English versus Academic Success……	126
7.3.1.3	Non-Cognitive Factors……....	128
7.3.2	Psychosocial Factors……..	128
7.3.2.1	Shared University Residence Room (University Support)……...	128
7.3.2.2	Integration……	129
7.3.2.3	Information about Support from Classmates……..	131
7.3.2.4	Career Choice…….. ……..	132
7.4	Perceptions on Determinants of Academic Success…….....	132
7.4.1	Contextual Facilitators of Success……...	133
7.4.2	Individual Facilitators of Success……..	134
7.4.3	Barriers to Success……	137
8.	**Chapter 8: Conclusion, Recommendations and Limitations of the Study**……..	139
8.1	Implications for Physiotherapy Education……...	139
8.2	Limitations of the Study……..	141
8.3	Implications for Further Research……	142
8.3.1	Regarding this Current Research……..	142
8.3.2	Regarding Physiotherapy Education……...	142

Page

9. **References**……. 143

Appendix A : Draft 1 Questionnaire …… 158
Appendix B : Draft 2 Questionnaire …… 165
Appendix C : Final Questionnaire……..... 172
Appendix D : Clearance Certificate…….. 181
Appendix E : Subject Information…..... 182
Appendix F : Letter to HODs……. 183
Appendix G : Consent Form…….. 184
Appendix H : Graduate Responses……..... 185
Appendix I : Conceptual Audit Trail – Students' Perceptions on Success……... 191
Appendix J : Interviews…….. 196
Appendix K : Data Matrix……... 214
Appendix L : Letter for Member Checking……..... 219
Appendix M : Member Checking Document…… 220
Appendix N : Conceptual Audit Trail – HODs' Perceptions on Success…….. 226

LIST OF TABLES

			Page
Table 1.1	:	Physiotherapy Student Admissions (1994-2005)……..	6
Table 1.2	:	Admission vs Final Year of Study (Black Students)…….	7
Table 1.3	:	National Physiotherapy Admissions and Output……..	11
Table 1.4	:	Physiotherapy Graduates (2000-2005)……..	16
Table 1.5	:	Black Physiotherapy Graduates per University (1998-2004)……..	17
Table 3.1	:	Panel of 'Experts' for Content Validation……	46
Table 3.2	:	Illustration of Strategies for Attaining Trustworthiness and Rigour……	54
Table 4.1	:	Demographic Characteristics of the Respondents (n=128)……	61
Table 4.2	:	Test of Independence between Success and Matric Performance ……..	66
Table 4.3	:	Test of Independence between Success and Aspects of High School Education…….	67
Table 4.4	:	Test of Independence between Success and Knowledge of Physiotherapy	68
Table 4.5	:	Test of Independence between Success and Source of Information about Physiotherapy…….....	68
Table 4.6	:	Test of Independence between Success and Source of Information about University…….....	69
Table 4.7	:	Test of Independence between Success and Aspects of Socioeconomic Background……....	70
Table 4.8	:	Test of Independence between Success and Parents' Highest Level of Education…….	70
Table 4.9	:	Test of Independence between Success and Parents' Employment…….	71
Table 4.10	:	Test of Independence between Success and University Experience……	71
Table 4.11	:	Illustration of Significant Variables……..	74
Table 4.12	:	Frequency Analysis of Matric Aggregate Symbols…….....	75
Table 4.13	:	Frequency Distribution of Success According to Grade in which the Subjects were Studies……...	76
Table 4.14	:	Test of Independence between Success and Symbols Obtained for the Different Subjects……...	77
Table 4.15	:	Frequency Distribution of Success According to Language of Instruction at School……..	77
Table 4.16	:	Test of Independence between Success and Type of School Attended…...	78
Table 4.17	:	Frequency Analysis of Factors that Influence Choice of Physiotherapy as a Career……..	78
Table 4.18	:	Frequency Analysis of Source of Information about Physiotherapy……..	79
Table 4.19	:	Frequency Analysis of Information about the University of Qualification…..	80

Page

Table 4.20	:	Frequency Analysis of Source of Funding for the University Studies……	81
Table 4.21	:	Frequency Analysis of Employment of Parents of the Respondents…….	82
Table 4.22	:	Frequency Analysis of the Level of Education of the Respondents' Parents…….	82
Table 4.23	:	Frequency Analysis of Knowledge about Available University Support Systems……...	83
Table 4.24	:	Frequency Analysis of Source of Information Regarding Support…….	84
Table 4.25	:	Frequency Analysis of Accommodation during Study at University……...	84
Table 4.26	:	Test of Independence between Success and Mode of Transport to Clinical Areas……	85
Table 4.27	:	Test of Independence between Success and Language of Instruction Policy……	85
Table 4.28	:	Summary of Significant Variables for Black Respondents……..	86
Table 4.29	:	Regression Analysis Results of Significant Variables in Black Students…..	87
Table 4.30	:	Summary of Significant Results for Black Respondents……..	87
Table 5.1	:	Definition of Academic Success……..	91
Table 5.2	:	Determinants of General Success: Respondents' Perspective……..	92
Table 5.3	:	Successful Respondents' Perspective of their own Success……..	92
Table 5.4	:	Unsuccessful Respondents' Perspective of Colleagues' Success…….	93
Table 5.5	:	Enabling Factors for Completion of Physiotherapy Degree……	93
Table 5.6	:	Unsuccessful Respondents' Perspective……...	94
Table 5.7	:	Successful Respondents' Perspective…….....	95
Table 5.8	:	Barriers to Success……	96
Table 5.9	:	Perceived Reasons for Others Leaving the Programme…….	97
Table 5.10	:	Reasons for not Leaving the Programme……..	98
Table 5.11	:	Illustration of Integration……	99
Table 5.12	:	Challenges Encountered at University……	100
Table 5.13	:	Highlights at University……..	101
Table 5.14	:	Summary of Variables and Factors Associated with Success in Physiotherapy…….	101
Table 6.1	:	Access and Throughput……	104
Table 6.2	:	Factors Contributing to Students' Success……	105
Table 6.3	:	Challenges Causing Poor Performance…….	106
Table 6.4	:	Available Support Systems……...	107
Table 6.5	:	Comparison of Interview Concepts…….	108

Page

Table 6.6 : Respondents' Comments on the Interpretation of the Interviews…….. 109

Table 6.7 : Categories of the Interviews…….. 109

Table 6.8 : Summary of all the Results……... 112

LIST OF FIGURES

			Page
	:		
Figure 1.1		Macro Organisation of the National Health System……..	9
Figure 2.1	:	South African Model of Physiotherapy Training Trends……..	42;88
Figure 3.1	:	Concurrent Nested Strategy……..	44
Figure 4.1	:	Comparison of Matric Aggregate Symbols between Black and White Respondents……	62
Figure 4.2	:	English Results of Black and White Respondents……..	63
Figure 4.3	:	Biology Results of Black and White Respondents……..	63
Figure 4.4	:	Mathematics Results of Black and White Respondents……	64
Figure 4.5	:	Physical Science Results of Black and White Respondents……	64
Figure 4.6	:	Matric Performance versus Success of All Respondents……..	65
Figure 6.1	:	Schematic Representation of HODs views Regarding Contributors to Success……..	110
Figure 6.2	:	Schematic Representation of Contributors to Lack of Success……..	111
Figure 7.1	:	Discussion Framework……...	116
Figure 8.1	:	Model for Improving Throughput……...	141

CHAPTER 1

1.1 INTRODUCTION

Studying in an institution of higher education and obtaining a qualification is a dream of most learners at high school level. For some of these learners the dream becomes a reality but for others it remains a dream for many years to come. Attaining this dream has different levels, starting with a sound foundation at school, identifying the desired career, identifying an institution from which the qualification would be obtained, making an application and gaining admission into that institution. In black[1] communities simply being admitted into a university is a huge and exciting step for many a black learner in South Africa, particularly those who would be first generation university students. Parents immediately take pride in their children and regard admission itself as a major achievement. Obtaining a degree is an even greater achievement, as demonstrated by the large numbers of family members that attend graduation ceremonies, and the ululating of parents who cannot contain their excitement and pride. Under these circumstances one can imagine that failure to obtain a qualification is not only a disappointment to the student, but also to the family and in some instances to the community at large. Such pressure puts an added burden on the student who does not want to be the cause of this disappointment. On the other hand, a white student is *expected* by parents to gain admission to a university and to qualify at the end of the studies. This foregone conclusion by parents and family puts a different pressure on these students, knowing that nothing less is expected. Pressure may be compounded if the lecturers make an assumption that white students cope much better, have no financial or academic difficulties, and will inevitably succeed without support being offered by the institution.

There are several issues that that are involved in the success or lack of success in attaining a degree. Although it is seen as every student's responsibility to succeed at university, others should share that responsibility, for example: the institution in its policies, ethos and support structures, the lecturers in their teaching, mentoring and nurturing roles, and parents. However factors that enable students to succeed in their endeavours at university are poorly understood in general, and in physiotherapy in particular.

[1] *For the purposes of this study, the term black refers to native South Africans; coloureds and Indians are excluded.*

This chapter provides a background of physiotherapy as a profession and its origins. The history of physiotherapy[2] education in South Africa is described and the context of this study is explained.

1.2 PHYSIOTHERAPY AS A PROFESSION

The World Confederation for Physical Therapy (WCPT) is an international, non-profit, professional organization founded in 1951. The Confederation represents over 250,000 physical therapists worldwide maintained and supported by subscriptions from its 101 Member Organizations. The Confederation works to improve global health by: encouraging high standards of physical therapy research, education and practice; supporting communication and exchange of information between regions and between WCPT Member Organizations; and collaborating with national and international organizations.

In response to a motion at the 13th General Meeting of June 1995 to develop a description of physical therapy, WCPT initiated a consultative exercise with the intention of providing a foundation on which Member Organizations in different parts of the world could build of a physical therapy programme that would be relevant to their needs. The WCPT position statement describes physiotherapy or physical therapy as providing services to people and populations to develop, maintain and restore maximum movement and functional ability throughout the human lifespan. Physical therapy includes the provision of services in circumstances where movement and function are threatened by the processes of ageing, injury or disease. Full and functional movement is at the heart of what it means to be healthy.

Physical therapy is concerned with identifying and maximising movement potential within the spheres of promotion, prevention, treatment and rehabilitation, and it therefore involves the interaction between physical therapist, patients or clients, families and care givers. It involves a process of assessing movement potential and establishing agreed-upon goals and objectives, using knowledge and skills unique to physical therapists. The profession therefore requires problem solving, clinical reasoning, handling and interpersonal skills.

The earliest documented origins of actual physical therapy as a profession date back to 1894 when nurses in England formed the Chartered Society for Physiotherapy

[2] *Physiotherapy and Physical Therapy are used synonymously to accommodate terminology used in different countries.*

(Chartered Society for Physiotherapy, United Kingdom). Other countries soon followed and started formal training programs, such as the School of Physiotherapy at the University of Otago in New Zealand in 1913. In the United States, physical therapy began in 1914 in Portland, Oregon, with Reed College and Walter Reed Hospital graduating the first physical therapists, then called "reconstruction aides." These were nurses who, with a specialized background in physical education, were needed to help manage the devastating effects of the First World War (www.ptjournal.org/pt_journal/Nov96/Moffat.cfm).

The development of the first true hospitals occurred between 1850 and 1900; these institutions were devoted to and organized for only the sick. It was during this time of change that the scientific method was introduced into the field of medicine. The early 1900's brought formal rehabilitation to the hospital setting.

Both nationally and internationally, physiotherapy is a four year university degree[3]. Inevitably there are variations that will depend on the nature of education and health system models within countries as well as physical therapy education and practice. The WCPT recognises that there is considerable diversity in the social, economic and political environments in which physical therapists are educated and practice. There are similarities and variations in a physical therapist's qualifications both within and across WCPT regions. WCPT in it's position statement on *Education for Entry Level Physical Therapists*(WCPT, July 1997), recommends that education should be based on university or university-level studies, of a minimum of 4 years of study, independently validated and accredited as being at a standard that awards graduates full status and international recognition. However, WCPT recognizes that not all countries in all regions have physical therapist education programs that meet this recommendation at this time. For example, in some countries the variation in length of program alone ranges from 2.5 to 7 years and is offered in polytechnic institutions as well as higher education universities.

Having described the global situation, it should nevertheless be noted that the United States of America, Australia and some European countries have introduced a five year postgraduate degree, the Doctor of Physiotherapy to further develop the profession. This degree requires that the students should already have a three year degree before starting physiotherapy and then study a further five years for physiotherapy. Developing

[3] In South Africa the minimum time for completion of the degree is four years, however students who in their final year examinations have a minor lapse may repeat short clinical time prior to re-examination and will graduate at the next graduation ceremony which is typically at 4 1/2 years. In this study, these students are defined as successful.

countries, South Africa included, cannot afford this form of training at present due to existing shortages of physiotherapy services (Amosun, 2007). Some Ministries of Health of these developing countries are advocating for mid-level workers who are trained for a shorter period in order to deal with the immediate need of physiotherapy services (Rwanda National Health Human Resource Plan, 2006, Thailand Human Resource Plan, 2002, South African National Resource Plan for Health, 2006).

1.3 PHYSIOTHERAPY EDUCATION IN SOUTH AFRICA

The history of physiotherapy training in South Africa dates back to 1942. It was only offered in historically white universities (HWUs). In those years black people could not study in white universities because the laws of the country prohibited black students from entering HWUs without ministerial consent (Extension of University Education Act of 1959). In 1969 black physiotherapy students were first admitted into technikons and colleges for the Diploma in Physiotherapy. Some hospitals like the Jubilee Hospital in what is now the North West Province also offered a two year diploma. In 1979 the Medical University of Southern Africa (MEDUNSA) a historically black university (HBU) started admitting students for the two-year Diploma in Physiotherapy but in 1982 this was converted into a four year degree programme (MEDUNSA Registration Records).

In South Africa there are currently eight universities across several provinces that offer physiotherapy training. Three are located in the Western Cape, three in Gauteng, one in the Free State and one in KwaZulu Natal. All these universities have a racial and language history which even in post-apartheid South Africa, is still evident in the student and lecturer demographics. Universities of Free State, Stellenbosch (Western Cape) Pretoria (Gauteng) are HWUs with Afrikaans as their medium of instruction. Universities of the Witwatersrand (Gauteng) and Cape Town (Western Cape) are HWUs with English as their medium of instruction. The University of KwaZulu Natal is a historically Indian university with English as medium of instruction, University of the Western Cape is a historically Coloured university with English as medium of instruction, and MEDUNSA (University of Limpopo) located in the Gauteng, is an HBU university with English as medium of instruction.

Promulgation of the Universities Amendment Act (July 1991) formally removed the restriction on the number of blacks, Asians and mixed-race students entering white universities. This created an opportunity for all students to attend the university of their choice and for the universities to respond to the needs of the different students. Prior to

this MEDUNSA had admitted most of the African black students, with the University of Durban-Westville admitting a few. A characteristic of this era was that very few African black physiotherapists were being graduated (Health Professions Council of South Africa Physiotherapy Register). The Universities Amendment Act (July 1991) therefore, was also an opportunity for the physiotherapy profession to expand its programmes of recruitment and training of African black physiotherapists. However, according to the Physiotherapy, Podiatry and Biokinetics Professional Board of HPCSA 2002 – 2003 Reports, the HWUs (Universities of Pretoria, Free State, Witwatersrand, Cape Town and Stellenbosch) enrolled only 2 – 5 African black students per year into their programmes. The 2003 records show that there was an intake of 327 first year physiotherapy students at all universities of which 51 (16%) were African black students. Thirty-one (61%) of these African black students were admitted at MEDUNSA and the remaining 39% was distributed among the other seven universities.

In an effort to increase the number of black students, selection usually involved admission of students whose inferior education in racially segregated secondary schools resulted in poorer matriculation grades. Some of these students succeeded in their studies and completed the degree in minimum time. This may mean that poor high school results do not necessarily determine whether a student will be successful in physiotherapy or not because there are other skills other than academic performance that are required.

An illustration of one HWU's admissions and students' progress is presented in Tables 1.1 and 1.2.

Table 1.1: Physiotherapy Student Admissions (1994-2005)

Year	African Male	African Female	**Total African**	White Male	White Fem	**Total White**	Total Male	Total Fem	**Total**
1994	2	2	**4** (11%)	7	27	**34** (89%)	9	29	**38**
1995	0	4	**4** (14%)	3	18	**21** (86%)	3	22	**25**
1996	3	2	**5** (14%)	5	27	**32** (84%)	8	29	**37**
1997	0	1	**1** (3%)	3	29	**32** (97%)	3	30	**33**
1998	2	4	**6** (16%)	5	27	**32** (84%)	7	31	**38**
1999	2	5	**7** (17%)	5	30	**35** (83%)	7	35	**42**
2000	2	5	**7** (14%)	4	40	**44** (86%)	6	45	**51**
2001	0	7	**7** (11%)	8	46	**54** (89%)	8	53	**61**
2002	3	4	**7** (12%)	12	39	**51** (88%)	15	43	**58**
2003	0	5	**5** (9%)	5	47	**52** (91%)	5	52	**57**
2004	5	4	**9** (21%)	3	32	**35** (79%)	8	36	**44**
2005	2	10	**12** (31%)	5	22	**27** (69%)	7	32	**39**
TOTAL	**21**	**53**	**74** (14%)	**65**	**385**	**450** (86%)	**86** (16%)	**438** (84%)	**523**

Source: Faculty Office

According to Table 1.1 523 students were admitted into physiotherapy from 1998 – 2005 (11 year period). Of these students 16% were male and 84% were female. Fourteen percent were African black students and 86% were white students. The 2005 increase to 31% is worth noting, possibly marking the beginning of a change in demographics.

In the USA, despite the increased focus that the federal government is placing on underrepresented minorities (URMs), there has been little increase in the number of minorities enrolled in health professional programmes (Baldwin, Woods, Simmons, 2006). Unfortunately, there is a lack of high-quality research that addresses the effectiveness of existing initiatives that attempt to address the problem of low URM enrollment in the health professions. As a result, the exact cause of this failure to increase URMs is unclear. The same can be said for South African universities that are failing to increase the number of African black students in their physiotherapy programmes.

Table 1.2: Admission vs Final Year of Study (Black Students)

African Black			
First year	**Students**	**Final Year**	**Graduates**
1994	4	1997	3 (75%)
1995	4	1998	2 (50%)
1996	5	1999	4 (80%)
1997	**1**	2000	**0**
1998	6	2001	3 (50%)
1999	7	2002	3 (43%)
2000	7	2003	5 (71%)
2001	**7**	2004	**0**
2002	7	2005	4 (57%)

Table 1.2 illustrates the number of students admitted and the number of students that graduated from that number. While noting that the figures show a satisfactory pass rate, it needs also to be noted that some of these students may have taken longer than 4 years to complete (i.e. they may have failed one or more years but subsequently passed after completing additional time). In general these successful African black students have had similar educational and socioeconomic experiences (although a few may be students from private schools) and the same selection criteria are used to select them. If that is the case, it raises a question of how those who complete the degree in minimum time manage to do so.

Although there seems to be a reasonable number of physiotherapists that graduate every year, according to the Department of Health there is a shortage of health professionals including physiotherapists. The low number of black physiotherapists is of concern, particularly with the government's efforts to increase equity in education and employment (National Policy on Higher Education, 2001). Physiotherapy, as a health profession and a higher education qualification operates within national policies of education and health. It must also therefore respond to the needs of the country in terms of providing adequate numbers of physiotherapists through widening access and ensuring success of students from disadvantaged backgrounds.

1.4 NATIONAL HUMAN RESOURCES FOR HEALTH PLAN

The World Health Organization's 2000 World Health Report recognizes that human resources "are the most important of the health system's inputs" and that the "performance of health systems depends ultimately on the knowledge, skills and motivation of the people responsible for delivering services." It is globally recognized that a focused human resource strategy backed up by an appropriate implementation plan is a critical ingredient for positive change in health care.

South Africa's health system faces the most intricate human resource demands. These are also characteristic of health systems in many other developing countries. Ensuring an adequate human resource pool for the staffing of the public health sector in particular is a major task. Both the Constitution of the Republic of South Africa and the National Health Act Number 61 of 2003 mandate the National Department of Health to ensure delivery of health services to South African society. In addition to the legislative and constitutional mandate to provide good quality health services to the nation, the 2001 National Human Resource Strategy provides the context for developing a human resource plan.

In developing the plan, ten core guiding principles were set which represented the commitment of government to develop a national health system that possesses the necessary human capital to deliver health to the nation. One of these guiding principles is that South Africans must enjoy a reliable supply of skilled and competent health professionals for self-sufficiency. This principle recognizes that output has not kept up with the demand for health professionals, made more pressing by the increasing burden of disease and global migration of health professionals. The National Department of Health, in partnership with other government departments such as the Department of Education and National Treasury, therefore committed itself to finding ways to ensure a reliable supply of health professionals for the national health system. The education and training institutions have also committed themselves to providing South Africans with skilled and competent health professionals.

Figure 1.1 illustrates the structural organization of the national health system and the relationship between health and education (National Human Resources Health Plan, 2006).

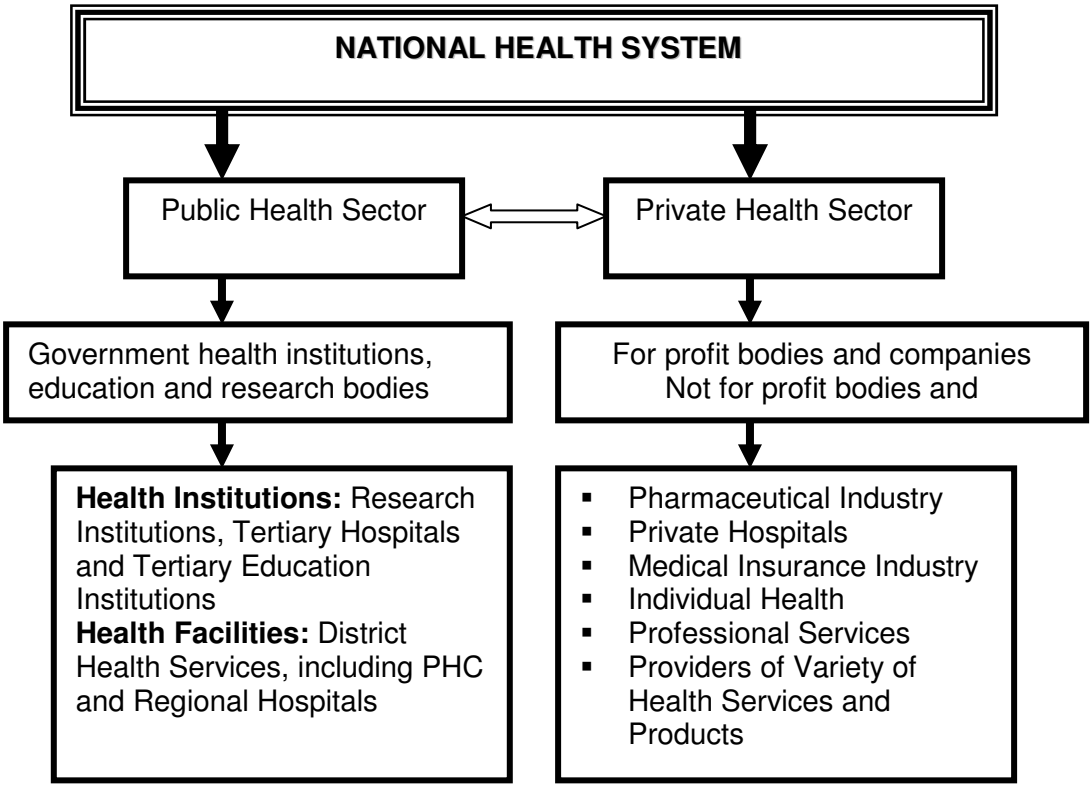

Figure 1.1: Macro Organization of the National Health System

Population growth and related demographics in addition to other health drivers play an important role in the planning of human resources for health. The South African population continues to grow, hence the need to maintain the production of health professionals to care for it. In October 2001 the population was 44,8 million and the last official census showed that this had increased to 46,9 million, an increase of about 2,1 million people (Statistics SA 2005). Africans were in the majority at 37.7-million (79.5%), with the white population estimated at 4.4-million (9.2%), the Coloured population at 4.2-million (8.9%) and the Indian/Asian population at 1.2-million (2.5%). The increase in population superimposed on historical undersupply poses a major challenge to the provision of health services.

While urbanization is on the increase, the health system nevertheless faces the task of attracting health professionals to rural and other under-served areas in which 46% of South African people still reside. The location of almost all health education and training institutions in urban areas influences young professionals' choices regarding their employment. Even though provinces have tended to focus on providing study assistance to students from rural communities, there are conflicting views concerning whether this strategy ensures that such students willingly return to work in their communities after

graduation. Having said that, black physiotherapy graduates are more likely to work in government health institutions (Provincial Physiotherapy Human Resource Records, 2007) and in rural areas, for a variety of reasons. Some work in these health institutions because they are closer to home and therefore it is conducive for them to fulfill their family obligations, others have a legal obligation to pay back the financial assistance by working in provincial hospitals, while there are those who feel a moral obligation to serve the government. The rapid promotion to senior status in historically understaffed facilities could also be an attraction.

Compared to other African countries, South Africa has large numbers of health professionals; however, national figures conceal serious geographical differences as well as differences between the public and the private health sectors. The varying but high staff vacancy rates in the former are a good indication of this. Furthermore, needs are not only changing, but also increasing, owing particularly to changing disease profiles. Hence the training of health professionals must keep abreast of all the trends that impact on health care, especially the changing disease profiles and global human resource trends.

Of further concern is the challenge of attracting prospective students to the health sciences. Recruitment strategies therefore have to extend to pre-higher education student life, whilst also recognizing the urge for young people, including those from rural communities, to experience urban life and travel, both national and international. Utilizing the size of the population in rural areas as a basis for argument, it is clear that the availability of health professionals in provinces with large rural communities is a serious issue because staffing of health facilities in these areas is a perennial problem. Ironically, it is students from these areas that struggle to complete their physiotherapy studies. The introduction of community service by the Department of Health (in 2003) was a strategy of increasing service delivery to the periphery, but the reality is that logistical and other problems have resulted in more health professionals delivering community service in the urban and semi-urban areas. Some of these logistical problems include accommodation and availability of qualified staff to support newly-qualified health professionals, physiotherapists included. If more health professionals from the rural areas are trained and placed back to these areas for community service then some of these logistical problems can be solved.

In 2004 the National Department of Health requested records of admissions and graduation rates from all physiotherapy training institutions. The following table is an extract of data that were compiled, and it is used here to illustrate the trends in the production of physiotherapy as a health professional category over specified periods.

Table 1.3: National Physiotherapy Admissions and Output

	1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Admissions	205	309	329	389	396	399	403	410			
Output				196	208	241	236	224	253	259	294

Source: National Department of Health 2005 (The staggering of data is to provide a sense of throughput e.g. 1994 admissions graduating in 1997)

The reported shortages of health professionals in South Africa appear to contradict the number of higher education institutions that the country possesses. Many reasons have been advanced for the dwindling numbers of health professionals, especially of those working in the public health sector. Migration of health personnel (also dubbed the brain drain), partly from rural to urban areas, but more particularly out of the country, has become a hotly debated issue in human resources circles, not only in South Africa but also on the African continent. Reliable figures are hard to come by and are invariably controversial. For many years before 1994, South Africa represented a preferred destination for many health professionals, the majority being doctors from the African continent. However, this situation has changed since the late 1990's when a policy of not recruiting from fellow developing African countries was adopted by the Southern African Development Community (SADC) Health Ministers (2001).

The question of attending to the production of health professionals is not limited to numbers but extends to other factors that influence production. From the outline and debates around human resource development it is evident that higher education plays a major role in the provision of health care professionals. Much as health professions are specialized (physiotherapy included), they are governed by the policies set by the National Department of Education because it is the custodian of higher education, and teaching and training institutions are accountable to this Department. Thus with a better understanding of the need for increased numbers of health professionals, the next section describes higher education as the provider of health professionals.

1.5 HIGHER EDUCATION IN SOUTH AFRICA

The change from school to university is a major life transition to which many students have considerable difficulty adjusting. This process of adjustment is multidimensional, requiring students to develop effective strategies for adapting to a host of substantial new demands, including those found in the academic, social and emotional spheres of development (Barker and Siryk, 1989). In the South African context, African black students with inferior educational and disadvantaged socioeconomic backgrounds are particularly vulnerable during this transition. Some researchers (Kagee et al, 1997, Sennett et al 2003) have argued that due to gross historic inequality in access to education and resource provision, students from disadvantaged backgrounds are generally under-prepared for the demands of tertiary education. Aside from educational disadvantage, a range of other factors is thought to contribute to African Black students' difficulties at university, particularly those who enter HWUs (Mbambo, 2005). Of further significance in the adjustment of black students are the adverse effects of financial strain, transport problems and housing-related difficulties as well as the stress of living long distances from home. A brainstorming session with physiotherapy colleagues who qualified from HWUs highlighted the challenges of moving from being a top student in high school to being at the bottom of the class, difficulties with accommodation, lack of knowledge of where to go if one had problems, and being in the minority and therefore feeling vulnerable. Some of those colleagues who are now lecturers in HWUs reported identifying these challenges with the African Black students at their institutions. Additional factors described by Taljaard-Plaut and Strauss (1988) include adapting from a traditional African to a modern western culture; from a rural to an urban environment; from being identified as a high achiever in a small community to being one of many such students; and leaving the closeness and support of extended families to live in impersonal and isolating residences. With the changes in the South African economic landscape and political dispensation, some black students are benefiting from these changes, whilst some white students are less privileged than before. It may well be that it is not only black students that are faced with some of the challenges. For instance, there are white students who come from Afrikaans medium high schools who attend English medium universities and vice versa, some of them also originate far from their universities. These students are expected to cope because they are supposedly from privileged backgrounds and attention is given to black students who are known to be obviously disadvantaged.

Physiotherapy training falls within the higher education band because it is provided by higher education institutions, and the university departments operate within the ethos of their institutions. Therefore, although the following discussion is mainly on access into higher education in general, it applies equally to access into physiotherapy programmes.

The National Policy on Higher Education finds its basis in Section 29 of the Final Constitution of South Africa (1996) which determines:

- the right to basic education
- equal access to education institutions
- instruction in a language of choice where it is reasonably possible
- the right to establish educational institutions of common culture and religion provided that there is no discrimination on the grounds of race.

In a formal sense, the South African Constitution obliges education authorities to ensure that democratic structures, education models and curricula are put in place. In a more informal sense it ensures that democratic values and tolerance are cultivated in schools, and that a change in attitudes is brought about (Venter et al, in press).

The National Plan on Higher Education is based on the policy framework and the goals, values and principles outlined in the Education White Paper. These were intended to develop a higher education system that would, amongst other things, promote equity of access and fair chances of success to all who are seeking to realize their potential through higher education, while eradicating all forms of unfair discrimination and advancing redress for past inequalities (White Paper 1997: 1.14).

The Plan addresses five key policy goals and strategic objectives which are central to achieving the overall goal of the transformation of the higher education system. These goals and strategic objectives are:

- To provide access to higher education to all irrespective of race, gender, age, creed, class or disability and to produce graduates with the skills and competencies necessary to meet the human resource needs of the country.
- To promote equity of access and to redress past inequalities through ensuring that the staff and student profiles in higher education progressively reflect the demographic realities of South African society.
- To ensure diversity in the organizational form and institutional landscape of the higher education system through mission and programme differentiation, thus

enabling the addressing of regional and national needs in social and economic development.

- To build high-level research capacity to address the research and knowledge needs of South Africa.
- To build new institutional and organizational forms and new institutional identities through regional collaboration between institutions.

Internationally, higher education has seen enormous growth in student numbers over the past two decades. The general perception has been that growth is appropriate and contributes to enhanced skills development for students, improved job and career opportunities, improvements in society, the economy and communities and a commitment to realizing the principles of life-long learning (Pascarella and Terenzini, 1998). In addition to this growth in participation rates, there has been an increase in international and national recognition that such growth brings with it challenges regarding access to and success in higher education, because students are increasingly coming from diverse educational, socio-economic, cultural, language and life experience backgrounds (Cliff, 2003).

Although, according to Gladieux and Swail (2000), internationally the roots of unequal educational opportunity are deep, the change in the racial composition of the student body in South Africa has been striking. According to the profile by Subotzky (2003), the enrolments of black students increased by 61% between 1993 and 1999, and African student enrolments increased from 191 000 to 343 000 (75%). Thus, in 1999, African students constituted 59% of the total head count enrolments in higher education. The institutional distribution of African students has also changed. In 1993 49% of African students were enrolled in the historically black institutions, 13% in the historically white institutions, and 38% in the two distance education institutions. This had changed by 1999 to 23% in the historically black institutions, 41% in historically white institutions, and 27% in the distance education institutions (Subotzky, 2003). Despite these changes there is nevertheless still a concern around the uneven spread of black students across different programme areas, in particular those which generate the highest levels of private benefits for graduates (National Plan for Higher Education, 2001). The available evidence (National Plan for Higher Education, 2001) indicates that African Black students remain clustered in the humanities, with low enrolments in science, engineering and technology, business/commerce, and in postgraduate programmes. The other concern is that even though matriculation pass rates have improved in recent years, the

throughput in higher education i.e. the number of students that go through a degree in minimum time remain low (Griesel, 2003). Given the vast disparities in provision and resources, the concern is that academic success or failure, reflect socio-economic inequalities and the legacy of apartheid rather than individual learners' intellectual ability or potential.

The significant changes that have occurred in both the race and the gender profile of the student body in the higher education system have not gone far enough. There are also wide disparities in the graduation rates of black and white students. The evidence suggests that the average graduation rate for white students tends to be more than double that of black students. The achievement of equity in relation to the composition of the student and staff bodies in higher education is one of the White Paper's central goals for the transformation of the higher education system. The importance of access to higher education in determining social and economic opportunity is demonstrated both by the fact that graduate unemployment is low, but also that graduates with a bachelors degree earn 125% more than people with only a matric (HSRC, 2000:c). The shift in employment distribution in favour of professional and managerial occupations between 1970 and 1995 has had a differential impact on the rate of employment of Africans and non-Africans based on educational qualifications. In this period, the employment of non-Africans increased by between 48% and 108%, while that of Africans remained constant. This difference is in part explained by the differing access of Africans and non-Africans to education in general and to higher education in particular. As the White Paper states, "equity of access must be complemented by a concern for equity of outcomes. Increased access must not lead to a 'revolving door' syndrome for students with high failure and drop-out rates" (White Paper 1997: 2.29). The launch of the National Plan for Higher Education in South Africa provided a framework and mechanisms for restructuring of the higher education system in order to achieve the vision and goals for the transformation (NPHE, 2001).

A further concern is that the selection practices and values of institutions may militate against increasing the access of Black and women students to particular fields of study, especially in science, engineering and technology programmes. This can be illustrated by the fact that the Government has found it necessary to send Black students (over 200 to date) to Cuba to be trained as medical doctors. Why could they not have been placed in South African medical schools?

The answer may be found in the fact that the admissions requirements of most South African medical schools are largely targeted at the academically qualified applicants rather than at attracting those who have the potential, but have not had the opportunity to *develop* academically because of the poor state of schooling in black communities. Moreover, the evidence suggests that a large number of students currently receiving training in medical schools leave the country soon after graduating. This suggests that the values and practices of some medical schools may be at variance with the values, principles and broader objectives that underpin the transformation agenda in higher education and the needs of the country.

Despite challenges, there are students who complete their degree either in minimum or extended time. The question is again: how have these students managed to succeed if academic and non-academic challenges exist?

1.6 SUCCESS IN PHYSIOTHERAPY PROGRAMMES

Black physiotherapists are underrepresented in the profession as illustrated by the national completion rate in Tables 1.4 and 1.5 (hereunder).

Table 1.4: Physiotherapy Graduates (2000-2005)

Year of graduation	No. black graduates	No. other graduates	Total graduates
2000	37 (23%)	125	162
2001	35 (16%)	186	221
2002	33 (12%)	249	282
2003	31 (10%)	269	300
2004	39 (17%)	186	225
2005	35 (15%)	203	238
TOTAL	**210 (15%)**	**1218**	**1428**

Source: HPCSA Register (2006)

Over a period of 6 years (2000 –2005) 1428 physiotherapy students have graduated. Of these students only 15% are black students. This figure corresponds with the low intake and moderate success of African Black students (refer Tables 1.1 and 1.2).

Table 1.5: Black Physiotherapy Graduates per University (1998 – 2004)

Year	Wits HWU	UCT HWU	UWC HCU	UDW HIU	US HWU	UP HWU	FSU HWU	MEDUNSA HBU
1998	1	1	5	1	0	0	0	14
1999	2	5	8	6	0	0	0	13
2000	1	2	5	7	0	0	2	20
2001	2	3	3	4	0	2	0	20
2002	3	1	4	7	0	3	0	18
2003	5	3	1	11	0	1	0	16
2004	0	0	0	2	0	0	0	4
	14 (7%)	**17 (8%)**	**26 (12%)**	**38 (18%)**	**0 (0%)**	**6 (3%)**	**2 (1%)**	**107 (51%)**

Source: HPCSA Register (2006)

HCU: History Coloured University

HIU : History Indian University

According to the figures in Table 1.5 the majority (51%) of the African black graduates studied at MEDUNSA which is an HBU. All the HWUs have graduated less than 10% over the six years.

The representation of blacks in the physiotherapy profession may not only be linked to admission concerns, although according to McKenzie and Clayton (1994), black students in South Africa have consistently under-performed in matriculation, and therefore the pool for selection is smaller. Badenhorst et al (1990) points to various detrimental non-academic experiences of black students particularly at predominantly white universities. These experiences include subtle racism, feelings of alienation, socio-political influences and concrete problems regarding finances. Although there are these negative experiences they do invariably lead to failure since there are students who are able to overcome these and succeed in their studies. Some of the factors that assist students in general include adequate financial support, family support, personal attributes, knowledge about physiotherapy and positive experiences at university (Mbambo, 2005).

Although the major responsibility lies with students to succeed in their studies, the universities also have a responsibility towards the students. Strategies that are used by universities to select students into physiotherapy and to improve throughput should reflect factors that are likely to assist students to succeed. Tinto (2002) suggested four conditions

for student retention which are under university control and can be changed if the universities so wish. These include:

- Institutional commitment, i.e. willingness to invest the resources and provide the incentives and rewards needed to enhance student retention.
- Student support including developmental education courses, tutoring, study groups, counselling, mentoring and ethnic student centres.
- Student involvement, i.e. academic and social integration.
- Learning i.e. the more students learn and the more value they find in their learning, the more likely they are to stay and graduate.

Other specific retention strategies to retain more students of colour in higher education have been recommended by a number of educators, researchers and policy makers in America (Opp, 2002). These retention strategies involve a wide variety of programmes, policies and practices, including tailored financial programmes and policies (Parker, 1998); tutorial programmes (Levin and Levin, 1991; Sherman et al 1994) development of reporting systems for identification and tracking (Sherman et al 1994; Parker, 1998); cultural workshops and awareness efforts; ethnic studies courses, creation of offices or coordinators for minority affairs (Parker, 1998); and support of minority student organizations (Rooney, 1985; Pincus and DeCamp, 1989; Richardson and Skinner, 1992; Lavant and Terrell, 1994; Parker, 1998).

Highlighting various factors that influence physiotherapy students' education in general and black students in particular, and their role or relationship to the success of completing the degree in minimum time, formed the basis for this research. The research therefore studied success from the perspective of successful students.

According to a Nexus search, no empirical study has been conducted in South Africa to identify and analyze non-academic factors that influence programme completion of Black students in physiotherapy programmes.

1.7 PURPOSE OF THE STUDY

The purpose of this study was to establish factors that might predict completion of the physiotherapy degree in a minimum time of four years or up to four and a half years.

1.8 OBJECTIVES

- To establish factors which predict successful completion of the physiotherapy degree by black students.
- To determine whether the established factors that predict success are similar for black and white graduates.
- To define academic success from the student's perspective.
- To determine graduates' perception of factors which contribute to success or lack thereof.
- To determine physiotherapy academic leaders' perception of factors that contribute to student success or lack thereof

1.9 SIGNIFICANCE OF THE STUDY

Students' poor academic performance has been studied from the perspective of what the students do not have or what they fail to do. In that sense, students' academic performance is solely put on the students' shoulders, yet there are other responsible role players notably the culture of the university both academic and cultural, family and social environment. Institutions of higher learning are under pressure to change demographics of their student populations and to improve throughput of black students. In a bid to enforce the latter, the Department of Education's funding formula has changed to focus on throughput and not enrolments as was previously the case. However, admission policies are still a challenge as there are not enough black matriculants with good to excellent results, and therefore criteria are modified in order to change the demographics.

In order to improve the throughput of physiotherapy students who enter with lower academic ratings, universities must take cognisance of issues and factors that are likely to disadvantage and compromise students in general and previously disadvantaged black students in particular. The lecturers in the physiotherapy departments must also be aware of the factors that contribute towards successful completion of the degree, so that strategies are formulated to ensure an increase in the number of African black students who successfully complete the physiotherapy degree.

1.10 STATEMENT OF THE PROBLEM

The low number of black physiotherapy admissions figures as compared to their white counterparts is concerning. The intake is particularly low at the HWUs and it does not seem to be improving. Annual reports submitted to the Physiotherapy, Podiatry and

Biokinetics Professional Board confirm this problem. In preparing the National Human Resource Plan for Health (NHRPH) (2005), the Department of Health requested training statistics from physiotherapy departments in universities. These statistics confirm the low admission of African black students and even lower graduation rates. The problem of low graduating students is further compounded by high drop-out rates and extended time of qualification. Anecdotal evidence from the different universities suggests that the period taken by an average black student to complete a four year programme is five years or longer.

Although there is a low intake and graduation of black physiotherapy students, there are African black students who complete the physiotherapy degree in minimum time despite having disadvantaged educational and socioeconomic backgrounds. What are the factors that enable these students to succeed? Can these factors be used to predict academic success? What do we need to do to support those at risk?

1.11 RESEARCH QUESTIONS

What are the factors that may predict completion of the physiotherapy degree within the minimum time by African black students? Would these factors be applicable to white students or are they unique to black students and which of these factors are amenable to intervention and change? What perspectives do graduates and lecturers have regarding academic success?

1.12 OPERATIONAL DEFINITIONS

Access: Freedom or ability to obtain or make use of. For the purposes of this study, access refers to the ability of students to obtain admission to study physiotherapy.

African Black: This term refers to indigenous black people. For the purposes of this study, 'black' refers to this population group

High School education: This is the level of education which starts from Grade 8 and ends in Grade 12 at the end of which a national examination is written for students to qualify for tertiary education.

Historically Black Universities: Universities that were set up exclusively for African Black students and were set mainly in rural areas, serving regional tribes.

Historically White Universities: Universities that were set up exclusively for White students. Permission for Black students to study in these universities was obtained from the Minister of Education and was granted only if the student wanted to study for a

course that was not offered at Black Universities and if they were allowed by law to study for that particular degree.

Matriculation (or **matric**) is a term commonly used in South Africa to refer to the final year of high school and the qualification received on graduating from high school refers to the minimum university entrance requirements.(Wikipedia)

Throughput: Output relative to input or the amount passing through a system from input to output. For the purposes of this study, throughput refers to the number of students that study for the physiotherapy degree and complete it.

Success: In this study success refers to a favourable or desired outcome. For the purposes of this study, success refers to the completion of the physiotherapy degree within minimum time i.e. 4 years or 4.5 years (see footnote 3).

Unsuccessful: In this study unsuccessful refers to an undesired outcome. For the purposes of this study, unsuccessful refers to the completion of the physiotherapy degree in **more than** the minimum prescribed time. It would have proved difficult to trace the students who did not complete the degree and therefore the differentiation was made using the number of years taken to complete the degree.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter the literature that is relevant to this study will be presented in three categories, namely access to higher education, academic success, and predictors of success. Physiotherapy departments operate within institutions of higher education, therefore whatever policies or challenges that these institutions have to deal with, physiotherapy departments are implicated. The body of knowledge of higher education will therefore be discussed to locate the framework within which the physiotherapy discipline operates.

The literature presented here is of studies done in different countries and therefore different terminology and abbreviations have been used. For clarity, the following is the list of terminology used and abbreviations:

- **ACT** : American College Test (USA)
- **FETC** : Further Education and Training Certificate (South Africa)
- **GCSE** : General Certificate of Secondary Education (England)
- **GPA** : Grade Point Average (USA)
- **MCAT** : Medical College Admissions Test (USA)
- **NBME** : National Board of Medical Examiners (USA)
- **NCQ** : Non-cognitive Questionnaire (Tracy and Sedlacek, 1984, USA)
- **NSC** : National Senior Certificate (South Africa)
- **SAT** : Scholastic Aptitude Test (USA)

The education sector in South Africa has to respond to issues of broadening access to give all students who qualify for entry into higher education an opportunity to achieve the vision and goals of transformation. Access to higher education therefore is relevant to this research because it has implications for success. For students with the potential to succeed academically, they must have been afforded the opportunity to access an institution of higher education in order to exercise their abilities to learn. On the other hand, lowering academic and/or using non-academic criteria entry criteria to broaden access must be accompanied by efforts from the institutions to address the academic deficit if academic success is to be attained.

This study is about academic success of students in physiotherapy and predictors of that success. Literature on academic success and predictors of success that is presented here is key to the interpretation and discussion of the outcomes of this particular study.

The databases that were used to search for the literature were Pubmed, Nexus, ProQuest, JSTOR, and other articles were hand sorted.

- Key words: physiotherapy education, predictors, academic success, higher education, Black students

The literature that is presented covers 27 years of research (1980-2007). The reason for including older literature is to illustrate the fact that prediction of success is a long-standing issue for debate. Furthermore, it is to illustrate that the issues of racial discrepancy in access and success in education also have a long history, in other countries as well as in South Africa.

2.2 HIGHER EDUCATION AND ACCESS

Although this study is not directly evaluating issues of access into higher education, it is important to define and discuss access as it is the first step towards academic success. The following paragraphs define access, and address the challenges and national and international debates pertaining to access.

Access refers to the overall representation of a given population of interest in Higher Education (Tonks and Farr, 2003) and it reflects both opportunity and exclusion. Strydom (2002) defined access to higher education as providing learners with the possibility of gaining access to educational institutions where high quality education and training is provided, preparing them for the world of work. Human potential development and true capacity development can really only take place if access is defined also in terms of access to full administrative support, full learner support services and full opportunity to access technology, lifelong learning and success (Ratangee, 2007). In other words, access has to be seen as full exposure to the opportunity to add value to students' learning experiences.

Access is a complex issue, resulting from several factors such as special groups that compete for access opportunities, continuous changes in societal needs, and political pressures that impact on policy. In South Africa, access to higher education is one of the

priorities of the National Plan on Higher Education. It is central to policy debates throughout the world and manifests itself in a multitude of interventions (Osborne, 2003). According to Tonks and Farr (2003), widening access to higher education for those who have been disadvantaged for reasons of socio-economic position, race and ethnicity, gender, disability or geography has been a major topic of debate since the mid-1990s in a number of European countries. In the United Kingdom, access to higher education is a significant public policy issue where intentions of government are usually articulated in terms of social justice, equality of opportunity and economic prosperity at levels of both the individual and the nation (Tonks and Farr, 2003).

There are many access challenges facing higher education institutions. Most institutions of higher learning use the conventional school leaving certification as a criterion for selection. According to Cliff (2003), when that certification is used as a sole criterion there is a serious possibility of excluding some talented students who have not had adequate opportunity to demonstrate their potential for higher education. However, another side of the debate is that the decision to accept a student into a medical programme presents a major challenge for all members of the medical school community (Höschl and Kožený, 1997) because the quality of students influences the school's reputation.

Most higher education institutions in the United Kingdom have been involved in increasing participation generally for students over the past decade (Walker, Matthew and Black, 2004). Although the numbers have increased over this period, there are concerns (Hutchings and Archer, 2001; Thomas, 2001) around the continued under-representation of the lower socio-economic groups. In its final conference report, UNESCO (1998) made it clear that access to higher education for members of some special target groups such as indigenous peoples, cultural and linguistic minorities, disadvantaged groups, people living under occupation and those who suffer from disabilities, must be actively facilitated. Special help and educational solutions can help overcome obstacles that these people face, both in accessing and in continuing higher education (UNESCO 1998b: Article 3(d): 22). However, particular significance within the international literature is that while there has been rapid expansion in higher education numbers, this has not resulted in parallel increase in participation by underrepresented groups (Osborne, 2003). In fact, in virtually every country of the world, participation in higher education is closely associated with socioeconomic status (Gladieux and Swail, 2000).

In South Africa, there are many reasons why universities have to take seriously the issue of fair access to higher education (Ratangee, 2007). The implementation of a National Senior Certificate (NSC) and the Further Education and Training Certificate (FETC) Vocational, which replace with the current Senior Certificate (SC) and the matriculation endorsement as an entry requirement to university, has prompted the need for universities to look for new access practices (DoE, 1997; Strydom, 2002). Such practices must take into account the introduction of enrolment capping across the higher education sector in 2005 which has put a new emphasis on throughput rates as part of public higher education funding (Badsha, 2004). In order to address these issues, universities should develop their own access tests and identify alternative methods of predicting academic performance that can be utilized as interim and future measures (Yeld, 2003). This study is an attempt to add to the body of knowledge that will inform these alternative methods of predicting success in general and in physiotherapy in particular.

Most of the physiotherapy departments in South African universities, particularly those in HWIs, apply various admissions criteria to assist entry of previously disadvantaged African students (HPCSA annual reports), yet no studies specific to African students have been done to establish the impact of these criteria on student success. Sedlacek et al (1990) ask a pertinent question in this regard: In selecting students into a degree programme, why should we do anything differently for Black applicants and students? To answer this question, Sedlacek et al (1990) use Sternberg's context on intelligence (1985) in which he proposes that there are three types of intelligence namely, componential, experiential and contextual. Componential intelligence is the ability to interpret information hierarchically and taxonomically in a well-defined and unchanging context. People who do well on standardized tests used as selection criterion have this type of intelligence. It is seen as particularly relevant to ability to perform in the early, more didactic parts of a medical curriculum. Experiential intelligence involves the ability to interpret information in changing contexts; to be creative. Standardized tests do not measure this type of intelligence. It is seen as important in the later parts of the medical curriculum, in the integrating and synthesizing that comes with clinical and professional work. The third type is contextual intelligence. It is the ability to adapt to a changing environment, the ability to handle and negotiate the system. Sedlacek et al (1990) believe that an admission committee must try and assess these three areas for all applicants. However, traditional admission systems have tended to concentrate on measures of componential intelligence. They make a case that due to lack of attention to

minorities in the society and educational system, minorities have had to develop and show abilities in the experiential and contextual intelligence areas in ways that non-minority applicants have not had to demonstrate. Most Black South African students who take longer to complete or are excluded from physiotherapy programmes due to poor academic performance, experience academic difficulties in the first two years of study, but mainly in the first year (HPCSA Academic Records). These are the parts of the curriculum which are more didactic and require componential intelligence. Morris and Farmer's study (1998) confirms this observation because it revealed that the cognitive predictive strength for academic performance of physiotherapy students weakened progressively in the clinical years.

2.3 ACADEMIC SUCCESS

Universities must understand that the implications of offering access to non-traditional students does not end but rather begins at the point of entry (Ratangee, 2007). This means providing sustained support to students throughout the course in relation to the external and internal factors that affect the learning process and ultimately success. Fuetrie (2002) described higher education in France as a system that is relatively easy to enter but one within which it is relatively difficult to succeed. It would seem therefore that the issue of academic success is not unique to South Africa.

The following sections define academic success and also address the predictors of success, more specifically, non-cognitive predictors of academic success.

Researchers have tried to determine what it is that students do 'wrong' that leads to failure in college or departure from college (Padilla et al, 1997). A number of researchers has examined the issue from the angle of successful students (Hurtado, 1994; Rendón, 1994; and Gándara, 1995) but much more is still to be learned about what students do 'right' that leads to graduation from college (Padilla et al, 1997). This study took the approach of primarily investigating what students do right that leads to completing their degrees in minimum time.

How would one define academic success? Past research in the occupational literature has led to the integration of the terms 'career' and 'success' to refer to objective and subjective elements of achievement and progress of an individual through the vocational lifespan (Judge et al,1995 and Melamed, 1996). Objective career success has been measured in terms of society's evaluation of achievement with reference to extrinsic

measures such as salary and managerial level (Melamed, 1996). In contrast, subjective career success has been measured in terms of the individual's feelings of success with reference to intrinsic measures such as perceptions of career accomplishments and future prospects (Ayree et al, 1994). Strydom (1996) defines academic success as a situation where learners progress and adjust competently in a specific context according to their specific needs and abilities, thereby maximizing their learning development. Ellis and Worthington (1994) and Scheuermann (2000) further define academic success as successful students that have learned to effectively manage the academic and social demands of university, that are expected to succeed, and may be described as socially proficient, intrinsically motivated and goal oriented. The present research deems a participant as having achieved academic success if (s)he obtained the physiotherapy degree in minimum time.

If one takes Ellis and Worthington's (1994) and Scheuermann's (2000) definition it means that for students to successfully navigate at university they require accurate maps, often maps that are created along the way as much as they are defined by those who led the way. This process is especially tricky for students engaged with institutional cultures quite unlike their own. For these students, prior achievement seems to be a key to successful navigation (Hoffman and Lowitzki, 2005). Some researchers (Tracey and Sedlacek, 1987; Throgmorton, 1999) have suggested that the key to success for students of colour is finding means to apply academic skills in unfriendly environments (Hoffman and Lowitzki, 2005). However, from the perspective of students of colour, having a critical mass of other students of colour within their academic setting is important for their own academic success (Ulloa and Herrera, 2006). Other students (Yan and Gaier, 1994) attribute academic success first to their efforts, then to ability, strategies and finally to luck.

Yorke and Thomas (2003) suggest that there is no simple blueprint for success, but there are several factors that could, contribute to improved rates of retention of students from under-represented groups. They identified the following factors that they deemed likely to have positive impact on retention and students' subsequent success:

- An institutional climate supportive in various ways of students development, that is, perceived as 'friendly';
- An emphasis on support leading up to and during the critically important first year of study;

- An emphasis on formative assessment in the early phase of programmes;
- A recognition of the importance of the social dimension in learning activities; and
- Recognition that the pattern of students' engagement in higher education was changing, and a preparedness to respond positively to this in various ways.

Cliff (2003) supports Yorke and Thomas (2003) by postulating that there seem to be two major sets of insights into what makes students engage successfully in higher education:

- Factors influencing success are a complex blend of cognitive, affective, motivational, dispositional, socio-cultural, economic and institutional variables; and
- The changing characteristics of student bodies worldwide have highlighted the need to better understand the complex relations between student and institutional characteristics and success.

Thus it is evident that both cognitive and non-cognitive variables contribute and are indicators of academic success.

2.4 PREDICTORS OF ACADEMIC SUCCESS

Why should there be a concern about predicting academic success? Riordan (2002) highlights the following reasons as to why the prediction of academic success is important:

- Inappropriate admission can lead to costly problems for universities and students
- Inadequate initial evaluation can result in failure to provide learners with support and appropriate curriculum design, enhancing the possibility of poor graduation rates.
- An understanding of the variables contributing to academic success will allow universities to understand which type of students are likely to be successful in graduating within the expected 3 – 4 years of studies.

Extensive research has been done worldwide on prediction of success, particularly in the USA. There are studies (Ting, 1997; Ting and Robinson, 1998; Ting, 2000; Strage, 2000; Huysamen, 2000; Hu and St John, 2001; Hoffman and Lowitzki, 2005 and Thompson et al, 2006) which have studied racial differences in prediction of success, and some (Boyle, 1986; Sedlacek and Prieto, 1990; Kegel-Flom, 1990; Calkins and Willoughby, 1992; Reede, 1999) have researched predictors of success of black and minority students.

Some researchers (Tracey and Sedlacek, 1984 and1989;Padilla et al, 1997; Landsman, 2000; James and Chilvers, 2001; Guffey, Farris, Aldridge, Thomas, 2002; DeAngelis, 2003; Lynch, 2006) have specifically studied both cognitive and non-cognitive variables as predictors of success. A limited number of studies on predictors of success in physiotherapy have been found (Balogun, 1986; Morris and Farmer, 1998 and Guffey et al, 2002). Most of the above mentioned studies examined the validity of entry requirements in predicting the performance of students in medical school.

Boyle (1986) reviewed literature to investigate the best predictive combination of variables for success by comparing black and non-black minorities. He concluded that cognitive attributes e.g. reading tests, mathematical skills and study skills, showed predictive relationships that are critical to academic success among minorities, but that variables interfering with programme completion needed to be explored. Calkins and Willoughby explored (1992) both cognitive and non-cognitive variables that relate to the successful completion of a degree. They compared black students to non-minority students and predictors of graduation for black students were found to be parents' level of education, admission test score, self-evaluation, and average vote of selection committee members. Their results supported the inclusion of non-cognitive information when considering black applicants for medical school. Reede (1999) agrees with these findings in arguing that admission to medical school should not be based solely on Grade Point Average (GPA) and Medical College Admission Test (MCAT) scores because these offer no measure of extremely important non-cognitive attributes but measure componential intelligence (Sternberg, 1986). He bases this argument on the fact that no correlation exists between GPA and MCAT scores and achievement in the clinical years during postgraduate training and as physicians after qualification.

In the search for predictors of academic performance during the past 20 years, considerable effort has been devoted to finding indicators of the applicant's potential (Höschl and Kožený, 1997). These indicators have included cognitive abilities, high school grades, personality traits, letters of reference and socioeconomic data. Correlation matrices have been developed using linear and stepwise multivariate regression to show predictive ability of these indicators.

2.4.1 **Cognitive Predictors**

In South Africa matriculation results continue to be the single best cognitive predictor of university success for White students. This is especially so in the cases that fall in the

top range of scores, but in lower range scores this relation begin to break down (Griesel, Bradbury and Craig, 1993; Strydom, 1996).

Hoffman and Lowitzki (2005) have established that in the USA there is a significant body of literature that shows that both high school GPA and scores on standardized tests such as the Scholastic Aptitude Test (SAT) or American College Test (ACT) are generally strong predictors of student success in college for students of all races (Moffat, 1993; Ramist et al, 1993; Waugh et al, 1994; Wolfe and Johnson, 1995; Tross et al, 2000; Fleming, 2002; Kim, 2002; Zheng at al, 2002). This approach may be justified because it is important to bear in mind the level of competence or cognitive level with which students enter higher education (Ratangee, 2007). However, there is evidence that predictive strength of test scores and high school grades for academic achievement in college weakens for several minority groups (Moffat, 1993; Hoffman, 2002; Nettles, Theony, Gosman, 2003).

Extensive research has been done on academic success of minority students in general (Sedlacek and Prieto, 1990; Hoffman and Lowitzki, 2005) and Black students in particular (Dell and Haplin, 1980;Johnson, Lloyd, Jones and Anderson, 1986; Ting and Robinson, 1998; Huysamen, 2000; Thompson et al, 2006).

This research has been conducted mainly on specific university and levels of study. When it has been done on professional degrees, a lot has been done in medicine (Johnson et al, 1986; Mitchell, 1990; Hojat et al, 1993; Höschl and Kožený, 1997; Reede, 1999; James and Chilvers, 2001; Ferguson, James and Madeley, 2002) with some work done in the nursing profession (Dell and Haplin, 1980; Wilson, 1999). Extensive search on physiotherapy research on minority or black students yielded no results.

Johnson et al (1986) conducted a study at a predominantly Black medical school to examine the validity of the MCAT, undergraduate GPA and ‘competitiveness’ of undergraduate college in predicting performance of students. Performance measures that were used were course grades of all four years of medical school, and scores on both Part I and Part II of the National Board of Medical Examiners (NBME) test. MCAT scores at this black school had a somewhat lower validity in predicting NBME scores compared with other schools. Of the six MCAT subtest scores, skills analysis in the reading sub-category had the highest correlation with first year grades. Dell and Haplin

(1980) conducted a study of black nursing students. The discriminant analysis that they performed showed that SAT verbal and quantitative scores and National League for Nursing Pre-Nursing Examination scores differentiated between dropouts and graduates. Earlier studies elsewhere had found standardized test scores to be significant predictors of academic success (Mazzoli, 1982). However, other researchers (Scott, Chase, Leftkowitz, Morton-Rias, Chambers, Joel, 1995; Agho et al, 1999) raised concern regarding the validity of the SAT or similar standardized test scores in predicting the academic success of minority students.

Two recent studies show that test scores predict academic achievement better for black students, especially black men, who attend historically black colleges and universities (Fleming and Garcia, 1998; Fleming, 2002). Several authors have suggested that black students become more involved and thus more successful in HBUs (Allen, 1987; Wagener and Nettles, 1998). Hoffman (2002) found that co-curricular involvement had a strong positive effect on academic achievement and retention of black students.

Morris and Farmer (1998) conducted a study to investigate the predictive strength of entry grades and biographical factors on the academic and clinical performance of three student cohorts in the physiotherapy course. Student data were used for this investigation. Three variables were considered i.e. General Certificate of Secondary Education (GCSE), university entrance examination grades and biology grades. The GCSE average and A level biology had strongest predictive strength of success. There were very few significant correlations with two clinical scores, and those present were only weak to moderately strong.

Huysamen (2000) conducted a study on the validity of matriculation results and university performance as predictors of post-first-year performance. He found that for both white and black students, first year percentage marks were better predictors of subsequent performance than were matriculation results. In South Africa the majority of educationally disadvantaged students achieve results in the lower ranges of the Senior Certificate. It is therefore neither helpful nor fair to base admissions decisions only on school-leaving results (Ratangee, 2007).

2.4.2 **Non Cognitive Predictors**

The issue of non-cognitive predictors of success dates back to the 1970's. According to Wiltse, Kruppa and Lindgren (1979), cognitive measures alone have been shown to

account for about half the variance in academic performance, leaving a considerable amount unexplained. Subsequently Sedlacek and Tracey (1984 and 1989) and others studied psychosocial factors to establish whether they would predict academic success.

The following literature illustrates some of the research that has been done on non-cognitive predictors of success.

2.4.2.1 **Finance and parental education**

Student financial issues have frequently been identified as a barrier to completion, especially by students from lower socio-economic groups (Ozga and Sukhnandan, 1997; Yorke et al, 1997; Yorke, 1999; Dodgson and Bolam, 2002). In South Africa, Landsman (2000) conducted interviews to establish factors perceived by black students as affecting their success or failure in a specific discipline. The students cited financial difficulties, relations between white and black students, violence and crime in the community, and individual differences such as confidence and language as obstacles facing black students. The students also highlighted that most black students are distracted by financial difficulties, which ranged from paying tuition fees to being able to afford to eat. Ting and Robinson (1998) also found that parental education and need for financial aid were related to students' academic performance in the first year of college. Strage's (2000) study is in contrast with that notion in that his study revealed that the advantages of financial influence, parental education and prior experience with college did not seem to help students develop greater confidence nor did they appear to help students to be more persistent and task-involved in their approach to academic challenges.

2.4.2.2 **Personal experiences**

In a study in which second year medical students had to respond to a set of nine psychosocial questionnaires as predictors of academic performance, Hojat et al (1993) noticed that fewer stressful life events, less anxiety, less loneliness, less externality in locus of control, and more sociability contributed significantly in predicting the ratings of the students' clinical competence.

Sennett et al (2003) found that typical painful events or experiences of university students included death or illness of parents, family members or friends; breakups of relationships; discord or conflict in relations; family problems; and financial stresses, most often relating to home. In further analysis of the relationship between race and the reporting of painful experience, they found significantly more African black students who

reported having had a painful event or experience. A significant relationship was also found between reporting a painful event or experience and having felt like dropping out of university during the course of the year, and also with average grade marks.

Padilla et al (1997) used the expertise model of successful college students (Padilla, 1991and 1994) to develop a local model of successful ethnic minority students at a large research university. They sought to identify the campus-specific heuristic knowledge and actions that successful minority students employ to overcome barriers to academic success. The expertise model suggests that successful college students are those who are in effect 'experts' at being successful students at a specific university. 'Expertise' is a function of knowledge, which comprises theoretical and heuristic knowledge (Harmon and King, 1985). Theoretical knowledge is book knowledge learned through course work and formal study, whereas heuristic knowledge is necessary to function competently on campus and is locally defined and acquired experientially. Overall, heuristic knowledge is not acquired systematically, and such knowledge therefore does not reach many students effectively. Matrices were used to collect data from 28 students. In defining and describing success, the participants were instructed to think about a successful student at the institution, someone who had completed a degree or was making satisfactory progress toward that end. Data were collected on the barriers, frequency of occurrence, knowledge and action taken by the students to deal with the barriers. The matrix produced four categories of barriers: discontinuity barriers (obstacles hindering a smooth and continuous transition from high school to college), lack-of-nurturing barriers (absence of supportive resources needed to facilitate the adjustment and development of minority students), lack-of-presence barriers (absence of minorities in the curriculum, in the university's programmes and in the general university population of students, staff and faculty), and resource barriers (lack of money and difficulties associated with financial aid system). Actions taken by successful minority students included: building a support base by joining clubs related to the students' ethnic background; promoting independence by making their own decisions; acting as informed consumers; creating a supportive 'family' on campus; attending ethnic events; seeking out nurturing persons; using resources such as tutors and mentors; making themselves known on campus; developing academic skills; networking with people with knowledge of the financial aid system; planning on time to star the financial aid process; preparing well in academic work in order to be eligible for scholarships.

2.4.2.3 **Psychosocial factors**

Tracey and Sedlacek (1984) designed a non-cognitive questionnaire (NCQ) to assess psychosocial aspects that influence college success. These researchers (Tracey and Sedlacek, 1989) subsequently validated this in a study which revealed eight factors that appear to enhance student academic success. According to their findings, students are more likely to succeed in college if they (a) have a positive self-concept with knowledge about personal strengths and weaknesses; (b) adopt a realistic self-appraisal system and are open to feedback; (c) understand the role of society in their lives and can cope with racism; (d) prefer long term goals to short-term or immediate goals; (e) have received support from a strong person when needed; (f) are successful leaders on campus; (g) demonstrate on-campus and off-campus community service; (h) equip themselves with knowledge and unusual culturally-related ways to study in a field.

Ting (2000) found literature that found the NCQ to have effective predictability of academic performance and student retention for different student populations: Asian Americans (Fuertes et al, 1994), African Africans (Boyer and Sedlacek, 1988; Sedlacek and Adams-Gaston, 1992), Hispanics (Fuertes and Sedlacek, 1995), white and African Americans (Ting and Robinson, 1998; Tracey and Sedlacek, 1984, 1985, 1987) specially-admitted students (White and Sedlacek, 1986;Ting, 1987;) and low-income and first generation students (Ting, 1998).

Having applied the NCQ to Asian American first year students, Ting (2000) found that those students who have a realistic self-appraisal system tend also to understand their minority situation, recognize the social environment of the campus and understand ways to work through the existing system. Therefore they are more likely to remain on the same campus. Demonstrated community service was another indication for student retention and academic performance. In earlier studies (Sedlacek and Prieto, 1990, Hojat et al 1993 and Reed, 1999), minority students' medical grades and scores on the NBME are predicted more accurately by non-cognitive measures than by traditional cognitive measures, and prediction of academic performance in medical school is significantly increased when non-cognitive factors were included with traditional cognitive measures. When applied to physiotherapy (Guffey et al, 2002) however, the total score of these non-cognitive variables was not a significant predictor of success on the licensing examination. They concluded that the total score should not be used in making admission decisions if the intent of the admissions decision is to select students who will perform well on the physical therapy licensing examination.

2.4.2.4 **Career choice/development**

Career development is a process an individual has to follow not only for the sake of choosing and holding a career but also a lifestyle. Several longitudinal studies on reasons for career choice amongst physiotherapy students have been conducted over the years in Canada, Sweden and recently South Africa, (Ohman et al, 2001; Ohman et al, 2002; Mbambo, 2002). These studies have highlighted some of the major reasons for career choice. These include, job accessibility; a desire to help and work with people; an interest in sports and athletic injuries and previous knowledge of the profession, (Ohman et al, 2001; Ohman, et al 2002; Mbambo, 2002).

Career training matures with age and continues throughout life but is already a concern by the time an individual enters high school. , However, most high school students are still unclear about the skills and abilities needed for their prospective professions (Kallus et al, 1999). Feldman (2003), as cited in Miers et al (2006) found that in comparison with earlier generations, young adults in the twenty-first century are delaying making career decisions and are comfortable switching career paths and fields of study. Due to people maturing and developing identities they develop interests that are broad at an early stage of their lives. This process continues by becoming narrower and more career-specific; for example people who first choose nursing or medicine as an indication of their medical interests, but closer to entering university might decide to do occupational therapy or physiotherapy (Miers et al, 2006).

Pearl's (1990) study provides evidence that qualified physiotherapists are primarily motivated by salary and this, in future, might hinder academic performance of physiotherapy students if it continues. Career choices do, however, have barriers that affect the decision making process. Lent et al (2002) found that financial concerns, negative social or family influences and role conflicts were external barriers to success in career choice or development. This is probably why the physiotherapy students themselves find the salary to be a vital part of their motivation for their career choice (Park et al, 2003). Bodfish (2005), in his study of students majoring in process technology, found that the top five factors that students considered when making career choices were: (1) finding a job with good benefits, (2) finding a job that pays well, (3) seeking jobs in a growing industry, (4) choosing fields with plentiful job openings and (5) finding jobs with opportunity for promotion. Other influencing factors included work environment, work schedules and location of workplace. Location, together with salary were the two factors that ranked the highest in job selection in another study, followed by

job benefits, working in a private practice setting and room for personal growth. Physiotherapy and midwifery students frequently mentioned professional values and rewards as important factors (Miers et al, 2006). Internal barriers were adjustment difficulties and ability limitations.

Students or practicing health professionals who are misplaced in their professions because of wrong career choices will often find themselves suffering dissonance, high anxiety or both, (Hardigan and Cohen, 1998). This in turn will affect their work motivation and efficiency.

Lastly, a factor that often attracted students to choosing physiotherapy as a career was high levels of teamwork (Park et al, 2003). Variety of work content, control over working arrangements, support from other staff members and high levels of teamwork were therefore among the main attractions of physiotherapy, demonstrating that the opportunity to work with other professionals in a multi-disciplinary setting is something that is found to be desirable to prospective physiotherapists.

2.4.2.5 **Selection criteria/admissions policies**

Unlike other allied health professions, physiotherapy courses are usually over-subscribed. However there are larger classes during the first year of study compared to graduation class size, which is indicative of a problem with the retention of students. Work undertaken on recruitment, retention and return has not related the findings to the relevant social circumstances (Park et al, 2003).

In South Africa, selection criteria for entrance into physiotherapy vary between universities; however, one standard remains consistent: the universities (and therefore physiotherapy departments) evaluate past academic performances as likely predictors of future success in physiotherapy programmes. Common criteria for evaluation of academic success include matriculation aggregate symbol (MAS) with mathematics, physical science and biology as desirable subjects. The acceptable symbols obtained in these subjects vary from university to university, but on average no less than a C symbol in each is accepted. However, to allow access for black students into the programmes, different universities have additional criteria that are considered for entry. These may range from accepting lower symbols to extending the curriculum to a minimum of 5 years instead of 4 years. This is also the case in the USA where admission requirements and selection processes for education programmes in the health sciences have focused on cognitive academic variables such as GPA, science GPA and standardized test scores

(Guffey et al, 2002). Extensive research has been done in the USA and UK to test the correlation of the admission criteria with completion of a degree but very little has been done on physiotherapy specifically.

In physiotherapy, correlation between selection criteria and performance in physiotherapy education has not been fully explored for prediction of academic success. Studies done in South Africa which are specific to physiotherapy were conducted on students at MEDUNSA by Mokoena (1997) and Mothabeng (1998) to establish the correlation between matriculation results and successful completion of a physiotherapy degree. Both these studies found no correlation between matriculation results and successful completion of the physiotherapy degree. However South African studies on selection and admission to higher education (Badenhorst et al, 1990; Skuy et al, 1996) support the theory that the strongest single predictor of success at university is the aggregate score on the school leaving examination. Unfortunately, these studies fail to examine either gender or race (Dawes et al 1999). In addition, these studies focus on specific university courses, and are therefore unsuitable for making any generalization in terms of professions. In the few cases (Badenhorst et al, 1990; Schochet, 1985) where race was examined, the number of students other than white in the sample was extremely small. However, where the number of black students was significant (Badsha et al, 1986), the results point to a complex relationship between school-leaving examination and success at university.

A number of studies have been conducted in other countries in the physiotherapy profession with regard to the correlation between entry grades and academic performance at university level. In 1985 two studies into how well admission qualifications predict success were published (Hill, 1985; Kerr, 1985). Hill (1985) concluded that academic entry scores were good predictors of first year performance and Kerr's (1985) results showed moderate correlations with the final year scores. The American studies on physiotherapy training (Balogun, 1988; Roehrig, 1988; Templeton et al, 1994) demonstrated low to moderate correlation between entry grades and academic performance. Similar results were obtained in Australia by Rickard-Bell, Marshall and Chekaluk (1991). Studies in Canada by Peat, Woodbury and Donner (1982), Pickles (1977) and Olney (1977) found low but significant correlations between entry grades and clinical performance. An interesting finding from the studies by Peat et al (1982) and Pickles (1977) was that the predictive strength of the entry grades for academic performance was strongest in the first year of physiotherapy education and

this weakened progressively in the clinical years (Morris and Farmer, 1998). All these studies though are old and the information may be outdated. No recent studies have been found that are specific to physiotherapy.

There is a clear need to place the best students in the limited training vacancies in physiotherapy and at the same time meet the equity targets. Therefore selection criteria need to be adequately chosen (Nadasan and Puckree, 2003). Students who are more knowledgeable about physiotherapy may be better able to make career decisions that are based on their own likes and dislikes, rather than on the need for more professionals (Kallus, 1999). This implies that carefully chosen selection criteria need to be based on existing evidence and subject to introspection and research (Nadasan and Puckree, 2003).

In a sample population of thirty-one students, Nadasan and Puckree (2003), set out to establish if the selection criteria for admission to the physiotherapy educational program predict students' performance. In their methodology they included how school pupils scored in an interview (amongst other procedures) based on the extent of the students' knowledge about physiotherapy training and clinical practice; the students motivation; communication skills and commitment; and their attitudes towards disabled people. This study included a population that was predominantly Indians. Nadasan and Puckree (2003) found that the interview might predict clinical skill but definitely does not predict academic performance. Even so the interview only correlates with fourth year physiotherapy performance, and not so significantly with the other years of training (Nadasan and Puckree, 2003). A limitation of this study, noted by the researchers was that an interview is a subjective procedure, and in order to be more accurate, it needs to be more objective. To achieve this, the interviewer would need to undergo some rigorous training and the interview itself would require preset criteria. This study's main finding was that pre-professional knowledge, motivation and attitudes do not predict success in physiotherapy.

2.4.3 Cognitive and Non-Cognitive Predictors

In 1997 Ting used a combination of cognitive (high school rank and ACT scores) and Tracey and Sedlacek's (1984) non-cognitive questionnaire of psychosocial variables to predict success of white freshmen. These students were ranked in the lower 40% of their high school classes. Both high school rank and ACT scores appeared to be effective predictors for estimating performance in these students' first year of college. Of the psychosocial variables, demonstrated community service and preference for long-range goals were significant predictors for student retention. In 1998 Ting and Robinson undertook a study of academic performance of Caucasian and African American college freshmen using high school GPA, SAT verbal, mathematics and total scores and Tracey and Sedlacek's (1984) non-cognitive questionnaire and First Year Student Survey. They used these to predict students' GPA and retention. Their findings indicated that parent education level and need for financial aid were inversely related to students' academic performance in the first year of college. Given the large amounts of variance that were not explained by their research, they suggested the inclusion of qualitative research components to better understand academic success across the various race and gender groups. In 2000 Ting tested the NCQ (Tracey and Sedlacek, 1984) among Asian American students and in this study he combined it with only SAT verbal and mathematics scores. Realistic self-appraisal, successful leadership experience, demonstrated community service and SAT mathematics score were significant predictors of academic success. In all these three studies, it is evident that combination of cognitive and selected non-cognitive variables may assist in predicting academic performance and retention of students.

Höschl and Kožený (1997) conducted a study in a Faculty of Medicine. They chose independent variables from four domains: high school performance in physics, mathematics and Czech language, written entrance examination, admission interview and personality traits. These were tested against GPA scores of first to third year courses. Apart from the results of the entrance examination in chemistry and biology, they found a statistically correlation between all predictors and the total GPA. The interview variables correlated non-significantly with the second year GPA. The semi-partial correlation coefficients indicated that the incremental validity of predictors from cognitive domains tended to decrease toward the end of the third year in comparison with the predictors from the personality trait and interview domains. They suggest that the personality dispositions might compensate for mental ability deficiencies in achieving academic success.

Although these studies used a combination of cognitive and non-cognitive variables to predict success, when it comes to non-cognitive variables, they vary considerably.

Other

Gupta, Harris, Carrier, Caron, 2006 investigated predictors of success in entry-level undergraduate mathematics courses. They used a self-administered questionnaire to collect information about student demographics, factors that could impact student study time, student academic background and student learning behaviours. Their results showed that students who were male, older, cared for more children at home, were in smaller classes, were instructed by lower ranked instructors and accessed less tutoring classes, got better grades in mathematics. The results were found in both univariate and ordinal logistic regression analysis. The limitation in their study was that their study only provided information of correlation but did not address causation.

2.4.4 Selection of the Institution

As early as 1979 Roman et.al. found that college selectivity, self-evaluation of skills and mother's education predicted minority student performance (Sedlacek et al,1990). Evans et al (1975) found that selectivity of undergraduate institution to be a valid predictor for minority students. Shea and Fullilove (1985) concluded that the failure rates of minority students are due to their educational experience at predominantly white institutions.

2.5 CONCLUSION

2.5.1 Methods Available to Address the Problem of Predicting Success

Most studies made use of students' records from particular universities and standardized tests to predict success. They have also used different non-cognitive variables to predict success and to make comparisons between races. In South Africa though there are no national standard tests that were utilized by all universities to select students.

2.5.2 Deficiencies in Knowledge

No recent studies were found that pertain to physiotherapy specifically. Studies that were found were old dating back to the 1970's and none investigated race differences. South African studies done on predictors of success have looked at one or two institutions, on success at a certain level of study (Fraser and Killen, 2005; Ayaya, 1996)or on success in a particular course e.g. mathematics, computer science or

engineering (Zaaiman, 1998;Huysamen, 2000; De Villiers and Rwigema, 1998; Potter and van der Merwe, 1994)

2.5.3 Current Status of Knowledge Relating to the Topic

There is knowledge that cognitive factors do predict success although not for all students. The prediction is stronger in the higher percentile of achievement and reduces at the lower end. In health professions the prediction is higher at the first two years of basic sciences and reduces at the last clinical years of study. A number of the studies are in agreement that cognitive factors should not be used exclusively to predict academic success; non-cognitive factors have to be included.

2.5.4 Justification for New Investigation of the Topic

Other studies in the literature have investigated subjects, level of study and most medical ones investigated academic performance versus success in obtaining practicing license. The new investigation undertaken in this study investigated success in a qualification for a profession and although it investigated factors that may affect all students, it included factors like influence of career choice, knowledge of the profession, source of information about the profession, transport to clinical areas, integration with classmates and class size. These factors pertain to physiotherapy specifically because (1) physiotherapy is not a well known profession within the African black communities which may influence how a student performs (2) lack of transport and dependence on others is a known factor to put students under stress and (3) integration and size relates to the nature of training of physiotherapy which involves working in pairs and teams and physical contact during practicing of skills.

2.5.5 South African Model of Physiotherapy Training Trends

Figure 2.1 illustrates that there are two cohorts of students that are admitted into physiotherapy education because of diversity in educational background and the demands for equity and opportunities for all students with potential to gain access into higher education. There are students who are admitted with higher matric aggregate symbols, however in order to address the issue of equal opportunity, other students are admitted with lower matric aggregate symbols with some resort to the use of non-academic criteria for admission (Sedlacek et al, 1990;Reede, 1999; Cliff, 2003; Yeld, 2003). There is evidence in the literature that good high school performance is a predictor of academic success in higher education (Skuy et al, 1996; Höschl and Kožený, 1997; Hoffman and Lowitzki, 2005) therefore students who are admitted with higher

matric results are expected to successfully complete the physiotherapy degree in minimum time. Simultaneously it is important to note that factors that predict academic success do not necessarily also predict clinical competence (Höschl and Kožený, 1997; Morris and Farmer, 1998)

The students who are admitted with lower matric results and non-academic criteria are able to complete the physiotherapy course if appropriate augmentation is implemented. The intervention can be institutional and/or individual i.e. factors that the student brings to the learning environment can be helpful in ensuring completion of the degree (Fuertes and Sedlacek, 1995; Padilla et al, 1997; UNESCO, 1998; Yorke and Thomas, 2003; Hoffman and Lowitzki, 2005; Ulloa and Herrera, 2006)

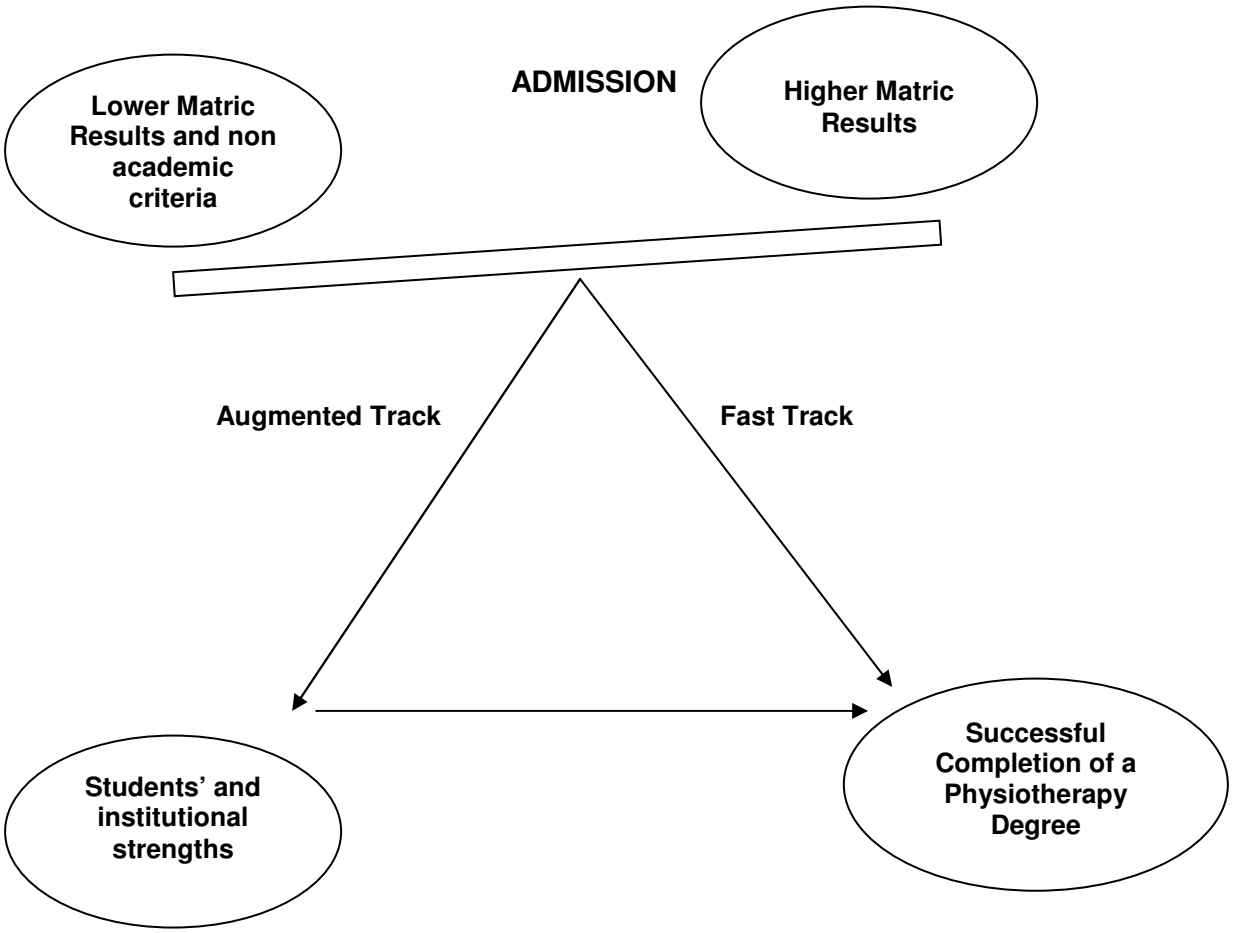

Figure 2.1: South African Model of Physiotherapy Training Trends

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the methodology that was undertaken to investigate factors that might predict physiotherapy students' academic success.

3.2 RESEARCH DESIGN

Qualitative and quantitative research can be effectively combined in the same research project (Strauss and Corbin, 1990; Patton, 1990). For example, Russek and Weinberg (1993) claim that by using both quantitative and qualitative data, their study of technology-based materials for the elementary classroom gave insights that neither type of analysis could provide alone. Cronbach (1975) claims that statistical research is not able to take full account of the many interaction effects that take place in social settings. He further states that "the time has come to exorcise the null hypothesis," because it ignores effects that may be important, but that are not statistically significant (Cronbach, 1975).

The purpose of this research was to develop a model that could be generalized to a population of physiotherapy students and also to develop a view of the meaning of success and what constitutes it. To that effect, a mixed-methods approach, as described by Creswell (2003), was adopted to conduct this study. The methods that were mixed were (1) quantitative enquiry which was Part 1 of the questionnaire where different variables were tested for predictability of academic success and (2) qualitative enquiry which was Part 2 of the questionnaire with open-ended questions and interviews with the HODs exploring factors that are thought to influence academic success.

3.2.1 Nature of Mixed Methods

According to Creswell (2003), the concept of mixing different methods probably originated in 1959. Recognizing that all the methods have limitations, researchers felt that biases inherent in any single method could neutralize or cancel the biases in other methods. Triangulating of data sources followed (Jick, 1979). From the original concept of triangulation emerged additional reasons for mixing different types of data, for example the results from one method can help develop or inform the other method (Greene, Caracelli and Graham, 1989), or one method can be nested within another method to provide insight into different levels or units of analysis (Tashakkori and Teddlie, 1998), or methods can serve a large transformative purpose to change and

advocate for marginalized groups (Mertens, 2003). For the purposes of this present study, the nested approach described by Tashakkori and Teddlie (1998) was adopted to gain insight into the concept of academic success.

Procedures have been developed (Creswell, 2003) for mixed methods of enquiry, namely, sequential, concurrent and transformative procedures. For the purposes of this present research the concurrent procedure was adopted. In the concurrent procedure the investigator collects both forms of data at the same time during the study and then integrates the information in the interpretation of the overall results. Also, in this design the researcher nests one form of data within another larger data collection procedure in order to analyze different questions or level of units within an organization (refer figure 3.1). The different levels that were analyzed within the physiotherapy profession as an organization were the graduates and the lecturers.

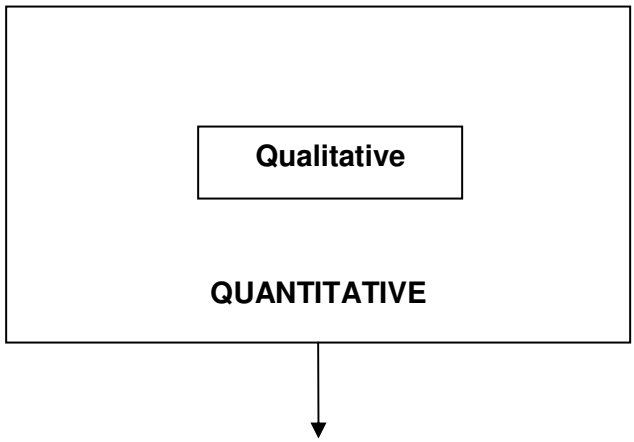

Figure 3.1: Concurrent Nested Strategy

Source: Creswell (2003)

The challenge with this method was the time-intensive nature of analyzing both text and numerical data, and the requirement for the researcher to be familiar with both quantitative and qualitative forms of research.

3.2.2 Data Collection Strategy of the Mixed Method

3.2.2.1 Implementation sequence

The implementation sequence chosen for this present research was the concurrent method where the data collection tool had both open (qualitative) and closed ended

(quantitative) questions to the graduates. In the case of lecturers one-on-one interviews were conducted with the lecturers using a schedule of questions to guide the interviews.

3.2.2.2 **Priority**

Equal priority in this research was given to both the quantitative and qualitative approaches. The reasons for this choice were that the researcher wanted to emphasize generalization of the results to the physiotherapy students.

3.2.2.3 **Integration**

The integration of quantitative and qualitative methods started at the implementation stage and continued in the discussion stage. Each data set was treated with the techniques usually used to analyze quantitative and qualitative data and the analyses were presented separately. The results were then combined at discussion level, but each data set remained analytically separate from the other (Sandelowski, 2000).

3.3 DEVELOPMENT OF THE QUESTIONNAIRE FOR GRADUATES

Variables used in different studies (Boyle, 1988; Platt, Turocy, McGlumyl, 2001; Downey et al, 2002; Hoffman and Lowitzki, 2005; Gupta et al 2006) and concepts that emerged from brainstorming with physiotherapists were used to construct the questionnaire. A draft questionnaire was constructed (Appendix A).

3.3.1 **Validity**

Data are said to be valid when they represent what they purport to represent and meaningful inferences can therefore be drawn from them (Sim and Arnell, 1993).

3.3.2 **Content Validity**

Content validity demands that a tool is free from influence of factors that are irrelevant to the purpose of the measurement. The tool should contain all the elements that reflect the variable being studied. The determination of content validity is essentially a subjective process because there are no statistical indices that can assess content validity. (Portney and Watkins, 2000). Claims for content validation are made by a panel of ‘experts’ who review the instrument and determine if the questions satisfy the content domain.

To achieve the above, a purposive sample of ten qualified physiotherapists was selected as an ‘expert’ panel. These physiotherapists were chosen because they had relevant

experience of HBUs and/or HWUs at different levels. Their experience is illustrated below:

Table 3.1: Panel of 'Experts' for Content Validation

	Institution of qualification		Involvement in physiotherapy			
Physiotherapist	**HBU**	**HWU**	**Lecturer HBU**	**Lecturer HWU**	**Clinician**	**HPCSA**
A		✓			✓	✓
B		✓			✓	
C		✓			✓	
D	✓		✓			✓
E	✓			✓		✓
F	✓		✓	✓		
G	✓		✓	✓		
H	✓		✓			✓
I		✓		✓		✓
J		✓		✓		

Five panelists qualified from HWBs and five from HWUs. Three African panelists (A, B and C) had no experience of lecturing but had studied in an HWU. Three of the panelists (E, F and G) studied at HBWs and had experience of lecturing in HWUs. They were included for their experience of having studied in an HBU and also having been involved with white and African black students in an HWU environment. Two (D and H) studied at HBUs, and had experience of teaching at HBUs, and also had experience of working with the HPCSA. Two (I and J) studied at HWUs and had experience of lecturing at HWUs, and were included because of their involvement with African black and white students in an HWU environment. Two panelists (F and G) had lectured at both HBU and HWU level with an experience of attending an HBU university.

A draft questionnaire together with aim and objectives of the study was emailed or faxed to the panelists. They were requested to evaluate the questionnaire content validity. In terms of content validity they had to evaluate the extent to which the questionnaire covered the full domain of the content (Simm and Wright, 2002). This means that they had to assess whether in their opinion all aspects that may influence student success at university had been covered by the questionnaire.

3.3.3 Responses to the Draft Questionnaire

SECTION A

No comments were made

SECTION B

One of the panelist felt that it was important to include parents' level of education. He felt the fact that his mother was a lecturer at a university assisted a lot in preparing him for what to expect at a university and for giving advice when he was experiencing problems. Another panelist felt that because she was the first person in her family to go to university she did not receive relevant support from parents or family. The question of parents' level of education remained in the questionnaire in Section B.

SECTION C

The aggregate symbol obtained at the end of matriculation was not asked for in the draft questionnaire and lecturers felt that this is a major deciding criterion for admission into physiotherapy and therefore should be included. The grade in which the different subjects were studied was also included.

Some of the lecturers felt that the classification of the types of school may not be familiar to all students. The classification was changed to private and public schools.

SECTION D

The African Black panelists who studied in an HWU raised a number of issues that they felt should be covered in order to establish whether they are related to success.

- The first issue raised was being part of a group of classmates both academically and socially. They felt that feelings of isolation can be destructive and deny students the opportunity to have classmates to study with or seek clarification from about academic work.
- The issue of knowledge about the profession prior to studying for it and source of information was raised as an issue that needed more coverage since it was believed to be important in motivating a student in times of difficulties (Section D).
- They raised an issue of getting information at the relevant time about support systems that are available at the university. Their experience was of lack of formal information sharing which resulted in struggling and not knowing where to go for assistance (Section E).

- The issue of having to ask for a lift to go to clinical settings was raised. They felt that it made them feel that they were at the mercy of other students they had to be 'nice' all the time and overall were put at a disadvantage.

The majority of the lecturers alluded to the fact that some students did not have knowledge of physiotherapy when they applied and did not like the course and therefore struggled during studies.

From this discussion, Section D and E were refined and included in the questionnaire.

SECTION E

Most of the panelists who are lecturers raised the issue of finances. In their opinion, financial stability and security play a major role in enabling the students to concentrate on their studies. Those who were involved with both Black and White students were of the opinion that students were affected differently. On the one hand, some white students manage to get part-time jobs but sometimes work long hours, which interfered with their studying, causing them to be exhausted during lectures. On the other hand, black students are less able to get funding and are therefore constantly burdened about issues of daily living like food, accommodation and transport to the university. From this discussion, questions on socioeconomic background were included.

The other aspects of the questionnaire were seen by the panelists to be covering the content domain.

After consideration of the responses in context with the whole questionnaire, the draft was reconstructed (Appendix B) and a statistician was consulted for advice on coding of the questionnaire. Part 2 of the questionnaire was drafted to probe on some of the questions asked in the Part 1 and to further get students' perspectives on academic success or lack thereof. The questionnaire was then piloted with graduates who did not form part of the main study.

3.3.4 Pilot Study

Fifty questionnaires were sent out to graduates of 1999. In addition to answering the questions the graduates were requested to indicate the time it took them to complete the questionnaire and were asked whether questions were clear.

3.3.4.1 **Response**

Twenty questionnaires were returned (response rate 42%). The average time taken to complete the questionnaire was 40 minutes. There were questions that were not clear to the participants and responses that were given by the respondents which were not in the choice of answers. Certain questions were deemed to be irrelevant to the aim of the study and therefore would not achieve the aim or add value to the study. These comments are discussed in detail below:

SECTION A: Demographic Data

The respondents were asked to indicate their home. The respondents felt that this question was not relevant to the aim of the study. They felt that whereas the actual home language would not make a difference, it was instruction in a language that was not their home language that would be more relevant to the study.

Changes

- The question about home language was removed
- The year of qualification was removed and duration of completion of the degree was included in its place (this was to establish who was successful or not)
- The question on the guidance teacher was removed and was asked differently in Section D (Career Choice)

SECTION B: Socioeconomic Background

- The choices on parents' employment at the time of studies did not include deceased and unemployed parents. The researcher had made an error in assuming that all students had both parents at the time of studying and that they were both employed in one way or another. Many respondents commented that parents were deceased or unemployed.
- The respondents were asked to state whether they had needed additional funding and what they needed it for. They felt that this was not relevant to the aim of the study: what was relevant was simply whether or not they were able to source sufficient funding during their studies.
- In the question on the source of additional funding, a few respondents wrote Provincial funding which was not one of the choices given.

Changes

- The choice of deceased and unemployed parents was added
- The question on the reasons for additional funding was removed
- Provincial Funding was added as an alternative source of funding

SECTION C: Previous Academic Record

The phrasing of the questions was confusing for the respondents because the responses varied widely. The questions were rephrased.

SECTION D: Career Choice

The respondents were asked to indicate the factors that influenced them in choosing physiotherapy as a career. There were two responses that were given by the respondents more than once which were not in the questionnaire. These were: 'interest in the profession' and 'didn't get admission into my first choice'. These were included as possible answers for this question.

SECTION E: University Support Systems

A question on how the students found out about the support systems was added

SECTION F: Physiotherapy Education

There were no comments

PART 2

There were no comments in relation to this part of the questionnaire. All the respondents answered these questions fully.

3.3.5 Internal Consistency Reliability

Internal consistency reliability of items on the questionnaire indicates how strongly the items are related to one another, that is, whether they are measuring a single characteristic. Cronbach's alpha is the most common form of consistency reliability coefficient. It models consistency based on average correlation among items. A lenient cut-off of 0.60 is common in exploratory research. Internal consistency was tested on this study and the overall score was **0.8302**. This means that the questionnaire is 83% reliable for establishing predictors of success.

After all the changes were effected after piloting the questionnaire, the third draft questionnaire was piloted on another group of graduates who were also not part of the main study. There were no major comments noted on the content of the questionnaire and the time taken to complete the questionnaire was 25-30 minutes and this is presented in 3.3.3

3.3.6 Final Questionnaire

The final questionnaire that was used for the main study consisted of five sections to collect the following data (Appendix C):

PART 1

SECTION A: Demographic Data

Demographic data were collected to establish the profile of graduates for the time period under review.

The year of enrollment and duration of study were asked for differentiating between successful and unsuccessful students as operationally defined in this study.

Type of high school established educational background. (There is a perception that students from private schools are better prepared for higher education than students from public schools and therefore more likely to succeed).

The institution awarding the qualification was required to establish which graduates were from the HWUs and which ones from HBUs. This was later used to establish whether there was a difference in success or lack of success among students from these two types of universities.

SECTION B: Socioeconomic Background

This section included parents' employment during the period of the graduates' enrolment at university, parents' highest level of education (for relevant support) and source of funding for the studies (Hoffman and Lowitzki, 2005).

SECTION C: High School Performance

This section included matriculation aggregate symbol, matriculation marks or symbols and medium of instruction at school.

Matriculation aggregate or equivalent has been widely used in South Africa and other countries in studies investigating predictors of success (Boyle, 1988; Höschl and Koźený, 1997; Platt et al, 2001; Downey et al, 2002). South African studies include those of Badsha et al, 1986; Badenhorst et al, 1990; McKenzie and Clayton, 1994; Skuy et al, 1996; and Huysamen, 2000.

Medium of instruction was included as an item in the questionnaire because in South Africa, there are eleven official languages, and some schools use a combination of these languages in their instruction. Furthermore, there may be discordance between medium of instruction at school and at university.

The combination of subjects whose symbols were collected in this study includes the subjects generally used by the eight South African universities as entry requirements for physiotherapy.

SECTION D: Career Choice

This section sought to establish whether the graduates had prior knowledge of physiotherapy, whether it was their first choice of career, and what influenced them in choosing it as a career. This information was necessary to establish whether there were correlations between the various responses and academic success.

SECTION E: University Support Systems

This section sought to establish the availability of support systems or structures at the university and whether these structures were accessed by the students. This information was necessary to establish whether the students that were successful were the ones who knew about the available support systems.

SECTION F: Physiotherapy Education

This section sought to establish the language policy of the physiotherapy departments, whether the language of instruction was also the home language of the students and whether they had the opportunity to ask questions in other languages. It was then established whether language of instruction and ability to seek clarification had an effect on the success of students.

This section also sought to establish whether the students had felt part of the group of physiotherapy students and were integrated into the classes.

PART 2

Part two of the questionnaire consisted of 17 open-ended questions aimed at determining the factors that affected the graduates during their studies and obtaining perceptions of factors related to academic success or failure (their own and that of peers). Some of the open-ended questions in Part 2 of the questionnaire ask for secondary data because it was not possible to access the students that had left the programme without completing it.

3.4 INTEGRITY OF THE QUALITATIVE METHOD

3.4.1 Trustworthiness and Rigour

Within qualitative research methodologies, the requirement for sound, trustworthy and rigorous research is met procedurally rather than statistically (Miles and Huberman, 1994). In the present study while the emphasis was on both understanding and identifying causal relationships, measures were taken to ensure a high level of reliability and validity through appropriate procedures (Altheide and Johnson, 1994). While the terms validity and reliability can be applied to qualitative research, they are not measured numerically (Hegner and Helm, 1994). Reliability in qualitative approach may be more appropriately covered under *confirmability* and validity may be addressed with the concepts of transferability and consistency (Kuiper, 1998). The following Table identifies each requirement, notes strategies employed and identifies how each strategy was met, (either procedurally through the process of conducting the research or descriptively through measures of reporting and presentation of results). The criteria sought in the current study were:

- Reliability and confirmability
- Transferability and External Validity
- Consistency and Internal Validity

Table 3.2: Illustration of Strategies for Attaining Trustworthiness and Rigour

Methodological requirement	Strategy Employed	Achieved
Reliability and confirmability	Clear description of data gathering and analysis. The use of audit trail (Holloway and Wheeler, 1996; Mays and Pope, 1995; Rodgers and Cowles, 1993)	Descriptively
	Presentation of analysed and traceable raw data for scrutiny (Mays and Pope, 1995)	Descriptively
	Participant checking (Brown, 1991; Gliner, 1994)	Procedurally
Transferability and External Validity	A clear and explicit account of the method and analysis (Mays and Pope, 1995)	Descriptively
	The use of a audit trail (Mays and Pope, 1995; Rodgers and Cowles, 1993)	Descriptively
	Participant checking (Brown, 1991; Gliner, 1994; Huberman and Miles, 1994)	Procedurally
Consistency and Internal Validity	Credibility of the researcher to the participants (Holloway and Wheeler, 1996)	Procedurally
	Participant checking (Brown, 1991; Gliner, 1994; Huberman and Miles, 1994; Mays and Pope, 1995)	Procedurally
	The researcher's understanding of the area (Altheide and Johnson, 1994)	Descriptively
	Translation Fidelity –outcomes of the study reflect and are applicable to the problem (Krathwohl, 1993; Walker,1993)	Procedurally

3.5 PROCEDURE FOR DATA COLLECTION

3.5.1 Questionnaire

- Addresses of sampled graduates were extracted from the HPCSA Physiotherapy Register (2005).
- Questionnaires and information sheets were sent with a stamped return envelope to the participants.
- After three weeks reminders were sent out to the graduates.

After a month there were very few responses and therefore a different approach was taken:

In respect of the black non-respondents:

- Questionnaires were personally distributed by the researcher and these were collected after one day.
- Research assistants were identified in the further-afield provinces to personally distribute and collect questionnaires.

- Questionnaires were faxed to different hospitals in the Provinces that the researcher could not get assistants to distribute and collect.

To increase the response of white participants, new participants were recruited because there was a large enough population to sample from.

3.5.2 **Interviews**

The physiotherapy Heads of Departments (HODs) were recruited to participate in this component of the research (York and Thomas, 2003). Six HODs agreed to participate in the study. Appointments were made telephonically and emails were sent to explain the study and to seek consent. One-on-one in-depth interviews were conducted with the HODs at their institutions with the purpose of establishing their perspective on factors that influence students' progress through the physiotherapy training.

All the interviews were audio-taped and then transcribed. The questions were adapted as the interviews continued, to allow the information obtained from the initial interviews to guide later interviews in the direction of the emerging themes.

3.6 **ETHICAL CONSIDERATIONS**

Ethical clearance to conduct this study was obtained from the Committee for Research on Human Subjects of the University of the Witwatersrand (clearance number M051004) (Appendix D).

An information sheet (Appendix E) about the research was included with the questionnaire to graduates. Besides information about the research, the participants were assured of the confidentiality of their responses and that the information would only be used for the purposes of this research.

A letter to explain the study (Appendix F) consent form (Appendix G) was sent to the Heads of Department for the recording of the interviews and to use the information in the study.

3.7 STATISTICAL CONSIDERATIONS

3.7.1 Population

The population for this study consisted of physiotherapists who graduated between 2000 and 2005. These were graduates of the eight universities that offer physiotherapy programmes in South Africa. Between 2000 and 2005 one thousand four hundred and twenty eight (1428) students graduated of which 210 were African black students. Of the 210 African black physiotherapists 155 were found to have current contact details on the HPCSA Register. The physiotherapy Heads of Departments of these institutions were also part of the population for this study.

3.7.2 Study Samples

Sample 1: To obtain a reasonable sample all the 155 African black physiotherapists were recruited to participate in the study.

Sample 2: Proportional random sampling per institution that had white graduates was done to obtain an equal number (n=155) of white physiotherapists for recruitment to participate in this study. In probability sampling the researcher can specify in advance that each segment of the population will be represented in the sample. The composition of the sample is derived by selecting units from those of a larger population by a process of randomization. In this study randomization was done by using the systematic sampling method (Hicks, 2004) where every n^{th} member of the population is chosen. The interval is chosen in advance and in this study every 6th graduate on the list was chosen until the required number was obtained for each institution. The same sampling fraction within strata was used, the strata being the different universities.

Sample 3: Seven physiotherapy Heads of Departments or their senior representatives were invited to participate in the study. Heads of Departments from six universities agreed to participate in the study.

3.7.3 Statistical Analysis

3.7.3.1 Quantitative data

Data preparation

- Data were captured and summarized to check that all were within acceptable limits and boundaries. Missing data were traced back to the original data collected and then included to the captured data.
- The raw data were transformed into variables that would be usable in the analyses. Missing values on the STATA 9.2 statistical package were treated as 0 and this was transformed to (.) because 0 was already designated for other variables. Some variables were collapsed into categories.

Data analysis

- The data were described using frequencies, means and standard deviations.
- $p \leq 0.05$ was accepted as significant in this study.
- Factors that influence successful completion of the physiotherapy course that were collected using the questionnaire were described and then analyzed using bivariate analysis to obtain preliminary results.
- Chi-square was used to determine whether differences existed between successful and unsuccessful students, between black and white students, and between successful and unsuccessful students in each of the race categories.
- Multivariate regression analysis was then done to predict the probability that a black physiotherapy student would be successful in his/her studies if a number of variables were considered.

3.7.3.2 Qualitative Data

Qualitative analysis involved examining the assembled relevant data to determine how they evaluate the questions at hand. It provided ways of examining, comparing and contrasting and interpreting meaningful patterns or themes (Berkowitz, 1997). Meaningfulness was determined by the aim and objectives of the study.

3.7.3.2.1 Open-ended questions

In this study, to analyze the responses from the questionnaire, content analysis method (Mayan, 2002) was adopted. In this method the answers to each question are studied together. The process involves identifying, coding and categorizing primary patterns in the data.

a) **Coding**

Coding is defined as the process of identifying persistent words, phrases, themes or concepts within the data so that the underlying patterns can be identified and analyzed. Through coding, the researcher becomes familiar with the data and starts to organize the information.

b) **Categorizing**

The coded data are grouped into categories that are labeled. Sometimes the same piece of data may fit two different categories; when that happens, the researcher should either cross-reference the piece of data to the other category or place it in both categories. All the data must be accounted for, and once the researcher is satisfied that the categories represent the cases, a summary is written for each category or sub-category (if it exists).

The categories are then judged by two criteria for internal and external homogeneity. Internal homogeneity refers to individual categories, whether all the data reflect the category and if the category makes sense. External homogeneity refers to the relationships between the categories, whether they are all distinct and separate.

At this point of the process the categories should have the following qualities:

- All parts of the data are included and unique data have been investigated.
- The categories make sense and give a picture of the whole data.
- The categories should make sense to others.
- The categories should have internal validity i.e. they should be credible to the people that provided the information.

c) **Integrating the categories and finding themes**

The intention at this point is to move to a higher level of analysis by discovering the relationships between the categories, and to find common threads or themes that run through the data. The data can then be put together with other types of data that have been collected including other qualitative or quantitative data. The researcher looks for contradictions or agreements between the data.

The details of how this approach was used in this study are explained in the results with the presentation of the findings in Chapter Five.

3.7.3.2.2 **Interviews**

The framework developed by Miles and Huberman (1994) was adopted to analyze the data collected during the one-on-one interviews. This framework describes three major phases of data analysis: data reduction, data display, and conclusion drawing and verification.

a) **Data reduction**

Data reduction refers to the process of selecting, focusing, simplifying, abstracting and transforming the data. Not only do the data need to be condensed for the sake of manageability, they also have to be transformed so they can be made intelligible in terms of the issues being addressed.

To reduce the data, a descriptive/interpretative analysis of data (Tesch, 1990) using general inductive approach (Bryman and Burgess, 1994; Dey, 1993) was done.

b) **Data display**

Data display provides an organized, compressed assembly of information that permits conclusion drawing. Data displays allow the analyst to extrapolate from the data enough to begin to discern systematic patterns and interrelationships. At this stage, additional higher order categories or themes may emerge from the data that go beyond those first discovered during the initial process of data reduction.

c) **Conclusion drawing and verification**

Conclusion drawing involves stepping back to consider what the analyzed data mean to assess their implications for questions at hand. Verification entails revisiting the data as many times as necessary to cross-check or verify these emergent conclusions. The meaning emerging from the data have to be tested for their validity i.e. whether the conclusions being drawn from the data are credible, defensible, warranted and able to withstand alternative explanations.

The details of how these approaches were used in this study are explained in full with the presentation of findings in Chapter Six.

CHAPTER 4

RESULTS: QUANTITATIVE DATA

4.1 INTRODUCTION

There were two methods of data collection that were employed in this study namely, a questionnaire and one-on-one interviews. The questionnaire had two parts: part one sought categorical and continuous data and part two included open ended questions. In this chapter the results of the first part of the questionnaire will be presented. The aim of this part of the questionnaire was to determine whether variables that were investigated could significantly predict success in completing a physiotherapy degree in minimum time and whether these variables were the same for both black and white students.

The independent variables were:

- Race
- Gender
- Matriculation results and certain matriculation subjects
- Type of school
- Language of instruction at school
- Career choice
- Socioeconomic background
- University experience

STATA, a statistical software system, was used to analyse data that were captured on Epi Info. This chapter contains statistical results which will be reported in the following order:

- Response rate
- Descriptive statistics
- Frequency analysis of variables
- Multivariate analysis of variables

The statistical values obtained will be reported in full according to the sections in the questionnaire.

4.2 RESPONSE RATE

A total number of 310 questionnaires (155 of black graduates with contact details and 155 of randomly selected white graduates) were distributed to the graduates through mail, fax, e-mail and hand delivery. The distribution and collection were conducted over a four month period. After the four month period 135 questionnaires were returned. Seven parents of the graduates made contact to indicate that they were working overseas. Of the 135 questionnaires, six were discarded because they had more than one error, one questionnaire which was returned by fax was illegible. The remaining 128 questionnaires (41%) were analyzed and the results are presented below. For postal questionnaires, a return rate of about 40% is considered adequate (Hicks, 2004).

4.3 DESCRIPTIVE STATISTICS

Table 4.1: Demographic Characteristics of the Respondents (n = 128)

Variable	**White graduates n = 62**				**Black graduates n = 66**			
Starting age	Mean = 18.5yrs SD = ± 1.54				Mean = 19.5yrs SD = ± 2.53			
Gender	Male		Female		Male		Female	
	Succ	Unsucc	Succ	Unsucc	Succ	Unsucc	Succ	Unsucc
	10 (16%)	0	46 (74%)	6 (10%)	19 (29%)	11 (17%)	20 (30%)	16 (24%)
	$X^2 = 1.27$; p = 0.25				$X^2 = 0.40$; p = 0.52			
Outcome	successful		unsuccessful		successful		unsuccessful	
	56 (90%)		6 (10%)		39 (59%)		27 (41%)	
	Odds ratio = 6.461 p = 0.00 CI = 2.43 – 17.12				Odds ratio = 0.155 p = 0.00 CI = 0.058 – 0.41			
White vs black	$X^2 = 16.29$; p = 0.00							
Duration of study	Average = 4yrs				Average = 5yrs			

The results show that there were more successful white respondents (90%) than successful black respondents (59%) and that this difference is significant ($X^2 = 16.29$; $p < 0.001$). There is no association between gender and success for either race which means both males and females had an equal chance of success. The results also show that within the race groups blacks are less likely to be successful (OR = 0.155; CI = 0.058 – 0.45) and whites more likely to be successful (OR = 6.461; CI = 2.43 – 17.12).

4.4 FREQUENCY DISTRIBUTIONS

Respondents were asked to report their matriculation aggregate symbols and the symbols of the subjects that are used for selection into physiotherapy. The fact that the survey was anonymous and that the respondents had already graduated and therefore had nothing to gain or lose by reporting inaccurate symbols should help alleviate concerns about the accuracy of the respondents' report of their own symbols.

Aspects of the graduates' high school education that were investigated included the aggregate symbol received at the end of matriculation, the symbols obtained in the different subjects that are considered for selection into physiotherapy, the level at which these subjects were learned and examined (Higher or Standard grade), the language of instruction at the school, and the type of school.

4.4.1 Matriculation Aggregate Symbol

Figure 4.1 shows a normal distribution curve of matric symbols for black respondents and a curve skewed to the left for white respondents. This means that most of the white respondents obtained A and B symbols matric aggregate symbols. These symbols are regarded as high because they range from 70 – 100%.

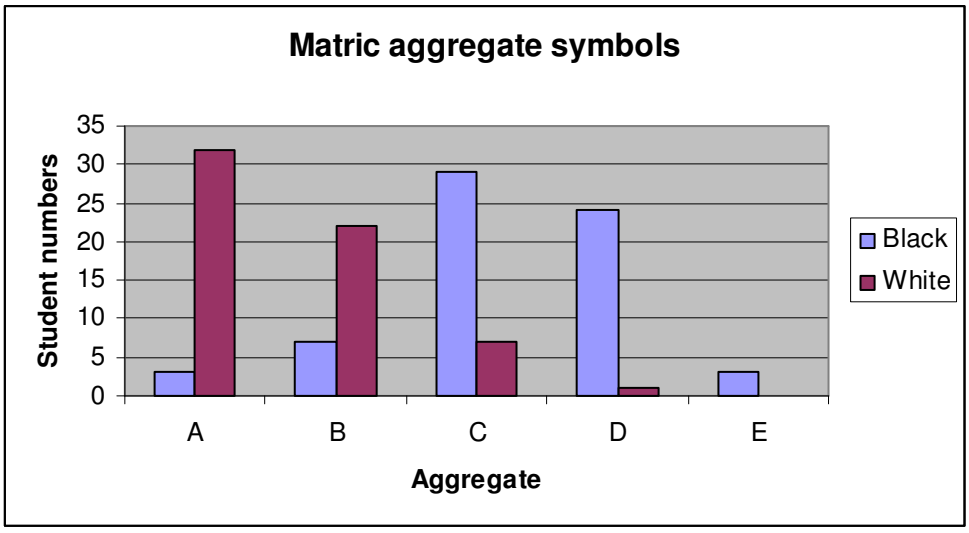

Figure 4.1: Comparison of Matric Aggregate Symbols between Black and White Respondents

4.4.2 High School Subjects

Figures 4.2 - 4.5 show that white respondents had higher matric results for individual subjects than black respondents. Figures 4.2 and 4.3 show that most of black respondents obtained C symbol in biology and English, and figures 4.4 and 4.5 show lower performance in mathematics and physical science as most respondents obtained D symbol.

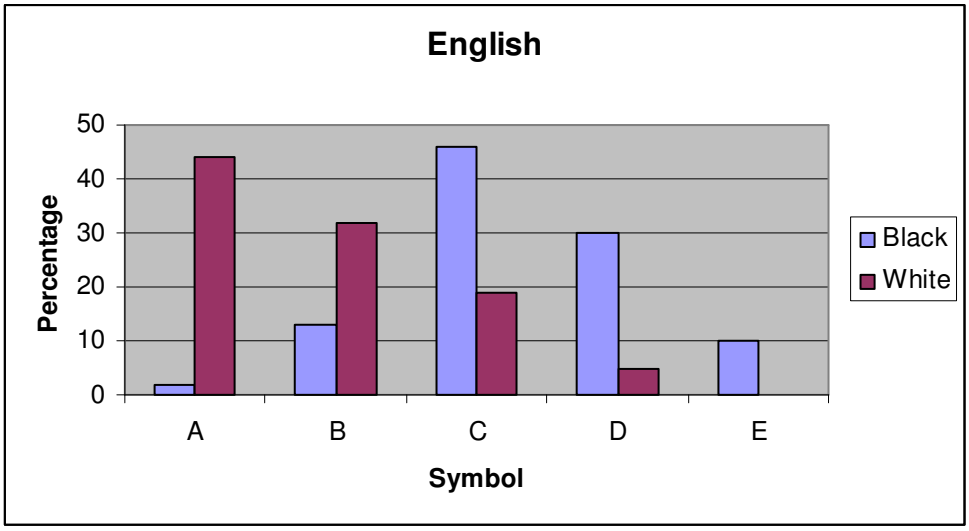

Figure 4.2: English Results of Black and White Respondents

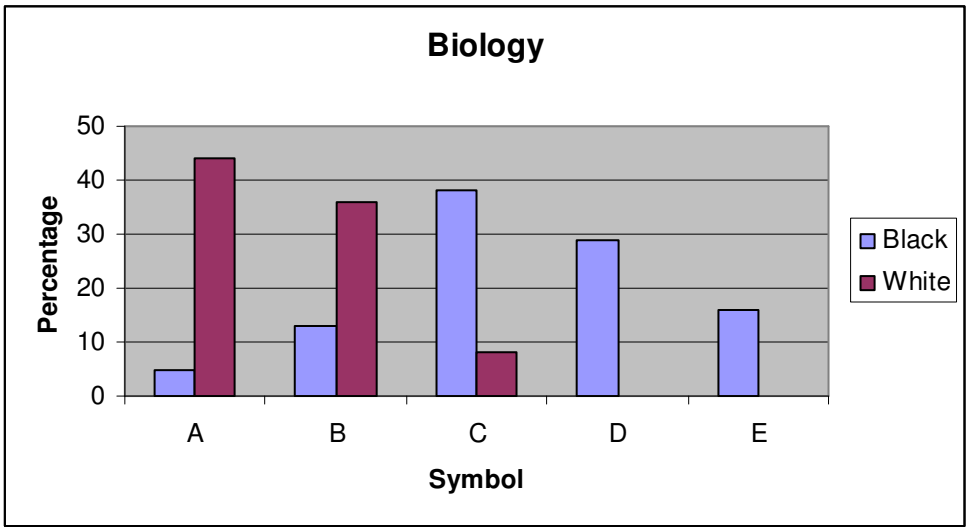

Figure 4.3: Biology Results of Black and White Respondents

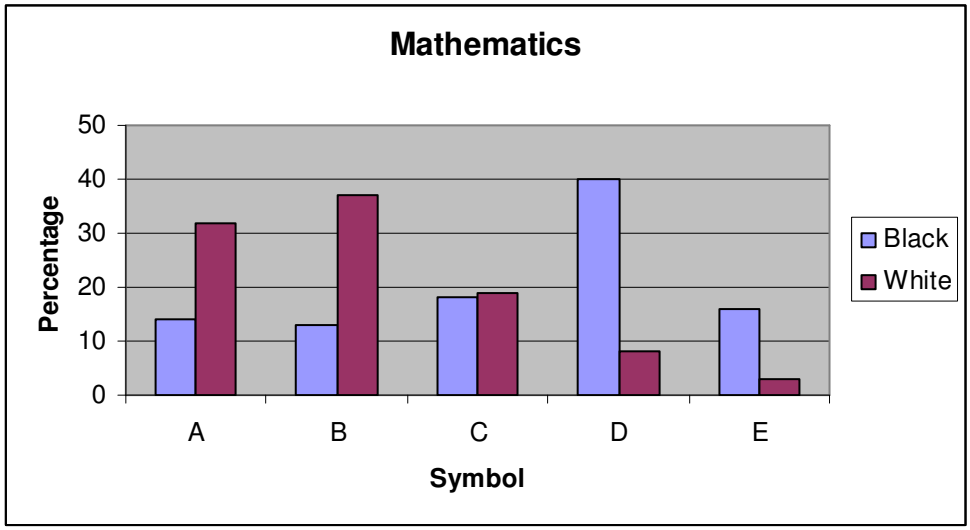

Figure 4.4: Mathematics Results of Black and White Respondents

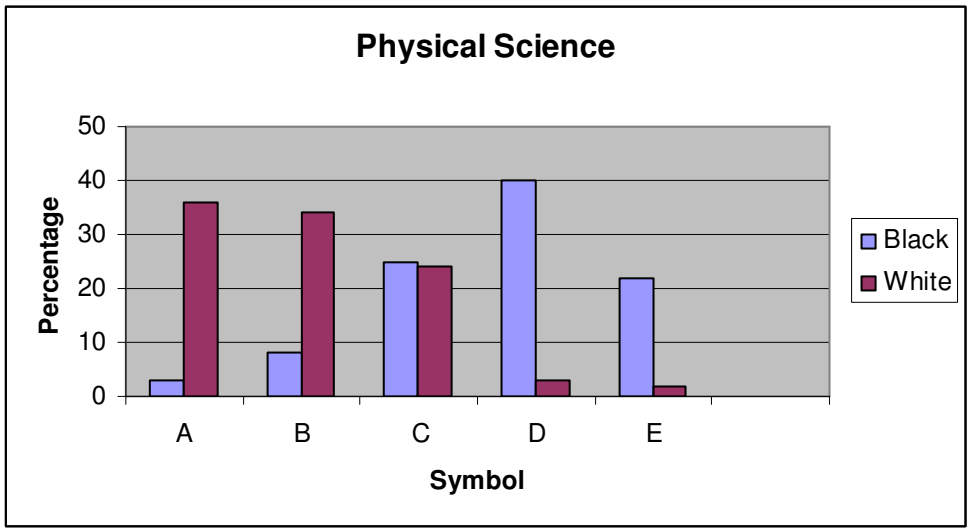

Figure 4.5: Physical Science Results of Black and White Respondents

4.4.3 Matriculation Aggregate Symbol versus Success

When considering all the respondents Figure 4.6 once again illustrates the difference between the distribution curves. Results are left-shifted for successful candidates and right-shifted for those who were unsuccessful. However it also illustrates that some respondents who had obtained an E symbol were successful.

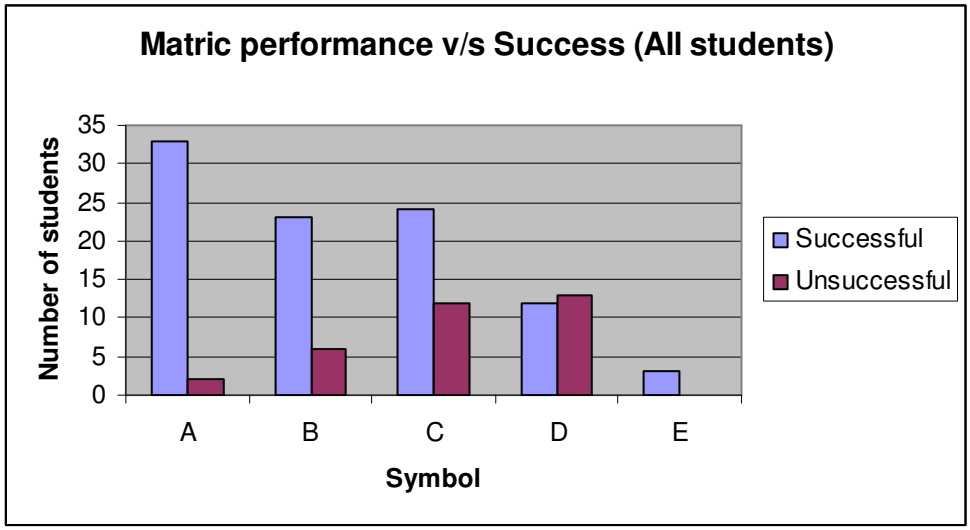

Figure 4.6: Matric Performance versus Success of all Respondents

4.5 FREQUENCY ANALYSIS OF ALL RESPONDENTS

The data shown in the preceding histograms were subjected to statistical analysis. The Chi-square (X^2) test was used as a test of independence to examine the association or lack of association between two categorical variables based on the proportion of individuals who fall into each category (Portney and Watkins, 2000). The null hypothesis for a test of independence states that two sets of categorical variables are independent of each other. Therefore, where a null hypothesis is rejected following a significant X^2 test, it indicates that an association between the variables is present. Where frequencies were less than five, Fisher's Exact Test (FET) was used to examine the association. The results of analyses are illustrated on the following tables.

4.5.1 High School Performance

Table 4.2: Test of Independence between Success and Matric Performance

		N			
		S	**US**	**X^2**	**p**
Matric Aggregate	**A**	33	2	18.85	**0.00**
	B	23	6		
	C	24	12		
	D	12	13		
	E	3	0		
English	**A**	28	0	15.73	**0.00**
	B	22	6		
	C	26	15		
	D	13	9		
	E	5	1		
Biology	**A**	28	2	12.19	**0.03**
	B	22	8		
	C	21	8		
	D	13	5		
	E	4	6		
Mathematics	**A**	25	4	6.12	0.19
	B	24	7		
	C	17	6		
	D	22	8		
	E	6	6		
Physical Science	**A**	22	2	9.88	0.07
	B	22	4		
	C	22	9		
	D	19	8		
	E	8	7		

The results show an association between matriculation aggregate symbol and success which means that there are symbols that give students a better chance of success. From the above results most respondents who were successful had symbols in the A to C range. Although the above results are referring to all respondents, if these results are

considered with results in figure 4.1 it can be seen that most respondents who had higher aggregate symbols were white and most of those with lower aggregate symbol were black.

The results also show significant association between English and biology results and success, which means students who obtain higher symbols in English and biology have a better chance of success than those who have obtained lower symbols. The results show no association between success and marks obtained for mathematics and physical science.

4.5.2 High School Education

Table 4.3: Test of Independence between Success and aspects of High School Education

	N			
	S	**US**	**X^2**	**p**
Language of Instruction				
▪ Afrikaans	13	1	10.46	**0.03**
▪ English	53	16		
▪ English and Afrikaans	8	1		
▪ African and English	19	15		
▪ African	2	0		
Type of School				
▪ Public	78	27	0.001	0.97
▪ Private	17	6		

The results show an association between language of instruction at school and success in physiotherapy ($p < 0.05$) and the significance is in the direction of Afrikaans because Afrikaans is underrepresented in the unsuccessful group. This means that fewer fail if attended an Afrikaans medium school. However the type of school attended shows no association which means that whether students attended a private or public school they stood a similar chance of being successful in physiotherapy.

4.5.3 Career Choice

Table 4.4: Test of Independence between Success and Knowledge of Physiotherapy

	N			
	S	**US**	**X^2**	**p**
1st choice (Yes)	65	23	0.02	0.98
1st choice (No)	30	10		
KOC (Yes)	59	7	16	**0.00**
KOC (No)	35	25		

The results show that there is an association between knowledge of the community (KOC) from which the student came about physiotherapy and success in physiotherapy ($p < 0.001$). This means that students who come from communities that know about physiotherapy are more likely to be successful. The results also show that for the total group there is no association between choosing physiotherapy as a first choice of career and success.

In the following sections the participants were asked to choose from a list of variables those that applied to them in response to the questions asked.

Table 4.5: Test of Independence between Success and Source of Information about Physiotherapy

	N			
	S	**US**	**X^2**	**p**
Career Guidance	23	10	0.47	0.49
Physiotherapist	41	6	6.57	**0.01**
Media	18	3	1.73	0.18
As a Patient	27	2	6.98	**0.01**
Career's Evening	11	1	2.10	0.18
Pamphlets	3	4	3.80	0.07
Family Friend	59	25	2.02	0.15
Relative	8	1	1.08	0.44
Relative in the health profession	14	3	0.67	0.55

The results in table 4.5 show that information about the physiotherapy profession from a physiotherapist (p = 0.01) and/or from being a patient (p = 0.01) have a significant association with success.

Table 4.6: Test of Independence between Success and Source of Information about University

	N			
	S	**US**	**X^2**	**p**
Parents attended	15	0	5.90	**0.01**
Through internet	4	4	2.61	0.20
Parents worked there	4	0	1.43	0.57
Friend	28	12	0.54	0.46
University personnel	8	0	2.96	0.11
Member of Family	13	7	1.05	0.30
School Teacher	10	3	0.06	1.00
Open Day	17	2	2.71	0.15
University Brochure	49	16	0.09	0.75

The results show that attendance of parents at the university where the students trained as a physiotherapist has an association with success.

4.5.4 Socioeconomic Background

Table 4.7: Test of Independence between Success and Aspects of Socioeconomic Background

	N			
	S	**US**	**X^2**	**p**
Source of Funding				
Parents	51	10	5.36	**0.02**
Study Loan	34	12	0.00	0.95
Family	3	3	1.92	0.17
Bursary	34	17	2.52	0.11
Relatives	10	8	3.81	0.07
Bank Loan	11	1	2.10	0.18
Sports Bursary	0	1	2.90	0.25
University Funding	7	7	5.09	0.08
Part-Time Job	8	5	1.21	0.31
Provincial Funding	9	7	3.08	0.12

Parents as source of funding were associated with success in physiotherapy education which means that elements of socioeconomic background have an association with success.

Table 4.8: Test of Independence between Success and Parents' Highest Level of Education

	N			
	S	**US**	**X^2**	**p**
Father's education				
No schooling	3	0	17.15	**0.00**
Primary education	8	7		
High school education	26	10		
Tertiary education	49	6		
No parents	3	5		
Mother's education				
No schooling	3	2	9.02	0.06
Primary education	12	5		
High school education	27	15		
Tertiary education	51	9		
No parents	1	2		

There was an association between fathers' tertiary education for the total group and success in physiotherapy and no association with the mother's level of education.

Table 4.9: Test of Independence between Success and Parents' Employment

	N			
	S	**US**	**X^2**	**p**
Father's employment				
Professional	37	8	13.03	**0.02**
Unskilled labour	15	2		
Self-employed	20	5		
Informal sector	9	4		
Unemployed	1	1		
Deceased	8	10		
Mother's employment				
Professional	40	9	11.07	**0.05**
Unskilled labour	12	10		
Self-employed	10	5		
Informal sector	16	1		
Unemployed	13	4		
Deceased	4	3		

There was an association between parents' employment and success in physiotherapy

4.5.5 University Experience

Table 4.10: Test of Independence between Success and University Experience

	N			
	S	**US**	**X^2**	**p**
University Language Policy				
English	76	28	4.14	0.12
Afrikaans	1	2		
English and Afrikaans	18	3		

X^2 and the p value refers to all the languages and shows no association between the language policy of the university and students' academic success.

	N			
	S	**US**	**X^2**	**p**
Physiotherapy Language Policy				
English	75	28	1.84	0.39
Afrikaans	3	2		
English and Afrikaans	17	3		
Lectures in Home Language	51	7	10.42	0.00*

The results show no association between the language in which physiotherapy lectures are given but whether that language is the students' home language or not shows an association with success.

	N			
	S	**US**	**X^2**	**p**
Source of Information about Support				
Classmates	31	3	6.95	0.01*
Advert	14	6	0.22	0.63
Orientation Week	32	11	0.47	0.97
Lecturers	30	12	0.25	0.61
Physiotherapy Department	60	18	0.76	0.38
Mentor	14	9	2.61	0.10

The only significant difference is between the students who obtained information about the available support systems from their classmates.

	N			
	S	**US**	**X^2**	**p**
Accommodation				
Own Room at Home	25	1	8.20	0.00***
Shared Room at Home	5	2	0.30	1.00
Own Room at Residence	30	17	4.18	0.04*
Shared Room at Residence	51	18	0.00	0.93
Rented Flat	1	0	0.35	1.00
Shared Flat	18	2	3.08	0.07

	N			
	S	**US**	**X^2**	**p**
Transport to Clinical Areas				
Own Transport	51	8	8.54	0.00***
Lift from Friends	27	6	1.34	0.24
University Transport	65	24	0.21	0.64
Parents Transport	0	3	8.84	0.00***

Owning a room at home or in the university residence show an association with success. Mode of transport to clinical areas has an association with success. Using own transport or being transported by parents and having own room will determine whether a student is successful or not. Both these forms of support are probably proxies for privilege.

	N			
	S	**US**	**X^2**	**p**
Part of the Group	78	22	9.28	0.00***

The results show that an association exists between success and students feeling being part of a group of classmates.

4.5.6 Summary of Variables that have Association with Success in the Total Group

Table 4.11: Illustration of Significant Variables

Variable	X^2	p
Matric aggregate symbol	18.85	0.00
High School English symbol	15.73	0.00
High School biology symbol	12.19	0.03
High School language of instruction	10.46	0.03
Source of information about physiotherapy ▪ Physiotherapist ▪ As a patient	 6.57 6.98	 0.01 0.01
Source of information about the university ▪ Parents attended	 5.90	 0.01
Parents as source of funding	5.36	0.02
Father's education	17.15	0.00
Father's employment	13.03	0.02
Mother's employment	11.07	0.05
Lectures in home language	10.47	0.00
Classmates as source of information about support systems	6.95	0.01
Accommodation ▪ Room at home ▪ Own room at university residence	 8.20 4.18	 0.00 0.04
Transport to clinical areas ▪ Own transport ▪ Parents transported	 8.54 9.28	 0.00 0.00
Being part of the group of classmates	9.28	0.00

When considering the total group of students, academic achievement is a significant factor in differentiating between students who are successful or not. Fathers' education, parent's employment, financial standing and input regarding choice of the university show significant differences between successful and unsuccessful students. First hand information about the physiotherapy profession also plays a role in outcome. Positive relationship with classmates also shows an association with success.

4.6 FREQUENCY ANALYSIS BY RACE

While one of the objectives of the study was to ascertain whether predictors of success or failure were specific to one ethnic group or applied equally to blacks or whites, such an analysis proved to be impossible because of the small number of white respondents who were not successful. Therefore the following results are a further exploration of the different independent variables against success as applied only to black respondents.

4.6.1 High School Performance

Table 4.12: Frequency Analysis of Matric Aggregate Symbols

Matric Results	Black				
	N = 66 (%)	Successful n (%)	Unsuccessful n (%)	X^2	p
A	3 (5)	2 (67)	1 (33)	3.41	0.57
B	7 (11)	5 (71)	2 (29)		
C	29 (44)	17 (57)	12 (43)		
D	24 (36)	12 (50)	12 (50)		
E	3 (5)	3 (100)	0		

The results show that the spread of symbols is similar for successful and unsuccessful respondents. The point to note is that black students with D or E symbols which are regarded as low symbols may be successful. There is no association between the aggregate symbol obtained in high school by black respondents and success.

Table 4.13: Frequency Distribution of Success According to Grade in which the Subjects were Studied

Subjects	Black			
	Grade	**N=63**	**Successful n(%)**	**Unsuccessful n(%)**
English	HG	63 (100)	38 (60)	25 (40)
	SG	0	0	0
	All respondents studied English in higher grade and therefore constituted one group. No p-value could be generated			
Biology	HG	60 (95)	35 (58)	25 (42)
	SG	3 (5)	3 (100)	0
	$x^2 = 2.07$; p = 0.15			
Mathematics	HG	37 (59)	22 (60)	15 (40)
	SG	26 (41)	16 (62)	10 (38)
	$X^2 = 0.03$; p = 0.86			
Physical Science	HG	48 (76)	28 (58)	20 (42)
	SG	14 (22)	10 (71)	4 (29)
	$X^2 = 2.32$; p = 0.31			

HG = Higher Grade; SG = Standard Grade

Three of the respondents did not supply information on symbols obtained for the different subjects hence n = 63. For the four subjects the majority of the respondents undertook studies in the higher grade but the results show no association between the grade in which a subject was studied and success.

Table 4.14: Test of Independence between Success and Symbols Obtained for the Different Subjects

Subject	Symbol	Black			
		N - 63	Successful n(%)	Unsuccessful n(%)	X^2 p
English	A - C	38	22 (58)	16 (42)	2.36 0.66
	D and E	25	16 (64)	9 (36)	
Biology	A - C	35	21 (60)	14 (40)	8.11 0.08
	D and E	28	17 (61)	11 (39)	
Maths	A - C	28	15 (54)	13 (46)	3.91 0.41
	D and E	35	23 (66)	12 (34)	
Physical Science	A - C	23	13 (57)	10 (43)	3.80 0.58
	D and E	39	25 (64)	14 (36)	

The results show no association between the results obtained in the four subjects and success. The other point to note is that attainment of A – C symbols yielded no greater chance of success than D and E, and similarly D and E did not predict failure any more than attainment of A – C symbols.

4.6.2 High School Education

Table 4.15: Frequency Distribution of Success According to Language of Instruction at School

Language of Instruction	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
English	26	15 (58)	11 (42)	2.31 0.67
Afrikaans	1	1 (100)	0	
English and Afrikaans	3	2 (67)	1 (33)	
African	2	2 (100)	0	
African and English	34	19 (56)	15 (44)	

The results show no association between language of instruction results and success.

Table 4.16: Test of Independence between Success and Type of School Attended

Type of School	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
Public	59 (89)	36 (61)	23 (39)	0.83 0.35
Private	7 (11)	3 (42)	4 (58)	

There is no significant association between the type of high school attended and success in physiotherapy. However, it is important to note that 89% of the respondents attended public schools.

4.6.3 Career Choice

The respondents were asked to indicate whether physiotherapy was their first choice of career and whether it was a known profession in their communities. They were further asked to indicate which factor or factors influenced their decision to choose physiotherapy as a career. All the respondents indicated more than one factor which influenced them. Frequency analysis of their responses is presented in Table 4.17.

Table 4.17: Frequency Analysis of Factors that Influence Choice of Physiotherapy as a Career

Influence on Career Choice	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
Physiotherapy as first career choice	39 (59)	19 (49)	20 (51)	4.24 **0.03**
Community's knowledge	7 (11)	5 (71)	2 (29)	0.47 0.69
Status of the profession	6 (9)	3 (50)	3 (50)	0.22 0.68
Family	8 (12)	3 (38)	5 (62)	1.75 0.25
Salary	2 (3)	2 (100)	0	1.42 0.50
Friends	8 (12)	6 (75)	2 (25)	0.95 0.45
Interest in the profession	38 (58)	23 (61)	15 (39)	0.07 0.78
Didn't qualify for 1st choice	17 (26)	11 (65)	6 (35)	0.29 0.77

The results shows that among blacks there is an association between choosing physiotherapy as a first choice and success ($p < 0,05$). Note should be taken that 'interest in the profession' also approached significance ($p = 0.07$) .

Table 4.18: Frequency Analysis of Source of Information about Physiotherapy

Source of information	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
Career guidance	21	13 (62)	8 (38)	0.10 0.75
Physiotherapist	18	14 (86)	4 (14)	3.57 0.09
Media	9	7 (78)	2 (22)	1.50 0.29
Being a patient	3	2 (67)	1 (33)	0.07 1.00
Career's evening	7	6 (86)	1 (14)	2.29 0.22
Pamphlets	7	3 (43)	2 (57)	0.85 0.43
Family/friend	20	12 (60)	8 (40)	0.00 0.92
Relative	4	3 (75)	1 (25)	0.44 0.63
Relative in health profession	8	5 (63)	3 (37)	0.04 1.00

The results show no association between source of information about physiotherapy and success, which means that source of information is irrelevant to success.

Table 4.19: Frequency Analysis of Source of Information about the University of Qualification

Source of Information about the University	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
Parents attended	1	1 (100)	0	0.70 1.00
Parents worked at the university	0	0	0	-
University personnel	2	2 (100)	0	1.42 0.23
University brochure	30	18 (60)	12 (40)	0.01 0.89
Through the internet	4	3 (75)	1 (25)	0.44 0.63
Through a friend	31	19 (61)	12 (39)	0.11 0.73
Through a member of the family	12	6 (50)	6 (50)	0.50 0.52
From a teacher at school	8	5 (63)	3 (37)	0.04 1.00
Open day	6	5 (83)	1 (17)	1.60 0.38

The results show no association between source of information about the university of qualification and success which means that source of information is irrelevant to success.

4.6.4 Socioeconomic Background

Table 4.20: Frequency Analysis of Source of Funding for the University Studies

Source of Funding	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
Parents	18	11 (61)	7 (39)	0.04 1.00
Study loan	30	19 (63)	11 (37)	0.04 0.52
Family	4	1 (25)	3 (75)	2.04 0.29
Bursary	41	27 (66)	14 (34)	2.04 0.15
Other funding	1	0	1 (100)	1.46 0.40
Need for Additional funding	48	25 (52)	23 (48)	3.57 **0.05**
Source of additional funding				
Relatives	15	7(47)	8 (53)	1.23 0.37
Bank loan	4	4 (100)	0	2.94 0.13
Sport bursary	1	0	1 (100)	1.46 0.40
University funding	11	5 (46)	6 (54)	1.62 0.60
Part-time job	7	3 (43)	4 (57)	0.85 0.43
Provincial	16	9 (56)	7 (44)	0.07 1.00

Source of funding for most black respondents was from a combination of sources. Seventy three percent of the respondents indicated a need for additional funding with most coming from Provincial government and relatives. The need for funding was statistically significant (p = 0.05). However the results of the test on independence show no association of source of funding with success.

Table 4.21: Frequency Analysis of Employment of Parents of the Respondents

Mother's employment	**Black**			
	N = 66	**Successful n(%)**	**Unsuccessful n(%)**	**X^2 p**
Professional	21	12 (57)	9 (43)	5.33 0.37
Unskilled labour	16	7 (44)	9 (56)	
Informal sector	4	4 (100)	0	
Self employed	3	2 (67)	1 (33)	
Unemployed	14	10 (71)	4 (29)	
Deceased	7	4 (57)	3 (43)	
Father's employment	**N = 66**	**Successful n(%)**	**Unsuccessful n(%)**	
Professional	16	9 (56)	7 (44)	9.20 0.10
Unskilled labour	15	13 (87)	2 (13)	
Informal sector	7	5 (71)	2 (29)	
Self employed	3	1 (33)	2 (67)	
Unemployed	2	1 (50)	1 (50)	
Deceased	16	6 (38)	10 (62)	

Parental employment shows no association with success.

Table 4.22: Frequency Analysis of the Level of Education of the Respondents' Parents

Mother's Education	**Black**			
	N = 66	**Successful n(%)**	**Unsuccessful n(%)**	**X^2 p**
No schooling	5	3 (60)	2 (40)	1.90 0.76
Primary	14	10 (71)	4 (29)	
High school	22	12 (56)	10 (44)	
Tertiary	21	12 (57)	9 (43)	
Father's Education				
No schooling	3	3 (100)	0	4.09 0.46
Primary	14	8 (57)	6 (43)	
High school	18	12 (67)	6 (33)	
Tertiary	13	8 (62)	5 (38)	

The level of education of the parents did not influence success or failure.

4.6.5 University Experience

4.6.5.1 Available support systems at the university

Participants were asked to indicate support systems that they knew to be available at the university. Their responses and analysis thereof are illustrated in Table 4.23.

Table 4.23: Frequency Analysis of Knowledge about available University Support Systems

Support System	Black			
	N = 66 (%)	Successful n(%)	Unsuccessful n(%)	X^2 p
Additional tutorials	33 (50)	19 (56)	14 (44)	0.06 0.80
Study skills	9 (14)	5 (56)	4 (44)	0.05 1.00
Counseling	25 (38)	16 (64)	9 (36)	0.40 0.52
Language support	10 (15)	7 (70)	3 (30)	0.58 0.50
Mentoring	30 (46)	19 (63)	11 (37)	0.40 0.52
Study groups	35 (53)	24 (69)	11 (31)	2.77 0.09
Student affairs	28 (42)	19 (68)	9 (32)	1.54 0.21
Transport	47 (71)	31 (66)	16 (34)	3.18 0.07
Did not know	8 (12)	4 (50)	4 (50)	0.31 0.70
No support available	0	0	0	-

The results show that fairly substantial numbers knew about university transport, study groups, additional tutorials and mentoring and fewer students knew about study skills (14%) and language support (15%). Overall knowledge about support systems that are available at university shows no association with success in physiotherapy.

Table 4.24: Frequency Analysis of Source of Information Regarding Support

Source of Information	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
Classmates	15	13 (87)	2 (13)	6.10 **0.01**
Adverts around campus	10	6 (60)	4 (40)	0.00 0.94
Orientation week	20	12 (60)	8 (40)	0.00 0.92
Lecturers	15	6 (40)	9 (60)	2.92 0.08
Physiotherapy dept	36	22 (61)	14 (39)	0.13 0.71
Mentor	14	8 (57)	6 (43)	0.02 0.86

Information about the available support systems was mainly obtained from the physiotherapy departments but the test of independence shows an association with source of information being classmates.

Table 4.25: Frequency Analysis of Type of Accommodation during Study at University

Accommodation	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
Shared room at home	3	2 (67)	1 (33)	0.07 0.78
Own residence room	29	14 (48)	15 (52)	2.50 0.11
Own room at home	1	1 (100)	0	0.70 0.40
Shared residence room	44	30 (68)	14 (32)	4.51 **0.03**
Rented flat	0	0	0	-
Shared rented flat	0	0	0	-

Most (67%) of the black respondents shared a room in the university residence during their studies. This type of accommodation showed an association ($p<0.05$) with success which means that students who share a room in the university residence stand a better chance of success with their studies.

Table 4.26: Test of Independence between Success and Mode of Transport to Clinical Areas

Transport to Clinical Areas	Black			
	N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
Own transport	11	7 (64)	4 (36)	0.11 0.73
Lift with friends	8	4 (50)	4 (50)	0.31 0.57
University transport	57	36 (92)	11 (8)	2.86 0.09
Parents	2	0	2 (100)	2.97 0.16

None of the modes of transport showed an association with success.

Table 4.27: Test of Independence between Success and Language of Instruction Policy

Language policy	Language	Black			
		N = 66	Successful n(%)	Unsuccessful n(%)	X^2 p
University	English	62	39 (63)	23 (37)	6.51 **0.04**
	Afrikaans	2	0	2 (100)	
	English and Afrikaans	2	0	2 (100)	
Physiotherapy department	English	61	38 (62)	23 (38)	3.97 0.13
	Afrikaans	2	0	2 (100)	
	English and Afrikaans	3	1 (33)	2 (67)	
Lectures in home language		2	1 (50)	1 (50)	0.07 0.79
Ability to ask questions in another language		21	13 (62)	8 (38)	0.10 0.75
Explanations in language of instruction		50	31 (62)	19 (38)	0.72 0.39
Class size	20 – 30	31	17 (55)	14 (45)	0.54 0.90
	31 – 40	23	14 (61)	9 (39)	
	41 – 50	9	6 (67)	3 (33)	
	>50	3	2 (67)	1 (33)	
Part of group	YES	50	33 (66)	17 (34)	4.07 **0.04**
	NO	16	6 (38)	10 (62)	

Among black respondents the university's language policy showed an association with success. The analysis revealed that English as medium of instruction favours success of black students and/or that Afrikaans is more likely to result in failure.

Being taught in home language and being able to ask questions in another language other than that of instruction has no association with success.

Class size has no association with success but being part of the group showed an association ($p < 0.05$) with success.

Table 4.28: Summary of Significant Variables for Black Respondents

Category	Variable	X^2 p
Influence on career choice	Physiotherapy as a 1st choice of career	4.24 0.03
Source of information about available support systems	Classmates	6.10 0.01
Accommodation	Shared residence room	4.51 0.03
Language policy	University	6.51 0.04
University experience	Part of the group	4.07 0.04

4.7 REGRESSION ANALYSIS

The variables that showed a statistically significant association with success of black respondents were subjected to a logistic regression analysis to predict the probability of success. The regression equation is used to determine if the independent variables can predict. The results are presented in table 4.29.

Table 4.29: Regression Analysis Results of Significant Independent Variables in Black Students

Independent Variable	R^2	Significance
First Choice Career	0.04	**0.04**
Information from Classmates	0.07	**0.02***
Shared Residence Room	0.03	**0.05**
University Language Policy	0.00	**0.00**
Part of a Group	0.04	**0.04**

Although the above five variables are the most significant together they account for only 18% of the variance which means that there is 82% of the variance of success that is not explained.

Table 4.30: Summary of Significant Results for Black Respondents

Variable	Chi square	Regression analysis
Shared residence room	✓	✓
Received information about support systems from classmates	✓	✓
Physiotherapy as a 1st choice of career	✓	✓
University language policy	✓	✓
Part of the group	✓	✓

The data presented above and confirmed by bivariate and multivariate analysis support the following major conclusions:

1. White students are more likely to succeed than black students and their matric results are higher than those of black students.
2. The predictors for black students are quite different from those for the total group (Table 4.11).
3. Performance in high school is not a predictor of success for this group of black respondents. This is in accordance with several studies that have found that at the lower end of academic success (at high school level) there is poor correlation with university performance.
4. Other factors that were thought to predict success e.g. socioeconomic background, type of school, career choice, etc have not been shown to predict success.
5. Tuition in English favours success.

6. Interest in the profession thus choosing it as a first career choice is important for success.
7. Support from classmates in various areas (accommodation, information, part of the group) is related to success.

Note should be taken of the fact that correlation matrices were not utilized to analyse data. This was due to most of the data being captured categorically as Yes/No or ½ etc. Under these circumstances a correlation coefficient does not yield any more than a frequency analysis e.g.

Success		xxx
No success	xxx	
	Yes	No

No success	success
success	No success

Will yield the same results as:

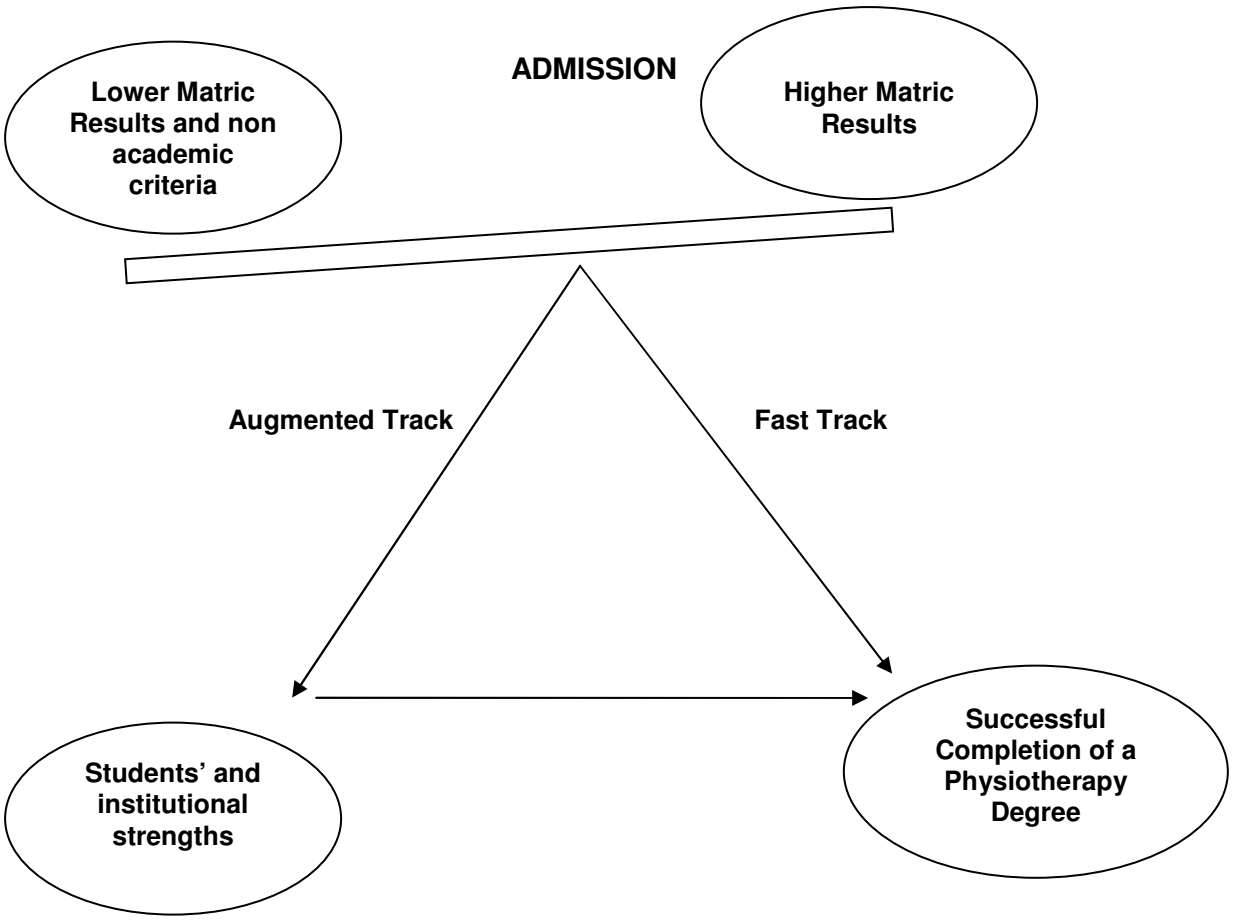

Figure 2.1: South African Model of Physiotherapy Training Trends

Referring back to Figure 2.1 above the results in this chapter have confirmed that students who are admitted with higher matric results, who complete the degree in minimum time (fast track) are predominantly white. Students who are admitted with lower matric results and therefore take longer to complete the physiotherapy degree are black. These are the students who would most likely need to have individual strengths to complete the degree and are supported by meaningful institutional factors. The results in this chapter have shown that individual strengths include physiotherapy as a first choice, whereas conducive institutional factors are shared university accommodation and supportive environment from classmates.

CHAPTER 5

RESULTS: GRADUATES' PERCEPTIONS OF ACADEMIC SUCCESS

5.1 INTRODUCTION

The method used for collection of data was Part 2 of the questionnaire which had open ended questions. The main aim of the questions was to determine the students' perceptions of academic success, although other aspects of university experience were asked. In this chapter the results will be presented.

The responses to each open ended question were compiled as one document. Summative content analysis which started with content counting and then extended to include meanings and themes was used (Yan Zhang, 2006). The responses to each question were read repeatedly with the aim of identifying recurring responses which were then grouped, tallied and coded according to the content analysis method (Appendix H). The data were then categorized using general inductive approach (Bryman and Burgess, 1994; Dey, 1993). The primary purpose of this approach is to allow research findings to emerge from the frequent or significant themes inherent in raw data (Thomas, 2006). The purpose of this section of the research was to determine the students' perceptions, and therefore the categories had to emerge from the raw data. Hence, the inductive approach was used. Coding consistency check (Thomas, 2006) was done to assess trustworthiness of the data analysis. An independent person who is familiar with the research method was asked to create a second set of categories by reading the raw data without seeing the initial categories done by the researcher. The second set of categories was compared with the initial set to establish the extent of overlap. The differences in the outcome of coding were discussed with the independent coder. The differences noted were in the phrasing of the categories, for example 'poor attendance of lectures' vs 'bunking classes' ; 'understanding of language of instruction' vs 'language proficiency'. The two sets of categories were merged into a combined set. This process is depicted in an audit trail (Appendix I) The following are the results of each open-ended question on the questionnaire.

5.2 DEFINITION OF ACADEMIC SUCCESS

The respondents were asked to define academic success. The phrases used in response to this question were grouped according to frequency with which they were raised. The groups were then coded using categories as units of analysis because the

researcher was primarily looking for the expression of an idea: academic success (Minichiello, 1990). Three categories emerged from the coded data:

- Completing the degree in stipulated time
- Obtaining the degree
- Ability to apply knowledge

These categories were re-contextualized (Tesch, 1990) into two themes that were then used to construct the definition. Table 5.1 depicts this process and illustrates the definition that is constructed from the themes.

Table 5.1: Definition of Academic Success

Question: Define academic success	
Categories	**Definition**
Completing the degree in stipulated time	Academic success is obtaining a degree within the minimum time and having confidence in applying the knowledge gained.
Ability to apply knowledge	

The categories that were identified have internal homogeneity (Mayan, 2002) because all the data that were collected are reflected in each category and each category makes sense to academic success. However, the categories do not have external homogeneity because 'ability to apply knowledge' is distinct and separate from the other two categories. It reflects a different aspect of academic success. The definition highlights that the respondents already have clinical experience, hence the definition that makes reference to clinical competence.

5.3 DETERMINANTS OF SUCCESS

In establishing factors that graduates perceive as determining success, they were asked about (1) reasons they thought generally contributed to some students being more successful than others (2) factors they thought contributed to their own success (3) factors they thought contributed to their colleagues completing the degree in minimum time (this question was asked specifically from those graduates who had exceeded the minimum time)

5.3.1 Analysis of Responses

The categories that emerged from the data were distinct and separate and could be grouped into individual and contextual factors that are perceived to determine success. Individual factors are those factors which individuals bring to the learning environment and contextual factors are those factors that are in the learning environment. The results are presented in Tables 5.2, 5.3 and 5.4 below.

Table 5.2: Determinants of General Success: Respondents' Perspective

Question	Categories	Groups
Why are some students more successful than others?	Will to succeed	Individual factors
	Intellectual ability	
	Advantage of language and educational background	
	Effective study techniques	
	Personality	
	Availability of resources including finances	Contextual factors
	Family support	

Table 5.3: Successful Respondents' Perspective of Their own Success

Question: What do you consider as factors that enabled you to complete the degree in minimum time?		
Category	**Theme**	**Group**
▪ Will to succeed ▪ Proper time management ▪ Attending lectures/practicals	Determination	Individual factors
▪ Understanding of language of instruction	Language proficiency	
▪ Maturity (when studying at university) ▪ Belief in God	Personal attributes	
▪ Support from friends/fellow students ▪ Support from lecturers ▪ Support from family/parents ▪ Financial Support	Availability of support	Contextual factors
▪ Pressure from family (poor background) ▪ Fear to lose bursary/financial aid	Compelling factors	

Twelve categories emerged and these were collapsed to form themes that would best represent the essence of the responses. Five themes emerged as factors that contribute to success: Determination, Proficiency in language of instruction, Personal attributes, Availability of support, Compelling factors.

Table 5.4: Unsuccessful Respondents' Perspective of Colleagues' Success

Question	Category	Groups
In your opinion, what were the factors that enabled other students to complete in minimum time?	Racial favoritism	Contextual factors
	Support from lecturers	
	Hard work	Individual factors
	Self discipline	

The unsuccessful respondents felt that those that were successful were either favoured because of their race and also received support from lecturers. The implication is that these respondents perceive that some students who are successful were "pushed through". Other respondents acknowledged that students who worked hard and were self disciplined towards their studies were able to complete in minimum time of four or four and a half years. This is probably an admission on their part that if they had worked hard and had been more disciplined, they could have been successful. This implies that they have insight into reasons for their lack of success.

Table 5.5: Enabling Factors for Completion of Physiotherapy Degree

General Factors	Successful Respondents	Unsuccessful Respondents	Emerging Theme	Group
Will to succeed	Will to succeed	Self discipline	Determination	Individual factors
Effective study techniques	Proper time management	Hard work		
Intellectual ability	Attending lectures/practicals			
Advantage of language and educational background	Understanding of language of instruction		Language proficiency	
Personality	Maturity (when studying at university)		Personal attributes	
	Belief in God			
	Support from friends/fellow students	Support from lecturers	Availability of support	Contextual factors
	Support from lecturers			
Family support	Support from family/parents			
Availability of resources including finances	Financial Support			
	Pressure from family (poor background)		Compelling factors	
	Fear to lose bursary/financial aid			

When comparing the perceptions of successful and unsuccessful respondents on factors that contribute to academic success, common themes emerged which were identical to the themes of successful respondents. Therefore according to the graduates, a student who will be successful is the one who has determination to succeed, is proficient in the language of instruction, has favourable personal attributes and has the necessary support. If the student has some compelling circumstances, that student will make sure that he/she is successful. Although racial favoritism was seen by some students to contribute to success of others, it did not fit within the themes that emerged.

5.4 BARRIERS TO SUCCESS

In determining factors that graduates perceive as being barriers to success the respondents who were defined as having been unsuccessful (according to the definition of this study) were asked to indicate factors that they thought contributed to their poor academic performance. Most of the unsuccessful respondents did not respond to this question, there were only four responses. Themes were used as coding units for these responses because the researcher could merely look for the expression of the responses. The respondents who completed the physiotherapy degree in minimum time were also asked what they perceived to be factors that are barriers to academic success. Categories were used as the units of analysis and then themes were developed from the categories. The results are presented in Tables 5.6 and 57 respectively.

Table 5.6: Unsuccessful Respondents' Perspective

Question	Themes	Group
What do you consider as factors that resulted in your taking additional time to complete your degree?	Poor understanding of physiotherapy concepts	Individual factors
	Personal problems	
	Lecturers' negative attitude	Contextual factors
	Poor clinical supervision	

Table 5.7: Successful Respondents' Perspective

Question: In your opinion, what were the factors that resulted in other students taking additional time to complete?		
Category	**Theme**	**Group**
▪ Poor time management (Didn't balance study and social time) ▪ Inadequate effort put into studies ▪ Poor attendance of lectures ▪ Lack of motivation	Lack of academic discipline	Individual factors
▪ Language Barrier ▪ Poor study techniques ▪ Poor high school background ▪ Inadequate aptitude	Academic problems	
▪ Emotional/Physical Issues ▪ Financial problems (Poor socioeconomic background)	Psychosocial difficulties	Contextual factors
▪ Victimisation (especially by lecturers) ▪ Poor Teaching Methods ▪ Poor Support from Department ▪ Bad influence from friends ▪ Racial Discrimination ▪ Stringent University Rules	Poor learning environment	

According to the successful respondents students who lack academic discipline, have academic challenges and psychosocial difficulties and experience poor learning environment will not be successful in their studies.

Both the categories that were identified and themes that emerged have internal homogeneity (Mayan, 2002) because all the data that were collected are reflected in each category and each category makes sense to lack of academic success. However, the themes do not have external homogeneity because they are distinct and separate, and reflect different aspects that contribute to poor academic performance.

Table 5.8: Barriers to Success

Successful Respondents	Unsuccessful Respondents	Theme	Group
Poor time management (Didn't balance study and social time)		Lack of academic discipline	Individual factors
Inadequate effort put into studies			
Poor attendance of lectures			
Lack of motivation			
Language Barrier	Poor understanding of physiotherapy concepts	Inadequate academic preparation	
Poor study techniques			
Poor high school background			
Inadequate aptitude			
Emotional/Physical Issues	Personal problems	Personal difficulties	
Financial problems (Poor socioeconomic background)		Socioeconomic difficulties	Contextual factors
Victimisation (especially by lecturers)	Lecturers' negative attitude	Poor learning environment	
Poor Teaching Methods	Poor clinical supervision		
Poor Support from Department			
Bad influence from friends			
Racial Discrimination			
Stringent University Rules			

Although there were few responses from the unsuccessful respondents on factors that hinder academic success, these were compared with the perceptions of successful respondents. Categories that emerged from unsuccessful respondents could be fitted into the themes of successful respondents. Thus according to the graduates, a student who lacks academic discipline, has inadequate academic preparation, experiences psychosocial difficulties and the learning environment is poor, that student will not be successful. Contextual and individual factors could also be differentiated.

5.5 REASONS FOR LEAVING THE PROGRAMME

In establishing factors that are barriers to success the researcher would have wanted to establish from the students who left the programme what their reasons for leaving were. Unfortunately physiotherapy departments do not keep track of students who leave the

programme without completion. Secondary data about the reasons of students leaving the programme were therefore sought from the respondents. They were asked if they knew of any students who had left the programme at the time of their training and the reasons they perceived to be responsible for departure of those students. Seventy six (59%) respondents knew a student or students who had left during the course of the programme. Some of the respondents indicated that although they knew of students who left had the programme they were not aware of the reasons for their departure. Table 5.9 depicts the categories of the perceived reasons for departure and explanation of the categories.

Table 5.9: Perceived Reasons for Others Leaving the Programme

Question: If you knew of any students who left the programme, what were their reasons?		
Category	**Explanation of the category**	**Group**
Change of career	Some of the students who left realized that they chose the wrong career or it had been their second choice and they moved to their first choice. Some did not like the profession e.g. dissection, human touch, etc.	Individual reasons
Academic exclusion	There were students who failed more than once or with very poor marks and were excluded from the programme	
Career change due to failure	Failed and decided to change the career and do something different	
Financial problems	Some students did not have financial back-up and therefore could not afford to pay fees	Contextual reason
Disillusionment	There were students who were disillusioned by the course because they: ▪ Felt they were not treated fairly ▪ Could not cope with racism ▪ Found it difficult due to impossible lecturers ▪ Discouraged by high failure rate ▪ Could not cope with language ▪ Were unable to cope with workload	Individual reasons
Illness or pregnancy	Self explanatory	

Change of career and academic exclusion were the two categories most cited reasons for students to leave the programme. Few respondents knew of colleagues who had left the programme because of financial problems, disillusionment, illness or pregnancy.

The categories that were identified have internal homogeneity (Mayan, 2002) because all the data that were collected are reflected in each category and each category makes sense to being a reason for departure from the programme. However, the categories do

not have external homogeneity because there are those that are distinct and separate and can be grouped into individual and contextual reasons.

5.6 REASONS FOR NOT LEAVING THE PROGRAMME

The respondents were asked if they themselves had ever considered leaving during the programme. Twenty eight (22%) respondents indicated that they had wanted to drop out of the course. They were asked to give reasons for their continuing with the programme; the categories of the reasons are depicted in Table 5.10.

Table 5.10: Reasons for Not Leaving the Programme

Question: If you thought of leaving the programme, what made you stayed on?		
Category	**Explanation of the category**	**Group**
Will/wish to become a physiotherapist	Determination to become a physiotherapist as the driving force. For some because they wanted the profession and for others it was to prove that they could do it.	Individual reasons
"Wasted time" implications	The thought of wasting time already spent in the programme was difficult to contemplate.	
Finance	The respondents stayed on the programme for different financial reasons. Some would not be able to secure funding if they changed the course, some managed to secure funding to continue studies and others were their families' hope for financial assistance once they completed.	Contextual reasons
Family situation/pressure	Students experienced different pressures that compelled them to stay on. Some had pressure to complete so that they could assist the family financially others had pressure of family expectations of success.	
Inability to change the course	Changing the course meant losing the funding and different academic entry requirements and the students could not manage either.	

Most of the respondents cited the will to become a physiotherapist as a reason for carrying on with the programme. The categories had internal and external homonogeity in that all the data reflected each category and relate to reasons for staying on to complete the course. The actual categories are distinct and separate in that they reflect different aspects of motivation to continue with programme.

The categories that were identified have internal homogeneity (Mayan, 2002) because all the data that were collected are reflected in each category and each category makes sense to continuing with the programme. The categories also have external homogeneity.

5.7 UNIVERSITY EXPERIENCES

5.7.1 Integration

As part of their experience of the learning environment the respondents were asked whether they had felt that they were part of their class i.e. felt integrated within the group of physiotherapy students. They were further asked to elaborate on what made them feel part of the group or not. Ninety (70%) of the respondents felt that they were part of the group. Those that did not feel integrated were asked to elaborate on the factors that were barriers to their integration. The categories that emerged from their responses are presented in Table 5.11.

Table 5.11: Illustration of Integration

	Categories	Group
Reasons for feeling part of the group	Friendships that were established some of which are still in existence.	Individual
	Support from the group	Contextual
	Group academic activities	
	Small classes which encouraged closeness	
Reasons for feeling isolated	Racial and cultural differences	Contextual
	Socio-economic disparities	

Students who felt part of the group undertook academic activities with fellow students, had support from others, formed friendships and were in small classes that made it easier for them to interact with one another.

Students who felt isolated experienced racial and cultural differences and socio-economic disparities.

5.7.2 Challenges

The respondents were asked about challenges that they encountered when they were at universities. The categories that emerged were further grouped and accommodated into five groups: academic, social, financial, institutional and personal. Challenges that fall within these groups presented in Table 5.12.

Table 5.12: Challenges Encountered at University

Question: What were the most difficult moments of your time at university?		
Category	**Group**	
Dealing with exams (theory and clinical)	Academic	Individual challenges
Long hours of lectures and studying		
Research		
Student council duties	Personal	
Pregnancy		
Ill health		
Poor accommodation (and failure to fit in)	Social	Contextual challenges
Family issues		
Relationship issues (love)		
Lack of essential resources like food, books, practical equipment and books	Financial	
Financial difficulties		
Racial discrimination	Institutional	
Inadequate socialization		
Victimisation by lecturers (perceived)		
Irrelevant courses (perceived)		
Transition from high school to university		
Traveling to clinical placements		

The categories that were identified have internal homogeneity (Mayan, 2002) because all the data that were collected are reflected in each category and each category can be challenge for a student at university. However, the categories do not have external homogeneity because they are distinct and separate. Hence, they could be grouped into fewer categories and be separated into individual and contextual challenges.

5.7.3 Highlights

The respondents were asked about experiences that they would regard as highlights of their physiotherapy studies. The highlights could be grouped into academic and social activities and these are presented in Table 5.13.

Table 5.13: Highlights at University

Question: What were the highlights of your time at university?	
Category	**Group**
Passing/doing well in studies	Academic (Individual)
Learning new things	
Competing well against people of other races	
Good friendships	Social (Contextual)
Social activities	

It can be seen from the previous paragraphs that both individual and contextual factors influence students' experiences at university.

The following table includes only factors that were perceived as predictors of success by the graduates.

Table 5.14: Summary of Variables and Factors Associated with Success in Physiotherapy

Variable	Chi square	Regression analysis	Graduates
Support ▪ Shared residence room ▪ Received information about support systems from classmates ▪ Part of the group ▪ Availability of support	✓	✓	✓
Physiotherapy as a 1st choice of career	✓	✓	
University language policy	✓	✓	✓
Determination			✓
Personal attributes			✓
Compelling factors			✓
Academic discipline			✓

The themes that emerged from responses of the graduates to questions on academic success contribute to the factors that influence success. Some of them can be linked to the factors that were significant in the quantitative data analysis, for example university language policy can be linked with language proficiency which has been cited as one of the contributors to success, availability of support particularly from friends and classmates can be linked with feeling part of the group and obtaining information from classmates. Note should be taken of those aspects that were probed in both the quantitative and qualitative components of this study and emerged as contributing to success versus those that were only probed in the qualitative component of the study (determination, personal attributes, academic discipline and compelling factors). These linkages will be discussed in Chapter Seven.

Referring again to Figure 2.1 it would appear from graduates' response that contextual factors such as support and language policy and individual factors such as determination and academic discipline are critical to success in the South African model.

CHAPTER 6

RESULTS: HEAD OF DEPARTMENTS' PERCEPTIONS OF ACADEMIC SUCCESS

6.1 INTRODUCTION

The purpose of this chapter is to present findings from the interviews conducted with the Heads of Physiotherapy Departments in universities. In this chapter, a balance has been sought between accurately portraying the nature and scope of the raw data and succinctly presenting the outcome of the interviews. The chapter commences with a brief description of the way in which the results are presented, followed by data analysis procedures and the actual results.

6.1.1 Content

In order to provide conceptually convincing evidence that the results and conclusions are grounded in the data, many qualitative researchers have relied on detailed quotes and examples of raw data (Strauss and Corbin, 1994). Such use of extended, unreduced text has been criticized as a weak and cumbersome form of display (Miles and Huberman, 1994). At the other extreme, some qualitative researchers seeking to avoid such cumbersome presentation of results have failed to provide adequate data to demonstrate the basis of their conclusion (Miles and Huberman, 1994) resulting in unconvincing research with poor replicability.

The present study sought to balance these potential flaws by constructing succinct summaries of results which maintain faithfulness to the original data (Kuipers, 1998) through the use of data matrices displays (Miles and Huberman, 1994). This form of presentation enables the reader to clarify key variables and demonstrates how they emerged (Miles and Huberman, 1994).

6.2 DATA ANALYSIS

The data collected via the audio-tapes included six lecturers' semi-structured interviews. The data were transcribed verbatim by a professional transcriber. The researcher ensured the accuracy of these transcriptions by listening to the audio-tapes while reading the transcriptions and making any necessary changes. This is a process DePoy and Gitlin (1998) refer to as 'cleaning'.

As this study was exploratory in nature and did not aim to substantiate a previously formulated theory, inductive reasoning was primarily used to analyse and interpret the

data collected. This process started by reading the transcripts a number of times to allow the researcher to become immersed in the data (DePoy and Gitlin, 1998). At this point, the researcher wrote a narrative from each interviewee, describing in detail all the critical information which had emerged from the interview (Appendix J). The narratives were repeatedly checked against the original transcripts and pertinent quotes from the transcripts. Creation of categories was done by segmenting the raw data (Tesch, 1990). Tesch (1990) also describes a segment of text as comprehensible by itself and containing one idea or piece of information. The segments of text that had a potential relationship with the purpose of this study were then taken out of their context, i.e. they were de-contextualized (Tesch, 1990, page 118). The segments were given topics and then sorted into categories by marking certain features and patterns in the segments for each interview. Some of the segments were coded into more than one category, and some of the text was not assigned to any category because the text was not relevant to the objective of the interviews. These groups were displayed in a matrix (Appendix K) to allow for constant comparison among the data from the interviewees (Miles and Hubermann, 1994). The findings of this process are illustrated in the following sections.

6.3 FINDINGS

6.3.1 Selection and Duration of Study

Before establishing issues around academic success with the Heads of Departments (HODs) it was important to establish some issues around access and throughput of black students in the physiotherapy programmes. This included selection criteria and student demographics. The results on access and throughput are depicted in Table 6.1

Table 6.1: Access and Throughput

Number of black students	▪ Varies between 2 – 10 in predominantly white universities
Additional selection criteria for widening access of black students	▪ Consideration of lower academic entry requirements ▪ Additional criteria include black and coming from areas of need, for extra curricular activities at school, leadership role at school, independent visit to a clinical physiotherapy department
Duration of completion	Average duration is 5 years
Throughput	50 – 90%.
Level of study where failure mainly occurs	Mainly in the first two years of study but first year in particular

6.3.2 Factors Facilitating Success

Although there are students who experience difficulties during their training, there are students who perform well academically and complete their studies in minimum time. The interviewees were asked to give their views of factors that contribute to the success of these students. The sub-categories and categories that emerged from data reduction are presented in Table 6.2

Table 6.2: Factors Contributing to Students' Success

Sub-Categories	Category
▪ Good integration into class ▪ Sense of belonging ▪ Comfortable relationship between staff and students	Integration within the department
▪ Parental/family support and guidance ▪ Social support at university ▪ Organized peer support ▪ Departmental support ▪ Security in academic support	Availability of relevant support
▪ Prior knowledge of physiotherapy ▪ Anticipated university challenges	Adequate knowledge about the profession
▪ Motivation ▪ Social discipline ▪ Hard work ▪ Perseverance ▪ Awaiting responsibilities at home	Academic discipline

According to the HODs students who are well integrated within their class and the department, have the necessary support, enter physiotherapy with relevant knowledge and who have academic discipline, perform well in their studies and succeed in completing physiotherapy within the minimum time required.

6.3.3 Factors Hindering Success

Lecturers were asked about what they viewed as challenges facing students who take longer than minimum time to complete their studies. They were further asked to give an account of how their universities in general and departments in particular, support students to overcome these challenges. The sub-categories and categories that emerged from data reduction are presented in Table 6.3.

Table 6.3: Challenges Causing Poor Performance

Subcategories	Categories	Groups
▪ Poor English writing skills ▪ Poor proficiency in language of instruction ▪ Poor academic literacy	Poor language skills	Individual factors
▪ Fast paced academic life ▪ Failure of basic sciences ▪ School science background ▪ Poor mathematics literacy background ▪ Complacency of high achievers	Inadequate preparation for higher education	
▪ Lack of prior knowledge of physiotherapy ▪ Poor understanding and expectations of physiotherapy	Inadequate knowledge about physiotherapy	
▪ Bereavement and illness ▪ Unconventional family structure ▪ Lack of parental presence for broad support ▪ Crime	Difficult social circumstances	Contextual factors
▪ Financial difficulties ▪ Loss of bursary due to failure	Lack of finances	

All the Heads of Departments mentioned language of instruction and financial problems as factors that result in students' poor performance. The issue around English was written language where the students have to express themselves which they found great difficulty in. Some of the HODs felt that the lack of confidence in language made some students to away from asking for assistance.

6.3.4 Support Systems

With all the challenges that had been identified by the HODs they were asked about the support that is available either in the department, faculty or university. The categories that emerged from their responses to this question are presented in Table 6.4

Table 6.4: Available Support Systems

Subcategories	Categories	Group
• Low interest loans on merit • Logistical rearrangement of clinical placement to relieve financial burden • Assist with organizing of bursaries and loans • Food and money from dept • Financial peer support	Financial	Individual support
• Counseling services • Structured mentoring system • Clinical psychologist • Email contact	Emotional	
• Psychosocial services from the university • House committees in residences • Staff and student mentoring system • Class coordinator to follow up students progress • Accommodation • Minority student support portfolio	Social	Contextual support
• Academic and clinical tutor system, structured and mixed race pairing • Student advisors • Afrikaans writing lab • Assistance with designing appropriate study patterns • Structured pairing of students for academic support • Learning development programme	Academic	

Different universities have programmes to support students socially and emotionally although a lot of effort is put on academic support. Efforts are made to assist students financially.

6.4 VERIFICATION OF FINDINGS

6.4.1 Independent Parallel Coding

An independent person who is not familiar with the research was given the objectives and all of the raw data from which the initial categories were developed. Without seeing the initial categories coded by the researcher she was requested to create a second set of categories from the raw data. This independent coder is a physiotherapy lecturer in another African country and has vast experience in qualitative research. She was chosen for her expertise in analysis of qualitative data.

The second set of categories was compared with the first set created by the researcher. The differences that were found were either in omission or a difference in the phrasing e.g. “Time to degree completion” versus “average time taken” Omissions that were found in the independent researchers categories were included in the final results, while

categories with slight differences were noted; where they enriched the data they were included. The results of agreement between categories of the researcher' and the independent researcher are shown in Table 6.5.

Table 6.5: Comparison of Interview Concepts

Interview discussion site	Total categories	Differences	% agreement
University of Pretoria	17	4	77%
University of Cape Town	10	3	70%
University of Stellenbosch	12	4	67%
University of Free State	17	3	82%
University of Western Cape	25	10	72%
University of Limpopo	14	2	86%

6.4.2 Member Checking

Member checking enhances the credibility of findings by allowing participants and other people who may have specific interests to comment on or assess the research findings, interpretations and conclusions (Thomas, 2006). To that effect, the categories that emerged were returned to interviewees for review and comment (Appendix L) and were accompanied by a letter of request (Appendix M).

Four feedback forms were returned by the interviewees. The respondents agreed with the interpretations of the comments they made during the interviews. On the category of 'prior knowledge of the profession' two respondents mentioned that black students are now more informed about physiotherapy than in the previous years. On the judgements and conclusions drawn by the researcher the respondents commented on the changes that they have already put in place in their own institutions. These are presented in Table 6.6 below.

Table 6.6: Respondents' Comments on the Interpretation of the Interviews

Category	Respondents' comments
Access and throughput	"The university already has criteria for black students that will enable them to complete the course….we do not want to put extra strain on the students who will not be able to cope academically" "The entrance criteria are reviewed every year….there is much debate about the criteria for 2009 applicants who would have undergone the new school criteria"
Financial support	"First year students get preference for residence….students are informed about all the available support….there is also a physio students welcoming function arranged by the students."
Academic support	"….is now instituting a year long intervention programme for those who are underperforming ….aimed at academic literacy and numeracy skills and will articulate with the main stream lectures."
Language support	" …done at …..through the course on Academic Literacy.."

The comments indicate that physiotherapy training is transforming although there are still challenges. The independent researcher had also commented that the data were transitional in nature.

6.4.3 Audit Trail

Data management process is depicted as an audit trail (Appendix N). The audit trail includes keeping a record of thinking, methods and action processes in deriving the outcomes of the study. It allows others to follow in a logical manner how these outcomes were reached. Consequently, others may decide whether they agree or disagree with what was found (DePoy and Gitlin, 1998)

The various categories that emerged from all the responses in the interviews were collapsed into eight overall categories (Table 6.7).

Table 6.7: Categories of the Interviews

Overall Categories	▪ Access and throughput ▪ Funding support ▪ Academic support ▪ Psychosocial support ▪ Prior knowledge of the profession ▪ Language proficiency ▪ Motivation ▪ Social environment

It emerged that these categories could be further grouped into individual and contextual categories. Individual categories were those categories which pertained to factors that students brought to the learning environment e.g. motivation, intellect. Contextual categories were those categories that pertained to factors within the learning environment be it institutional, social or financial issues. The eight overall categories were maintained as the final categories and the outcome of the interviews are depicted in figure 6.1 below.

A schematic representation of factors that contribute to success is presented in Figure 6.1

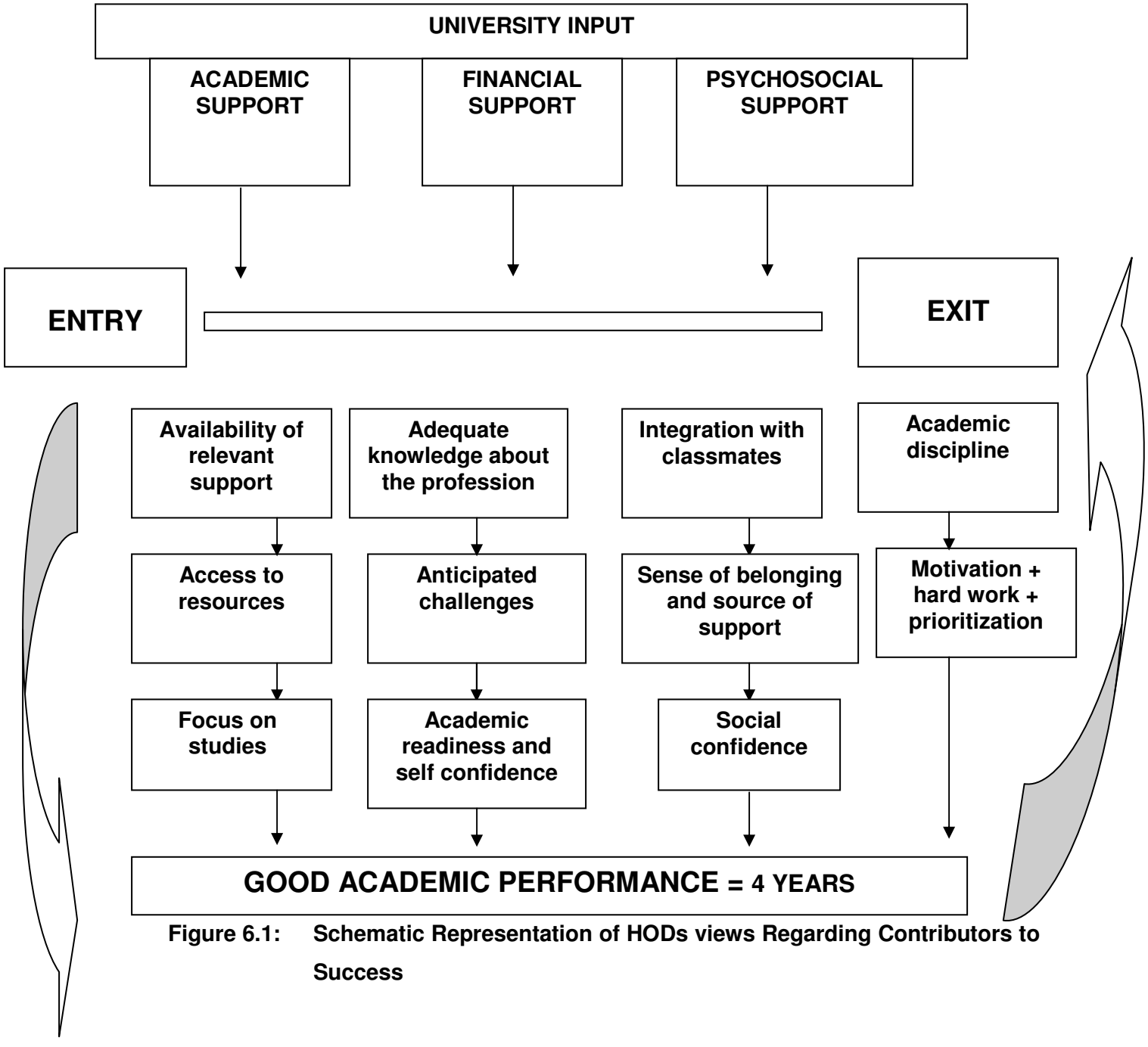

Figure 6.1: Schematic Representation of HODs views Regarding Contributors to Success

A schematic representation of categories regarded as factors that hinder success is presented in Figure 6.2.

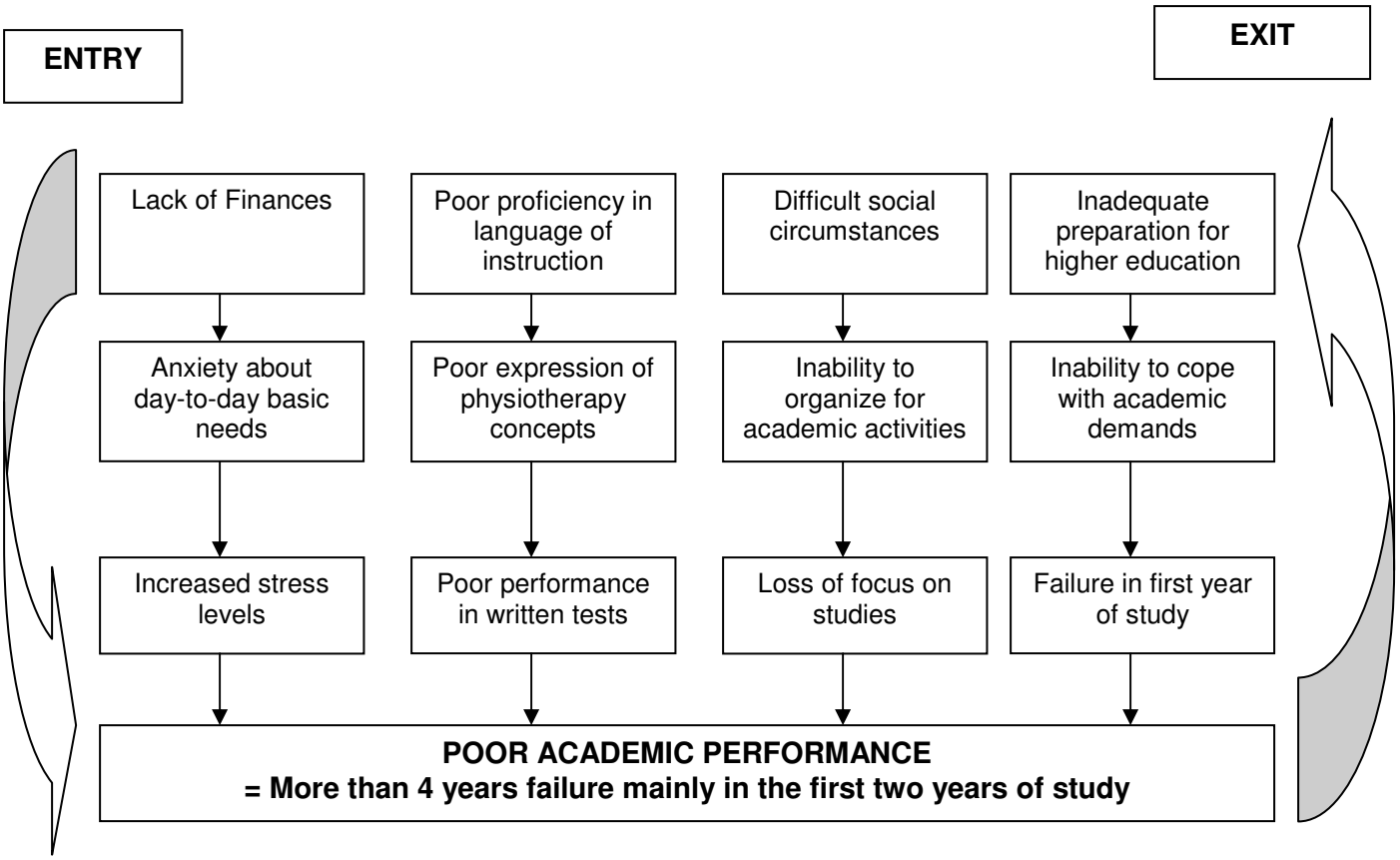

Figure 6.2: Schematic Representation of Contributors to Lack of Success (Mbambo, 2008)

The interviews conducted with the Heads of Departments confirm that on average black students take longer to complete the physiotherapy degree, and that in general HWUs are still battling to attract black students to their programmes. The interviews gave an insight into what the HODs understand to be factors that contribute to success or lack thereof. In the next chapter, these factors will be discussed together with the factors that came out from the quantitative aspect of this study and those that emerged from the open ended questions. An overview of all the results is given in Table 6.8 below.

The interviews also gave an overview of different support systems created by the physiotherapy departments and the universities to assist students to overcome some of the challenges that are seen to interfere with their studies.

Table 6.8: Summary of all the Results

Variable	Chi square	Regression analysis	Graduates	HODs
Support ▪ Shared residence room ▪ Received information about support systems from classmates ▪ Part of the group ▪ Availability of support	✓	✓	✓	✓
Physiotherapy as a 1st choice of career / knowledge of the profession	✓	✓		✓
University language policy	✓	✓	✓	
Determination			✓	
Personality			✓	
Compelling factors			✓	
Academic discipline			✓	✓

When all the results are considered there are important overlaps. As shown in Table 5.14 there are overlaps between quantitative and graduates' results, and now also between quantitative and HODs results, and between graduates and HODs qualitative responses. Referring to Figure 2.1 again the HODs results confirm some of the individual (students) and contextual (institutional) factors that have already been shown to be important for academic success. All these results are discussed in the next Chapter.

CHAPTER 7

DISCUSSION OF FINDINGS

7.1 INTRODUCTION

The motivation behind this study was to establish whether there are factors that can predict academic success of black physiotherapy students in South Africa. Alongside this motivation was the recognition that South Africa is going through transformation, and also that factors which apply to black students could similarly apply to white students. This study explored a range of factors, which impact on students' learning: their motivation for selecting physiotherapy as a career, their knowledge of the profession, their preparedness for higher education in terms of high school performance, personal and external support systems and their perceptions regarding academic success. The study further explored the perceptions of physiotherapy educators of factors that facilitate or hinder academic success of black students and of the support that is available for the students. These factors were seen to be important as they help define the relationships between students and the learning environment, which in turn influences the quality of learning achieved (Byrne and Flood, 2005).

The starting point for this study was to investigate cognitive and non-cognitive factors, which could predict success. This would provide a combination of factors that would best predict success of students in general and black students in particular. The processes followed in finding the answers were based on literature which to a large extent emerged from developed countries. Recognizing South Africa's unique situation it was important to explore factors that were not otherwise mentioned in the literature, including diversity in medium of instruction.

Two standpoints underlying this study were firstly that students are individuals and would therefore have different experiences during their learning. Secondly, students' academic performance and therefore success, is not only influenced by their interaction with content and skills development, but also by the learning environment including the university ethos and the physiotherapy departments through the lecturers. Significant variables that can predict success were the outcomes of interest. The perceptions of the students and lecturers of academic success were also outcomes of interest as these provide a broader understanding of the concept of academic success that cannot be quantified. In this study the perceptions sought included the definition of academic

success, the factors that facilitate success, factors that hinder success, existing support that the universities provide, and experiences of students during their studies.

The previous three chapters presented results of the quantitative and qualitative enquiries. The major findings from the quantitative enquiry were that (1) white students are admitted with high matriculation symbols and they are more likely to succeed in physiotherapy education (2) black students are admitted with lower matriculation symbols than white students and they are less likely to succeed in physiotherapy education.(3) academic performance in high school is not statistically significant in predicting success of black students in physiotherapy education but is significant when the group is combined (5) when the group is combined there are many factors that differentiate successful students from unsuccessful students but there are minimal factors for black students (6) black students with low high school academic performance are as successful in physiotherapy training as those with high academic performance in high school (7) supporting and integrating experiences at university are better predictors of success in physiotherapy education for black students.

The qualitative component of the study yielded a number of issues that were not explored on the quantitative analysis. The major findings from the qualitative enquiry regarding factors that contribute to academic success were themes that emerged from both the graduates and the HODs. It emerged that these themes could be grouped into individual and contextual factors:

1. Individual factors were those factors that students bring to the learning environment (determination, language proficiency, academic discipline and knowledge about physiotherapy).
2. Contextual factors were the conditions under which students develop and learn (availability of relevant support, integration with classmates).

The graduates also indicated reasons they thought contributed to some students leaving the physiotherapy programme. These were also individual (e.g. decision to change career) and contextual (e.g. lack of finances to continue).

When considering quantitative results against qualitative results, it can be seen that there are several predictors or determinants of success that emerge from both methodologies. This would strongly suggest that these are important factors that must be taken seriously. Some additional factors were put forward by both HODs and

graduates. It should be noted that these factors were not included in the quantitative analysis, but since they support one another they also should be taken seriously.

In this chapter the results of the quantitative and qualitative enquiries are combined in the discussion to answer these research questions: What are the significant predictors of black students' success in physiotherapy? Is there a difference in the success in physiotherapy between black and white students? How do students define academic success? What are the perceptions of students and lecturers regarding academic success? The framework used in this discussion in depicted in Figure 7.1.

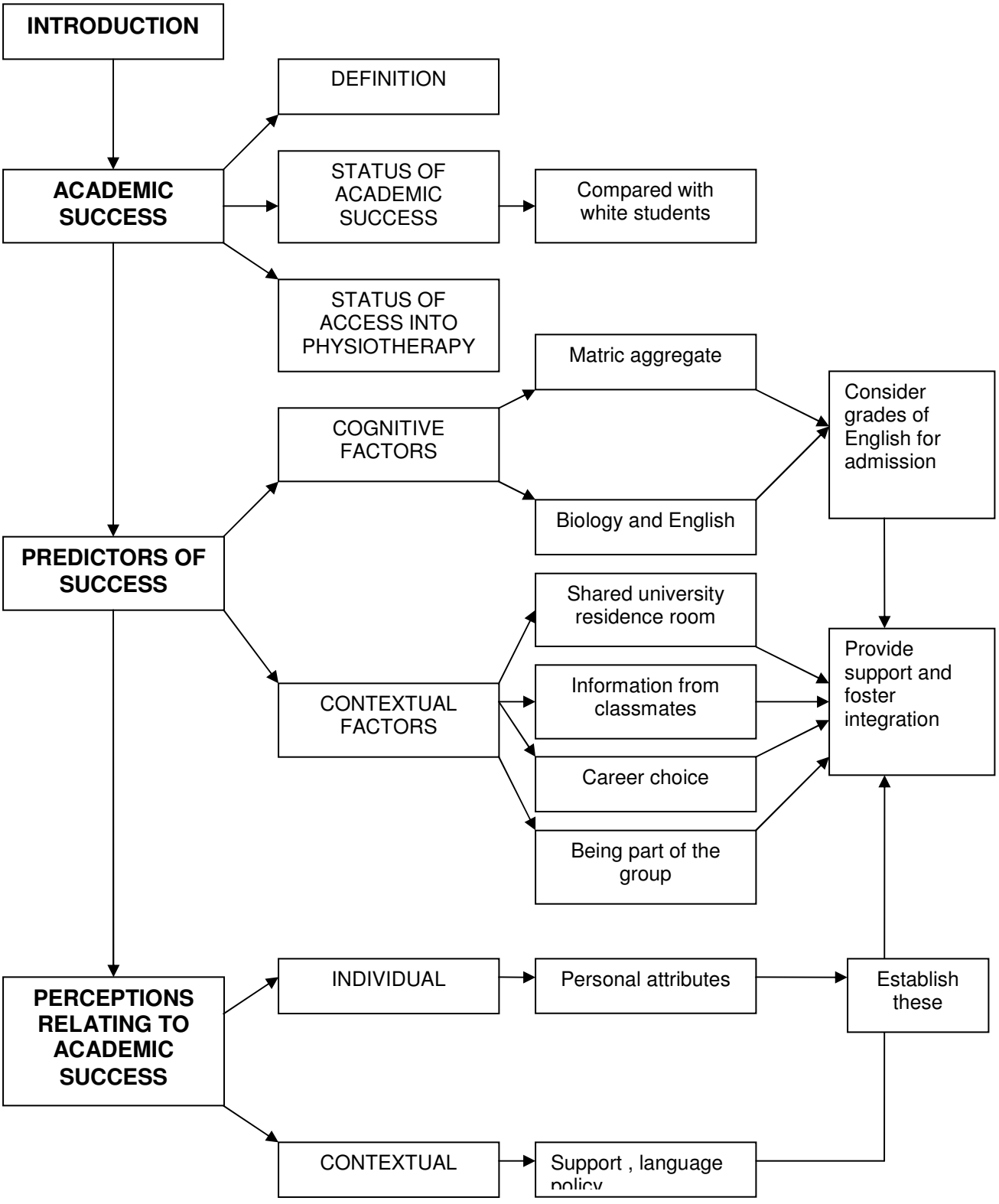

Figure 7.1: Discussion Framework

7.2 ACADEMIC SUCCESS

7.2.1 Definition of Academic Success

In differentiating between successful and unsuccessful students in this study, academic success was operationally defined as completion of the physiotherapy degree within minimum time. Graduates who completed the degree in four and a half years were regarded as successful because up to six months may be added at the end of the fourth year examination as remedial time for a student who has not performed to the satisfaction of the examiners. This would be a student who has progressed well in all the previous three years and throughout the fourth year but encounters difficulty in the final examination. This operational definition was meant for the purposes of this research, and it was therefore important to establish how the students would define academic success for themselves. This would assist in contextualizing factors that they would indicate as facilitators or barriers to academic success.

Two themes that defined success emerged and these were obtaining a degree within the minimum time and having confidence in applying the knowledge gained during training. The latter theme of the definition is no surprise considering the fact that the respondents were already practicing physiotherapists during this study and therefore appreciate the importance of application of knowledge and skills. Interestingly, the themes that define academic success in this study were from black and white respondents, from respondents who had completed their degree in minimum time and also from those who took longer. In studies that have been done on academic success, academic success has been defined as performance in examination at the end of the programme (Balogun, 1986), and/or performance at university (Mitchell, 1990). Literature that addresses performance at university looks mainly at marks that have been obtained either in different subjects (Lipton et al, 1984; Thompson et al, 2006) or average marks (Graunke and Woosley, 2005). No studies were found that described academic success as completion of a degree in a minimum time period.

7.2.2 Status of Academic Success

Having defined academic success, the determinants of this success were explored by means of quantitative data analysis and through qualitative data analysis of responses from open ended questions in the questionnaire and from the interviews. Quantitative data were analyzed first for the total group and then for the black student group. Qualitative data provided additional information on individual and contextual factors.

7.2.2.1 **Black versus white students academic success**

The results of this study have shown that black students are less likely (OR = 0.155; p< 0.001) to be successful in physiotherapy education whereas white students are more likely (OR = 6.461; p < 0.001) to be successful. In America, according to Graves (2008) the gap between black and white graduation rates still exists; it has been found that many colleges and universities graduate black students at significantly lower rates than white students. The immediate reaction to this result in the South African context would be that the reason for this outcome is that most black students are admitted with lower high school performance results as is confirmed by the frequency distributions in this study (Figures 4.1 – 4.5) and by the HODs who confirmed that most black students were admitted with lower results in an attempt to widen access and correct the demographic imbalances. The HODs tried to explain this when saying:

"And for the white students we expect that they have about 40 points. So we have to be a lot more competitive with our white students because there is a bigger pool. For the black students, we tend to take students who got 36 points or more…….. Which has its own problems but then you end up with a bimodal distribution and it's not that… that the black students aren't capable, it's just that they came in with a worse score and you took the very cream of the white students."

"So we do have different criteria for them as well. They must have as well at least a C symbol or 60 percent for the language that they're going to do the course in, like English. And we also look at the science mark, that must be at least 60 percent; and also the average mark must also be like 60 percent. So then we select all the black students that we can, using that criteria."

"We have special criteria because all of us know that the mathematics and science at school level is a problem. So we have to comply with the 50% on higher grade minimal requested by the Faculty of Natural Sciences "

However, the results in this study have shown no association between high school academic performance and success of black students in physiotherapy. This is in keeping with Griesel et al (1993) and Strydom (2002) in that they found that the relationship holds at the top end and breaks down at the lower end of performance. The association was shown when the total group was considered. These results therefore question the use of matric results as a major criterion for admission of black students into physiotherapy by the different institutions in South Africa. Zaaiman (1998) and

Ayaya (1996) as quoted by van der Merwe (2003) pointed out that intelligence is not the only factor that could influence academic performance and indicated that certain non-cognitive factors also play a role. The matric results from the former Department of Education have been regarded as unreliable predictors of future academic performance (Rutherford and Watson, 1990; Zaaiman, 1998) because of the variation in quality of school education in South Africa (Boeyens, 1989). In 1991 Fourie reported that 66.8% of the successful students' performance could be ascribed to their matric results. This study was however, conducted on a group of Afrikaans speaking students and it is likely that they probably attended schools that prepared them appropriately for university. If it is not the lower grades that contribute to black students' less likelihood to succeed, there could be other contributing factors. Some of these factors were probed in the rest of the questionnaire and during the interviews, but the focus of this study was not on what contributes to students' lack of success but rather on what contributes to students' success. Later in this discussion the psychosocial factors which were found to statistically predict success and those thought to influence success are discussed.

According to the HODs, the average time taken by black students to complete the degree is five years. Students tend to repeat mostly in the first two years of study and those who dropped out of the degree did so at these levels. This is in keeping with Graves (2008) who found that fewer than half of the black students who enroll in college graduate from four-year institutions within six years. In 1993 Tinto estimated that about 60% of all students who leave college do so during their freshman year. Other studies have demonstrated that the transition from school to university can be a particularly difficult and unsettling experience for many students as they are entering an unfamiliar domain (Lowe and Cook, 2003; Ridley, 2004). This unfamiliarity and uncertainty is at its height in first year. It is at this time that students regardless of their culture or educational background are likely to encounter academic failure, and are most at risk with respect to a range of potential social, emotional, health and financial problems (McInnis, 2001).

The issue of failure in the early years of the physiotherapy degree is supported by the graduates' responses to the question asked about reasons for students leaving the physiotherapy programme before completion. They mentioned failure of first year courses as one of the reasons why students left the physiotherapy degree. This finding can be explained using Sternberg's context on intelligence (1985) which proposes three types of intelligence namely, componential, experiential and contextual. He defines componential intelligence as the ability to interpret information hierarchically and

taxonomically in a well-defined and unchanging context. This intelligence can be seen as particularly relevant to ability to perform in the early, more didactic parts of a curriculum. The early part of the physiotherapy curriculum consists of basic sciences like chemistry, physics and biology and these are the parts of the curriculum which are more didactic and therefore require componential intelligence. This type of intelligence does not get developed in black students who attend schools where they are not expected to perform at highest of their intellectual ability. This may be the manifestation of the poor qualifications of most, if not all teachers in the black schools.

Experiential intelligence on the other hand involves the ability to interpret information in changing environment. For most of the black students, school environment and home environment are in contrast and therefore these students have to constantly interchange their context. In the physiotherapy curriculum experiential intelligence can be seen as important in the later parts, in the integrating and synthesizing that accompanies clinical and professional work.

Morris and Farmer (1999) also found that the cognitive predictive strength for academic performance of physiotherapy students weakened progressively in the clinical years but was stronger in the first two years of study particularly first year.

Comments from HODs regarding performance during the four years of study were:

'*And what we find is that after the 2nd year they've actually caught up with everybody else and they manage fine'*

'*But it can happen that they repeat the first year and also the 2nd year and that's how I get 6 years. But usually when they pass the 1st and 2nd year they're ok for the 3rd, 4th year'*

"There are two areas where we are actually dropping them or where they seem to lag behind: it's the first 2 years where the major subjects are the basic sciences. And they fail basic sciences. In terms of physiotherapy, there will be 1 or 2 students who fail physiotherapy. So I really can't say what the major problem is, whether it's students who are coming here without relevant preparation for basic sciences or maybe they don't have enough or sufficient information in basic sciences. And therefore when they are faced with deeper basic sciences, they struggle."

The third type of intelligence is contextual intelligence which is the ability to adapt to a changing environment, the ability to handle and negotiate the system. Black students have to learn to adapt in different ways. For instance, learning in a language that is not their home language needs adaptation in expression of grammar. They also have to learn to negotiate the system. For example, for those attending multiracial schools, in many instances the system does not favour them culturally therefore they have to learn to negotiate the system by learning what works in that environment in order to survive in it. To find their place in the school community and society these students create a new identity for themselves (George, 2002). Some of these students suppress their cultural heritage and become 'raceless' to conform to the expectations of the dominant group (Steele, 1997). Black students therefore have had to develop and show abilities in the experiential and contextual intelligence areas in ways that white students have not had to demonstrate, hence they are able to handle better the later part of the curriculum. In the later years as well, the students would have learnt how to adapt to the academic demands of higher education, are familiar with the language of instruction, are familiar with the university environment and have formed meaningful partnerships e.g. friends and study groups.

7.2.3 **Access into Physiotherapy Training**

Access is the first step towards academic success. Tonks and Farr (2003) define access as the overall representation of a given population of interest in Higher Education and it is an assessment of opportunity and of exclusion. A crucial factor in sound university access policies is the validity and reliability of the criteria used for selection (Herman, 1995). In establishing academic success, it was felt important to consider the status of access of students into physiotherapy programmes.

The outcome of the interviews held with the physiotherapy training HODs in terms of access revealed that there are few black students that access physiotherapy training in the predominantly white universities, (approximately 2-10 black students out of an average of 50 students per year) are admitted into physiotherapy education. It was also evident in the demographic data from the questionnaires that there were fewer black graduates from the predominantly white universities. Out of the 66 black respondents, only 10 were from the historically white universities. As they were liberalizing their admission policies to include more black students, English medium HWUs introduced academic support programmes for low achievers and second language English speakers (Herman, 1995). These attempts to increase the enrolment and academic

development of disadvantaged students are laudable, sincere efforts to address historical imbalances and inequity. The question to ask is why physiotherapy departments in HWUs continue to enroll low numbers of black students? The one reason could be that the pool for selection of black students still includes a fair number of students with lower than required matriculation symbols. The other reason could be that if the HWUs have a poor track record of success of black students, and if black students who graduate from these institutions have few or no positive experiences to share, then prospective students are bound to be reluctant to study at these universities. Two of the HODs attributed this low number of black students to the fact that black students choose physiotherapy as a second choice to medicine, and if they are admitted to medicine they abandon physiotherapy. One might argue that the reason is that physiotherapy is not known or understood in most of the black communities, as was shown by the results from this study, and that medicine is known and has a higher status. Students are therefore more comfortable with pursuing a career that they know of. However, students do access physiotherapy but mostly in HBUs and responses from the HODs about students' knowledge of physiotherapy indicate more and more black students now come into physiotherapy with some knowledge of the profession. Engestrom and Tinto (2008) suggest, "that institutions do not intentionally exclude students from entering college does not mean that they are including them as fully valued members of the institution and providing them with support that enables them to translate access into success."

In South Africa universities are expected to ensure that, while they are addressing issues of broader access as well as race and gender imbalances, they are not creating a situation that is characterized by high drop out and failure rates. Universities and other higher education institutions thus face a difficult dual mandate in which they are required to face issues of redress and equity, as well as produce employable graduates who are equipped with skills and competencies necessary to function in modern society and meet the human resource needs of the country (Bundy, 2002; DoE, 2001; Strydom, 2002). Engestrom and Tinto (2008) suggest that in order to face the issues of redress effectively, institutions have to believe that all students have the ability to succeed under the right set of conditions and that it is their responsibility to construct those conditions. They further suggest that institutions have to take seriously the notion that the failure of students to thrive in college lies not just in the students, but also in the ways the institutions construct the environments in which they ask the students to learn.

While both the government and higher education institutions acknowledge the changing profile and characteristics of those aspiring to attend university, the general entry requirements for undergraduate programmes in South African universities have changed little since 1994 (Fraser and Killen, 2005). Some attempts have been made to facilitate access for previously disadvantaged students (Potter and van der Merwe, 1994) and to provide bridging courses that target language and mathematics deficiencies (De Villiers and Rwigema,1998). However, the traditional practice of using school matriculation results as prime basis for university entrance is still dominant.

7.3 PREDICTION OF ACADEMIC SUCCESS

The call for increasing participation in higher education by the South African government since 1994 (White Paper on Higher Education, 1995)) has resulted in students with diverse academic backgrounds and levels of preparation entering physiotherapy training. The diversity makes prediction of academic success a complex issue. There are a number of factors that can contribute to success or lack thereof, with different combinations for different students which make it difficult to pin-point exactly which factors will best predict success. A number of factors thought to influence academic success were investigated in this study for their predictability. The factors can be divided into individual factors which are cognitive (intellectual abilities) and non-cognitive (personality, for an example, academic discipline, motivation and hard work) and contextual factors which include racial issues, language policy and financial and academic support.

The following paragraphs discuss all these factors.

7.3.1 Cognitive Factors

Performance at high school level, that is, matriculation aggregate symbol, symbols obtained in English, Biology, Mathematics and Physical Science and the level of grades in which the subjects were studied were used as cognitive factors that could predict academic success. Other studies that were mentioned in the literature reviewed for this study have in addition to high school grades, National Entry Examination results and Aptitude Tests as a cognitive predictor. For instance, in China the National College Entrance Examination is an academic examination held annually in the mainland of the People's Republic of China. This examination is almost always required for college admission. It is usually taken by students in their last year of high school. The Scholastic Aptitude Test (SAT) is a standardized test taken by American high school students

applying to colleges as a means of promoting merit-based college admissions. The test, which most colleges use as one measure of an applicant's ability, has been denounced as biased in favour of men and the white middle class. Other critics claim that the SAT is inadequate for testing various important capacities (Britannica Concise Encyclopedia).

A similar compulsory National Entrance Examination is not available in South Africa but a Health Sciences Placement Test (HSPT) for students entering the health professions was developed in 2006 and is currently administered by Alternative Admissions Research Project (AARP) for seven South African universities. This test is said to enhance the appropriateness of an applicant's quest for admission. Test results are used to complement existing measures for the assessment of applications to Health Sciences Faculties. The HSPT gives applicants an opportunity to demonstrate their potential for access to university study although they may come from diverse educational backgrounds. The tests also provide diagnostic information about the individual applicants' strengths and weaknesses in important areas of academic literacy, numeracy and scientific reasoning. This information can be used to improve access opportunities and, if coupled with appropriate teaching and learning interventions, can enhance the possibilities of success for students (www.aarp.ac.za).

The HSPT is used by six of the universities that train physiotherapists, five of which admit the lowest number of black physiotherapy students. This test was not considered in this study because it was implemented in 2006 and therefore the respondents in this cohort were not subjected to this test. Notably is the fact that different 'threshold' may be used for this test depending on ethnic background of applicants e.g. white students may require higher scores to qualify for entry than blacks

The following paragraphs discuss analysis of the high school performance.

7.3.1.1 **Matric aggregate versus academic success**

The results of this study show a difference between black and white students' high school performance. In this study 59% of black students had symbols A – C compared to 98% of white students. In the lower range of symbols (D and E) there were 41% of black students compared to 2% of white students. This is an expected difference in a country where, for centuries, the school system has been highly unequal, favoring the privileged white minority (Huysamen, 2000). To substantiate this unequal education Huysamen (2000) illustrated that for instance in 1988 to 1989, R656 was spent per black child on

education as opposed to R2882 per white child. Many of the respondents in this study still came from that unequal, educationally disadvantaged background.

The literature on educational disadvantage regards a student as having been disadvantaged if (s)he had inadequate access to quality education services resulting in a lack of opportunity to fully develop his or her academic potential (Zaaiman,1998). The greatest uncertainty about the validity of matric as a predictor of further performance has long existed for low-scoring, disadvantaged students from the previous DET (Department of Education and Training) black-only educational systems (Hofmeyr and Spence, 1989; Rutherford and Watson, 1990; Martin, 1992; Braun and Nel, 1995; Herman, 1995; Yeld and Haeck, 1997). The rapidly changing South African situation complicates the use and evaluation of the use of matric results for selection (Flier, Thijs, Zaaiman, 2003). This change will be seen in 2009 when some of the students entering physiotherapy programmes would have studied mathematics literacy instead of mathematics proper. There have been differences of opinion as to whether the matriculation examination is primarily a prognostic test to predict future academic success or whether it is an assessment of a standard of general education (Herman, 1995). However, while institutions and therefore physiotherapy continue to use matric symbols as the main admission requirement, the predictive validity of these symbols were investigated in this study.

Admission of students with D-E aggregate symbols in matric and their ability to succeed in physiotherapy training may raise a question of academic standards at the universities that admit these students. In South Africa there are quality assurance systems which all academic physiotherapy departments subscribe to. Firstly, all departments are subjected to a regular accreditation process by the Health Professions Council of South Africa. A set standard of training is expected from all the departments, and if a department does not meet these standards, accreditation becomes provisional until all criteria have been met. Secondly, theory, practical and clinical final examinations are subject to moderation by external examiners from the different universities throughout the country. It would therefore not be possible for a university to operate at a lower level of training than the rest of the other universities. This leads to a conclusion that the standard of training is the same and students are able to succeed having obtained lower symbols. What then leads to this success? The factors found to predict success and factors perceived to influence students' performance are discussed later in this chapter.

7.3.1.2 Biology and English versus academic success

In this study, the difference between black and white respondents was also evident in the symbols obtained in the different subjects. The results of this study show that 56% of black students achieved high symbols in English and Biology. When Chi square tests were done for these subjects considering the total group, they showed an association with success (English: $X^2 = 15.73$; $p < 0.001$ and Biology: $X^2 = 12.96$; $p < 0.05$). However, when these tests were applied to the results of the black group there was no significant difference between students who were successful and those who were not. Most of the subjects in physiotherapy are biological sciences and therefore if a student had performed well in biology in high school, it is generally expected that their chances of being able to grasp the concepts to be high. Morris and Farmer (1998) conducted a study to investigate the predictive strength of entry grades and biographical factors on the academic and clinical performance of three student cohorts in the physiotherapy course. Three variables were considered i.e. General Certificate of Secondary Education (GCSE), university entrance examination grades and biology grades. The GCSE average and A-level biology had the strongest predictive strength of success. However, for a student to understand content of a subject and be able to demonstrate competency in it, they must understand the language in which it is being taught. Hence, it is assumed in this study that the high symbols obtained by black students in English meant that the students were proficient in English, which is the medium of instruction at university. This could have assisted the students in understanding physiotherapy concepts. The success of white students can also be attributed to their proficiency in English and high symbols in biology among other factors. More recently, Barton and Neville-Barton (2003) as quoted in Rauchas, Rosman and Konidaris (2006), investigated the connection between language and mathematics learning. Their results indicated that there is a strong linguistic component to consider. Rauchas et al (2006) themselves investigated the connection between English and performance in computer sciences and found a strong statistically significant positive correlation between English first language results and computer science performance. Although these studies are done for specific subjects, they still link understanding of new concepts with proficiency in the language that they are taught. Elaborating on language proficiency as a problem for black students, some of the HODs had this to say:

> *"I think a big thing is also language. You know, they have a compulsory English language course in the first year but there is a big difference between being able to speak and read and the comprehension"*

"*He can't speak proper English, let alone – and he struggles because, you know, about a week ago he missed an exam because, I think things go past him. Like he doesn't realize it and I don't know if it's- because all the things are written down, all the things, but I think it's just so overwhelming sometimes for him."*

Jardine (1986) as cited by Toni and Olivier (2004) sees the South African black student as a victim of an education system which forces her/him to study in a foreign language. In most cases this student is penalized for an inability to effectively utilize the language in her/his academic endeavours. The students in this current study revealed language as one of the barriers to academic success:

"English language was my problem as I was doing well in clinical work but struggling in writing theory"

"Most people who had English as their first language finished in minimum time and the rest had repeated somewhere along the way."

"In first year I did chemistry and physics in Afrikaans so language was major barrier to me. Second year was the same but even worse because I needed first year background so I didn't do well"

Black students' educational disadvantage is greatest in mathematics and science where schools still typically have few qualified science and mathematics teachers and inadequate or non-existent physical facilities (Arnott et al, 1997). This is confirmed in, the results in this study, which show low performance in these subjects. Mathematics and science though, were not shown to be associated with success of black students.

Diversity of academic background and level of preparation for higher education heightens the need for physiotherapy educators to develop innovative ways of teaching that will cater for these differences.

7.3.1.3 **Non-cognitive factors**

In the qualitative analysis of both the graduates and HODs responses themes on personality factors emerged. When asked about factors that contribute to own success and success of others the responses of the graduate yielded themes of will to succeed, language proficiency and maturity. These were in agreement with some of the themes from the HODs interviews but in addition the HODs' themes included academic discipline.

7.3.2 **Psychosocial Factors**

From the analyses of quantitative data in this present study, five factors were found to be statistically significant in predicting academic success. These were shared university residence, information from classmates, physiotherapy as first choice of career, university language policy and being part of the group. It can be seen that these are individual and institutional predictors. Some of these factors are in agreement with themes that emerged from the HODs and the graduates (Table 6.8). Being part of the group was the factor that was common in all the analyses in this study. One would therefore argue that support and integration are the most important factors to come out from this study. The following paragraphs discuss these factors.

7.3.2.1 **Shared university residence room (university support)**

The fact that sharing a room at the university residence is a predictor of success for blacks in this study may be due to the fact that these graduates had found their roommate to be a source of physical, social and academic support. Tinto (1993) observed that residence halls provide scaled down environments that enable newcomers to find an early physical, social and academic anchor during the transition to college life. In terms of physical support, most black students come from typical home environments of sharing a room with siblings, no private space and some no electricity. Coming to university and staying in the residence often brings a positive change in environment, which provides for better physical facilities, private space for studying, and ability to organize time and self because there are no other family responsibilities. On the other hand, sharing a room gives familiarity with home. Social support is crucial and particularly for students who are from outside the area of the university. If they share a room with a local student they are assisted to socialize, and if both are from outside they support one another in learning the local and campus social ropes. In one of the interviews one HOD mentioned a student who was struggling academically because she did not have friends and was lonely, staying far from home and unable to visit home

during holidays because of financial constraints. One would argue that if such a student had shared a room she would at least have one contact person and source of support. Academic support from a roommate can be in the form of sharing academic problems as well as information regarding where assistance can be sought. Blimling (1993) [in Berger, 1997] cited abundant evidence that living in residence halls has a strong positive effect on student persistence in college, although there is no evidence whether the persistence ends up in success. Studies conducted by Blai (1971) Ainsworth and Maynard (1976) Duncan and Stoner (1977) and Pascarella and Terenzini (1978) [as cited by Nettles et al, 1986] have provided consistent evidence that residential peer influence as well as on-campus academic environments have a significant effect on students' college achievements for both high- and low-aptitude college students. Nettles et al (1986) found that these studies are particularly convincing in showing the positive effects of residential hall placement upon the performance of low-aptitude students when matched with high-aptitude roommates of similar personality type. Blimling and Hample (1979) have also found that students if they live in campus residence halls with structured emphases upon studying improve their academic performance in college.

7.3.2.2 **Integration**

The results show that 66% of black respondents who felt part of the group were successful. Integration into the group of fellow students is important because physiotherapy training involves group work and is partnership orientated, and therefore a student needs to fit into the group and have a good working partnership to be able to learn successfully. When asked about factors that contributed to graduates' feeling part of the group, themes that emerged from the responses were friendships that the students were able to form, support from one another, engaging in academic activities together, and small classes that encouraged closeness. The feeling of being part of the group with fellow students provided academic support. Most research on this topic concludes that the better the fit between student and his or her environment, the better the chances of that student's academic success.

When students attend a university where they are a majority or where the culture of the university favours them, there is often greater cultural continuity between the home and university environment that provides them with a sense of familiarity, belonging and security. For black students, when this is not the case in a predominantly white university, they tend to have a weaker relationship with the lecturers and are more likely to feel like outsiders. Sedlacek (1999) mentioned the fact that research on

undergraduate black students in predominantly white universities in Tennessee showed that they had not achieved a feeling of belonging. To illustrate this finding some of the graduates had this to say:

"It was always a problem to pair myself for practicals as I was the only Black in my class. No one was keen to be my partner"

"If we had a group discussion and I raised a point to my classmates, they would ignore it unless another white student agreed or said exactly the same thing"

"Never felt entirely part of the group, felt insecure and didn't always fit in"

There were graduates who had positive experiences with being part of the group which seemed to assist them academically as well. The following are some of the comments that they made:

"Because of small class we were able to get to know each other personally. Also group work during lectures and practicals promoted comraderadie [sic]"

"I was well supported by classmates through my pregnancy and by lecturers."

"The class was very small which meant everyone got to know each other. We worked together and swapped partners often, so by the end of the 4 years we were very close. A small class is vital."

"…some of classmates were friendly, accommodating, assisting with academics and transport to our clinical areas and socially."

Tinto's model of individual student departure (Tinto, 1975) is among the most widely discussed and explored in the higher education literature. Tinto (1993) asserted that the process of becoming integrated into the academic and social systems of a college occurs when students successfully navigate the stages of separation, transition, and incorporation. Separation involves students' ability to disassociate themselves to some degree from the norms of past communities, including families, high school friends, and other local ties. Transition occurs after the successful negotiation of separation. In transition, students find themselves in a situation where they have separated themselves from the norms and patterns of their past lives but have not yet adopted norms and

behaviors from their new environment. Incorporation happens when students adapt to and adopt the prevailing norms and behavior patterns of their college or university community. Once incorporated, the students become integrated, although successful integration does not necessarily ensure persistence. The primary components of the process of incorporation involve the academic and social integration of students into the life of the college. Tinto's (1993) discussions of academic and social integration seem to be rooted chiefly in the degree to which students believe they are a part of the academic and social systems of the college or university.

Milem and Berger (1997) conclude that higher education practitioners generally do a good job of encouraging students to become involved with their peers upon their arrival at college, but practitioners seem to place less relative importance on the need for students to become more actively engaged with faculty members from the inception of their college careers. Practitioners often seem to think that involvement with faculty is something that happens later in students' college careers.

"The power of the postsecondary experience lies in people. At the end of the day it is people that make a difference in how students experience an institution. So it is very important for people to be a supportive mechanism in institutions." Dietsche (2008).

7.3.2.3 **Information about support from classmates**

The graduates were asked how they found out about the support systems that were available at university. The sources of information were tested for association with success and their predictability and the results showed that obtaining information from classmates was a predictor of success. Harmon and King's (1985) expert systems theory suggests that successful college students are those who are in effect 'experts' at being successful as students at a specific university or college. This theory views expertise as compiled knowledge, which comprises two key components: theoretical and heuristic knowledge. Theoretical knowledge is largely book knowledge that is learned through coursework and formal study, whereas heuristic knowledge is locally defined and is acquired experientially and is necessary to function competently on campus. Support systems that are available at a university form part of this heuristic knowledge because they are not acquired systematically and therefore do not reach many students effectively. Graduates were asked about support systems that were available at the university they graduated from and it was interesting to note that graduates from the same university knew of different support systems. This was particularly with the black

graduates. Heuristic knowledge is locally defined and therefore will differ from institution to institution and one may argue that it will differ between predominantly black and white universities. Furthermore, if this knowledge is transferred from student to student, the chances are that it may bypass a black student in a predominantly white university.

The core business of physiotherapy departments is teaching and learning, but fostering good working relationships between groups of students through social activities may be a way of constructing a learning environment that allows students to succeed in their studies. It emerged from the interviews with HODs that some of the physiotherapy departments have recognized this aspect and are already engaging students or creating opportunities for students to feel part of the student community. In this way students can feel comfortable with one another, and if they have missed out on any information or need information they may obtain this from their classmates or even senior students who either know or have used some of the available support. Tinto's Student Integration Model (1975 and 1993) places a greater emphasis on the role of within-institution peer culture.

7.3.2.4 **Career choice**

The results of the various analyses in this study showed an association between black graduates who chose physiotherapy as a first choice of career and success. Two of the HODs thought that the lack of prior knowledge of the profession or choosing physiotherapy by chance contribute to the lack of success. Marketing strategies by the different universities and the physiotherapy profession itself therefore should be targeted at black communities so that prospective students can make well informed choices.

Over the years, physiotherapy departments have been reluctant to admit students who had chosen physiotherapy as a second choice because they were thought to be not committed to the career and therefore would not put much effort to succeed. The results of this study questions that practice and calls for reconsideration of admitting students even if they had not chosen physiotherapy as their first choice.

7.4 PERCEPTIONS ON DETERMINANTS OF ACADEMIC SUCCESS

Students' approach to study is influenced by their beliefs about what will enhance their chances of success or diminish their chances of failure, as well as by motivational and personality factors (Killen, Marais and Leodolff, 2003). According to Sprinthall, Sprinthall and Oja (1998) students take cues from their teachers' attitudes and actions. Those who

know that they are expected to do well and who receive extra support are more likely to achieve; those who perceive that they are not expected to do well often fail. Likewise ,lecturers' perceptions of what factors contribute to student success influence their approach to teaching (Jacobs and Gravett, 1998). This study investigated HODs' and students' perceptions of factors that influence students' academic success.

The themes that emerged from the interviews with the HODs and from the students' questionnaires revealed (as mentioned earlier in this chapter) that there are individual and contextual factors that facilitate or become barriers to academic success. Individual factors are those that a student brings to the learning environment, and contextual factors are the conditions under which the student studies which includes institutional characteristics. These are discussed in the following paragraphs.

7.4.1 **Contextual Facilitators of Success**

The common contextual themes that emerged on factors that facilitate success from the HODs and graduates was availability of support which includes financial support and support from friends and family. A study conducted in South Africa by Landsman (2000) highlighted that most Black students are distracted from their studies by financial difficulties, which ranged from paying tuition fees to being able to afford to eat. In this present study there were students who were faced with this dilemma as three of them explain when saying:

"There was a time in 1998, 1st yr, when I had no food to eat, lacked clothes to wear and couldn't fit in any social group. Overall I couldn't be happy with myself. And yet I had to study ….."

"Not to have financial support for food and study materials (I was sometimes stressed because of financial stress)"

"In the 1st yr I honestly felt isolated ….. I had no money and always worried about the next day. But from 2nd yr I was more happier and healthy, that brought out the best academic one in me. I got distinctions and awards. I felt like one of the top performing students in my group. Other students would come and ask for assistance from me"

The quantitative results did not support this perception of financial stability because none of the variables related to finance were associated with success of black students.

An additional theme from HODs was integration within the department and with the group which has already been discussed under psychosocial predictors of success. Additional contextual factor from the graduates were the compelling factors from family. The family pressures were different for black and white students. For white students the family pressure was the expectation to do well at university as everybody else in the family and the clear indication from parents that funding was available for fours years only. For black students, the family pressure was to complete the degree so that the person could start working and assist siblings or the family as a breadwinner. In this instance, although these were seen as pressures by students they had positive outcomes in motivating them to be successful in their studies. Contextual variables found in the literature which influence success in higher education include prior schooling, family and cultural attitudes, motivation and aspirations, educational preparation, financial barriers (including student and institutional finance) and a supportive environment (Bamber and Tent, 2000; Gladieux and Swail, 2000; Hurd, 2000; Watt and Patterson, 2000; Hurtado and Inkelas, 1998).

7.4.2 **Individual Facilitators of Success**

The themes that emerged on individual factors from the HODs were prior knowledge of the profession and English language proficiency. Language proficiency was also a theme that emerged from the graduates. University language policy was found to be associated with success of black students as well. Almost all the lecturers indicated that black students who were proficient in English language were more confident and fitted easily within their group and the department. These were the students who had the confidence to approach the lecturers with either academic or personal problems and therefore could be assisted. Realizing this factor as one that assists students, the different universities have language support services for all students that need the service. The interesting thing was that when asked to indicate support systems they utilized, in the quantitative part of this present study, very few students indicated that they actually made use of language support services. A study done by Nolan (2002) [cited in Rauchas et al 2006] at a South African institution indicates that most students do not think they have any problem with English. However, even though students are confident about their English ability, there are indications that their actual ability may be

less than they perceived it to be (Buthelezi, 1995, cited in Nolan, 2002). One HOD alludes to this fact when saying:

> *"You know, they have a compulsory English language course in the first year but there is a big difference between being able to speak and read and the comprehension."*

Chi-square test showed that English results in matric were a differentiating factor between successful and unsuccessful students in general ($X^2 = 15.73$; $p < 0.001$) but not among black students ($X^2 = 2.36$; $p > 0.05$). Rauchas et al (2006) found that matric English first language is a predictor of success in computer sciences first year courses. They suggest that there are two ways in which experience with the language of instruction is an advantage. First, it is easier for students who are already comfortable with the language to learn new concepts and words. Secondly, it easier to make sensible guesses about what a new word might mean, and it's also easier to remember what words signify, through connection with other known words. The experience of black students with English language is improving particularly in the urban areas because of the opening of all school to all races. The HODs are seeing this transition as one of them puts it:

> *"It varies a lot, hey, and what we're finding now are some extremely articulate black students. I mean, if I think of our 1st and 2nd year, the students who, you know, have been to sort of schools in, I don't know, the B-class schools or what have you, and they are far more articulate and very, very competent, I mean particularly in our 1st year, you know, the 2 students who are near the top of the class, who are black students, are extremely articulate."*

> *"I mean she's from a private school, you know, she's just so relaxed and confident, used to everything, no problem."*

Prior knowledge of the physiotherapy profession was seen as a contributor to success because the HODs felt that if a student was determined to be something, they will put the effort and have motivation. Even when the student is experiencing difficulties the determination of wanting to be a physiotherapist will give them the drive to succeed. This is evident in some of the reasons given by students for staying on even if they had thought of leaving the course, some of the students had this to say:

"I know that I wanted to be a physio, so I just persevere"

"the fact that I really wanted to be a physiotherapist"

"I wanted to become a qualified physiotherapist hence I worked very hard, positive attitude"

"I liked the course and I thought I owed it to my black community and to myself to keep going. I also knew I had the potential to pass and become the physiotherapist despite what the dept/lecturers think about black students"

Frequency analysis showed knowledge of community about physiotherapy and physiotherapy as a first choice of career to be associated with success of black students. Choice of physiotherapy was also a predictor of success from the results of the logistic regression. Extensive marketing of the profession in the black communities will go a long way in increasing the pool of prospective students who a have good knowledge of what they are going to study.

Determination, language proficiency and personal attributes are the themes that emerged from the graduates' responses to the question of factors that contribute to success. Both black and white graduates in this study described a successful student as a student who is motivated, hard working, committed and disciplined towards their studies, that is, a student who has the will to succeed. This is in keeping with Fraser and Killen (2005) who found that the 'success' items that both lecturers and students ranked highly paint a picture of a self-motivated, hard-working student who can learn independently, prepare well for examinations and who has made a wise choice of course of study. Similar findings were also reported by Fraser and Nieman (1995), emphasizing the fact that self-discipline and self-control should be regarded as two important variables impacting on the performance of students. The lecturers in this study also viewed successful students as students who were motivated and knew what they wanted to do i.e. they had knowledge about physiotherapy and were interested in it. Pintrich and Schunk (2002) define this implication as intrinsic motivation whereby an individual engages in an activity for its own sake and not as a means to an end.

Since at least the 1980s there has been a sustained research focus on how motivational and cognitive factors interact and jointly influence student learning and achievement

(Linnenbrink and Pintrich, 2002). The integration of motivational and cognitive factors was facilitated by the shift in the motivational theories from traditional achievement motivation models to social cognitive models of motivation (Pintrich and Schunk, 2002). These social cognitive models make three assumptions: students can be motivated in multiple ways, and the important issue is understanding how and why students are motivated; motivation is not a stable trait of an individual, but is more situated, contextual and domain specific i.e. students' motivation can vary depending on the situation or context in the classroom; students' own thoughts about their motivation and learning play a key role in mediating their engagement and subsequent achievement.

Conditions under which students learn were mentioned as a factor that can influence students' academic performance. A conducive condition for academic success painted by the themes from the responses of both the HODs and graduates indicate that success appears to be related to sound family support, financial stability, strong support from the physiotherapy department (both socially and academically), and prior knowledge about the profession and the institution. If the social circumstances of the student allow him/her to organize academic life properly, that student will stand a better chance of succeeding academically.

7.4.3 **Barriers to Success**

Although the approach of this study was to consider academic success from factors that predict success, it was felt important to understand what the HODs and graduates perceive to be barriers to success. These factors are discussed briefly in the following paragraphs.

Both from the graduates' responses and the HODs interviews, it became evident again that there are individual and contextual factors. Inadequate academic preparation for higher education and lack of language proficiency were themes that emerged from both HODs and graduates as an individual factors contributing to lack of success. Some of the language difficulties arise where two languages are used in a single institution. Students who enrolled at universities where they understood English to be the medium of instruction and discover once enrolled that that is not the case, experience added language difficulties.

Personal problems caused by difficult social circumstances which can lead to emotional instability are also seen by both HODs and graduates as a factor that can hinder

success. Personal problems range from financial instability which sometimes culminates in lack of basic needed like food and accommodation to emotional difficulties caused by difficult social circumstances. One of the HODs revealed startling results of some of these problems when she commented:

> "*It's difficult. I think it's very difficult. We've had- we've had suicide cases where, you know, students just wanted to commit suicide ….. a student who threw himself on the train…He was now one case that we lost. We have had something like 3 or 4 who have tried but we caught them in time. You know, that is why we are so clued up on the monitoring and in terms of when we see a student is down we try to call the student in and to actually get to know them"*.

These personal problems impact on the academic performance of some of the students because they interfere with the focus towards studies. One HOD made a comment that difficult social circumstances can interfere with the ability of a student to organize his or her academic life and activities. The following is her succinct explanation:

> "*One of the things that I find really difficult for our students is that sometimes they are expected to perform at pretty high levels but meanwhile, at home, mom is ill, grandmother has died, there's a sister who's got HIV. There are all these things that are happening which makes it very difficult for them to organise their lives. And so the- you know, where they might very well be the students whose notes are bad, who arrive late for lecturers, they arrive late because they live out in ……. I think it's that organisation that is so important. And the organized student is the student who goes ahead….. because they're the student, rather than having to be supporting the family when there's this crisis or that crisis."*

The aim of this study was to establish factors that are predictors of success for African black students. Perceptions of HODs and graduates regarding factors that contribute to success were also sought. The predictors and perceptions were considered together and there were some agreements between the two methods of enquiry.

CHAPTER 8

CONCLUSION, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

In concluding this thesis, it is appropriate to return to the initial questions which guided the research as a whole. As stated in Chapter One, the questions were:

What are the factors that may predict completion of the physiotherapy degree within the minimum time by African black students? Would these factors be applicable to white students or are they unique to black students? What is the perspective of graduates and HODs regarding academic success?

- The predictors of success of African black students were established using quantitative data analyses
- From the initial analyses of the quantitative data it became apparent that the number of white respondents who were unsuccessful was very small which made it impossible to make the comparison between blacks and whites in terms of predictors of success. What came out was that factors that predicted success for the total group were quite different from factors that predicted success of black respondents.
- The perceptions of the graduates and HODs were established using qualitative data analyses
- The predictors and perceptions were considered together and there were some agreements between the two methods of enquiry. Factors that have been established can be divided into those that were tested both quantitatively and qualitatively (support, knowledge of the profession and university language policy) and those that were tested qualitatively (determination, academic discipline, personal attributes and compelling factors).

What then are the implications of these findings on physiotherapy training and on the goal of increasing throughput of black physiotherapy students?

8.1 IMPLICATIONS FOR PHYSIOTHERAPY EDUCATION

This study covered students who graduated between 2000 and 2005. Much has changed in South Africa since the turn of the century and more black students have access to educational systems that were previously the domain of the white population. The consequence of this is that more black students will matriculate with marks that are equal to those of white students. The first goal then would be to attract students with top matric marks into physiotherapy because literature has shown that good performance in high school is a good predictor of success in higher education.

Until the equality in marks is attained alternative selection criteria should be used and monitored on regular basis. The reality is that for some time there will still be black students who obtain lower matric results who need access into physiotherapy programmes. Access without support is no opportunity (Engstrom and Tinto, 2008). For these students therefore the following goals should be focused on:

- Ensuring that these students are applying on the basis of knowledge; knowledge about the profession and about the expectations of higher education and university life = effective marketing strategies
- On application, existence of desirable personal attributes (academic discipline, determination, ambition) should be sought from these students = appropriate psychosocial testing
- On application, HSPT and the non-academic criteria used by the different universities should continue to be used for selection but their predictability should be continuously monitored.
- On admission, integration into the student body should be promoted and transition from high school be managed by:
  - Effective orientation programme
  - Offering shared accommodation for those in need
  - Encouraging 'ubuntu' by fostering a supportive culture among students = senior student mentors
- During physiotherapy training, offer training in study and writing skills and put in place supportive language strategies which are integrated into the physiotherapy curriculum. Put emphasis on formative assessment in the early phase of the programme so that students can have security in their knowledge and skills.
- All strategies that are put in place should be monitored and evaluated through tracking of student progress

The small number of black students in HWUs should be increased so that the students have a critical mass of other black students within their academic setting. The HWUs need to investigate the real reasons for students not applying or not registering for physiotherapy even if they have been admitted. The challenge would be in dealing with the outcomes of those investigations.

Recognizing from the HODs responses that some of these recommendations are already in place, this research nonetheless provides a holistic overview of the situation. The following is a model (Figure 8.1) that could be utilized for improving throughput of black students in physiotherapy.

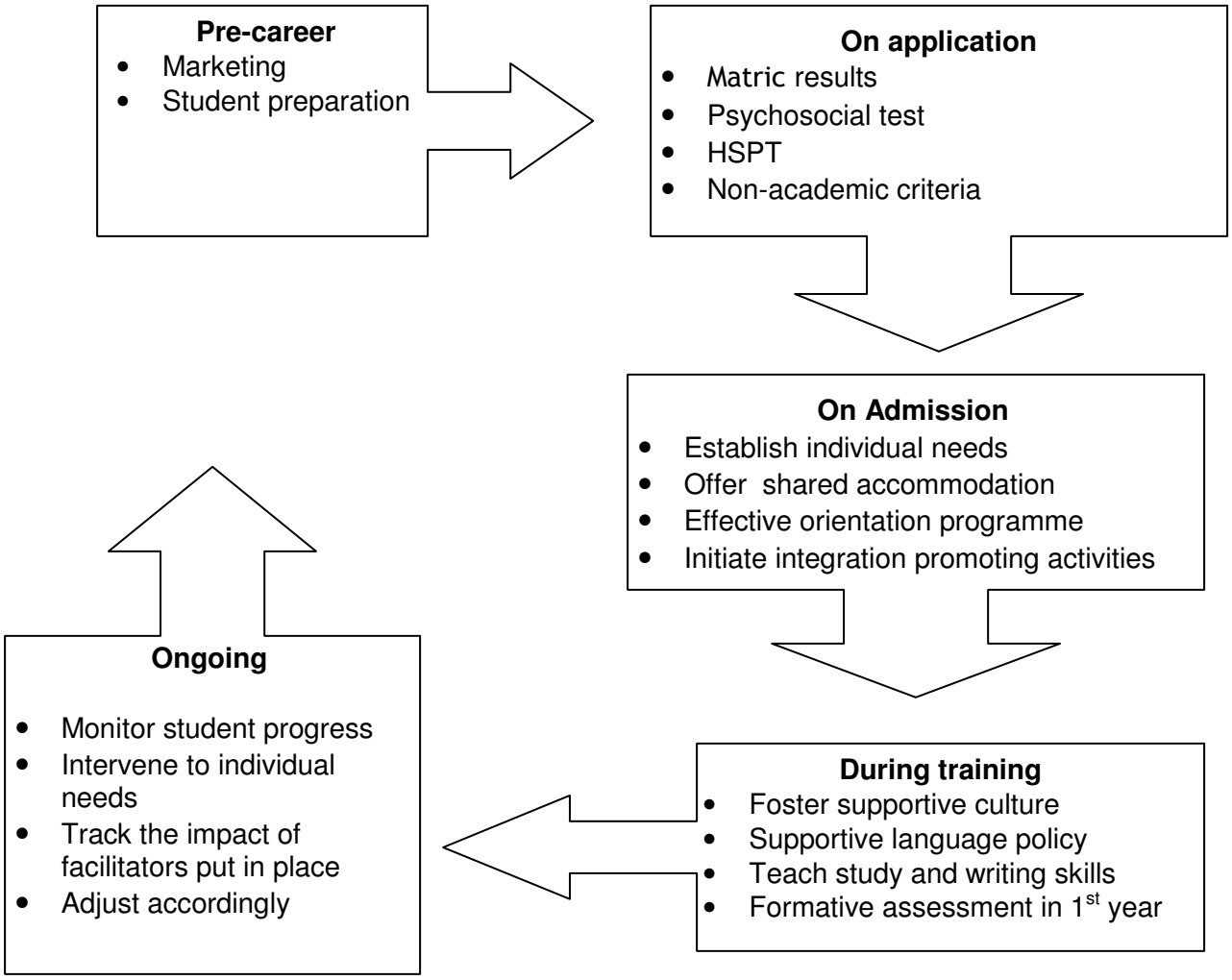

Figure 8.1: Model for Improving Throughput

8.2 LIMITATIONS OF THE STUDY

- The sampling was done on the students that were available i.e. graduates who could be traced and therefore no real unsuccessful students were included to make the comparisons.
- The logistic regression explained 18% of the variance which means that there is much of the variance that is not accounted for.

8.3 IMPLICATIONS FOR FURTHER RESEARCH

8.3.1 Regarding this Current Research

- Further research could be done to investigate the aspects that were not explained by the logistic regression analysis.
- Prospective study of current students. Each physiotherapy department can track current students from admission to graduation to confirm the current findings or establish the current picture because of the contextual changes taking place in South Africa.

8.3.2 Regarding Physiotherapy Education

- Development of a psychosocial test that will establish existence of desirable personal attributes
- Evaluation of the predictability of the non-academic admission criteria that are already in place
- Evaluation of the impact of the support strategies employed by the different physiotherapy departments

REFERENCES

Ainsworth C, and Maynard D, 1976. The impact of roommate personality on achievement: An exploratory study and model analysis. *Research in Higher Education.* 4: 291-301.

Agho AO, Mosley BW, Williams AM, 1999. A national survey of current admissions practices in selected allied health educational programs. *Journal of Allied Health.* 28(1): 8-14.

Altheide DL and Johnson JM, 1994. Criteria for assessing interpretive validity in qualitative research. In NK Denzin and YS Lincoln (Eds), Handbook of qualitative research (pp 485-499). Thousand Oaks, CA: Sage.

Amosun S, 2007. Qualifying education: What are the right entry-level qualifications for physical therapy? *Panel discussion presentation, 15th International WCPT Congress.* Vancouver, Canada.

Arnott A, Kubeka Z, Rice M, Hall G, 1997. Mathematics and Science Teachers: Demand, utilization, supply and training in South Africa. *Edusource* 97/01. The Education Foundation, Johannesburg.

Astin AW, Korn W, Green K, 1987. Retaining and satisfying students. *Educational Record.* 68(1): 36-42.

Ayaya OO, 1996. The prediction of academic performance in the first year: A case study at the National University of Lesotho. *South African Journal of Higher Education.* 10(2): 101-113.

Ayree S, Chay YW, Tan HH, 1994. An examination of the antecedents of subjective career success among managerial sample in Singapore. *Human Relations.* 47(5): 487-509.

Badsha, N. (2004). Right to reply: we cannot afford revolving-door syndrome. Mail and Guardian: 8 September.

http://www.mg.co.za/content/13asp?cg=insightcommentaryandAnalysis and ao=121858. Retrieved on 26/11/2005.

Baker RW, and Siryk B, 1989. *SACQ Student Adaptation to College Questionnaire manual.* Los Angeles: Western Psychological Services.

Balogun JA, 1988. Predictors of academic and clinical performance in a Baccalaureate Physical Therapy Program. *Physical therapy.* 68(2): 238-242.

Blai B,1971. Roommate - Impact upon academic performance. Bryn Mawr, Pa: Harcum Junior College.

Badenhorst FD, Foster DH, Lea SJ, 1990. Factors affecting academic performance in first-year psychology at the University of Cape Town. *South African Journal of Higher Education.* 4(1): 39-45.

Bamber J, and Tett L, 2000. Transforming the learning experiences of non-traditional students: a perspective from higher education. *Studies in continuing education* 22 (1): 57-75.

Baldwin A, Woods K, Simmons MC, 2006. Diversity of the allied health workforce: The unmet challenge. *Journal of Allied Health.* 35(2): 116-120.

Barton B, Neville-Barton P, 2003. Investigating the relationship between English language and mathematical learning. In *CERME 3, Third Conference of the European Society for Research in Mathematics Education.* Italy.

Berger JB, 1997. Students' sense of community in residence halls, social integration and first-year persistence. *Journal of College Student Development.* 38(5): 441-452.

Blimling GS, 1993. The influence of college residence halls on students. In J Smart (Ed.), *Higher Education: Handbook of theory and research* (356 – 396) New York: Agathon.

Blimling GS, and Hample D, 1979. Structuring the peer environment residence halls to increase performance in average ability students. *Journal of College Students Personnel.* 20:311-316.

Bodfish ES, 2005. Research findings, *Career Choice Survey. Centre for the Advancement of Process Technology*, Texas.

Boeyes JCA, 1989. Learning Potential: An empirical investigation. *Report PERS,* 432. Pretoria: Human Resource Research Council.

Boyer SP, and Sedlacek, WE, 1988. Non-cognitive predictors of academic success for international students: A longitudinal study. *Journal of College Student Development*. 29: 218-222.

Boyle KK, 1986. Predicting the success of minority students in a baccalaureate nursing program. *Journal of Nursing Education.* 25(5): 186-192.

Braun MWH, Nel CM, 1995. Akademiese ontwikkeling: beginsils and tendense. UP-dosent. *Bulletin vir Hoër Onderwys.* 16: 3-8.

Brown D, 1991. Methodological considerations in the evaluation of social development programmes – an alternative approach. *Community Development Journal.* 26(4): 259-265.

Bryman A, and Burgess RG, 1994. Analyzing qualitative data. London, Routledge.

Bundy C, 2002. 1 October. Mountain High. The Gaurdian.

Buthelezi Q, 1995. Black South African English. *Language and Social History: Studies in South African Sociolinguistics.* 242-250.

Byrne M, and Flood B, 2005. A study of accounting students' motives, expectations and preparedness for higher education. *Journal of Further and Higher Education.* 29(2): 111-124.

Calkins EV, and Willoughby TL, 1992. Predictors of black medical school success. *Journal of the National Medical Association.* 84(3): 253-256.

Cliff AF, 2003. The Placement Test in English for Educational Purposes (PTEEP): A construct analysis. Alternative Admissions Research Project, Unpublished Report: University of Cape Town.

Covington M, 1984. The motive of self-worth. In RE Ames and C Ames (Eds.). Research on motivation in education: Vol 1. Students motivation (pp77-113). New York: Academic Press, Inc.

Creswell JW, 2003. *Research design: Qualitative, quantitative and mixed methods approaches.* Thousand Oaks, CA: Sage Publications.

Cronbach, LJ,1975. Beyond the two disciplines of scientific psychology. *American Psychologist*, *30*(2),116-127.

Dawes P, Yeld N, and Smith MJ, 1999. Access selection and admission to higher education: Maximizing the use of the school leaving examination, *South African Journal of Higher Education.* 13(3): 97-104.

Dell MA, Haplin G, 1980. Predictors of success in nursing school and on State Board Examinations in a predominantly black Baccalaureate Nursing Program. *Journal of Nursing Education.* 23(4): 147-150.

Department of Education, 1997. *Education White Paper 3.* A programme for the Transformation of Higher Education, *General Notice 1196 in the Government Gazette 18207 of 1997-08-15.* Pretoria.

Department of Education, 2001. National Plan for Higher Education. Pretoria: Department of Education.

DePoy E, and Gitlin LN, 1998. Introduction to Research: Understanding and Applying Multiple Strategies, 2nd Ed, Mosby, USA.

De Sousa DJ and Kuh GD, 1996. Does institutional racial composition make a difference in what black students gain in college? *The Journal of College student Development.* 37(3): 257-267.

De Villiers J, and Rwigema H, 1998. The effect of a bridging year on the graduation success of educationally disadvantaged commerce students, *South African Journal of Higher Education.* 12(1): 103-108.

Dey I, 1993. Qualitative data analysis: a user-friendly guide for social scientists. London, Routledge

Dietsche P, 2008. Keynote address at the first Southern African Conference on the First-Year Experience, Stellenbosch.

Dodgson R, and Bolam H, 2002. Student retention, Support and Widening Participation in the North East of England. Sunderland: Universities for the North East.

Duncan C, and Stoner K, 1977. The academic achievement of residents living in a scholar residence hall. *Journal of College and University Student Housing.* 6: 7-9.

Dweck CS, 1985. Intrinsic motivation, perceive control, an self-evaluation maintenance: An achievement goal analysis. In RE Ames and C Ames (Eds.). Research on motivation in education: Vol 2. The classroom milieu (pp 199 – 235). New York: Academic Press, Inc.

Dweck CS, 1986. Motivational processes affecting learning. *American Psychologist.* 41(10): 1040-1048.

Dweck CS, and Elliot ES, 1983. Achievement motivation. In PH Mussen (Gen. Ed) and ME Hetherington (Vol. Ed.) Handbook of child psychology: Vol IV: Social and personality development (pp 643-691). New York: Wiley.

Dweck CS and Leggett EL, 1988. A social-cognitive approach to motivation and personality. *Psychological Review.* 95: 256-273.

Ellis ES, and Worthington LA, 1994. Research synthesis on effective teaching principles and the design of quality tools for educators (Technical Report No. 5). Eugene: University of Oregon, National Center to Improve the Tools of Educators. (ERIC Document Reproduction Service No. ED386853).

Engestrom K, and Tinto V, 2008. Access without support is not opportunity. *Change* January/ February: 46-50.

Downey MC, Collins MA, Browning WD, 2002. Predictors of success in dental hygiene education: A six-year review. *Journal of Dental Education.* 66(11): 1269-1273.

Evans DA, Jones PK, Wortman RA, Jackson EB, 1975. Traditional criteria as predictors of minority student success in medical school. *Journal of Medical Education.* 50: 934-939.

Ferguson E, James D, Madeley L, 2002. Factors associated with success in medical school: systematic review of the literature. *British Medical Journal.* 324: 952-957.

Fleming J, 2002. Who will succeed in college? When the SAT predicts Black students' performance.

Fleming J, and Garcia N, 1998. Are standardized tests fair to African Americans? Predictive validity of the SAT in Black and White institutions. *Journal of Higher Education.* 69(5): 471-495.

Flier van der H, Thijs GD, Zaaiman H, 2003. Selecting students for a South African mathematics and science foundation programme: the effectiveness and fairness of school-leaving examinations and aptitude tests. *International Journal of Educational Development.* 23: 399-409.

Fourie CM, 1991. Keurig van eerstejaar universiteitstudente. *South African Journal of Education.* 11(4): 188-194.

Fraser W, and Killen R, 2005. The perceptions of students and lecturers of some factors influencing academic performance at two South African universities. *Perspectives in Education.* 23(1): 25-40.

Fraser WJ, and Nieman MM (Eds.), 1995. *The knowledge accessing modes, performance determinants and instructional preferences of first year students at eight major distance education institutions in South Africa.* Pretoria: University of South Africa.

Fuertes JN, and Sedlacek WE. 1995. Using non-cognitive variables to predict the grades and retention of Hispanic students. *College Student Affairs Journal*. 14(2): 30-36.

Fuertes JN, Sedlacek WE, Liu WM, 1994. Using the SAT and non-cognitive variables to predict the grades and retention of Asian American university students. *Measurement and Evaluation in Counseling and Development*. 27: 74-84.

Gándara P, 1995. *Over the Ivy Walls.* Albany, NY: University of New York Press.

Gladieux LE, and Swail WS, 2000. Beyond access: improving the odds of college success. *Phi Delta Kappan*. 81(9): 688-692.

Glaser BG, and Strauss AL, 1967. The discovery of grounded theory: strategies for qualitative research. New York: Aldine Publishing Company.

Gliner JA, 1994. Reviewing qualitative research: Proposed criteria for fairness and rigor. *Occupational Therapy Journal of Research.* 4(2): 78-90.

George P, 2002. Barriers to access and success. *Principal Leadership.* 9(2): 23-29.

Graves L, 2008. The gap in graduation rates: at many colleges, a disparity in who make sit to a diploma. *U.S. News and World Report.* 144(13): 62-63.

Graunke SS, and Woosley SA, 2005. An exploration of the factors that affect the academic success of college sophomores. *College Student Journal.* 39 (2): 367-376.

Green JC, Caracelli VJ, and Graham WF, 1989. Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis.* 11(3): 255-274.

Griesel H, Bradbury J, Craig A, 1993. Access, selection and educational development: A case study. Supporting document prepared for the exemptions committee of the Matriculation Board, Committee of University Principles. The TTT Programme, Durban: University of Natal.

Griesel H, 2003. Controversies of access to Higher Education study – The changing FEHE interface. Annual AEAA Conference (SAUVCA), Cape Town.

Guffey JS, Farris JW, Aldridge R, Thomas T, 2002. An evaluation of the usefulness of non-cognitive variables as predictors of scores on the National Physical Therapy Licensing. Examination. *Journal of Allied Health.* 31(2): 78-850.

Review of Higher Education. 25(3): 281-296.

Gupta S, Harris DE, Carrier MN, Caron P, 2006. Predictors of student success in entry-level undergraduate mathematics courses. *College Student Journal*. 40(1): 97-108.

Hanger DC, Helm DT, 1994. Qualitative methods in rehabilitation research. *Rehabilitation Counelling Bulletin.* 37(4): 290-303.

Hardigan PC, and Cohen SR, 1998. Comparison of personality styles between students enrolled in osteopathic medical, pharmacy, physical therapy, physician assistant and occupational therapy programs. *Journal of American Osteopath Association.* 98(11): 637-641,

Harmon P, and King D, 1985. Expert systems. New York: Wiley.

Hayamizu T, and Weiner B, 1991. A test of Dweck's model of achievement goals as related to perceptions of ability. *Journal of Experimental Education.* 56: 226-234.

Health Professions Council of South Africa: Physiotherapy, Biokinetics and Podiatry Professional Board Education Reports of 2003 and 2004.

Herman HD, 1995. School-leaving examinations, selection and equity in higher education in South Africa. *Comparative Education*. 31: 261-274.

Hoffman JL, and Lowitzki KE, 2005. Predicting college success with high school grades and test scores: Limitations for minority students. *Review of Higher Education.* 28(4): 455-474.

Hofmeyr J, Spence R, 1989. Bridges to the future. *Optima.* 37: 37-48.

Hojat M, Robeson M, Damjanov I, Voleski J, Glaser K, Gonnella JS, 1993. Students' psychosocial characteristics as predictors of academic performance in medical school. *Academic Medicine.* 68(8): 635-637.

Holloway I, and Wheeler S, 1996. *Qualitative Research for Nurses.* Oxford: Blackwell Science

Höschl C, and Kožený J, 1997. Predicting academic performance of medical students: The first three years. *American Journal of Psychiatry.* 154(6): 87-92.

Hurd H, 2000. State policies greatly impact minority access to higher education. Black issues in Higher Education 17(22): 18-19

Hurtado S, and Inkelas KK, 1998. New dilemmas of access and implications for national data use/availability: a summary and annotated bibliography of sources. In Policy Panel on Access, 1998. Re-conceptualising access in postsecondary education. Washington D.C. The American Council on Education (pp83-166).

Hurtado S, 1994. The institutional climate for talented Latino students. *Research in Higher Education.* 35(1): 21-41.

Hutchings M, and Archer L, 2001. 'Higher than Einsten': constructions of going to university among working-class non-participants. *Research Papers in Education.* 16(1): 69-91.

Huysamen GK, 2000. A differential validity of matriculation and university performance as predictors of post-first-year performance. *South African Journal of Higher Education.* 15(2): 146-151

James D, Chilvers C, 2001. Academic and non-academic predictors of success on the Nottin undergraduate medical course. *Medical Education.* 1056-1064.

Jardine RW, 1986. The Language Skills of the Academically Vulnerable University Student. *South African Journal of Education,* 6: 57-63.

Jawitz J, 1995. Performance in first and second year engineering at UCT. *South African Journal of Higher Education,* 9(1): 101-108.

Jacobs G, and Gravett S, 1998. University lecturers' conceptions of their teaching role, *South African Journal of Higher Education.* 12(1): 54-60.

Jick TD, 1979. Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly.* 24: 602-611.

Johnson DG, Lloyd SM, Jones RF, Anderson J, 1986. Predicting academic performance at a predominantly black medical school. *Journal of Medical Education.* 61: 629-639.

Judge TA, Cable DM, Boudreau JW, Bretz RD Jr, 1995. An imperical investigation of the predictors of executive career success. *Personnel Psychology*. 48: 485-519.

Kagee A, Naidoo T and Mahatey N, 1997. Theoretical underpinnings of a student mentoring programme at an historically black university in South Africa. *International Journal for the Advancement of Counselling.* 19: 249-258.

Kallus K, Noble D, Bezner J, Keely MS, 1999. An assessment of high school students' knowledge of physical therapy and the factors that influence their knowledge. *Journal of Physical Therapy Education*.

Killen R, Marais A and Leodolff P, 2003. Success and failure in distance education: Perceptions of South African students and lecturers in Business Management. *South African Journal of Higher Education.* 17(2): 147-158.

Killen R, Fraser WJ, 2002. *Success and failure in tertiary studies: Perceptions of students and lecturers.* Paper presented at the annual Conference of the South African Association of Educators, Pretoria.

Kim MM, 2002. Historically Black vs. White institutions: Academic development among Black students. *Review of Higher Education.* 25(4): 385-407.

Krathwohl DR, 1993. *Methods of Educational and Social Science Research: An Integrated Approach.* White Plains, NY: Longman.

Kuiper W, 1998. Community based rehabilitation as an engagement: context, parameters and Potentail. *Thesis Submitted for Fulfillment of the Requirements for the Degree Doctor of Philosophy,* Griffith University

Landsman CS, 2000. Factors perceived by Black students as affecting their success or failure in the Department o Psychology within the University of The Witwatersrand. *A Research Report Submitted in Part Fulfillment of the Degree of Master of Arts by Coursework.* University of the Witwatersrand.

Lavant BD, and Terrell MC, 1994. Assessing ethnic minority student leadership and involvement in student governance. In MC Terrell and MJ Cuyjet (Eds.), *New Direction for Student Services: No 66. Developing Student Government Leadership* (59-71).

Lent RW, Brows SD, Talleyrand R, McPartland EB, Davis T, Chopra SB, Alexander MS, Suthakaran V, Chai C-M, 2002. Career choice barriers, supports and coping strategies: College students' experiences. *Journal of Vocational Behaviour.* 60(1): 61-72.

Levin ME, and Levin JR, 1991. A critical examination of academic retention programs for at-risk minority college students. *Journal of College Student Development.* 32: 323-334.

Linnenbrink EA, and Pintrich PR, 2002. Motivation as an enabler for academic success. *School Psychology Review.* 31(3): 313-327.

Lipton A, Huxham GJ, Hamilton D, 1984. Predictors of success in a cohort of medical students. *Medical Education. 18(4): 203 -210.*

Lowe H, and Cook A, 2003. Mind the gap: are students prepared for higher education? *Journal for Further and Higher Education.* 27(1): 53-76.

Lynch DJ, 2006. Motivational factors, learning strategies and resource management as predictors of course grades. *College Student Journal.* 40(2): 423-429.

Martin J, 1992. Redressing the imbalance: academic issues in engineering at UCT, *UCT News Magazine*. 5: 13-15.

Mays N, and Pope C, 1995. Rigour and qualitative research. *British Medical Journal.* 311: 109-112.
Mayan MJ, 2002. *An Introduction to Qualitative Methods: A Training Module for Students and Professionals.* International Institute for Qualitative Methodology. Alberta, Canada.

Mazzoli AJ, 1982. Predicting success in baccalaureate degree respiratory therapy programs. *Respiratory Care.* 27(10): 1246.

Mbambo NP, 2005. A report on case studies reflecting the experiences of Black physiotherapy students at institutions where they are a minority. *The South African Journal of Physiotherapy* 61(4): 2-5.

McInnis C, 2001. Researching the first year experience: where to from here? *Higher Education Research and Development.* 20(2): 105-114.

McKenzie CG, 1994. Black students in “white” universities: The character and provision of liberal higher education institutions in post-apartheid South Africa. *A Journal of Comparative Education.* 24(1): 67-89.

Melamed T 1996. Validation of a stage model of career success. *Applied Psychology: An International Review.* 45(1): 35-65.

Mertens DM, 2003. Mixed methods and the politics of human research: The transformative – emancipatory perspective. In A Tashakkori and C Teddlie (Eds). *Handbook of Mixed Methods in the Social Behavioural Sciences.* Thousand Oaks, CA: Sage.

Milem JF, Jeffrey F, Berger JB, Joseph B, 1997. A modified model of college student persistence: Exploring the relationship between Astin's theory of involvement and Tinto's theory of student departure. *Journal of College Student Development*. http://findarticles.com/p/articles/mi_qa3752/is_199707/ai_n8776622

Miers ME, Rickaby CE, Pollard KC (2007) Career choices in health care: is nursing a special case? A content analysis of survey data. *International Journal of Nursing Studies.* 44(7): 1196-1209.

Miles M, Huberman AM, 1994. *Qualitative Data Analysis.* Thousand Oaks, CA: Sage Publications.

Minichiello V, Aroni R, Timewell E, Alexander L, 1990. *In-Depth Interviewing: Researching People.* Hong Kong: Longman Cheshire Pty Limited.

Mitchell KJ, 1990. Traditional predictors of performance in medical school. *Academic Medicine.* 65: 149-158.

Mizokawa DT, and Ryckman DB, 1990. Attributions of Academic Success and Failure: A Comparison of Six Asian-American Ethnic Groups. *Journal of Cross-Cultural Psychology*; 21: 434-451.

Mokoena KE, 1997. Matric rating: Is it a predictor for student performance for physiotherapy at MEDUNSA? *Paper presentation at the South African Society of Physiotherapy International Congress, March, 1997, Cape Town.*

Morris J, Farmer A, 1999. The predictive strength of entry grades and biographical factors on the academic and clinical performance of physiotherapy students. *Physiotherapy Theory and Practice.* 15: 165-173.

Mothabeng JD, 1998. Predictors of clinical performance among MEDUNSA students. *Paper Presented at the World Confederation of Physical therapy (Africa) Congress, Pretoria.*

Nabi GR, 1999. An investigation into the differential profile of predictors of objective and subjective career success. *Career Development International*. 4(4): 212-224.

Nadasan T, and Puckree T, 2003. Do the selection criteria for admittance to physiotherapy programme predict students' performance? *South African Journal of Physiotherapy.* 59(3): 20-24.

Nichols J, 1984. Conceptions of ability an achievement motivation. In RE Ames and C Ames (Eds.). Research on motivation in education: Vol 1. Students motivation (pp39 – 73). New York: Academic Press, Inc.

Neave G, 1987. External reform versus internal continuity: some perspectives on the links between secondary and higher education in certain Western countries. *Higher Education in Europe.* 12: 5-19

Nettles MT, Theony AR, Gosman EJ, 1986. Comparative and predictive analyses of black and white students' college achievement and experiences. *Journal of Higher Education.* 57(3): 289-318.

Nettles MT, Perna LW, Millet CM, 1998. Research questions and data resource needs for examining student access to higher education. In *Policy Panel on Access* (Ed.), Report on re-conceptualising access in post-secondary education. (pp. 35-56) Washington, D.C.: US Department of Education.

Nolan V, 2002. Influence of attitude towards statistics, English language ability and mathematical ability in subject quantitative techniques at the Vaal Triangle Technikon, South Africa. Vaal Triangle Technicon.

Ohman A, Stenlund H, Dahlgren L, 2001. Career choice, professional preferences and gender – the case for Swedish physiotherapy students. *Advances in Physiotherapy.* 3: 94-107.

Ohman A, Solomon P, Finch E, 2002. Career choice and professional preferences in a group of Canadian physiotherapy students. *Advances in Physiotherapy.* 4: 16-22.

OldhamB, 1988. The first year – make or break year. *Journal for Further and Higher Education* 12(2): 5-11.

Opp RD, 2002. Enhancing program completion rates among two-year college students of color. *Community Journal of Research and Practice.* 25: 21-86.

Osborne M, 2003. Policy and practice in widening participation : a six country comparative study of access as flexibility. *International Journal of Lifelong Education.* 22(1): 43-58.

Ozga J, and Sukhnandan L, 1997. Undergraduate non-completion in England, Report No. 2, in *Undergraduate No-completion in Higher Education in England.* Bristol: Higher Education Funding Council for England.

Padilla RV, Treviño J, Gonzalez K, Treviño J, 1997. Developing local models of minority success in college. *Journal of College Student Development.* 38(2): 125-135.

Padilla RV, 1991. Assessing heuristic knowledge to enhance college students' success. In GD Keller, JR Deneen and RJ Magallán (Eds), *Assessment and access: Hispanics in Higher Education* (pp 81 – 92) Albany, New York, State University of New York Press.

Padilla RV, 1994. The unfolding matrix: A technique for qualitative data acquisition and analysis. In RG Burgess (Ed.), *Studies in Qualitative Methodology: Vol 4. Issues in Qualitative Research* (pp273-285). Greenwich, CT: JAI Press.

Parker CE, 1998. Cultivate academic persistence – Now! *Issues in Higher Education.* 14: 104.

Pascarella E, and Terenzini P, 1998. Student-Faculty informal relationships and freshman year educational outcomes. *Journal of Educational Research.* 71:183-189.

Patton MQ, 1990. *Qualitative Evaluation and Research Methods*. NewBury Park, CA: Sage Publications.

Pearl MJ, 1990. Factors physical therapists use to make career decisions. *Physical Therapy.* 70(2): 105-107.

Pincus F, and DeCamp S, 1989. Minority community college students who transfer to four-year colleges: A study of a matched sample of B.A. recipients and non-recipients. *Community/Junior College Quarterly of Research and Practice*. 13: 191-219.

Pintrich PR, Schunk D, 2002. *Motivation in Education: Theory, Research and Applications.* (2nd ed) Upper Saddle, NJ: Prentice-Hall, Inc.

Platt LS, Turocy PS, McGlumpy BE, 2001. Preadmission criteria as predictors of academic success in entry-level athletic training and other allied health educational programs. *Journal of Athletic Training.* 36(2): 141-144.

Potter C, and van der Merwe E, 1994. Academic performance in Engineering. *South African Journal of Higher Education.* 8(1): 193-215.

Policy Panel on Access, 1998. Re-conceptualising access in postsecondary education. Washington D.C. The American Council on Education.

Portney and Watkins, 2000. *Foundations of Clinical Research – Applications to Practice.* Prentice-Hall, New Jersey.

Raaheim J, Wankowski K and Radford J, 1991. Helping students to learn. *Buckingham, The Society for Research into Higher Education and Open University Press.* In Byrne and Flood.

Ramist L, Lewis C, and McCamley-Jenkins L, 1993. Student group differences in predicting college grades: Sex, language, and ethnic groups. *College Board Report* 93-1. New York: College Board.

Ratangee N, 2006. Academic literacy, the PTEEP and the prediction of academic success. Unpublished Masters dissertation. University of Witwatersrand, Johannesburg.

Rauchas S, Rosman B, Konidaris G, 2006. Language performance at high school and success in first year computer science. *39th Technical Symposium of Special Interest Group on Computer Science.* Houston, Texas.

Reede JY, 1999. Predictors of success in medicine. *Clinical Orthopaedic.* 363: 72-77.

Rendón LI, 1994. Validating culturally diverse students: Towards a new model of learning and student development. *Innovative Higher Education.* 19(1): 35-51.

Richardson RC Jr., and Skinner EF, 1991. *Achieving Quality and Diversity: Universities in a Multicultural Society.* New York: Macmillan.

Ridley D, 2004. Puzzling experiences in higher education: critical moments for conversation. *Studies in Higher Education.* 29(1): 91-107.

Riordan MC, 2002. A Preliminary Investigation into the Use of the Non-cognitive Questionnaire (NCQ) with a Sample of University Applicants in South Africa. Unpublished Master's Dissertation. University of Port Elizabeth.

Rodgers BL, and Cowles KV, 1993. The qualitative research audit trail: A complex collection of documentation. *Research in Nursing and Health.* 16(3): 219-226.

Roman SA, Sorenson JR, Davis WI, Erickson R, 1979. Predicting minority student performance in the first medical school year. *Journal of National Medical association.* 71: 661-664.

Rooney GD, 1985. Minority students' involvement in minority students organizations: An exploratory study. *Journal of College Students Personnel.* 26: 450-456.

Rutherford M, Watson P, 1990. Selection of students for science courses. *South African Journal of Education.* 10: 353-359.

Russek BE and Weinberg SL, 1993. Mixed methods in a study of implementation of technology-based materials in the elementary classroom. *Evaluation and Program Planning*. 16(2): 131-142.

Sandelowski M, 2000. Combining qualitative and quantitative sampling, data collection and analysis techniques in mixed method studies. *Research in Nursing and Health*. 23: 246-255.

Schochet I, 1985. University admissions: can we measure potential? *Aspects.* 6: 18-40.

Scott AH, Chase LM, Leftkowitz R, Morton-Rias D, Chambers C, Joe J, 1995. A national survey of admissions criteria and processes in selected allied health professions. *Journal of Allied Health.* 24(2): 95-107.

Sedlacek WE, 1999. Black students on white campuses: 20 years of research. *Journal of College Student Development.* 40: 538-549.

Sedlacek WE, and Prieto DO, 1990. Predicting minority students' success in medical school. *Academic Medicine*. 65(3): 161-166.

Sedlacek WE, and Adams-Gaston J, 1992. Predicting the academic success of student-athletes using SAT and non-cognitive variables. *Journal of Counseling and Development*, 70(6): 24-27.

Sennett J, Finchilescu G, Gibson K, Strauss R, 2003. Adjustment of Black Students at a Historically White South African University. *Educational Psychology.* 23(1): 107-116.

Shea S, Fullilove MT, 1985. Entry of minority students into U.S. medical schools: Historical perspectives and recent trends. *New England Journal of Medicine*. 313: 933-940.

Sherman TM, Giles MB, Williams-Green J, 1994. Assessment and retention of black students in higher education. *Journal of Negro Education.* 63(2): 164-180.

Sim J, and Arnell P, 1993. Measurement validity in physical therapy research. *Physical Therapy*. 73: 102-115.
Simm J, and Wright C, 2002. Research in Health Care, Nelson Thornes Ltd, UK

Strage A, 2000. Predictors of college adjustments and success: similarities and differences among Southeast-Asian-American, Hispanic and White Students. *Education*. 120(4): 731-740 (continued on pp721).

Strauss A, and Corbin J, 1990. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. London: Sage.

Strydom JF, 2002. Access to higher education. A research project for the FOTIM and FSHFETT. Johannesburg.

Skuy M, Zolezzi S, Mentis M, Fridjhon P, Cockcroft K, 1996. Selection of advantaged and disadvantaged South African students for university admission. *South African Journal of Higher Education.* 19(1): 10-18.

Sprinthall R, Sprinthall N, Oja S, 1998. *Educational Psychology: A Developmental Approach (7th Ed.)* Boston: McGraw-Hill.

Sternberg RJ, Beyond IQ. London, England: Cambridge University Press 1985 and 1986 What would better intelligence tests look like? In *Measures in the College Admissions Process.* New York: College Entrance Examination Board, pp146-150).

Sternberg RJ, 1998. Abilities are forms of developing expertise. *Educational Researcher*. 27(3): 11-20.

Strauss A, and Corbin J, 1994. Grounded theory methodology. In NK Denzin and YS Lincoln (Eds), *Handbook of Qualitative Research* (pp273-285) Thousand Oaks, CA: Sage.

Steele C, 1997. A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist.* 52: 613-629.

Sulaiman A, and Mohezar S, 2006. Student success factors: Identifying key predictors. *Journal of Education for Business.* 81(6): 328-334.

Taljaard-Plaut J, and Strauss R, 1998. A generation in transition: understanding stress-related disorders in African black university students. *Psycho-analytic Psychotherapy in South Africa.* 6: 56-64.

Tashakkori A, and Teddlie C, 1998. *Mixed Methodology: Combining Qualitative and Quantitative Approaches.* Thousand Oaks, CA: Sage.

Taub GE, Hayes BG, Cunningham WR, Sivo SA, 2001. Relative roles of cognitive ability and practical intelligence in the prediction of success. *Psychological Reports*. 88: 931-942.

Tesch R, 1990. *Qualitative Research: Analysis Types and Software Tools.* Bristol, PA: The Falmer Press.

Thompson G, McClement S and Daeninck P, 2006. Nurses' perceptions of quality of end-of-life care on an acute medical ward. *Journal of Advance Nursing.* 53(2): 169-177.

Ting SR, 1997. Estimating academic success in the first year of college for specially admitted white students: A model combining cognitive and psychosocial predictors. *Journal of College Student Development.* 38(4): 401-409.

Ting SR, and Robinson TL, 1998. First year academic success: A prediction combining cognitive and psychosocial variables for Caucasian and African American Students. *Journal of College Student Development.* 39(6): 599-610.

Ting SR, 2000. Predicting Asian Americans' academic performance in the First Year of College: An approach combining SAT and non-cognitive variables. *Journal of College Student Development.* 41(4): 442-449.

Tinto V, 1975. Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*. 45: 89-125.

Tinto V, 1993. *Leaving college: Rethinking the Causes and Cures of Student Attrition.* Chicago, Illinois: Chicago University Press.

Tinto V, 2002. Establishing conditions for student success. *11th Annual Conference of the European Access Network, June, Italy.*

Thomas DR, 2006. A general inductive approach or analyzing qualitative evaluation data. *American Journal of Evaluation.* 27(2): 237-246.

Thomas L, 2001. Power assumptions and prescriptions: a critique of widening participation policy-making. *Higher Education Policy.* 14: 361-376.

Tracey TJ, and Sedlacek WE, 1984. Noncognitive variables in predicting academic success by race. *Measurement and Evaluation in Guidance.* 16: 171-178.

Tracey TJ, and Sedlacek WE, 1985. The relationship of non-cognitive variables to academic success: A longitudinal comparison by race. *Journal of College Student Personnel.* 26: 410.

Tracey TJ, and Sedlacek WE, 1987. Predicting college graduation using non-cognitive variables by race. *Measurement and Evaluation in Counseling and Development*. 19: 177-184.

Tracey TJ, and Sedlacek WE, 1989. Factor structure of the non-cognitive questionnaire: Revised across samples of Black and White college students. *Educational and Psychological Measurement.* 49: 637-648.

Tross SA, Harper JP, Osher LW, Kneidinger, 2000. Not just the usual cast of characteristics: using personality to predict college student performance and retention. *Journal of College Student Development.* 41(3): 323-334.

Toni MN, Olivier MAJ, 2004. Academic identities of black female first-year students. *South African Journal of Education.* 24(3): 194-199.

Tonks D, and Farr M, 2003. Widening access and participation in UK higher education. *The international Journal of Education Management.* 17(1): 26-36.

Ulloa EC, and Herrera M, 2006. Strategies for multicultural student success: what about grad school? *Career Development Quarterly* 54(4): 361-5.

UNESCO 1998. Higher Education in the 21st Century: Vision and Action. *Final Report of the World Conference on Higher Education,* Paris.

van der Merwe D, 2003. The predictive validity of a selection battery for technikon students.

Venter E, Franzsen K, van Heerden E, (in press) An Analysis of the Effect of Recent National Policy Changes on Values and Education in South Africa. In: *Education, Culture and Values - Volume 1. Systems of Education, Theories, Policies and Implicit Values* edited by Mal Leicester, Celia Modgil and Sohan Modgil. London: Falmer Press.

Wagener U, and Nettles MT, 1998. It takes a community to educate students. *Change.* 30(2): 18-25.

Walker ML, 1993. Participatory action research. *Rehabilitation Counseling Bulletin.* 37(1): 2-5.

Wallace DL, Bell A, 1999. Being black at a predominantly white university. *College English.* 61(3): 307-328.

Watt S, and Patterson LC, 2000. Pathways and partnerships: widening access to higher education. *Journal of Further and Higher Education* 24(1): 107-116.

Walker L, Matthew B, Black F, 2004. Widening access and student non-completion: an inevitable link? Evaluating the effects of the Top-Up Programme on student completion. *International Journal of Lifelong Education.* 23(1): 43-59.

Wiltse P, Kruppa, SN, Lindgren, HC, 1979. Prediction of achievement in a first year psychology class using cognitive and non-cognitive measures. *Education.* 99(4): 336-342.

White TJ, and Sedlacek WE, 1986. Non-cognitive predictors: Grades and retention of specially admitted students. *Journal of College Admissions.* 3(Spring): 20-23.

Wilson T, 1999. A student selection method and predictors of success in a graduate nursing program. *Journal of Nursing Education.* 38(4): 183-187.

Wolfe RN, and Johnson SD, 1995. Personality as a predictor of college performance. *Educational and Psychological Measurement.* 55(2): 177-185.

World Health Organization, 2000. Chapter 4: What resources are needed? in *The World Health Report 2000 – Health Systems: Improving Performance.* pp77.

www.ptjournal.org/pt_journal/Nov96/Moffat.cfm

Yan W, and Gaier EL, 1994. Causal attributions for college success and failure: An Asian American comparison. *Journal of Cross-Cultural Psychology.* 25: 146-158.

Yan Zhang, 2006. Thematic content analysis. In B. Wildemuth (Ed.), Application of Social Research Methods to Questions in Information and Library Science [book in preparation] www.ils.unc.edu/~yanz/content analysis.pdf.

Yazedjian A, Toews ML, Sevin T, Purswell KE, 2008. “It’s a new whole ne world”: A qualitative exploration of college students’ definitions of and strategies for college success. *Journal of College Student Development.* 49(2): 141-155.

Yeld N, Haeck W, 1997. Educational histories and academic potential. Can tests deliver? *Assessment and Evaluation in Higher Education.* 22: 5-16.

Yeld N, 2003. Academic Literacy and Numeracy profiles: An analysis of some results from the AARP and TELP tests of incoming students (2001/2002 entry years). Into Higher Education. Perspectives on entry thresholds and enrolment systems. Pretoria: SAUVCA-CTP HE Admissions Project.

Yorke M, and Thomas L, 2003. Improving the retention of students from Lower Socio-economic Groups. *Journal of Higher Education Policy and Management.* 25(1): 63-74.

Yorke M, 1999. Leaving early: undergraduate non-completion in higher education. London: Falmer.

Yorke M, Bell R, Dove A, Haslam L, Hughes Jones H, Longden B, O’Connell C, Typuszak R, Ward J, 1997. Undergraduate non-completion in England, Report No. 1, in *Undergraduate No-completion in Higher Education in England.* Bristol: Higher Education Funding Council for England.

Zaaiman H, 1998. *Selecting students for mathematics and science. The Challenge Facing Higher Education in South Africa.* Unpublished PhD thesis. Amsterdam: Vrije Universiteit.

APPENDIX A

DRAFT 1: QUESTIONNAIRE

SECTION A: Demographic Data

1. Age [ ] (at university entry)
2. Sex [M] 01 [F] 02
3. Institution of qualification [ ]
4. Year of enrolment [ ][ ][ ][ ]
5. Year of qualification [ ][ ][ ][ ]
6. Did you repeat any level of study? [Y] 00 [N] 01
7. If so, which one? [ ]

SECTION B: Socioeconomic background

1. Residence

Town	
Village	
Suburb	

2. Family size? [ ]
3. Parent's employment at the time of your studies

Professional	01	Unskilled labour	02	Self-employed	03	Informal sector	04
Other (specify)			05				

4. Joint Parents' income at the time of your studies

R2000 or less	01	R2001– R4000	02	R4001 –R6000	03	R6000 or more	04
Other (specify)			05				

5. Parents' highest level of education

Mother		Father	
Primary School		Primary School	
High School		High School	
Tertiary (specify)		Tertiary (specify)	

SECTION C: Schooling

1. What type of high school did you attend?

	Yes	No
DET		
Model C		
Private		
Farm		

2. What symbols did you get for the following subjects?

English ☐ 01

Biology ☐ 02

Mathematics ☐ 03

Physical Science ☐ 04

3. What was the language of instruction at school?

English ☐ 01

Afrikaans ☐ 02

English and Afrikaans ☐ 03

English and African language ☐ 04

African language ☐ 05

4. What is your home language? ☐

5. Did you have a mathematics teacher? Y ☐ 00 N ☐ 01

6. Did you have a laboratory in your school? Y ☐ N ☐ 01

SECTION D: Career choice

1. Was physiotherapy your first choice of career? Y ☐ 00 N ☐ 01

2. What influenced your choice of career?

	Yes	No
The work the physiotherapist does		
Status		
Salary		
Family		
Friends		

3. How did you find out about physiotherapy?

	Yes	No
Career guidance teacher		
Media		
Careers' evening		
From a physiotherapist		
I was a patient		
Pamphlets distributed at school		
Family/friend		

4. Was physiotherapy known in your community [Y] [N] 01

5. How did you find out about the university you attended?

	Yes	No
My parent(s) attended the university		
My parent(s) worked at the university		
Through the internet		
Through a friend		
Through a member of the family		
From a teacher at school		
The university personnel visited my school		
I attended an open day		

6. What influenced the choice of the university you studied in?

	Yes	No
The university was closer home		
Affordability		
The reputation of the university		
Language of instruction		
A lot of black students		
Fewer black students		
It was the only place I could get admission		

SECTION E: University experience

FINANCIAL NEEDS

1. Who funded your studies?

Parent(s)	**01**	Family	**02**	Bursary	**03**
Study Loan	**04**	Other Specify:	**05**		

2. What costs were covered by your funding?

	Yes	**No**
Tuition		
Books		
Meals		
Entertainment		
Transport		
All		

3. Did you need additional funding? Y 00 N 01

4. What did you need additional funding for?

	Yes	**No**
Tuition		
Books		
Meals		
Entertainment		
Transport		
Other (specify)		

5. Where did you get the additional funding?

	Yes	**No**
Relatives		
University funding		
Bank loan		
Book voucher		
Sports bursary		
Other (specify)		

6. Where did you stay while you were at university studies?

	Yes	**No**
Shared room at home		
Own room at home		
Shared university residence room		
Had own residence room		
Rented self-catering flat on my own		
Rented self-catering flat with a friend		
Other (specify)		

7. If you stayed away from the university, how did you get to the university?

	Yes	No
I walked		
I took a lift with friends		
I took a taxi/bus		
My parent dropped me		
I had own transport		
I used university transport		

8. How did you get to the hospitals for clinical training?

	Yes	No
I walked		
I took a lift with friends/classmates		
The department arranged transport		
I took a taxi		
My parents dropped me		
I had my own transport		

LANGUAGE

9. What was the language of instruction at university?

	Yes	No
English		
Afrikaans		
Mixed languages		

5. Did you cope with the language of instruction at university? Y N

PHYSIOTHERAPY

6. Racial composition in your first year class

Black	
Coloured	
Indian	
White	

7. How many black students graduated within the four years of the course? ☐

8. Was academic support available? ☐ ☐

9. If YES, did you access the support? ☐ ☐

10. If NO, why?

I did not need the support	
I did not know how to access the support	
I did not have time to attend	
I did not think it would help	
I did not think it was necessary	

11. Was a mentorship programme available? ☐ ☐

12. If YES, did you have a mentor? ☐ ☐

13. If NO, why?

I did not know what it was	
I did not need a mentor	
I did not think it would have any effect on my studies	

14. Did you belong to a study group? ☐ ☐

If YES continue with question 19. If NO go to question 23,

15. Did you find the group helpful? ☐ ☐

16. If YES, in what way?

I understood my work better	
My marks improved	
I could share my problems	

17. Were your study group members your friends as well? ☐ ☐

18. Did you keep the same study group until you graduated? ☐ ☐

19. If NO, why did you not belong?

I did not need a study group	
I prefer to study on my own	
There were no study groups	
It was difficult to join a study group	
I could not find a suitable group	

EXTRAMURAL ACTIVITIES

6. Were you involved in any extra-curriculum activities? Y ☐ N ☐

7. If YES, which one(s)?

Sport	☐	01
Choir/music	☐	02
Other	☐	03

8. If NO, why? ……..

I was not interested	
I did not know how to get involved	
I did not play any sport at high school level	
I stayed away from university and did not have transport	
I did not have time for extramural activities	
I did not feel welcomed to the activities	

9. If it was sport, at what level were you involved?

	Yes	No
Casual		
University league team		
Represented university		
Represented Province		
Represented country		

Any comments on matters not covered in this questionnaire

……

……

……

……

……

APPENDIX B

DRAFT 2: QUESTIONNAIRE

SECTION A: Demographic Data

8. Age (at university entry) ☐

9. Gender ☐ M 01 ☐ F 02

10. Institution of qualification ☐

11. Year of registration ☐☐☐☐

12. Year of qualification ☐☐☐☐

13. What type of high school did you attend?

	Yes	No
Public		
Private		
Other (specify)		

SECTION B: Socioeconomic background

6. Parent's employment at the time of your studies

Professional	01	Unskilled labour	02	Self-employed	03	Informal sector	04
Other (specify)			05				

7. Parents' highest level of education

Mother		Father	
Primary School		Primary School	
High School		High School	
Tertiary (specify)		Tertiary (specify)	

8. Who funded your studies?

Parent(s)	**01**	Family	**02**	Bursary	**03**
Study Loan	**04**	Other Specify:	**05**		

9. Did you need additional funding? Y 00 N 01

10. What did you need additional funding for?

	Yes	**No**
Tuition		
Books		
Meals		
Entertainment		
Transport		
Other (specify)		

11. Where did you get the additional funding?

	Yes	**No**
Relatives		
University funding		
Bank loan		
Book voucher		
Sports bursary		
Part-time job		
Other (specify)		

12. Did you have other siblings at university level? ☐ ☐

SECTION C: Previous academic record

1. What was your aggregate symbol in matric?

A ☐ 01

B ☐ 02

C ☐ 03

D ☐ 04

E ☐ 05

2. What symbols did you get for the following subjects?

Subject		Grade		Symbol
English	01	HG	SG	
Biology	02	HG	SG	
Mathematics	03	HG	SG	
Physical Science	04	HG	SG	

3. What was the language of instruction at your school?

English ☐ 01

Afrikaans ☐ 02

English and Afrikaans ☐ 03

English and African language ☐ 04

African language ☐ 05

SECTION D: Career choice

7. Was physiotherapy your first choice of career? Y ☐ 00 N ☐ 01

8. What influenced your choice of career?

	Yes 00	No 01
Status		
Salary		
Family		
Friends		
Other		

9. How did you find out about physiotherapy?

	Yes	No
Career guidance teacher		
Media		
Careers' evening		
From a physiotherapist		
I was a patient		
Pamphlets distributed at school		
Family/friend		

10. Was physiotherapy known in your community Y ☐ 00 N ☐ 01

11. How did you find out about the university you attended?

	Yes	No
My parent(s) attended the university		
My parent(s) worked at the university		
Through the internet		
Through a friend		
Through a member of the family		
From a teacher at school		
The university personnel visited my school		
I attended an open day		

SECTION E: University systems

1. What was the language of instruction at university?

	Yes	No
English		
Afrikaans		
Mixed languages		

2. What was the language of instruction at school?

	Yes	No
English		
Afrikaans		
African/venecular		
Mixed languages		

3. What is your home language?

	Yes	No
English		
Afrikaans		
African/venecular		

4. What were the university support systems?

Tutorials	01
Counselling	02
Mentoring	03
Study groups	04
Study skills classes	05
Student Affairs	06
Language support	07
Transport	08
No support available	09
Did not know there was available support	00

5. If you knew of the support systems, which one(s) did you access?

Tutorials	01
Counselling	02
Mentoring	03
Study groups	04
Study skills classes	05
Language support	06
Transport	07
None	00

6. Where did you stay while you were at university?

	Yes	**No**
Shared room at home		
Own room at home		
Shared university residence room		
Had own university residence room		
Rented flat on my own		
Rented flat with a friend		
Other (specify)		

PHYSIOTHERAPY

1. What was the language of physiotherapy lectures?

	Yes	**No**
English		
Afrikaans		
Mixed languages		

2. How big was your class through the years of study?

	Yes	No
20 - 30		
31 - 40		
41 - 50		
>50		

3. How many students graduated with you? ☐

4. How many black students graduated with you? ☐

5. What do you consider as factors that enabled you to complete in minimum time ($4 - 4^1/_2$ yrs)?

   - ……
   - ……
   - ……
   - ……
   - ……
   - ……

6. What do you consider as factors that prevented your colleagues from completing in minimum time?

   - ……
   - ……
   - ……
   - ……
   - ……
   - ……

7. What do you consider as factors that resulted in your taking additional time (>$4^1/_2$ yrs) to complete?

   - .....
   - .....
   - .....
   - .....
   - .....
   - .....

8. What do you consider as factors that enabled your colleagues to complete in minimum time?

   - .....
   - .....
   - .....
   - .....
   - .....
   - .....

SECTION F: EXTRAMURAL ACTIVITIES

9. Were you involved in any extra-curriculum activities? Y N

10. If it was sport, at what level were you involved?

	Yes	No
Leisure		
University league team		
Represented university		
Represented Province		
Represented country		

Any comments on matters not covered in this questionnaire

.....

.....

.....

.....

APPENDIX C

FINAL QUESTIONNAIRE

PART 1

SECTION A: DEMOGRAPHIC DATA

In this section, I would like to know a little about you so that I can have some background of the respondents, which I can link to the factors that might have affected progress in their studies.

14. How old were you when you started physiotherapy education? ———— yrs

15. What is your gender? (Circle the number next to the appropriate answer)

    1 Male 2 Female

16. Institution of qualification (Cross the number corresponding to your constitution)

1	University of Limpopo (MEDUNSA)
2	University of Pretoria
3	University of the Witwatersrand
4	University of KaZulu-Natal
5	University of Cape Town
6	University of Western Cape
7	University of Stellenbosch
8	University of Free State

17. Which year did you enroll for physiotherapy? ————————

18. How long did it take you to qualify?

1	4 years
2	$4^1/_2$ years
3	5 years
4	> 5years

19. What type of high school did you attend? (Circle the number next to the appropriate answer)

    1 Public 2 Private

SECTION B: SOCIOECONOMIC BACKGROUND

In this section I would like to know the social and economic background of the students who studied physiotherapy in the years that you were a student.

Indicate your answer by placing an X in the box beside the appropriate answer

13. Parent's employment at the time of your studies

Mother		Father	
Professional	1	Professional	1
Unskilled labour	2	Unskilled labour	2
Informal sector	3	Informal sector	3
Self employed	4	Self employed	4
Deceased	5	Deceased	5

14. What is your parents' highest level of education?

Mother		Father	
No schooling	1	No schooling	1
Primary School	2	Primary School	2
High School	3	High School	3
Tertiary	4	Tertiary	4
Not applicable	5	Not applicable	5

15. Who funded your studies?

Parent(s)	**1**	Family	**3**	Bursary	**4**
Study Loan	**2**	Other (Specify)	**5**		

16. Did you need additional funding for your education? (Circle the number next to the appropriate answer)

1 Yes 2 No

17. Where did you get the additional funding?

Relatives	**1**	Sports bursary	**3**	Part-time job	**4**
Bank loan	**2**	University funding	**5**	Provincial Government	**6**

SECTION C: PREVIOUS ACADEMIC RECORD

In this section I would like to know your academic performance at high school level so that I can establish whether it played a part in your success in physiotherapy studies.

Indicate your answer by placing an X in the box beside the appropriate answer

4. What was your aggregate symbol in Matric?

A	1
B	2
C	3
D	4
E	5

5. What symbols did you get for the following subjects? (Circle the grade in which you did the subject and indicate the symbol you obtained for each subject in the appropriate box)

Subject	Grade		Symbol
English	HG	SG	
Biology	HG	SG	
Mathematics	HG	SG	
Physical Science	HG	SG	

6. What was the language of instruction at your school? (Indicate your answer with an X in the appropriate box)

English	1
Afrikaans	2
English and Afrikaans	3
English and African language	4
African language	5

SECTION D: CAREER CHOICE

In this section I would like to know how you made the decision to study physiotherapy to see whether that played a part in your progress in physiotherapy studies.

1. Was physiotherapy your first choice of career? (Circle the number next to the appropriate answer)

   1 Yes 2 No

2. What influenced your choice of career? (Indicate your answer with an X in the appropriate box)

	Yes	No		Yes	No
Status			Family		
Salary			Friends		
Interest in the profession			Didn't get qualify for first choice		
Other (specify)					

3. How did you find out about physiotherapy? (Indicate your answer with an X in the appropriate box)

	Yes	No		Yes	No
Career guidance teacher			From a physiotherapist		
Media			I was a patient		
Careers' evening			Pamphlets distributed at school		
Family/friend			Community Youth Centre		
Relative			Relative in the health profession		

4. Was physiotherapy known in your community? (Circle the number next to the appropriate answer)

   1 Yes 2 No

5. How did you find out about the university you attended?

	Yes	No		Yes	No
My parent(s) attended the university			Through the internet		
My parent(s) worked at the university			Through a friend		
The university personnel visited my school			Through a member of the family		
From a teacher at school			I attended an open day		
University brochure/booklet					

SECTION E: University systems

In this section I would like to know the different support systems that were available in your university, whether you knew they existed and whether you made use of them. This information will assist to determine whether their availability or use played a part in your progress at university.

Indicate your answer by placing an X in the box beside the appropriate answer

1. What was the language of instruction at university?

	Yes	**No**
English		
Afrikaans		
English and Afrikaans		

2. What support systems were available at the university?

	Yes	No		Yes	No
AdditionalTutorials			Study skills classes		
Counselling			Language support		
Mentoring			Study groups		
Student Affairs			No support available		
Transport			Do not know if there was available support		

3. If you knew of the support systems, which one(s) did you access?
4.

	Yes	No		Yes	No
Additional Tutorials			Study skills classes		
Counselling (academic and/or social			Language support		
Mentoring			Study groups		
Student Affairs office			None		
Transport					

5. If you knew of the support systems, how did you find out about them?

	Yes	No		Yes	No
From classmates			Advertisement around campus		
From the Orientation Week			From lectures		
From the physiotherapy department			From my mentor		

6. Where did you stay while you were at university?

	Yes	No		Yes	No
Shared room at home			Had own residence room		
Own room at home			Rented flat on my own		
Shared university residence room			Rented flat with a friend		
Other (specify)					

7. Was the place you stayed at, conducive for studying?

1 Yes 2 No

8. How did you travel to the clinical areas?

	Yes	No		Yes	No
Used my own transport			Got a lift from classmates		
Used university transport			My parent transported me		

SECTION F: PHYSIOTHERAPY

In this section, I would like to know about your experience in the physiotherapy department in order to see whether it influenced the success in your studies.

1. What was the language of physiotherapy lectures?

		Yes	No
1	English		
2	Afrikaans		
3	English or Afrikaans		

2. Was the language of instruction your home language?

   1 Yes 2 No

3. Were you able to ask questions in class in another language other than the one of instruction? (Circle the number next to the appropriate answer)

   1 Yes 2 No

4. Were explanations from lecturers always in the language of instruction? (Circle the number next to the appropriate answer)

   1 Yes 2 No

5. Were there students of other races in your class? (Circle the number next to the appropriate answer)

   1 Yes 2 No

6. How big was your class through the years of study?

20 - 30	1
31 - 40	2
41 - 50	3
>50	4

7. Did you feel you were part of this group? (Circle the number next to the appropriate answer)

   1 Yes 2 No

PART 2

In this second part of the questionnaire I would like you to please give your opinion on the questions that I have raised.

1. What is your definition of academic success?

   ……
   ……
   ……
   ……

2. Why do you think some students are more successful than others?

   .....
   ……
   ……
   ……
   ……

If you completed the degree in 4 or $4^1/_2$ yrs, answer questions 3 and 4 then continue from 7

If you completed the degree in more than $4^1/_2$ yrs, start from questions 5 onwards

3. What do you consider as factors that enabled you to complete the degree in minimum time?

   ……
   ……
   ……
   ……
   ……

4. In your opinion, what were the factors that resulted in other students taking additional time to complete?

   ……
   ……
   ……
   ……

5. What do you consider as factors that resulted in your taking additional time to complete the degree?

   ……
   ……
   ……
   ……
   ……

6. In your opinion, what were the factors that enabled other students to complete in minimum time?

   ……
   ……
   ……
   ……
   ……

7. Do you know any students that dropped out from the course? ……..

8. If yes, what were their reasons?

   ……
   ……
   ……
   ……
   ……

9. Did you ever consider leaving the course? …….

10. If yes, what stopped you from leaving?

    ……
    ……
    ……
    ……
    ……

11. Did you feel isolated or part of the group of your classmates? Elaborate briefly.

……
……
……
……

12. Did you have any academic, social, financial or family difficulties whilst at university? …….

13. If you did, which of the three did you have?.....

14. How did you get the difficulties resolved?

……
……
……
……

15. If you did not access the university support systems and you knew about them, what were the reasons?

……
……
……
……

16. What were the most difficult moments of your time at university?

……
……
……
……

17. What were the highlights of your time at university?

……
……
……
……

APPENDIX D

CLEARANCE CERTIFICATE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Mbambo

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M051004**
PROJECT	Predicators of Success for African Black Physiotherapy Students in South Africa
INVESTIGATORS	Ms NP Mbambo
DEPARTMENT	Department of Physiotherapy
DATE CONSIDERED	05.10.28
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 05.11.14 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Prof JC Eales

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX E

SUBJECT INFORMATION

Dear Colleague

RE: PARTICIPATION IN A RESEARCH PROJECT

My name is Nonceba Mbambo, a PhD student at the University of the Witwatersrand. I am conducting a study entitled: *Predictors of success for African black physiotherapy students in South Africa*.

The purpose of this study is to develop a prediction model of success of Black students in physiotherapy programmes in South Africa so that access and success can be improved. I realize though that some of the predictors, if any, can be applicable to other racial groups if they had similar experiences at university level hence I will not be including only Black physiotherapists in my study.

I have obtained your name and address from the HPCSA Register. I feel that your perspective as a former physiotherapy student is extremely important in exploring different aspects of students' experiences during physiotherapy training. To date there has not been much research done in this area, and I am keen to add to our knowledge of what makes students successful in physiotherapy.

I would be most grateful if you could spare the time to assist in this project by completing the accompanying questionnaire. All information obtained from the questionnaire will be treated with strict confidentiality as none of the participants will be identifiable in the results and discussion of this study. The numbering on the questionnaires is for statistical analysis purposes only.

Thanking you in advance for your assistance and participation in this study.

Yours sincerely

Nonceba Mbambo
Department of Physiotherapy
University of the Witwatersrand
Phone: (011)7173728
Fax: (011) 7173719
0828850041

APPENDIX F

LETTER TO THE HEADS OF DEPARTMENTS

Dear Colleague

RE: PARTICIPATION IN A RESEARCH PROJECT

My name is Nonceba Mbambo, a PhD student at the University of the Witwatersrand. I am conducting a study entitled: *Predictors of success for African black physiotherapy students in South Africa*.

In South Africa there are more than 4000 physiotherapists registered but only a small percentage of them are Black physiotherapists. Over the years, there has been speculation on a number of factors including disadvantaged educational background. The interesting thing is that the ones who have succeeded to graduate, some of them had similar educational background. The question therefore is, what factors contributed to that success? Can those factors be used to predict success of current students? To date there has minimal research done in this area, and I am keen to add to our knowledge of what makes students successful in physiotherapy.

The purpose of this study is to develop a prediction model of success of Black students in physiotherapy programmes in South Africa so that success and therefore demographic representation can be increased. I realize though that some of the predictors, if any, can be applicable to other racial groups if they had similar experiences at university level hence I will not be including only Black physiotherapists in my study. To that effect, I have obtained the names and addresses of all physiotherapists from the HPCSA Register to select a sample for my study. I feel that the perspective of former physiotherapy students is extremely important in exploring different aspects of students' experiences at university in general and during physiotherapy training specifically. I would further like to obtain the perspective of the lecturing staff on the factors that might be influencing the success of Black students in physiotherapy programmes.

I would be most grateful if you could spare me time to assist in this project by granting me an interview with yourself of a senior staff member in your department. All information obtained from the interview will be treated with strict confidentiality as none of the participants will be identifiable in the results and discussion of this study. The recorded interview will be listened to by an independent transcriber. The recording will be deleted at the end of the write up of the study. I will bring the consent form when I come for the interview.

Thanking you in advance for your assistance and participation in this study.

Yours sincerely
Nonceba Mbambo
(HOD consent form)

APPENDIX G

CONSENT FORM

I …….. freely and voluntarily consent to participate in a research project under the direction of Nonceba Mbambo by way of participating in an interview.

I understand that a tape recording of my discussion with Ms Mbambo will be made for the sole purposes of this study.

I understand that I may withdraw my consent and discontinue participation in this research at any time without prejudice to me. I also understand that I can refuse to answer particular questions during the interview.

I have been assured that my name will not be associated with any of the results and findings of this study.

…… **……**

SIGNATURE (PARTICIPANT) **DATE**

APPENDIX H

GRADUATE RESPONSES

1. What is your definition of academic success?

Category	Respondents	Total	%
Completion of degree (on time)	96, 6, 16, 58, 118, 19, 21, 11, 13, 27, 119, 51, 123, 8, 25, 12, 120, 116, 28, 120, 48, 67, 77, 113, 45, 49, 47, 57, 43, 92, 75, 44, 112, 41	34	27
Understanding course content and able to apply knowledge gained clinically	35, 17, 46, 117, 121, 122, 57, 92, 88, 68, 24, 74, 89, 75, 23	15	12
Passing all subjects	31, 22, 14, 116, 53, 54, 122, 80, 32, 50	10	8
Getting good passes/marks	76, 78, 38, 69, 81, 32, 50	7	6
Achievement of personal goals	48, 93, 7, 94	4	3
Completion of degree without financial problems	43, 42, 39	3	2
To be taught at the highest standard possible	10	1	0.8
	Total	**74**	**58%**

2. Why do you think some students are more successful than others?

Category	Respondents	Total	%
Some work harder than others (personal motivation)	80, 112, 76, 48, 8, 46, 50, 52, 93, 27, 69, 75, 81, 45, 24, 28, 38, 94, 42, 118, 74, 121, 49, 53, 35, 37, 23, 117, 41, 447, 68, 92, 78, 116, 25, 42, 54, 47, 113, 67, 39, 22	42	33
Natural Intelligence	80, 121, 53, 88, 78, 38, 94, 116, 21, 57, 25, 89, 67, 447, 39	15	12
Have financial resources/family support	12, 96, 74, 42, 7, 43, 57, 29, 122, 120, 68, 92, 447, 25	14	11
Language barrier	37, 192, 120, 25, 31, 9	6	5
Group discussions/ study skills	31, 42, 54, 47, 113, 123	6	5
Positive attitude towards course and lectures	44, 117, 10, 21, 47	5	4
Good balance between academic and social activities	112, 51, 92, 123,	4	3
Attend more lectures	80, 81	2	2
Wrong friends	11, 23	2	2
Method of teaching	117, 9	2	2
Previous good education (high school)	77, 89	2	2
Failure to adapt (from high school)	122	1	0.8
Parents' careers	123	1	0.8
	Total	**102**	**80%**

3. What do you consider as factors that enabled you to complete the degree in minimum time?

Category	Respondents	Total	%
Determination/will to succeed	112, 48, 52, 8, 42, 46, 28, 13, 25, 69, 92, 12, 76, 78, 32, 116, 118, 93, 123, 45, 121, 41, 75, 47, 77, 81, 51, 21, 94, 23, 53, 117, 29, 38, 113, 49, 11, 39, 35, 27, 31, 74, 44, 447, 80, 10, 17, 47	48	38
Support from friends/fellow students	96, 14, 32, 69, 51, 24, 121, 50, 94, 23, 58, 57, 35, 31, 89, 22	16	13
Proper time management	28, 7, 77, 51, 21, 50, 37, **1,** 10, 43	10	8
Support from lecturers	67, 94, 49, 57, 11, 39, 35, 27, 31, 80	10	8
Support from family/parents	14, 48, 44, 25, 27, 76, 116, 32, 89	9	7
Pressure from family (poor background)	96, 74, 37, 123, 29, 54, 44	7	6
Attending lectures/practicals	94, 38, 113, 49, 27	5	4
Fear to lose bursary/financial aid	42, 67, 52, 78, 68	5	4
Financial Support	12, 116	2	2
Language/ Medium of Instruction	24, 23	2	2
Belief in God	447, 89	2	2
Maturity (when studying at university)	88, 6	2	2
	Total	**118**	**92%**

Category	Theme	Total	%
Will to succeed	Determination	62	53
Proper time management			
Attending lectures/practicals			
Support from friends/fellow students	Availability of support	37	31
Support from lecturers			
Support from family/parents			
Financial Support			
Understanding of language of instruction	Favourable environment	6	5
Maturity (when studying at university)			
Belief in God			
Pressure from family (poor background)	Compelling factors	12	10
Fear to lose bursary/financial aid			
		118	**92%**

4. In your opinion, what were the factors that resulted in other students taking additional time to complete?

Category	Respondents	Total	%
Poor time management (Didn't balance study and social time)	78, 28, 54, 118, 11, 7, 29, 77, 12, 13, 25, 112, 51, 41, 113, 75, 16, 17, 27, 43, 45, 48, 50, 52, 57	25	20
Not cut for it/Inadequate aptitude (course difficult)	58, 38, 54, 118, 116, 39, 88, 21, 31, 117, 35, 12, 76, 25, 51, 74, 121, 46, 44	19	15
Emotional/Physical Issues	38, 67, 68, 77, 14, 25, 112, 74, 39, 447, 89, 116, 46	13	10
Inadequate effort put into studies	68, 78, 58, 54, 69, 117, 24, 40, 25, 41, 81, 8, 16	13	10
Lack of motivation	96, 47, 76, 14, 32, 58, 41, 113, 89, 10, 50, 53	12	9
Poor English skills (Language Barrier)	77, 69, 88, 94, 24, 14, 37, 447, 16, 22	10	8
Poor study techniques	38, 47, 117, 75, 6, 27, 46, 48	8	6
Financial problems (Poor socioeconomic background)	29, 77, 13, 6, 22, 116, 53	7	6
Bunking classes	78, 12, 47, 76, 13, 49	6	5
Poor high school background	13, **1**, 50, 123, 57	5	4
Victimisation (especially by lecturers)	31, 42, 43, 44	4	3
Poor Teaching Methods	447, 32, 42	3	2
Poor Support from Department	6, 32, 57	3	2
Bad influence from friends	13, 17	2	2
Racial Discrimination	6	1	0.8
Bad luck	92	1	0.8
Stringent University Rules	74	1	0.8
		133	**104%**

Category	Theme	Total	%
Poor time management (Didn't balance study and social time)	Lack of academic discipline	56	44
Inadequate effort put into studies			
Poor attendance of lectures			
Lack of motivation			
Emotional/Physical Issues	Psychosocial difficulties	20	16
Financial problems (Poor socioeconomic background)			
Poor English skills (Language Barrier)	Academic problems	42	33
Poor study techniques			
Poor high school background			
Not cut for it/Inadequate aptitude (course difficult)			
Victimisation (especially by lecturers)	Poor learning environment	14	11
Poor Teaching Methods			
Poor Support from Department			
Bad influence from friends			
Racial Discrimination			
Stringent University Rules			
Bad luck		1	0.8
		133	**104%**

5. **What do you consider as factors that resulted in your taking additional time to complete your degree?**
    - Largely blank

Category	Respondents	Total	%
Racial discrimination	119	1	
Poor support from department	119	1	
Pregnancy	120	1	
	Total	**3**	

6. **In your opinion, what were the factors that enabled other students to complete in minimum time?**
    - Largely blank

Category	Respondents	Total	%
Racial discrimination	119	1	
Hard work	114	1	
Support from lectures	11	1	
Self discipline	11	1	
	Total	**4**	

7. Reasons for students dropping out of university/from the course

Category	Respondents	Total	%
Failing/Poor Grades	17, 118, 96, 41, 51, 78, 37, 45, 76, 112, 43, 12, 10, 116, 49, 92, 52, 77, 11, 19, 93, 39, 25, 113, 7, 53, **1**, 6, 13, 22, 46, 119	32	25
Didn't course/career	80, 24, 89, 118, 48, 68, 122, 50, 27, 94, 58, 67, 69, 81, 69, 57, 117, 45, 93, 113, 53, 21, 119	23	18
Didn't know much course before and so changed to another programme	69, 54, **1**, 121, 41, 23, 61, 78, 77, 113, 7, 21	12	9
Financial Difficulties	89, 17, 13, 16, 69, 81, 96, 6, 22	9	7
Social/Personal Difficulties (including racial discrimination – 3 and ill health – 1)	89, 50, 47, 11, 44, **1**, 123, 52, 46	9	7
Moved to study Medicine	32, 120, 27, 54, 47, 13, 21	7	5
Pregnancy	16, 112, 44, 21	4	3
Victimisation	32	1	0.8
		97	**76%**

8. Reasons for not leaving course

Category	Respondents	Total	%
Will/wish to become a physiotherapist	12, 118, 6, 49, 117, 89, 21, 37	8	6
Family situation/pressure	29, 17, 9, 122, 69, 42, 45	7	5
Couldn't be accepted into another course	94, 122, 43	3	2
"Wasted time" implications	121, 43	2	2
		20	**16%**

9. Did you feel isolated or part of group of your classmates

Category	Reasons
Part of group	Did academic activities together
	Supported each other like one big family
	Friendships
	Small classes enabled us to know each other well – encouraged group discussions
Isolated	Racial and cultural differences
	Socio-economic disparities

10. Reasons for not accessing university support systems

Category	Respondents	Total	%
Did not need any support	7, 8, 22, 25, 38, 53, 67, 68, 77, 78, 92, 93, 94, 113, 118, 123	16	13
Poor service from responsible departments	16, 27, 119	3	2
Time constraints	121	1	0.8
		20	**16%**

18. What were the most difficult moments of your time at university?

Category	Respondents	Total	%
Dealing with exams (theory and clinical)	7, 8, 9, 14, 16, 27, 37, 39, 44, 45, 48, 49, 51, 75, 76, 88, 92, 113, 116, 118, 119, 121, 122, 123	24	19
Long hours of lectures and studying	7, 13, 21, 23, 24, 37, 41, 50, 81, 112, 113, 123	12	9
Financial difficulties	12, 22, 28, 29, 31, 35, 42	7	5
Research	32, 38, 52, 57, 80, 96	6	4
Travelling for clinical placements	11, 69, 74	3	2
Transition from high school to university	27, 13, 96	3	2
Racial discrimination	6, 9, **1**	3	2
Poor accommodation (and failure to fit in)	8, 67	2	2
Family issues	42, 78	2	2
Ill health	42, 89	2	2
Inadequate socialisation	57, 117	2	2
Victimisation by lecturers	19	1	0.8
Relationship issues (love)	77	1	0.8
Student council duties	38	1	0.8
Pregnancy	120	1	0.8
Irrelevant courses	10	1	0.8
		71	**55%**

19. What were the highlights of your time at university?

Category	Respondents	Total	%
Passing/doing well in studies	7, 8, 11, **1**, 12, 13, 22, 25, 27, 28, 31, 32, 39, 42, 46, 44, 48, 50, 51, 53, 57, 67, 77, 81, 75, 76, 78, 89, 88, 94, 112, 118, 119, 120, 122, 123	36	28
Good friendships	7, 14, 21, 23, 24, 38, 41, 42, 45, 49, 50, 51, 54, 68, 69, 74, 77, 81, 80, 89, 113, 96, 92, 117, 121, 123	26	20
Learning new things	10, 42, 43, 69, 78, 116	6	5
Travelling	19, 39, 58	3	2
Competing well against people of other races	6	1	0.8
		72	**56%**

Question	Number of responses to the question	Categories of significance	n (%)
Definition of academic success	74	Completion of degree (on time)	34 (50)
		Understanding of course content and application	15 (20)
Academic success is completion of the degree on time, understanding of the course content and being able to apply what has been learnt			
Reasons why some students are more successful than others	102	Some work harder than others (personal ambition)	42 (41)
		Natural intelligence	15 (15)
		Availability of financial resources/family support	14 (14)
The differentiating factor between successful and unsuccessful students is personal ambition that makes them work harder, natural intelligence, financial resources and family support			
Factors contributing to own success (S)	118	Will to succeed	48 (41)
		Support from friends/fellow students	16 (14)
Students who are successful have the will to succeed and get support from friends and fellow students			
Factors resulting in others taking longer to complete (S)	133	Poor time management	25 (19)
		Inadequate aptitude	19 (14)
		Emotional issues	13 (10)
		Poor English skills	10 (8)
Students who took longer to complete the degree had poor time management, inadequate aptitude for physiotherapy, poor English proficiency and some emotional issues			
Factors contributing to own lack of success (US)	3	Racial discrimination	1(33)
		Poor support from department	1(33)
		Pregnancy	1(33)
Students who are unsuccessful are racially discriminated and get poor support from the physiotherapy department			
Factors contributing to others completing on time (US)	4	Racial discrimination	
		Hard work	
		Support from lecturers	
		Self discipline	
Students who complete the degree on time have racial advantage, receive support from lecturers, work hard and are self disciplined			
Reasons for other students to drop out of the course	97	Poor grades	32 (33)
		Didn't like the career	23 (24)
		Lack of prior knowledge about physiotherapy	12 (12)
Students who dropped out of the course had poor grades, did not like physiotherapy as a career and lacked prior knowledge of the profession			
Reasons for changing own mind about leaving the course	20	Wish to become a physiotherapist	8 (40)
		Family situation/pressure	7 (35)

Students who had though of dropping out of the course but changed their minds had the wish to become physiotherapist and had family issues and pressures that compelled them to stay on			
Reasons for feeling part of the group	30	Friendships	19 (63)
		Supported each other	16 925)
		Did academic activities together	9 (30)
		Small classes encouraged closeness	8 (27)
Students who felt part of the group did academic activities with fellow students, had support from others, formed friendships and were in small classes that made it easier for them to interact with one another			
Reasons for feeling isolated	15	Racial and cultural differences	9
		Socio-economic disparities	1
Students who felt isolated experienced racial and cultural differences and socio-economic disparities			
Reasons for not accessing university support systems	20	No need for the support	16 (80)
		Poor service	3 (15)
Students who did not access the services did not need the support and others had had poor service			
Difficulties at university	71	Dealing with examinations	24 (34)
		Long hours of lectures and studying	12 (17)
		Financial difficulties	7 (10)
Difficulties at university include having to deal with exams, the long hours of lectures and studying that must take place and financial difficulties			
Highlights	72	Doing well in studies	36 (50)
		Good friendships	26 (36)
Doing well in the studies and good friendships that are formed during the time at university form the highlights of university life.			

APPENDIX I

CONCEPTUAL AUDIT TRAIL – STUDENTS' PERCEPTIONS ON SUCCESS

Nature of raw data	▪ Open ended questionnaires from 128 respondents ▪ Responses typed per question and stored as computer files
Analysis of data	**Content analysis method was used (Mayan, 2002)** ▪ Identifying of primary patterns in the data by looking for recurrence of statements in the data ▪ Counting of recurrences of statements ▪ Grouping of the statements into sub-categories ▪ Categorizing of the sub-category groups
Subsequent analysis/process	▪ Confirmation of categories by an independent coder ▪ Comparison of the two sets of categories ▪ Division of the categories into individual attributes and contextual attributes
Preliminary categories on definition of success	▪ Completing the degree in record time ▪ Obtaining the degree ▪ Ability to apply knowledge effectively ▪ High achievement
Definition of academic success	Academic success is the completion of the degree in minimum time and ability to utilize the knowledge gained during the studies
Contribution	The expressed opinions of the graduates ▪ clarify what it means for students to be successful ▪ further confirms the operational definition of success given in this study

Emerging of Themes	▪ Categorizing of general responses, responses from the successful respondents and responses from unsuccessful respondents regarding contributors to success. ▪ Combination of categories from the different responses to formulate themes ▪ Categorizing of responses regarding barriers to success from the successful respondents and responses from unsuccessful respondents ▪ Combination of categories from the different responses to formulate themes ▪ Categorizing of all responses to the questions asked regarding reasons for leaving or not leaving the course before completion, integration with classmates, challenges encountered at university and highlights of university experience. ▪ Formulation of themes ▪ Division of themes into individual and contextual factors

Themes	▪ A successful student is a student who has determination to succeed, is proficient in language of instruction and has desirable personal attributes. If the student has the relevant support and/or compelling factors, the student will be successful academically. ▪ A student who lacks academic discipline, has inadequate academic preparation and experiences psychosocial difficulties will not be successful academically. Poor learning environment is not conducive for success. ▪ Students who leave the physiotherapy course before completion are thought to do so because of change in career, academic exclusion, financial problems, disillusionment, illness or pregnancy ▪ Students who stay on even if they had contemplated to leave the course do so because of their will to become a physiotherapist, of having sorted out their financial problems, pressure from family, inability to change the course and the 'wasted time' implications. ▪ Students who felt part of the group of their classmates did so because of the friendships they established, support from the group, group academic activities and small classes which encouraged closeness. ▪ Students who feel isolated feel so because of racial and cultural differences and socio-economic disparities. ▪ Challenges encountered by students were academic, personal, social, financial and institutional in nature ▪ The highlights at university included doing well in studies, learning new things, good friendships, social activities and competing well against people of other races

APPENDIX J

INTERVIEWS

Interview 1

When asked to describe the students' demographics and how the students are selected for physiotherapy in her university the interviewee responded by stating firstly that the department is striving to increase the number of African students. In her university they do this by adjusting the selection criteria to accommodate African students. Out of the 50 students admitted each year, the target is to admit 20 African students but this hindered by lack of student applications. The interviewee was asked to explain the throughput of the African students that are eventually admitted into the course. Her response was that the throughput of those students that are admitted is about 50% and students take an average of 5 years to complete the degree due to various reasons, problem being in the first two years of study. The interviewee explained how the longer period of studying comes about and the level of frequent occurrence by clearly stating: "*But it can happen that they repeat the first year and also the 2nd year and that's how it gets to 6 years. But usually when they pass the 1st and 2nd year they're ok for the 3rd and 4th year ….."*

The interviewee was asked to elaborate on the various reasons that cause the students to take longer to complete the degree. She responded by indicating that she recognizes that there are academic reasons that are a cause of failure but that besides the academic problems, students are faced with other problems which are economic or social. In explaining these problems, the interviewee puts it clearly in saying "*Sometimes it's illness, like a father or a mother passing away and the boy or son must go- ag no, the girl must go and look after the family or work or whatever. And also socio-economic, some of them just can't afford to study."* To make her point of economic difficulties she quoted a recent case in her department: *"I guess to answer your question, uhm, we've had students in the past who didn't have a place to sleep or food to eat. But then we found that the students actually look after themselves as well. The class- they started to bring in extra sandwich and then they forward them to us and just arrange to take lunch at the cafeteria one day. But it definitely is difficult and I think they are sometimes a bit, uhm, ashamed, you know, feeling very sensitive."* One other reason for poor performance that she cited was language proficiency. She commented

that in her university Afrikaans and English are used as medium of instruction but in the physiotherapy department, they mainly use English but have lecture notes in English and Afrikaans. Although they use mainly English, she feels that the students struggle even then. Her concise explanation is that: "*I think a big thing is also language. You know, they have a compulsory English language course in the first year but there is a big difference between being able to speak and read and the comprehension…in their answers when you ask a question, word by word you can understand what the person is saying but the comprehension thereof isn't you want it to be."*

With the problems that were clearly pointed out, the interviewee was asked how the university in general and the department in particular tries to deal with these problems. What measures are put in place to assist students who are struggling? The interviewee's response was that the faculty's role is to assist with funding. The department itself has come up with an infrastructure of firstly to identify these students and bring them to the attention of those concerned. There are also support structures in the department and at the university for all students, these include house committee within the department, with a portfolio for minority group students, there is definitely psychological help, support for learning problems, tutor system and comprehensive mentoring. The department is also trying to integrate the student and reduce the race gap, at least socially and within the department.

Although there are students who have a variety of problems that cause them to struggle even academically, there are students who perform better and are successful in their studies. The interviewee was asked to comment on the factors that contribute to academic success of these students from her point of view. The interviewee could remember specific students in this regard and the first thing that commented on was personal attributes of a student. She captures the first case succinctly when saying: "*I'm thinking of one student ……. He's now also a student on the house committee. He's a very kind person, he's always in class, he's open for criticism his whole attitude is one of "I want to learn", you know, not I'm now being critical on him or whatever. Uhm, ja. Very, very dedicated. Ja, although he's not academically that strong. But he's doing well in physio- no, he's wasn't on a school level that strong, but he's shaping perfectly in the physio world.….you can see the keenness and the interest in his face, he is just awake, he's there. Which is not a thing that I can say of all the white students, they are a bit spoiled, you know*." The second issue that the interviewee raised was maturity of students. She was referring to students who start in the basic sciences for one year

before coming to join physiotherapy. She perceives to be more mature and therefore are able to cope much better because they are not straight from school: "*The students who did basic_science in their first year and I think they're now used to the same situation. I think part of the university setup is there already, ja. They're a bit older. I think that also plays a role*." The interviewee was also of the opinion that if a student has been exposed to other cultures and have interacted with other races, they are likely to cope much better with their studies at her university: "*I'm thinking of* ***NAME*** *actually one of the tutors now, I mean she's from a private school, you know, she's just so relaxed and confident, used to everything, no problem"*

The interviewee had commented that their department has a few support structures where they can send students and they also have a tracking system to make sure that the students do not fall between the cracks: "*We usually request a feedback report from these facilities to track if students who have been referred do attend or make use of the facilit*y." All of these are done by people or departments who do not have a close working relationship with the students and only see the students when they come with a problem. It was important to establish things that can be done by the department seeing that the lecturers have a day-to-day relationship with the students. The interviewee was therefore asked to comment on what the department was doing in this regard. Her main thoughts about what should be done were around establishing a trusting relationship with the students and giving students security so that they can have confidence: *"I think the best thing is that just to establish that relationship with the students that they don't feel if I call you in, if I talk to you, that I'm victimising you. I am interested in you as a person because I want you to succeed. I think that is the first thing that you have to overcome. And then…you know to- the other thing I think is that students need security, security in academic support so that they know we're there if they need us and security in their knowledge or their skill. So they know that they can do things because I know, talking for myself, that if I don't feel very secure about something then I sort of put it away, you know"* She believes in giving the students a lot of support: *" And then definitely, ja, support, support, support because a student can actually disappear in the group. In the hospital, you send them to do work and they can just walk around the whole day"* She also believes that it is incumbent on the staff to make an effort to understand the students because there are cultural differences. She notes one of the differences in the speed with which things are done: "*The speed with which they work. Like I'm thinking now of this one girl, she took in a 20-minute BT practical, she took 45 minutes to do one technique that was expected of her in 20 minutes. And she came so*

close, you know. But then they get used to working a bit quicker, faster. I think that also is a cultural thing, we're always on the run, rushing, while you guys are much more relaxed" The interviewee admitted that she is in a privileged position in that she has African lecturers in her staff whom she consults on some of the issues: *I use **NAME** and **NAME** a lot to tell me how they would do it, things, because then I understand what I can expect and what I can't expect. Uhm. To have a better understanding of how we should approach certain class. But then also they assist me a lot by speaking to students who is not coping and who sort of- get the real detail, you know, why- what is the problem, things that white people won't understand*."

On being asked whether the issues she has brought up about students difficulties and support would apply to all student races in her department, she responded by saying: "*All these things would apply to all race groups because things are changing, there are white students from poor socio-economic backgrounds and the government schools education is also deteriorating all around. It's very good to talk about these things because then we know what to address and in a sensitive way."*

Interview 2

When asked to specify the number of African students that are admitted at her university and how the students are selected for physiotherapy the interviewee indicated that they admit 2 or 3 African students. She quickly points out that their success rate is not good. Their selection criteria include standard 9 results, activities that students do at school, community type activities, involvement in sport or in a choir. They get points for all these activities. To accommodate African students, although other students have to have a pass of 60% African students are taken with a lower percentage.

The interviewee was asked to elaborate on the throughput rate. It was clear in her response that they are not doing very well in this regard as she clearly explains: "*No, not good. No, no, no, no, no, not good. We find that they drop out in the first year.……You see, what we've got is we've got at our university they can do the first year over 2 years. So the extended curriculum where they can take their subjects over 2 years. We encourage them to go onto that programme, those students that we know the percentages wasn't very good, we give them this programme and we find that they've got problems sometimes. We see that in that extended programme some of them drop out, ja, ja ,ja and otherwise in 2nd year, ja. We haven't got a big success rate. We don't*

attract a lot of students"

The interviewee was asked to her opinion about the various reasons that cause students to take longer to complete or to drop out as she had already pointed out. Her first reason for poor success was language. Her university uses two languages, English and Afrikaans and notes are in both languages. The lecturers can teach in any language that they feel free in. The rule at faculty level is that the lecturer must teach half of the time, in Afrikaans and half in English but all the notes are in English, for those students. All the articles, all the prescribed handbooks are English. Even then, the students do struggle. She gives an example to illustrate her point: "*We've got a student now in his 3rd year of 1st year…….. but he's coming from Lesotho. He can't speak proper English, let alone any thing and he struggles because, you know, about a week ago he missed an exam because, I think things go past him. Like he doesn't realize it and I don't know if it's- because all the things are written down, all the things, but I think it's just so overwhelming sometimes for him. But we keep him in the course and we really want to help him because he really struggles a lot".* She also gave another example of a male student who dropped out at second year level having failed both 1st and 2nd year twice. The student struggled academically but had other contributing factors as she explains: "*And I think the other factor with him was, that broke our heart, he lost both- first his mother to HIV, and then in his studies- and then his father. So he was actually- during his studies he lost both parents. Now I think it's hard."* The other problem she raised was finances which she explained that it affects all students although at different levels. There are students who are unable to go home for holidays because of lack of money and there are those, white students who do not get or lose bursaries if they fail. She also pointed out that there are white students who also drop out for other reasons. She explains this when saying: "….b*ecause we have a dropout in white students too, and one of the main things that they will tell you is that I didn't know exactly what was physiotherapy is all about until I came into the programme. And now that I'm here I don't like it anymore and then they drop out."* She also indicated that they see this drop out even with the qualified physiotherapists. They leave the profession after qualifying because some of them wanted to drop out during the programme but were not allowed by their parents.

With the problems that were clearly pointed out, the interviewee was asked how the university in general and the department in particular tries to deal with these problems. What measures are put in place to assist students who are struggling? The interviewee

indicated that the department has its own academic support programme where two outside lecturers are paid to facilitate extra time with students that are struggling which includes and extra clinical help. Each lecturer in the department is allocated 15 students to be an advisor for and they have to monitor their progress. The advisor also has to follow up all reports given by other lecturers. In terms of the university, there is a small financial fund where students are given tasks and paid per hour. There is a writing laboratory, study methods guidance and 24 hour clinical psychology. The faculty is looking into costs of providing students with transport particularly to the clinical areas because more and more students who apply haven't got cars.

Although there are students who have a variety of problems that cause them to struggle even academically, there are students who perform better and are successful in their studies. The interviewee was asked to comment on the factors that contribute to academic success of these students from her point of view. The interviewee pointed out that knowledge about the university situation contributes to student success. In this regard, she gives a specific example: "*We've got now one girl in her 4th year class. Her mom is a physiotherapist from Johannesburg. I asked her the other day, I said, what did you do? How did you find it? How did you get, without failure, get into the 4th year? She said to me, Mrs* ***NAME****, I knew this was going to be an Afrikaans and English university. I knew it from the beginning. Although the notes are mostly in English, sometimes you find that you've got your odd lectures that aren't, but she said in that case, I sat with my dictionary and I had to work hard in the evenings, but I'm in my 4th year, my final year."* This student obviously came prepared for any eventuality and also knew something about the profession. The interviewee also mentioned personality, motivation and perseverance as contributors to success.

Interview 3

The discussion started on the demographics of the students and how selection of these students is done. The interviewee was asked specifically about the number of African students that are admitted per year. In her response, she referred to the previous year where out of 60 students, 11 were African students. She made a point that this is the first time that they have had such a large number of African students and they plan to keep increasing the numbers. In terms of the selection criteria, she mentioned that all the prospective students write an entrance examination called AARP. For the White students they look at the results of the AARP test and outside experience and they must

have 40 points to be admitted. This they do because there is a bigger pool to select from so the admission is made competitive. For African students they take student with 36 points and upwards and the AARP results do not count as much. She also pointed out that they realize that African students may not have had the same opportunities to engage in community activity and to do volunteer work and so that is not an expectation for admission. She raises a concern which she explains by saying: "*For the black students, we tend to take students who got 36 points or more. So we've got a sort of differential which has its own problems but then you end up with a bimodal distribution and it's not that you- you know, that the black students aren't capable, it's just that they came in with a worse score and you took the very cream of the white students. So it's a problem because we do have a bit of a bimodal distribution."* When asked about the throughput the interviewee responded by saying that the vast majority of students who start go all the way through and she puts the rate at 90%. She mentioned though that some of the African students take longer to complete with an average time of 5 years. The interviewee also pointed to the fact that after 2nd year they find that these students have caught up with everybody else and they manage well. She brought up an interesting point about the coloured students because they have a larger number of them: '…*what we're finding is a lot more of our coloured students now, they've come in with a lower mark and they've been to private schools.. if I think about our very weak students at the moment, they're the coloured students and not the black students.*"

When asked about whether English, being a second language for African students, was seen as a problem in her institution she responded that although language is a problem, it seems to vary a lot and that it is individualized than before. She captures this point well in saying: "*It varies a lot, hey, and what we're finding now are some extremely articulate black students. I mean, if I think of our 1st and 2nd year, the students who, have been to sort of schools they are far more articulate and very, very competent, I mean particularly in our 1st year, you know, the 2 students who are near the top of the class, who are black students, are extremely articulate. So again it's becoming, I think, more individualised than it was before. But having said that, obviously there are students who battle with language. That is also clear."* To illustrate the point further, she gave an example of a student who was in 4th year but had taken an extra year because he had language problems. Her observation was that it seemed that by 3rd year the students are familiar with the language and seemed to cope well onwards. The interviewee was asked whether she had observed any other problems that were encountered by students which influenced their academic performance. The first

problem she mentioned was lack of finance which manifests itself in issues of lack of accommodation, difficulties of travelling to and from the university and students having to work long hours of part-time jobs. She also mentioned emotional problems which can disturb students academically. Her example of a particular student makes this point clear: "*we have somebody from Mpumalanga, we are quite worried about her; she is very lonely. We are just concerned that she is not coping. Intellectually and academically she is absolutely fine, emotionally we are worried about her. She seems to be more isolated that she should be*." The interview points out though that some of these problems are becoming more individualized than being a group problem: "*I think maybe some years back, one would have been able to talk more of the 'black' problem. Now it's individual. Some are financial, some of them are just not working very hard."* As a result of this observation, in her institution, they look at each student and identify what that student's needs are and provide assistance accordingly. One of the solutions they have particularly for language is an academic literacy programme. All students do this programme in the first 2 weeks of term and then a diagnostic test is done. If there are students who are picked up as having problems still, they attend the programme regularly.

The interviewee was asked what she thought an African student who comes in and succeed, brings with him or her, that makes them succeed. The interviewee thought the first thing was motivation and knowing what the profession is about was very important. She elaborates well in this point by making this comparison: "*I think some of the students don't know enough about physio. You know, as I've said, the white students want to do physio, they've got high marks, they come in very motivated, they know where they're going. Some of the black students maybe they didn't get into medicine, maybe they wanted to do something in the medical field but they don't know physio as well, they haven't been exposed possibly as much to what physio is about. I think motivation is very important."* The second thing that students bring, she thought, was language proficiency because she believes that those that are articulate do a lot better. The other attribute is understanding of mathematical concepts which are needed in the biomechanics course because she had found that students who were admitted with low mathematics grade were struggling with this particular course. She also mentioned availability of finance and the confidence in knowing that the parents can help. The interviewee touched on the issue of organizational skills that the student should have in order to succeed in his or her studies. She explains these organizational skills and how they affect a student this way: "*One of the things that I find really difficult for our*

students is that sometimes they are expected to perform at pretty high levels but meanwhile, at home, mom is ill, grandmother has died, there's a sister who's got HIV. There are all these things that are happening which makes it very difficult for them to organise their lives. And so the- you know, where they might very well be the students whose notes are bad, who arrive late for lecturers, they arrive late because they live out in Khayelitsha. They arrive – do you know what I'm saying? I think it's that organisation that is so important. And the organized student is the student who goes ahead….. becasue they're the student, rather than having to be supporting the family when there's this crisis or that crisis."

The discussion now focused on the interaction between students of different races. She was asked specifically whether students find it easy to fit into the group and be part of it. This is her response: "*Something that we've spoken about a bit is, you know, if you look at your class, you've actually got the coloured students sitting here, the white student here and the black students here...But you've still got some white students in with the coloured students, and you've still got some black students in with the white students and you've still- so it's not as if they're rigid little barriers. And you know whenever they work together in groups it seems that they really interact really well. But I suppose people who speak Xhosa feel most comfortable being able to just relate to people...and I think it is a choice that we have spoken about. Should we for example, if we put students into groups to do topics or an assignment – should we ensure that it's multicultural what have you? Or should we just say look, they got on well in this particular group, the coloured students, some of them are Muslims, they maybe get on better, they've got to go to prayers on a Friday afternoon, their rhythms are somewhat different. Is there a problem with them working together in a group? As long as it's not above or below or in opposition…I mean there's a lot of mixing. There are some students who just mix better and there are some who tend to clump a little bit."* In terms of group dynamics she mentioned that these were changing; instead of white students coming in as a majority with academic confidence and therefore defining what happens in the class, the black students are now in the majority, they contribute to what goes on.

Interview 4

The interview started with discussion of student demographics at intake point. Although asked specifically about the number of African students in the first year class, the interviewee responded by giving an overall picture of the demographics. Out of 50

students they admit about 8 African students, 8 White students and the rest are Coloured students. She further noted though that this is not a set figure, a lot is dependent on the number of qualifying applicants that they receive. When asked about selection criteria, she responded by saying that they use the basic selection criteria of mathematics and physics or biology where mathematics must be no less than 50%. In order to accommodate African students and increase intake of students from areas of need in terms of physiotherapy, these students get additional points for selection. They also give these students additional time to arrive at the campus because some of them experience transport or financial problems. When asked about throughput, her response was that on the overall it is about 90% in the first year. For the first time in the previous year, all African students passed but generally the African students' throughput fluctuates. She accounts for this by saying: "*It fluctuates. I think the first year is the year where they are basically filtered. So we are- we see in first year if- if say for example of the 8, the 8 black students you will have like 2 that will fall out because of subjects like physiology……..So then it's the 6 that carries through. But once they're through- their 1st and 2nd year and then they're through.*" The interviewee mentioned that the average time taken to complete for African students is four and a half years. When responding to the issue of average time taken by students to complete, the interviewee noted that in actual fact, at the moment it is the coloured students that are struggling academically and taking longer to complete, some of them more than five years.

When asked about the problems that have been noticed by staff as hindering the success of the students, the interviewee responded by firstly mentioning the issue of language. This is how she explains the issue of language: "*Language is one problem. Because you tend to have students from areas of need and the children are Afrikaans speaking, …… and our medium of teaching is English……..they would ask the questions in Afrikaans, for example. So now I'm saying to them, you're asking me the questions in Afrikaans and I lecture in English, do you understand when I lecture? That is the- so you know language is a problem….They would write- you can see they have a concept here, they have an idea of what should be going on here, but they've lost it somewhere."* The interviewee was asked if there were any other academic problems that she noticed with students, her response was that on the contrary, they are not picking u any problems in that regard. Her explanation of this is clearly put when she says: "*I don't- you would normally think that the A B aggregate would be your strong student, but it's not. I think your C aggregate students are your hardworking students and they do well throughout because they've worked hard all the years, so varsity is*

then for them – it's just a continuation." The second problem she mentioned was the social circumstances of students in terms of food and money which impacts on their adjustment at university and slows them down academically. The other problem that she mentioned, which has become common recently in the department was sexual assault or have been part of crime or domestic violence or they know somebody who have died of AIDS. When asked how the department copes with such situations, this is her candid response: "*It's difficult. I think it's very difficult. We've had- we've had suicide cases where, you know, students just wanted to commit suicide ….. a student who threw himself on the train…He was now one case that we lost. We have had something like 3 or 4 who have tried but we caught them in time. You know, that is why we are so clued up on the monitoring and in terms of when we see a student is down we try to call the students in and to actually get to know them"*

After all the problems that were highlighted, the discussion now focused on support structures for the students. The interviewee was asked to elaborate on the support systems that the university or the department has. She started by mentioning the support that they offer in the department. They have class coordinators whom the students can go and talk to and the class coordinator can follow up on the problem. Their secretary was sent on a mentoring course because she's the first line person of the students and that she should be able to handle emergencies. They have a mentoring system as well where senior students mentor the junior students. To help the first years get used to university life, they have 'peer facilitators' who are 2nd year students. If the students do not have money to make clinical appointments for practicals then they will be given money in the department and transport is provided to the 'high risk' clinical areas. The department also assists the students to obtain bursaries. In terms of the university support structures, the interviewee indicated that there is student counseling for all students to attend workshops that they need, there are house committees at the residences to support students and feeding schemes. She also mentioned that the students assist one another when they see that another student is not coping financially. When asked about whether the students access the support structures, her response was that they would readily access counseling but there are students who do not want to go on the feeding scheme. In that case, the department takes it upon itself to provide food for such students.

The interviewee was then asked what she would say are contributing factors to student success. The interviewee believes that the support that they give the students, the effort

put in by staff to assist the students academically and the way they group them contribute to their success. The groups, she said, were set up in such a way that the students can assist one another rather than break down one another. The other contributing factor that she mentioned was that the students who work very hard and those who have good support base at home are the students who succeed. She also brought in a factor of maturity and this is what she had to say about mature students: "*You know we also take in the recognition of higher learning but the recognition of higher learning could be students who have exemption. Those are more mature students, so they have got their minds set on where they want to go. So they struggle, but they are able to push through because they are hard working students."*

The discussion now focused on the interpersonal relationship of the students. In her response she mentioned that initially, at 1st year level the students group themselves racially and religiously. That is the level at which they start mixing the groups. Her response about white students who are also in the minority is clearly stated in her interesting account: "*Uhm, initially we found the white students were more focused, so they would take charge of the class, kind of. So that they could keep their authority. That's what I think, I'm not sure. But to keep the authority, because they are few, they take charge. You will find they are the class reps initially in the 1st year because the others take the back step. But I think as the year continues, they start… the group dynamics starts working itself out. That the others start saying: but you don't know it all. You know, you know just as much as I know but I can also be a class rep….I think so. But initially they are the more…they are the ones who are more…how can I say…outspoken, ok outspoken. They're the ones who take charge more, first, ja, from the beginning whereas the other students tend to just check out the vibe before."* She mentioned though that the students do make friendships, some of them long lasting friendships. The department arranges social events to get the students to know one another and for the staff to build relationships with the students.

Interview 5

When asked to describe the students' demographics and how the students are selected for physiotherapy in her university the interviewee stated up front that they still have majority of white students although they select black students.. The problem they have is that the selected black students do not turn up for registration. Efforts have been made to find the students through the addresses that they provide but this effort is not

effective. She explains this when saying "*…we selected about 17 or 18 from the 40, so that was almost 40%. But they don't pitch.…we actually go with the police to try and find the places where they're staying and to tell them they were selected."* When asked about the number of black students that has registered in the past years the respondent indicated that 15% of overall 20 students in first year arrive to register. To try and establish reasons for the black students not turning up, the responded had enquired from their past black students. The students informed her that in the …… physiotherapy is not a profession that is known. In response to the question on selection criteria she indicated that their criteria included academic performance and non-academic components like cultural and sport involvement for which students get additional points. The academic entry requirement is set lower for black students than white students. The interviewee was asked to explain the throughput of the black students that are eventually admitted into the course. Her response was that the throughput of those students that are admitted is poor and that 30% of the students are lost and students take an average of 5 years to complete the degree. When asked the level at which the students are lost her response was explained as follows "*First year. If they pass the first year, because it's science…science and anatomy and so forth. If they pass that, their success rate is like 80%"*

The interviewee was asked to elaborate on the various reasons that cause the students to take longer to complete the degree. Her response was "*They have a big language barrier. If you speak to them, they are able to explain to you, like different concepts but if they have to write the theory paper, they really have a lot of difficulty to explain what they mean…they definitely have a language problem."* When asked about any know non-academic challenges that black students face the respondent indicated that some students struggle with day-to-day expenses like transport money to get to the different hospitals. She indicated that she was not aware of social problems that students experience.

With the problems that were pointed out, the interviewee was asked how the university in general and the department in particular tries to deal with these problems. What measures are put in place to assist students who are struggling? The interviewee's response was that the university does try to look after the students financially but it is a lot of students to look after so the students have to apply for loans. In terms of the language problem, the lecturers go through the question papers with the struggling students and explain what is expected of them from the questions. The faculty has a 6

months learning development programme which is compulsory for students (both black and white) who have failed the June exam. In this programme the students learn generic skills like language and science. The department itself has a course in first year that includes basic computer and research skills, how a library works and financial skills.

Although there are students who have a variety of problems that cause them to struggle even academically, there are students who perform better and are successful in their studies. The interviewee was asked to comment on the factors that seem to contribute to academic success of these students from her point of view. The interviewee's response was "*They fit into the class and they really are ok with the class. And they have their support within the class from other students, if they are socially integrated in the class…Not so much friends but support – they are able to communicate, they are able to reason things out with their classmates. They are able to just speak up."* She also felt that if students had good school education they didn't struggle much. Further probing in this aspect did not yield a clear response.

Seeing that the interviewee had mentioned that black students struggle with money for transport to the hospitals she was asked to elaborate on their system of transport. She mentioned that the department does not make any arrangements of transport, the students have to find their way to the hospitals. She mentioned a trend that they are beginning to see "*What actually…we have problems with our white students, especially to the remote areas…doesn't want to lift to go to that rural area and so forth. But we find the black students to be able to cope because they just hop on a taxi if they have to go to a place where the other students are not going with them. But our black students are able to go, they seem to manage better*."

The interviewee was probed further on the issue of language The interviewee had commented that their department has a few support structures where they can send students and they also have a tracking system to make sure that the students do not fall between the cracks: "*We usually request a feedback report from these facilities to track if students who have been referred do attend or make use of the facility*." All of these are done by people or departments who do not have a close working relationship with the students and only see the students when they come with a problem. It was important to establish things that can be done by the department seeing that the lecturers have a day-to-day relationship with the students. The interviewee was therefore asked to comment on what the department was doing in this regard. Her main thoughts about

what should be done were around establishing a trusting relationship with the students and giving students security so that they can have confidence: *"I think the best thing is that just to establish that relationship with the students that they don't feel if I call you in, if I talk to you, that I'm victimising you. I am interested in you as a person because I want you to succeed. I think that is the first thing that you have to overcome. And then…you know to- the other thing I think is that students need security, security in academic support so that they know we're there if they need us and security in their knowledge or their skill. So they know that they can do things because I know, talking for myself, that if I don't feel very secure about something then I sort of put it away, you know"* She believes in giving the students a lot of support: *" And then definitely, ja, support, support, support because a student can actually disappear in the group. In the hospital, you send them to do work and they can just walk around the whole day"* She also believes that it is incumbent on the staff to make an effort to understand the students because there are cultural differences. She notes one of the differences in the speed with which things are done: "*The speed with which they work. Like I'm thinking now of this one girl, she took in a 20-minute BT practical, she took 45 minutes to do one technique that was expected of her in 20 minutes. And she came so close, you know. But then they get used to working a bit quicker, faster. I think that also is a cultural thing, we're always on the run, rushing, while you guys are much more relaxed*" The interviewee admitted that she is in a privileged position in that she has African lecturers in her staff whom she consults on some of the issues: *I use **NAME** and **NAME** a lot to tell me how they would do it, things, because then I understand what I can expect and what I can't expect. Uhm. To have a better understanding of how we should approach certain class. But then also they assist me a lot by speaking to students who is not coping and who sort of- get the real detail, you know, why- what is the problem, things that white people won't understand*."

On being asked whether the issues she has brought up about students difficulties and support would apply to all student races in her department, she responded by saying: "*All these things would apply to all race groups because things are changing, there are white students from poor socio-economic backgrounds and the government schools education is also deteriorating all around. It's very good to talk about these things because then we know what to address and in a sensitive way."*

INTERVIEW 1

- Average time taken by African students to complete is 4 – 6 years
- Failure mainly in the first two years of study

Problems faced by students

- language comprehension
- economic and social problems

Support systems that are already in place

- faculty arranges bursaries
- dept has new portfolio for minority students
- psychological help
- support for learning problems
- tutor system and
- comprehensive mentoring

Contributors to student success

- personal attributes
- maturity
- exposure to different cultures

What departments can do

- build a trusting relationship with the students
- academic support
- give students a sense of security in their knowledge and skills consult with colleagues that understand the situation
- Support, support, support

INTERVIEW 2

- Students mainly drop out of the course
- Failure is mainly in the first two years of study
- Drop out in the second year of extended curriculum

Problems encountered by students

- Language
- Family tragedies
- Financial problems

Support systems that are already in place

- Department academic support programme
- Lecturer advisors
- University fund/part-time work
- Writing laboratory
- Study methods
- Clinical psychologist

Possible support

- Transport to clinical areas

Contributors to student success

- Prior knowledge about the profession and the institution
- Personality
- Motivation
- Perseverance

INTERVIEW 3

Problems encountered by students

- Language
- Finance
- Emotional problems

Contributors to student success

- Motivation

- Organization
- Knowledge about the profession
- Financial stability
- Understanding of mathematical concepts
- Language proficiency

INTERVIEW 4

- Failure mainly in 1st and 2nd year
- Average time taken is 4 and a half years
- Coloured students take longer to complete

Problems encountered by students

- Language problems
- Difficult social circumstances
- Finances
- Crime, either directed at them or witnessing it

Support structures

- Class coordinators
- Secretary who has been trained in mentorship
- Senior student mentoring system
- University counselling programme
- Feeding scheme
- Assistance with obtaining bursaries
- Financial assistance from the department

Contributors to academic success

- Strong support from the department, both socially and academically
- Sound family support
- Hard work
- Grouping of students
- Maturity

APPENDIX K

DATA MATRIX

	Interview 1	Interview2	Interview3	Interview 4
Status of success	▪ Average time taken by African students to complete is 4 – 6 years ▪ *Failure mainly in the first two years of study* ▪ Special selection criteria = 10/50	▪ Students mainly drop out of the course ▪ *Failure is mainly in the first two years of study* ▪ Drop out in the second year of extended curriculum ▪ Special selection = 3/50	▪ *After the first two years Black students catch up with everybody else and do well* ▪ Average time taken is usually 5 years ▪ Special selection = 11/60	▪ *Failure mainly in 1st and 2nd year* ▪ Average time taken is 4 and a half years ▪ Coloured students take longer to complete ▪ Special selection = 8/50
Although there are special selection criteria for African Black students, they are still in the minority. African Black students on average take 5 years to complete the degree. The difficulties are mainly experienced in the first two years of study where students either fail a subject, are excluded or drop out.				
Problems encountered by students	▪ *language comprehension* ▪ economic and social problems	▪ *Language* ▪ Family tragedies ▪ Financial problems	▪ *Language* ▪ Finance ▪ Emotional problems	▪ *Language problems* ▪ Difficult social circumstances ▪ Finances ▪ Crime, either directed at them or witnessing it
The problems encountered by students are: comprehension in the language of instruction, financial difficulties manifesting in lack of food and accommodation and social problems which can lead to emotional difficulties				
Available support systems	▪ faculty arranges bursaries ▪ dept has new portfolio for minority students ▪ psychological help ▪ support for learning problems ▪ *tutor system and* ▪ *comprehensive mentoring system*	▪ *Department academic support programme* ▪ Lecturer advisors ▪ University fund/part-time work ▪ Writing laboratory ▪ Study methods		▪ Class coordinators ▪ Secretary who has been trained in mentorship ▪ Senior student mentoring system ▪ University counselling programme ▪ Feeding scheme ▪ Assistance with obtaining bursaries ▪ Financial assistance from the department
The physiotherapy departments have recognized that the problems encountered by students are more social than academic. They have put systems in place to support the students and are aware of support systems offered by the universities and refer students. They all monitor the students to make sure that the students dos access the support they've been referred to. There is also academic support for students who are having academic and language difficulties.				

Contributors to student success	▪ **personal attributes** ▪ **maturity** ▪ **exposure to different cultures**	▪ **Prior knowledge about the profession and the institution** ▪ **Personality** ▪ **Motivation** ▪ **Perseverance**	▪ **Motivation** ▪ **Organizational skills** ▪ **Knowledge about the profession** ▪ **Financial stability** ▪ **Understanding of mathematical concepts** ▪ **Language proficiency**	▪ **Strong support from the department, both socially and academically** ▪ **Sound family support** ▪ **Hard work** ▪ **Grouping of students** ▪ **Maturity**
There are varying views about factors contributing to success. The factors that seem to be common are level of motivation of the students, personality of the students, prior knowledge of the profession and maturity. Other factors contributing to success which were mentioned, which tie in with the problems that are encountered by students are financial stability, sound family support, language proficiency and organizational skills. Academic factors are hard work and understanding of mathematical concepts.				
Additional support by dept	▪ **build a trusting relationship with the students** ▪ **academic support** ▪ **give students a sense of security in their knowledge and skills consult with colleagues that understand the situation** ▪ **Support, support, support**			

	Interview 1	Interview2	Interview3	Interview 4
Status of success	▪ Average time taken by African students to complete is 4 – 6 years ▪ *Failure mainly in the first two years of study* ▪ Special selection criteria = 10/50	▪ Students mainly drop out of the course ▪ *Failure is mainly in the first two years of study* ▪ Drop out in the second year of extended curriculum ▪ Special selection = 3/50	▪ *After the first two years Black students catch up with everybody else and do well* ▪ Average time taken is usually 5 years ▪ Special selection = 11/60	▪ *Failure mainly in 1st and 2nd year* ▪ Average time taken is 4 and a half years ▪ Coloured students take longer to complete ▪ Special selection = 8/50
Although there are special selection criteria for African Black students, they are still in the minority. African Black students on average take 5 years to complete the degree. The difficulties are mainly experienced in the first two years of study where students either fail a subject, are excluded or drop out.				
Problems encountered by students	▪ ***language comprehension*** ▪ **economic and social problems**	▪ ***Language*** ▪ **Family tragedies** ▪ **Financial problems**	▪ ***Language*** ▪ **Finance** ▪ **Emotional problems**	▪ ***Language problems*** ▪ **Difficult social circumstances** ▪ **Finances** ▪ **Crime, either directed at them or witnessing it**
The problems encountered by students are: comprehension in the language of instruction, financial difficulties manifesting in lack of food and accommodation and social problems which can lead to emotional difficulties				
Available support systems	▪ **faculty arranges bursaries** ▪ **dept has new portfolio for minority students** ▪ **psychological help** ▪ **support for learning problems** ▪ ***tutor system and*** ▪ ***comprehensive mentoring system***	▪ ***Department academic support programme*** ▪ **Lecturer advisors** ▪ **University fund/part-time work** ▪ **Writing laboratory** ▪ **Study methods**		▪ **Class coordinators** ▪ **Secretary who has been trained in mentorship** ▪ **Senior student mentoring system** ▪ **University counselling programme** ▪ **Feeding scheme** ▪ **Assistance with obtaining bursaries** ▪ **Financial assistance from the department**
The physiotherapy departments have recognized that the problems encountered by students are more social than academic. They have put systems in place to support the students and are aware of support systems offered by the universities and refer students. They all monitor the students to make sure that the students dos access the support they've been referred to. There is also academic support for students who are having academic and language difficulties.				

Contributors to student success	▪ **personal attributes** ▪ **maturity** ▪ **exposure to different cultures**	▪ **Prior knowledge about the profession and the institution** ▪ **Personality** ▪ **Motivation** ▪ **Perseverance**	▪ **Motivation** ▪ **Organizational skills** ▪ **Knowledge about the profession** ▪ **Financial stability** ▪ **Understanding of mathematical concepts** ▪ **Language proficiency**	▪ **Strong support from the department, both socially and academically** ▪ **Sound family support** ▪ **Hard work** ▪ **Grouping of students** ▪ **Maturity**
There are varying views about factors contributing to success. The factors that seem to be common are level of motivation of the students, personality of the students, prior knowledge of the profession and maturity. Other factors contributing to success which were mentioned, which tie in with the problems that are encountered by students are financial stability, sound family support, language proficiency and organizational skills. Academic factors are hard work and understanding of mathematical concepts.				
Additional support by dept	▪ **build a trusting relationship with the students** ▪ **academic support** ▪ **give students a sense of security in their knowledge and skills consult with colleagues that understand the situation** ▪ **Support, support, support**			

APPENDIX L

LETTER FOR MEMBER CHECKING

Dear

Last year you gave me an opportunity to conduct an interview with you for the purpose of my study titled "*Predictors of academic success for black physiotherapy students in South Africa"* of which I am very grateful. All of my interviews are now complete and I am ready to develop the conclusions.

I am sorry if it is a large document and I understand your time constraints. What I have done is to transcribe the interviews, drew out the major points and categorized them into eight major themes. These are presented as a schematic representation on the attached document. I have summarized the main aspects of each theme with an 'interpretation' statement and then developed that into a 'judgment 'statement which identifies issues that might be considered or which have implications for future research. I would value your feed back on all of this.

I am asking you to comment on the themes. Are these an accurate description of the issues as you see them? Do you think the main issues have been covered? Do you think other themes are left out? Comment on whether the you think the 'interpretations' and 'judgments' about your responses in the interview are accurate. Are there important things that I have omitted or got wrong? Would you add more or omit something? What would you emphasize less? I will welcome any comment from you.

Thank you in advance for your assistance. It would be helpful to me if I could have your feedback before 18 February 2008.

Kind regards

Nonceba Mbambo
Physiotherapy Department
University of the Witwatersrand

APPENDIX M

MEMBER CHECKING DOCUMENT

FEEDBACK FORM

I have categorized the comments from all of the interviews into 8 categories which fall under 4 main themes. They are as follows:

Theme A **Access and throughput**

1. Access and throughput

Theme B **University input**

2. Funding support
3. Academic support
4. Psychosocial support

Theme C **Attributes the student bring to the programme**

5. Prior knowledge of the profession
6. Language proficiency
7. Motivation

Theme D **Conditions under which the students learn in**

8. Social environment

1. ACCESS AND THROUGHPUT

1.1 Interpretation of Participants' Statements

Although there are special selection criteria to widen access of Black students into physiotherapy in the Historically White Universities, they are still in the minority. Because some these students come in at an academic disadvantage, they take 5 years on average to complete the degree although there are those who complete in record time. The academic difficulties are mainly experienced in the first two years of study where students either fail a subject and repeat a year or are excluded by the university or drop out.

Comments……

……

……

……..

1.2 Judgments and Conclusion

It may be beneficial for each university to investigate whether the additional criteria used to select Black students is beneficial to the learning and success of those students.

Comments……

……

……

2. FINANCIAL SUPPORT

2.1 Interpretation of Participants' Statements

Once the physiotherapy students establish that a student is not coping financially, they are assisted to access funds through the university structures. All the universities have accommodation for students but some students do not get the accommodation due to financial constraints or lack of space in the residences. Some universities have a feeding scheme for all students who are in need.

Comments……

……

……

2.2 Judgements and Conclusion

This is a socioeconomic issue which cannot be readily solved by the physiotherapy departments or universities. It would be beneficial if the departments were to be proactive by giving all students the relevant information regarding financial assistance rather than wait to find out if there are students who need assistance or find out from the onset if there are students who are financially strained. It would also be beneficial for the physiotherapy departments to investigate possibilities of having at least first year students who need accommodation to be accommodated at the residences. This would assist the students in finding their feet, have peer support and establish relationships during the transition from high school.

Comments……

……

……

3. ACADEMIC SUPPORT

3.1 Interpretation of Participants' Statements

When students are identified as having academic problems the departments are the first point of assistance with lecturers giving extra tutorials for the students in need. Some universities have structured academic support programmes where attendance is compulsory for students who have been identified to have serious academic difficulties. Some departments have put in place monitoring systems to track attendance of the students.

Comments……

……

……

3.2 Judgments and Conclusion

There is conscious effort by the physiotherapy departments to assist students who are struggling. There is evident improvement of some of the students after the intervention and therefore it is valuable to continue with the support and structure it in the departments where formal structures are not in place.

Comments……

……

……

4. PSYCHOSOCIAL SUPPORT

4.1 Interpretation of Participants' Statements

The physiotherapy departments have recognized that the problems encountered by students are academic as well as emotional and take steps to support the students socially and also refer students to support structures offered by the universities. Mentoring seems to be the most common method used by the physiotherapy departments.

Comments……

……

……

4.2 Judgments and Conclusion

The physiotherapy departments are doing well in dealing with students holistically. A focus on establishing whether the universities are giving the appropriate support may be advisable. As one lecturer stated, it might be better to get to know the students from the beginning rather than wait for problems to arise and then react to them.

Comments……

……

……

5. PRIOR KNOWLEDGE OF THE PROFESSION

5.1 Interpretation of Participants' Statements

Most of the black students who are admitted into physiotherapy have little or no knowledge of what physiotherapy is. As a result, they lack the motivation to want to be a physiotherapist and give up when there are difficulties.

Comments……

……

……

5.2 Judgments and Conclusion

There is a need for the universities and the physiotherapy profession to develop appropriate marketing strategies and to raise awareness of the profession among the black communities so that they can make informed career decisions.

Comments……

……

……

6. LANGUAGE PROFICIENCY

6.1 Interpretation of Participants' Statements

Most students experience a problem of English language proficiency which is evident in their written explanations particularly in written tests. Some students experience problems even in comprehending the concepts during lectures. Students who are proficient in the language are more confident and interact better with the learning environment.

Comments……

……

……

6.2 Judgments and Conclusion

The language support and English classes may not be sufficient in assisting the students who are struggling with language. It may be constructive for the physiotherapy department to have the language support incorporated in the physiotherapy courses rather than being a stand alone activity.

Comments……

……

……

7. MOTIVATION

7.1 Interpretation of Participants' Statements

Students who are motivated are able to persevere because they want to learn. They are open to constructive criticism and regard it as a learning opportunity rather than victimization

Comments……

……

……

7.2 Judgments and Conclusion

Strategies to improve motivation of the students should be explored and be employed by the physiotherapy departments. Ways of helping students to be motivated should emphasize:

- Enhancing students' individual belief about their performance capabilities
- Providing students with tasks within their range of competence
- Assisting student to learn appropriate learning strategies
- Assisting students to define their attribution of success and failure

Comments……

……

……

8. SOCIAL ENVIRONMENT

8.1 Interpretation of Participants' Statements

There are students who learn under very difficult social circumstances e.g. family commitments which render them incapable of concentrating on their studies, violence in the homes and communities and lack of support from family.

Comments……

……

……

8.2 Judgments and Conclusion

When making academic demands on the students, the lecturers need to take cognizance of some of the difficulties faced by the students. Providing different learning experiences for students with different needs would be valuable towards ensuring success of the students.

Comments……

……

……

Having read all of the statements and interpretations from the interviews please comment on the major themes and categories that were used to summarize the statements. Are they accurate?

APPENDIX N

CONCEPTUAL AUDIT TRAIL – HODS' PERCEPTIONS ON SUCCESS

Nature of raw data	▪ Researcher's interview audiotapes ▪ Researcher's interview notes consisting of main themes and quotes from each interview ▪ 6 interviews with Heads of Physiotherapy Departments ▪ 45 – 60 minutes each ▪ Transcribed to typed text by independent transcriber ▪ Stored as computer files
Analysis of data	▪ Segmenting of the transcribed interviews ▪ De-contextualization of statements ▪ Attribution of statements to concepts ▪ Recontextualisation of statements
Preliminary concepts	▪ Access and throughput ▪ Funding support ▪ Academic support ▪ Psychosocial support ▪ Prior knowledge of the profession ▪ Language proficiency ▪ Motivation ▪ Social environment

Subsequent Analysis/ Process	▪ Second coding by independent coder ▪ Comparison of first and second coding ▪ Merging of the two sets of coding
	▪ Development of detailed feedback form ▪ Sent form to all interviewees for confirmation ▪ Feedback from four interviewees ▪ Consideration of the agreements and comments on the conclusions drawn ▪ Stored as computer text



↓

Emerging Themes of academic success	▪ Availability of relevant support ▪ Adequate knowledge about the profession ▪ Integration with class mates ▪ Academic discipline
Contribution	The thesis contributes towards the understanding of factors that could be changed to improve students' performance and therefore increase throughput.

Emerging Themes of barriers to academic success	▪ Lack of finances ▪ Poor proficiency in language of instruction ▪ Difficult social circumstances ▪ Inadequate preparation for higher education