

TOWARDS WIDENING ACCESS TO UNDER-
REPRESENTED GROUPS IN THE BIOLOGICAL
SCIENCES: A CASE STUDY OF THE UNIVERSITY OF
PRETORIA

by

Abbey Mokwape Mathekga

Submitted in partial fulfilment of the degree

PHILOSOPHIAE DOCTOR

in

EDUCATION MANAGEMENT AND POLICY STUDIES

in the

FACULTY OF EDUCATION

at the

UNIVERSITY OF PRETORIA

December 2012



In memory of George Lekwapa Mathekga

1935 - 2011

ACKNOWLEDGEMENTS

This study will not have been a success without the guidance, wisdom, strength, perseverance and resilience that I received from God and my ancestors.

I like to acknowledge and appreciate profoundly and copiously the following people who contributed immensely in various ways towards the accomplishment of this study:

- My wife Laurencia for your unconditional love and unwavering support. We walked this path together and you became a sounding board, a pillar of strength and you shared my frustrations and enchanting moments;
- My son Makopye Samuel for your assistance and taking keen interest in this study, your encouragement has spurred me on when things were tough;
- My daughter Bonolo Seikagedi Phoebe for your understanding, support and assistance with transcriptions;
- My mother Diabeng for always being there for me;
- My paternal grandmother Evelyn Mmakonyana who never had education herself but knew the value thereof and instilled in me at an early age, the significance of education and perseverance in life;
- My sister-in-law Keabetswe Tlhagwane for assisting with transcriptions;
- My supervisor and co-supervisor Dr Chaya Herman and Prof Mokubung Nkomo for your insight and mentorship;
- Prof Chika Sehoole for your support and encouragement;
- Dr Mokgadi Mohlakwana for your encouragement during the difficult last stages of the project;
- Department of Statistics, particularly Ms Jaqui Sommerville for assistance with statistical analysis in a short space of time;
- John Kench for editing this study;
- Dr Jeffrey Mabelebele of HESA for knowing the value of PhD;
- My colleague – Annie Viljoen for your technical support;
- My classmates – Monaheng Sefotho and Phumza Khunou for always being there to lift me up in times of need and when the road ahead seemed murky;
- My friends who are stimulating, interesting and amusing;
- My participants – this study will not have been possible without you.

DECLARATION

I, Abbey Mkwape Mathekga the undersigned, hereby declare that the thesis for the Doctor of Philosophy degree in the study field of Education Management and Policy Studies or any version of it was not previously submitted for assessment to the University of Pretoria or any other university or institution of higher education. I declare that this is my own work and all sources have been properly acknowledged and referenced.

Signature: _____

Date: _____

ETHICAL CLEARANCE CERTIFICATE



RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	CLEARANCE NUMBER :	EM 10/10/01
<u>DEGREE AND PROJECT</u>	PhD Towards widening access to underrepresented groups in Biological Sciences: A case of the University of Pretoria	
<u>INVESTIGATOR(S)</u>	Abbey Mokwape Mathekga	
<u>DEPARTMENT</u>	Education Management and Policy Studies	
<u>DATE CONSIDERED</u>	22 June 2012	
<u>DECISION OF THE COMMITTEE</u>	APPROVED	
 Please note: <i>For Masters applications, ethical clearance is valid for 2 years</i> <i>For PhD applications, ethical clearance is valid for 3 years.</i>		
CHAIRPERSON OF ETHICS COMMITTEE	Prof L Ebersohn	
DATE	22 June 2012	
CC	Jeannie Beukes Chaya Herman	

This ethical clearance certificate is issued subject to the following conditions:

1. A signed personal declaration of responsibility
2. If the research question changes significantly so as to alter the nature of the study, a new application for ethical clearance must be submitted
3. It remains the students' responsibility to ensure that all the necessary forms for informed consent are kept for future queries.

Please quote the clearance number in all enquiries.

EDITOR'S CONFIRMATION LETTER

John Kench

Editor, proofreader and overwriter

LETTER OF CONFIRMATION

26 November 2012

To whom it may concern,

This is to confirm that I have edited Abbey Mathekga's doctoral dissertation, 'Towards widening access to under-represented groups in the Biological Sciences: A case study of the University of Pretoria'.

John Kench

2 Rose Street,

Mowbray 7700,

Cape Town

Tel/Fax: (021) 6866590

Email: johnkench@xsinet.co.za

ABSTRACT

Since the dawn of democracy in South Africa, significant progress has been made with regards to access to higher education. However, widening participation to under-represented groups in science and technology fields, with special reference to Biological Sciences, still remains a challenge. Despite the growing number of black students in this programme, there is still a substantial gap in terms of the enrolment numbers of student from this racial group in the Biological Sciences.

This research is a case study carried out in the faculty of Natural and Agricultural Sciences at the University of Pretoria, which is a historically white institution with a strong Afrikaans culture. The study used Osborne and Gallacher's (2004) framework of *getting in* and *getting through* to explore access policy at this institution in relation to widening participation in Biological Sciences.

The findings showed that, while there has been progress with regards to physical and epistemological access, *getting in* to Biological Sciences still proves difficult to attain, especially for black male students from under-represented groups, including those from township and rural areas. The challenges related to *getting in* are compounded by various factors. These include inadequate preparation of learners for university studies such as limited preparation for natural science studies, limited exposure to science laboratories, inadequate career guidance resulting in wrong subject mix, late submission of application forms and the 'walk-in' phenomenon.

Funding is crucial for facilitating access to Biological Sciences but it is hard to come by and insufficient for students from low socioeconomic groups. The government initiated funding have potential to help needy students with talent but it is not sufficient to cover both tuition and residence fees. In addition to the financial assistance that the university offers, it also provides a strong academic and psychosocial support to students, particularly in first year in Biological Sciences. Both academic and psychosocial support are factors enabling access and widening participation in Biological Sciences. They also underpin *getting through*. However, students in residences tend to benefit more from these support initiatives.

Key words: Access, Biological Sciences, higher education, under-represented groups, widening participation

TABLE OF CONTENTS

Dedication	i
Acknowledgements	ii
Declaration	iii
Ethical clearance certificate	iv
Editor's confirmation letter	v
Abstract	vi
Abbreviations and acronyms	xi
List of figures	xiii
List of tables	xiii
List of appendices	xiv

CHAPTER 1

RESEARCH PARAMETERS

1.1. Background of the study	1
1.2. Rationale of the study	6
1.3. The notion of access	8
1.4. Conceptualising access	10
1.4.1 Getting in	11
1.4.2 Getting through	11
1.4.3 Getting on	14
1.5. Research design	14
1.6. Significance of the study	15
1.7. Limitations of the study	16
1.8. Organisation and layout of the study	17

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction	19
2.2. Inherited merit	20
2.3. Equality of rights	25
2.4. Equality of opportunities	37
2.5. Access and higher education in Brazil	39
2.6. Access and higher education in Tanzania	42
2.7. Historical background of access in South Africa	44
2.7.1. Prior apartheid era	44
2.7.2. The apartheid era	46
2.7.3. The democratic era	49
2.8. Researching access in South Africa	51
2.9. Conclusion	62

CHAPTER 3

CONCEPTUAL FRAMEWORK

3.1. Introduction	63
3.2. Getting in	64
3.2.1. Student recruitment	64
3.2.2. Student readiness	66
3.2.3. Admission process	68
3.2.4. Student funding	70
3.3. Getting through	75
3.3.1. Orientation period	76
3.3.2. Student support (academic and psychosocial)	77
3.3.3. Institutional culture	79
3.5. Conclusion	82

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1.	Introduction	83
4.2.	Research methodology	83
4.3.	The scope of research	85
4.4	Sampling	85
4.5.	Data collection techniques	88
	4.5.1. Interviews	88
	4.5.1.1. Face-to-face interviews	88
	4.5.1.2. Focus group interviews	92
	4.5.2. Document analysis	94
4.6.	Data analysis	95
4.7.	Ensuring validity	98
4.8.	Ethical considerations	100
4.9.	Reflection and concluding comments	101

CHAPTER 5

RESEARCH FINDINGS

5.1.	Introduction	102
5.2.	Biological Sciences programme and sample description	102
5.3.	Getting in	105
	5.3.1. Widening participation through student recruitment	105
	5.3.2. Student readiness and widening participation	111
	5.3.3. Admission process and widening participation	121
	5.3.4. Student funding and widening participation	126
5.4.	Getting through	129
	5.4.1. Orientation period and widening participation	130
	5.4.2. Widening participation through academic support	133
	5.4.3. Widening participation through psychosocial student support	140
	5.4.4. Institutional culture and widening participation	142
5.5.	Conclusion	149

CHAPTER 6

INTERPRETATION AND DISCUSSIONS

6.1. Introduction	150
6.2. Reflection on the conceptual framework	150
6.3. Successes and challenges related to 'getting in'	152
6.4. Successes and challenges related to 'getting through'	157
6.5. Conclusion	161

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1. Introduction	164
7.2. Recommendations	165
7.3. Concluding comments	166
References	167

ABBREVIATIONS & ACRONYMS

ANA	– Annual National Assessments
ASSAf	– Academy of Science of South Africa
APS	– Admission Point Score
BS	– Biological Sciences
BSc	– Bachelor of Science
CHE	– Council on Higher Education
CSC	– Client Service Centre
DBE	– Department of Basic Education
DfES	– Department of Education and Skills
DHET	– Department of Higher Education and Training
DoE	– Department of Education
FET	– Further Education and Training
FTE	– Full Time Equivalent
HAI	– Historically Advantaged Institution
HDI	– Historically Disadvantaged Institution
HE	– Higher Education
HEI	– Higher Education Institution
HEMIS	– Higher Education Management Information System
HESA	– Higher Education South Africa
IT	– Information Technology
OBE	– Outcomes Based Education
MEDUNSA	– Medical University of Southern Africa
MoE	– Ministry of Education
NBT	– National Benchmark Tests
NFF	– National Funding Framework
NSC	– National Senior Certificate
NSFAS	– National Student Financial Aid Scheme
NPHE	– National Plan for Higher Education
PIRLS	– Progress in International Reading and Literacy Study
QL	– Qualitative Literacy
SAT	– Scholastic Aptitude Test
SET	– Science, Engineering and Technology

- TIMMS – Trends in International Mathematics and Science Study
- UCT – University of Cape Town
- UK – United Kingdom
- UNISA – University of South Africa
- UoT – University of Technology
- US – United States of America
- UP – University of Pretoria
- UWC – University of Western Cape
- Wits – University of the Witwatersrand
- WP – Widening participation

LIST OF FIGURES

Figure 1.1	Enrolment statistics in BSc Biological Sciences undergraduate degree programme	3
Figure 1.2	Graduation statistics for BSc in Biological Sciences at University of Pretoria	4
Figure 3.1	A framework of access to Higher Education	63
Figure 4.1	Family – support	97
Figure 4.2	Categories and emerging themes	98
Figure 5.1	Students' medium of knowing about University of Pretoria	108
Figure 5.2	Students' home area	109
Figure 5.3	Students' location of secondary school attended	110
Figure 5.4	Students' reasons for choosing Biological Sciences	115
Figure 5.5	Students' reasons for choosing Biological Sciences by home area	116
Figure 5.6	Student support received from University of Pretoria	127
Figure 5.7	Students' perception of their level of preparedness for university studies	135
Figure 5.8	Educational qualification level of students' mothers	137
Figure 5.9	Educational qualification level of students' fathers	138
Figure 5.10	Students' best university experience	144
Figure 5.11	Students' worst university experience	145
Figure 5.12	Students' experiences in Biological Sciences	146
Figure 6.1	The process of 'getting in' and 'getting through'	151

LIST OF TABLES

Table 2.1	The pros and cons of living on campus	61
Table 4.1	Focus group participant schedule	93
Table 4.2	Text analysis	96
Table 5.1	Enrolment figures and gender distribution for 1 st year Biological Sciences for 2011 academic year	104
Table 5.2	Race and gender distribution of the respondents from 1 st year second semester students in Biological Sciences in 2011	104

LIST OF APPENDICES

Appendix 1	Approval letter to access the research site	167
Appendix 2	Letter to participants requesting interview	183
Appendix 3	Interview consent form	184
Appendix 4	Interview schedule	185
Appendix 5	Questionnaire	186