CHAPTER 3

THE CONCEPTUAL FRAMEWORK
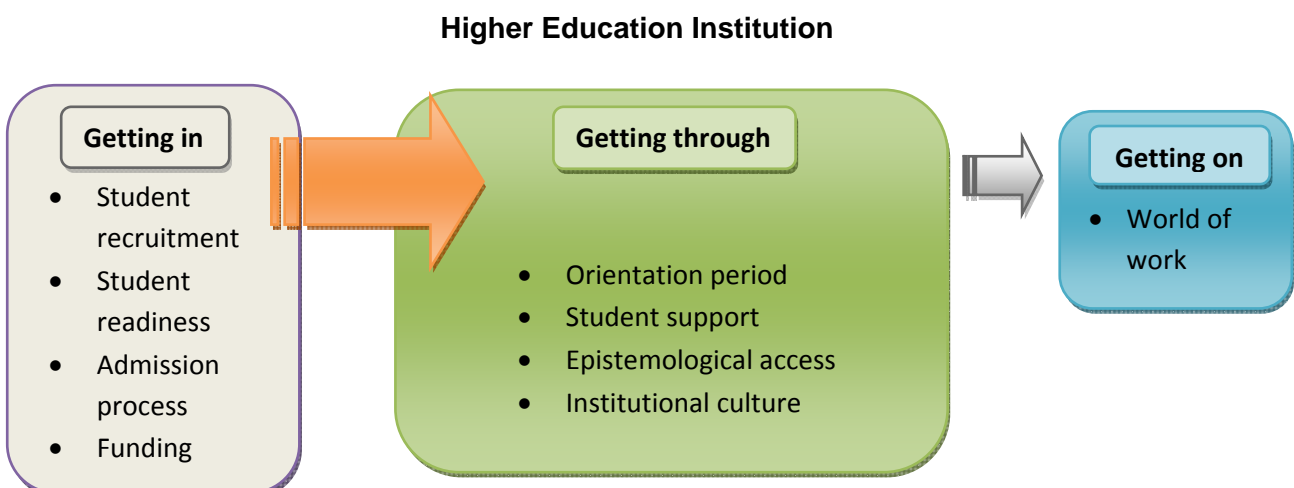
3.1. Introduction

The purpose of this chapter is to explore, delineate and contextualize widening participation within Osborne and Gallacher's (2004) concepts of 'getting in', 'getting through' and 'getting on', which serve as conceptual framework for this study. Since the study explores the experiences of first-year students, I will focus on the first two stages, namely: 'getting in' and 'getting through'. In the first section, I will examine the process of 'getting in', which includes student recruitment, student readiness, the admission process and student funding. In the second section, I will explore the process by which students are 'getting through' the system, focusing on the orientation period, student support (academic and psychosocial) and the institutional culture.

I chose to examine the various concepts which underpin 'getting in' and 'getting through', rather than focusing on one concept, because they give a broader view and better way of exploring the question of widening participation in the Biological Sciences, with special reference to students from under-represented groups.

The schematic representation below (figure 3.1) gives an overview of the access framework for higher education, depicting the three key concepts which form the basis for this study.

Figure 3.1

A framework of access to Higher Education

Higher Education Institution

3.2. Getting in

'Getting in' refers to the stages preceding the entry to higher education, such as student recruitment, student readiness, admission processes and funding. 'Getting in' is important, as it gives the potential students an insight into what is expected of them at the higher education level. The other important aspect is that 'getting in' edifies prospective students about the admission requirements that they need to satisfy in order to qualify for university studies, and what the costs will be of such a study programme at their chosen university. Furthermore, 'getting in' also explores the role that national and institutional policies play in widening participation. This stage in access therefore plays an important part in widening participation for students from under-represented groups.

3.2.1. Student recruitment

Student recruitment entails general institutional marketing and concomitant community enlightenment about the various available study programmes and the measures the institutions have in place for students (Osborne and Gallacher, 2004). It includes a number of related access initiatives, such as 'out-reach' and 'in-reach' programmes, with potential students from under-represented groups 'getting in' or university staff 'getting–out', that is, reaching out to them. Recruitment also has to do with flexible access initiatives, such as transformation, and the structural adjustment of both administration and educational programmes (Osborne and Gallacher, 2004).

The notion of recruitment encapsulates engagement with prospective students prior to them thinking about their higher education study choices. This engagement could be done through reaching out to the various communities or through strategic alliances with feeder schools. The purpose of such initiatives is to familiarize potential students with higher education exposing them to the opportunities that higher education institutions have to offer and preparing them for the experience of tertiary education. This kind of exposure helps them to choose a higher education institution and the relevant programme. The exposure to higher education could also be done through the university's open days (Grier, Cross and Oshun, 2010).

The awareness established during the recruitment drives conscientizes the potential students and school communities about the measures the university has in place to help students with access, such as financial assistance, psychological services, mentorship and tutoring programmes. Further, such deliberate efforts by various institutions of higher learning to reach out to communities and under-represented groups not only addresses the social and economic needs of potential students but also addresses the fundamental reason why the students need to register at such an institution in the first place (Osborne and Gallacher, 2004; Wangenge-Ouma, 2010).

Failure by an institution of higher learning to embark on this activity may result in the institution not being well diversified, since it will register a homogenous group of students, that is, students from similar backgrounds in terms of location, schooling and socioeconomic status. On the contrary, these endeavours, including the creation of awareness by the university through targeting under-represented groups and those people who believe that the 'university is not for them', go a long way to removing barriers to access and thus stimulating new demand for higher education.

Recruitment of students may be conducted because there are fewer applications than the available places in a programme. In this case, recruitment increases the pool from which the next phase can be implemented. Selection, on the other hand, means that the number of applicants for a specific programme exceeds the number of available places. It takes place therefore when demand exceeds the availability of places at a higher education institution. However, selection should provide students with fair opportunities and should not be based on factors such socioeconomic background (McCowan, 2007).

The recruitment and selection processes are not mutually exclusive, but occur in a sequence, that is, you first recruit and then select (Grier et al., 2010). For example, a university may experience an oversupply of applicants to the social sciences and humanities, but few well qualified applicants for science programmes. This occurs in South African universities where black students tend to enrol more in the social sciences and humanities than to science-related programmes (Jansen, 2010; CHE, 2009; Boughey, 2005).

Recruitment is crucial to reaching under-represented groups. However, the notion of equity does not preclude selection, as minimum of selection is necessary in order to

determine students' level of preparedness and their potential for success. Some of the more highly selective programmes may use additional tools such as interviews, essays motivating for selection and even performances in case of the arts and presentation of projects made by applicants. In some cases, selection tests are also used, for example, the vestibular in Brazil, the Scholastic Achievement Test in the US, and the National Benchmark Tests in South Africa (Goastellec, 2010; McCowan, 2007).

In the South African context, DoE (2008) suggests that higher education institutions should have a transparent selection process, one entailing clear criteria which are followed until a firm offer is made to the prospective students. The National Senior Certificate (NSC), representing the minimum admission requirements for bachelor's degree studies is the essential threshold for access to higher education. The next selection level is determined through the application of the admission point score (APS) system whereby students' scores are converted into points as per set criteria. Each university sets APS for each faculty and programme.

3.2.2. Student readiness

Student readiness refers to a student's preparedness for higher education. In an attempt to develop a deeper understanding of student readiness, Boughey (2010:5) identified four key issues which could explicate students' "under-preparedness":

- Lacking skills;
- Experiencing gaps in conceptual knowledge areas;
- In need of language development; and
- Lacking the ability to think 'critically'.

Students' under-preparedness for university studies may lead to poor throughput and high dropout rates. Thus resolving the above issues is basic to ensuring students' optimal academic performance at university level. Smit (2012:374) argues from deficit thinking and points out that under-preparedness should not be viewed as the students' issue alone, and that it is equally imperative to "acknowledge the university

as possibly an underprepared institution." She further argues that the use of the deficit theory as a dominant thinking mode within South African higher education frames students and their families as being short of certain academic and cultural resources that are essential for success in higher education (Smit, 2012). This highlights the fact that widening participation can also be hampered by institutions of higher learning which purport to be open and encourage diversity. Thus both the students' and the universities' under-preparedness can have a negative impact on widening participation.

In South Africa, impediments to student readiness include the inefficiency of the schooling system. For example, the Annual National Assessments (ANA) conducted in public schools in 2011 for the foundation phase (grades 1–3) and intermediate phase (grades 4–7) pointed out the sub-optimal performance of the schooling system in South Africa. In grade 3, the national average performance was 35% in literacy and 28% in numeracy. In grade 6, the national average in languages was 28% and for mathematics 30% (DBE, 2011). The ANA results confirm the Trends in International Mathematics and Science Study (TIMMS), and the difficulties with literacy and numeracy in South African public schools which were pointed out over the past decade in the international assessments, namely, Progress in the International Reading Literacy Study (PIRLS). The ANA results confirm the reality that many of our learners lack proper foundations in literacy and numeracy. As a result they struggle to progress from the school system into post-secondary education and the training system, including higher education.

Bradbury and Miller (2011:112) maintain that the lack of efficiency in the school system is rooted in the unequal "provision of education and schooling system in South Africa which creates multiple layers of disadvantages that require redress. These layers of disadvantage include low level of skills amongst teachers, inadequate infrastructure and paucity of equipment and books." These factors have negative implications for the general preparation of learners for university studies and the majority of learners who are negatively impacted by these adverse situations are blacks. The inadequate student preparation creates a dilemma for those institutions of higher learning who believe that access should be based on merit while concurring with the notion that education plays a critical role in social transformation.

Student readiness focuses not only on academic performance but also includes thorough preparation for higher education underpinned by career selection based on the student's interests and strengths. This phenomenon includes preplanning and carefully researching the university entrance requirements as well as making sure that the subject combination is appropriate for the student's chosen career path. In this sense, career guidance and counselling at school level play a significant role. Ideally, a student's readiness for university studies should be inculcated from the foundation phase of schooling and should follow the student's progress throughout secondary school.

3.2.3. Admission process

Cook (2009) argues that there are no best methods for admitting students to university studies. He identifies two ways of giving access to higher education. These ways seem to be sited at opposite ends of the continuum. At one extreme is open enrolment, which presents an opportunity for applicants who hold an appropriate school exit qualification to enter higher education studies; at the other end of the same continuum are highly selective systems which may be subject to state control. Measures such as admission point scores (APS), admission tests and interviews, are additional criteria used to select potential students. The latter suggest that the school exit qualification is not enough to grant access to higher education studies, perhaps because open enrolment can lead to attrition, since it implies that everyone could be enrolled to higher education studies.

In South Africa, access is regulated through legislation. As provided for in the Higher Education Act enjoins each higher education institution have to an admission policy which 'must provide appropriate measures for redress of past inequalities and may not unfairly discriminate in any way' (DoE, 1997b:20). However, universities remain autonomous and thus determine their own admission policies and the criteria for identifying students with the potential to be enrolled.

The inefficiency of the schooling system is further complicated by the obdurate inequalities that are perpetuated by the use of second language as a language of learning and teaching with learners whose first language is completely different.

Second language instruction thus hinders learners from reaching their full potential and achieving the requisite grades for university entry. Once enrolled for university studies, the second language becomes a further impediment to success. The majority of learners affected by this issue in South Africa are blacks and this has a negative impact on their enrolment numbers in HE (Bradbury and Miller, 2011; Cross and Carpentier, 2009). It is against this background that, in order to ensure a steady supply of diversified students, alternative ways to access institutions of higher learning need to be put in place. In this sense, the use of race in admissions is justified as a transitional measure while alternative admission routes are being sought.

The current alternative admission routes include admission tests or 'sociotechnic tools' (Goastellec, 2010), customized courses and other related measures which allow a second opportunity to students who otherwise would not access higher education, such as those from under-represented groups and adults. Alternative admission initiatives also involve the relaxation of entry requirements. Whilst these flexible admission procedures have the potential to attract diverse groups of students, the relaxation of entry requirements leads critics to question the quality of such students in terms of their ability to handle and survive the rigour of higher education studies (Osborne and Gallacher, 2004).

The use of admission tests could equally be viewed as a barrier to access, since to succeed in these tests, candidates need to be thoroughly prepared through additional tutoring and coaching. This suggests that candidates from low socioeconomic status, who are unable to afford the services of tutors and coaches will be less likely to do well in these tests and will thus be denied access (McCowan, 2007).

3.2.4. Student funding

Funding is one of the accoutrement which determines student's success or failure in higher education studies, since inclusion is directly linked to the ability to pay tuition fees. The financial challenges are critical for indigent students who come from disadvantaged communities and have inevitably been exposed to inimical school conditions.

How to fund higher education is a controversial issue. One option is large-scale public subsidies of university studies based on the principle of equal access (Asplund, Adbelkarim and Skalli, 2008). However, the empirical evidence to show that this route improves equity is inconclusive. Students from poor families remain under-represented in higher education because of various factors, including attending poor primary and secondary schools (Asplund et al., 2008; HESA, 2008; Wangenge-Ouma, 2010). Poor schooling, especially in secondary schools, fails to produce a critical mass of students from under-represented groups who can qualify for university studies. Furthermore, it is debatable who actually funds 'free' education. Revenue is collected through taxes from all citizens and this does not preclude the poor, as they too pay some form of indirect taxes. This tax is used by the state, *inter alia*, to fund higher education which is accessed by a high percentage of affluent people who can afford to pay the tuition fees. The poor will contribute to funding higher education, thus making the notion of free higher education problematic, since the very people it is intended to help are expected to make some form of payment. If this is the case, the second option would be to increase the financial participation of students by setting tuition fees. Supporting this argument is the view that the economic benefit for the students is high and mostly private. The counter-argument is that graduates are likely to pay back the costs of their studies from their earnings, thus making the equity argument more relevant (Asplund et al., 2008).

According to Asplund et al., (2008), there is a growing tendency in Europe to charge tuition fees, even though these are not enough to fund the universities. Such fees are often combined with various support mechanisms, such as grants, loans, family allowances and tax breaks. However, the tax breaks seem not to have been

successful in uplifting the socio-economic balance for those enrolling at university, thus validating the need for an increase in tuition fees.

In South Africa, funding for HEIs is divided into three main categories: first, an income stream made up by government grants, which are divided into block grants and earmarked grants; second, an income stream made up mainly of tuition fees; and, third, an income stream made up by partnerships between HEIs and industry, independent projects or service delivery modes, for example, law and health clinics (MoE, 2004; DHET, 2010). The focus of this section is on the first and second income streams.

In 2004, funding for higher education in South Africa shifted from being enrolment-driven to using a new formula that aimed at addressing the policy imperatives of the democratic government, namely equity and redress. One of the pivotal key features for this new funding formula was the link between higher education grants and both national and institutional planning (Wangenge-Ouma, 2010).

The national budget of higher education is divided into three components, namely block grants, earmarked funds, and institutional restructuring funds. The block grants are further divided into four parts, teaching input grants, teaching output grants, research output grants, and institutional factor grants, with the bulk of earmarked grants being allocated to NSFAS (MoE, 2004). The teaching input grant, which forms part of the block grants, "is generated through a formula which considers the approved full time equivalent (FTE) student places weighted against predetermined teaching input indicators or criteria, e.g. course material, course level and instruction delivery mode. A teaching output grant is dependent on the institution's actual number of non-research graduates and diplomats produced in terms of the national benchmarks" (Wangenge-Ouma, 2010: 483).

The other two key parts which form the block grant are the research output and institutional factor grants. Research grants are calculated using the sum total of the number of research outputs made up by research graduates and publications. Those institutions with a large proportion of disadvantaged students are awarded the institutional factor grant (MoE, 2004).

Wangenge-Ouma (2010) argues that there are some factors which hinder the achievement of the goals of the national funding framework (NFF). Firstly, there has been insufficient funding of the higher education sector, which has been declining. HESA (2008), DHET (2010) and Bunting (2012) echo the view that higher education funding has declined over the years, despite the 10,1% increase in government funding grants between the 2001 and 2009 financial years. Furthermore, "state funding for higher education as a percentage of total finance declined from 1999 by 3.08% to 2.45% in 2007" (HESA, 2008:17). Secondly, the institutional factor grant is calculated by totalling the amount of teaching input grants, determined by the number of disadvantaged students that the institution has enrolled. Since race is used as a proxy for disadvantaged, only Africans and coloureds are considered as disadvantaged, while South African-born Indian students are excluded. Furthermore, universities who enrol a large population of African and coloured students from affluent families who have attended high quality and expensive secondary schools will be equally rewarded through this grant (Wangenge-Ouma, 2010).

Thirdly, the NFF seems to reward institutions with a high success rate. The fact that the funding framework rewards success may be one of the reasons why most university programmes are highly selective. Even though the universities will benefit from the institutional fact grant, they seem to benefit more by having high output rates. Inevitably, they will select most learners from good schools and avoid those from poor schools and disadvantaged backgrounds, because the former have the potential for success, given their adequate preparation to university studies, whilst the latter have not. Slow study completion rate by students, especially those from disadvantaged groups, will deny the universities the benefit of government subsidies, i.e. teaching output grants, as they are heavily penalized if their students do not complete degree programmes within the stipulated time. It is therefore in the best interest of the universities to register few students from disadvantaged groups so that their completion rate is not negatively affected.

In line with resource dependency theory, which refers to the reliance on a person or institution for support, survival or enhancement (Ferraro, 2008), an organization which lacks resources will seek to survive by finding other sources, hence the need

for higher education institutions to consider other models of funding such as the cost-sharing model which is given effect by tuition fees.

HESA (2008) argues for the cost-sharing funding model, in which costs are shared between society and the students. The thrust behind this model is that higher education is perceived to be for both public good and private benefit. The proposed funding model should be underpinned by a strong partnership between government, parents and business in order to address this issue of student funding. The cost-sharing model could be in the form of tuition fees being introduced where they did not exist before or be increased to cover accommodation fees, books and other related costs. Tuition fees are vital to the economics of higher education in South Africa since tuition revenue is the second most important source of income after government funding conducted through the grants system. At the same time, in order to assist students from low socioeconomic families and enhance equity in higher education, a portion of the tuition fees may be set aside to fund university grants and student loans. Regardless of your socioeconomic status, once you complete university education you have the potential to earn a higher income which could be used to repay the loan (HESA, 2008).

Tuition fees translate to the price of education and could be looked at from point of view of the competitive market, where prices are determined on the basis of the principle of supply and demand. Demand is determined through the value of a product which may go down as the price increases. Supply, on the other hand, is determined by costs and may increase as the price increases. The markets are not always perfectly competitive, hence economies experience 'market failure'. The market failure in higher education can be stabilized or corrected either through subsidies to higher education institutions (i.e. on the supply side) or through vouchers, bursaries and loan schemes (i.e. on the demand side) (HESA, 2008).

In the administered price approach, efficient pricing is a problem because when prices, that is, tuition fees, are too high, few students from indigent families will be in a position to 'purchase' higher education. On the other hand, low prices could lead to a dearth of critical resources in higher education which in turn will result in wastage or internal inefficiency highlighted by students taking too long to graduate (ibid).

Financial challenges in the form of tuition fees therefore compound the issues of access to higher education, especially for students from disadvantaged groups. Letseka and Maile (2008) point out that the dropout rate for South African first-year university students' stands at 40%. The main reason for this is finance, making this a major barrier to access (ibid). Tuition fees are high and are increasing on a yearly basis, mainly because of the decline in funding from the state. This decline in state funding in real terms has compelled institutions of higher learning, exercising their autonomous right to set fees, to steadily increase student fees in order to defray the ever-escalating costs of higher education. Unfortunately, this practice continues to make higher education inaccessible to students from disadvantaged backgrounds. The mere sight of these high tuition fees discourages those from disadvantaged backgrounds or of low socioeconomic status from participating in higher education.

The government's effort to inject funds into higher education through NSFAS is somehow obviated by the insufficient money allocated due to budget constraints resulting from government having to balance the apportioning of funds with other competing priorities. This reduction in government funding puts more pressure on the students to carry a bigger share of higher education costs. The money provided by the NSFAS is not sufficient to cover tuition fees, residences fees and books. The students who qualify for this study loan will have to find additional funding to cover other costs, such residence fees, because the NSFAS will have covered only tuition fees (Asplund et al., 2008; Wangenge-Ouma, 2010).

So far, the conceptual framework has focused on the stages which facilitate the physical access of students from under-represented communities to a higher education institution. This includes reaching out to non-traditional students through recruitment initiatives, the students' level of preparedness to enter universities, the admission process, and funding. The next stage deals with the question of "access to what?" How can students from under-represented groups achieve access with success? This will be discussed in the next section, "getting through".

3.3. Getting through

'Getting through' refers to the period spent within a higher education institution. It highlights the support that HEIs offer students in order to give them some leverage towards success in their studies.

The literature refers to two types of access, namely physical and epistemological. Physical access refers to gaining admittance and being registered as a student in a particular institution of higher learning. Epistemological access denotes access to the knowledge that the university distributes (Morrow, 1994, 2009).

During the interaction between lecturers and students in the learning milieu, some students may be found to be under-prepared for this engagement. That is to say, they may not have been well prepared for university studies due to the kind of school that they attended. If one has attended poor school, he or she is likely to lack some rudimentary skills required to negotiate the rigours of high education such as the use of the library, computer skills, as well as reading and writing skills.

CHE (2010) argues that the notion of under-preparedness is evolving and therefore applies not only to students but to lecturers as well. This occurs because the lecturers find themselves under-prepared to deal with under-prepared students. In other words, the lecturers also need to be attuned to dealing with under-prepared students. The lecturers' under-preparedness in handling such students may be manifested in the form of 'pedagogic distance' (CHE, 2010). The theory of pedagogic distance elucidates the interaction between the student and lecturer in an attempt to understand the nature of pedagogic and social mediation. Both the physical and the pedagogic distance may have a negative effect on teaching and learning, and thus may hamper learning. In order for effective learning and teaching to take place the cognitive space between the student and the lecturer should be reduced. Distance has a negative effect on under-prepared students, as it further precludes them from academic engagement. As a result, epistemological access will not be achieved, and this may lead to the student dropping out and leaving university.

A number of policy instruments have been introduced by universities to widen participation, for example, an orientation period and giving academic and psycho-

social support for students. The aim of these programmes is to help the students to adjust to the culture of the institutions.

3.3.1. Orientation period

The orientation or induction period is the first step in the transition from secondary school to higher education. It is during this period that a student's expectations might or might not be fulfilled by the institution. The manner in which students are received and inducted creates a strong impression of academic life. It is therefore imperative that higher education institutions have a clear understanding of students, their backgrounds, experiences and expectations, with consideration given to disparate cultural aspects, especially in heterogeneous groups (Hultberg, Plos, Hendry and Kjellgren, 2008).

Orientation normally occurs during the first week or two prior to commencement of the academic year. It is intended to help new students to settle down in residences, to find their way around the campus and the town, to enrol, complete administrative tasks, obtain timetables and course materials, and be introduced to a variety of services, including welfare, ITC and libraries (Brown and Morgan, 2010). This kind of orientation process is steeped in administration. At this stage, it is important to strike a balance between information overload and under-information. It is important not to reduce the orientation period to administrative activities only, but to focus the students on their academic task as well (ibid). Getting students focused on the study programmes as early as possible is not only essential for student retention but is equally critical for their success in their various programmes. Brown and Morgan (2010) suggest that orientation programmes should be more academic than administrative and should also be instrumental in helping students to become independent learners. They maintain that this could be achieved through group activities which engender cohort cohesion and foster independent learning.

Leese (2010) argues that the transition from secondary school to higher education is critical, as new students are generally nervous and anxious. The induction period should ease their nerves by providing them with skills and knowledge of what is expected of them. It is plausible that first-generation students especially will struggle,

as they have nobody in their families with university experience upon which they can draw. It is important for universities not to perceive this as the individual student's problem, but to accept that there is a dire need for HEIs to adapt their programmes to meet the needs of a diverse student population.

The orientation period should therefore be structured in such a manner that it caters for various needs of the student, because an unsuccessful transition from secondary school to higher education is likely to have an impact on her or his future achievements (Hultberg et al., 2008). The orientation period should not be a one-off event but a process which supports students throughout the first year of their studies, and especially during first semester (Leese, 2010).

3.3.2. Student support (academic and psychosocial)

Various forms of support, such as academic/instructional and psychosocial, are available for students. Academic support can be understood in broad terms as referring to academic development programmes, commonly known as foundation programmes as they are government funded in terms of the NFF (MoE, 2004), or in narrow terms as tutoring and mentoring programmes (Boughey, 2010). Academic support evolved first into academic development and then into institutional development (ibid). Student support is a critical element in optimizing students' learning experiences in any learning milieu.

The proliferation of academic support programmes in South African public universities came about as a direct consequence of the admission of African/black students by the erstwhile white liberal universities in the 1980s, following the relaxation of the policies of the then apartheid state. In the 1990s, the need to increase enrolment numbers of such students at HEIs, particularly in science, technology and commerce became a driving force behind foundation programmes (Boughey, 2005). Academic support occurs in three ways: (a) stand-alone foundation programmes; (b) infused or integrated foundation programmes; and (c) tutoring and mentoring programmes. The programmes in (a) and (b) above put students on a slow graduation trajectory, as a extra year is added to the normal

duration of the course, so that a three-year course would now take four years (Boughey, 2010).

The early academic development programme employed a two-pronged strategy. Firstly, it was meant to increase access and improve throughput rates, especially of students from disadvantaged and under-represented groups. Since universities were then enrolling students on the basis of academic merit only, this process invariably precluded these kinds of students. Foundation programmes were not only used to increase access and improve the throughput rates of disadvantaged and under-represented groups but were also designed to encourage equity and equality in higher education in general. Thus academic support in this context was a transformational tool. Secondly, they were also intended to enhance the quality of teaching and learning in higher education (Boughey, 2010).

Academic/instructional support could be provided through tutoring, mentoring, academic advice and counselling. This kind of support is not only meant for students who are battling with their studies but is also intended to provide a safety net for first-year students. It is designed to help them navigate successfully through their first year of studies by managing the transition from secondary school to university. The lecturers, therefore, need to narrow the gap created through pedagogic distance. This could be achieved by recognizing students for who they are and by appreciating the diverse backgrounds from which they come (Lee, Srinivasan, Trail, Lewis and Lopez, 2011). Student support can be closely linked to the student's motivation and learning. Thus a student who is demotivated and despondent will not perform optimally in his/her studies. Lecturers should endeavour to create a supportive learning environment since such an environment is critical to the students' academic success (Lee et al., 2011).

Psychosocial support is a further important kind of support which, though not academically based, nevertheless plays a significant role in the academic space. If a student is experiencing psychosocial issues, these are likely to impact on his academic performance. Psychosocial support encapsulates HIV/AID counselling, career counselling, psychological services and day-houses. Day-houses are places of sanctuary incorporated in the psychological services where students in distress

can go, not only for psychosocial alleviation but also for help with more general practical problems, such having no means of getting a meal for that day.

Peer support refers to peer-to-peer learning, whereby students support each other academically by forming study groups, discussing questions and generally helping each other with studies (Lee et al., 2011). Furthermore, such support can also be used in the psychosocial context, since it is a form of social interaction in the learning environment. Peer counselling could also be used to reach out to more students in need, and this forms a cornerstone of psychosocial support.

Favish and Hendry (2010) found that academic development programmes, especially extended curriculum programmes which incorporated substantial foundational provision, were the most effective tools to widen participation at UCT, as they offered opportunities for access and success to under-prepared students. However, it was suggested that it was necessary to extend the support also to students in the mainstream.

3.3.3. Institutional culture

One of the challenges facing new students is to adjust to the culture of the higher education institution. Culture is defined by Toma et al. (2005:1-6) as institutional norms, values, and beliefs, while institutional culture is perceived as the glue binding together those who work and learn at the same institution. It is institutional culture which fosters 'a sense of oneness with or belonging to' an institution or a university. It encapsulates tangible symbols, including the language, narratives and practices needed to express common understanding across an organization. Jansen (2009) adds that meaning and interpretations can be found in cultural artefacts; these include buildings and memorials, stories and myths, campus language, shared rules and norms, and social conventions and beliefs.

In the South African context, the concept of 'institutional culture' is used in various ways to signify various perspectives on higher education transformation.

> It is used to capture the differences in administrative and management styles between the historically white English-medium universities (described in terms

of academic freedom, institutional autonomy, distance from the state, liberalism, less authoritarianism, etc) and the Afrikaans-medium universities (described in terms of centralised authority, anti-democratic approach, close relation with the state, authoritarianism, etc) (CHE, 2010:40).

In this sense, the concept of institutional culture aims to delineate different cultures as experienced in various institutions, classified in terms of the medium of instruction. One of the challenges with which students are faced is the language issue and the difficulty experienced in this regard in former Afrikaans universities.

In his seminal work, Thaver (2006:17) introduced the notion of "at home", which refers to *in situ,* that is, the physical place or site which includes symbols and practices. "At home" as a physical place provides shelter, warmth, love, food, security and acceptance. However, this physical place could also provide the opposite and become hostile, cold and insecure.

He argues that "there is in the duality of culture as process (the day-to-day routines) and as product (emergent reality) every chance that we may fall victims to imperceptibly shifting the object of knowledge from institutional culture to "at home" and thus blurring the divide between individuals being "at home" (their habitus) and an institution's culture (as an emergent reality) which is oriented to making its members feel "at home". In other words, we may establish who is at home (sites, symbols, practices and relations) and similarly, by contrast, who is not at home (locating emergent hostilities – disaffirmed identities, insecurities, and demotivation) in the institutions." Students' *habitus* and *cultural capital* could therefore play a critical part in terms of making them feel "at home away from home" (home in terms of both the physical space and the nation) (Said, 1983; cf Thaver, 2006). Once the student feels "at home away from home", he or she will have adjusted to the culture of the university and will be "fitting in". This "fitting in" and adjusting to university culture has potential benefits, including future success for the student in her/his studies. However, when students are unable to fit in with the institutional culture, the opposite may occur; they may not be successful in their studies and may drop out of the university. Institutional culture could therefore be perceived as bringing together in a relationship the physical space of the university (such as lecture hall, library, laboratory, etc) and the student's sense of identity, security and stimulation (ibid).

Thaver (2006) further asserts that institutional culture is a subset of a larger socio-historical process, and thus cannot be divorced from the societal microcosm. In the South African context, institutional culture is a highly contested terrain, since it is linked to the apartheid legacy. This assertion is underscored by Thaver (2006:25), who argues that in order to comprehend institutional cultures:

> ... we should be able to uncover various ways in which the racial "politicking" of the old has been transmuted and reconfigured (in other words, how it has been reinvented under the guise of "politically correct" rhetoric and demonstrates "democratic-speak" and even "nation-building" or alternatively, how the old has been challenged and negated and how new modalities are seen to emerge in their stead).

Institutional culture seems to have some relationship with the question of power and control in institutions of higher learning (Higgins, 2007); that is to say, those in positions of power have the opportunity to determine 'the way things should be done' and thus set the tone for the culture and, by inference, the institutional culture. The people who are supposed to imbibe the institutional culture are the students, administrative personnel, lecturers and the university community at large, who may not subscribe to the espoused institutional culture if they feel there is no link between it and their personal identities. Instead, they will feel alienated and will identify neither with such an institution nor with its institutional culture. It will then depend on the discourse between those in power and those who may not align themselves to the institutional culture to work together in developing such a culture. This makes institutional culture a contested terrain of power and authority (ibid).

In the South African context, institutional culture is perceived through the lens of a 'whiteness critique'. Higgins (2007:106) argues that "institutional culture is – above all - experienced by black staff and students as the overwhelming 'whiteness' of academic culture. 'Whiteness' here refers to the ensemble of cultural and subjective factors that together constitute the unspoken dominance in higher education of Western, European or Anglo-Saxon values and attitudes as these are reproduced and inflected in South Africa. This 'whiteness' is or can be experienced as an alienating and disempowering sense of not being fully recognised in or by the institution, and a consequent impossibility of feeling 'at home' within it."

The question is: Do students feel 'at home' when they are at university? How does a university foster 'a sense of oneness and belonging' in a diverse group of students with diverse cultures and languages?

3.4. Conclusion

This chapter described and contextualized Osborne and Gallacher's (2004) concepts of getting in and getting through as the framework of the study of widening access to students from disadvantaged backgrounds, with specific reference to the Biological Sciences at the University of Pretoria. I intend to investigate how different stakeholders perceive widening access to students from under-presented groups through this framework, as I believe that only a full understanding of the various components of this framework can provide us with a comprehensive view of the topic. In order to explore these issues in depth it was necessary to employ a qualitative research design. The research design and methodology for this study will be discussed in the next chapter.

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1.   Introduction

The focus of this chapter is on delineating and explaining the research design and methodology used in this study. A research design is a blueprint or plan of how a study will be carried out (Nieuwenhuis, 2007; Mouton, 2004). The researcher's choice of design is determined by the research questions and the purpose of the study (Swanepoel and Erasmus, 2000). The main aim of this project was to describe, explain and theorize on the possibilities and limitations of widening access to under-represented groups in one of the science programmes at the University of Pretoria. For this purpose, I chose a qualitative case study research design.

4.2. Research methodology

Qualitative research is used when an issue to be explored calls for the study of a specific population group and involves listening to the voices of the participants. Epistemologically, as a qualitative researcher I accept reality as a subjective social construct that needs to be interpreted, rather than measured; this view locates this study within the social constructivism or interpretivist paradigm.

A case study research design offers a detailed description of a phenomenon characterized by specific parameters in terms of context, place and time (Stake, 2000). A qualitative researcher may thus study a small group of individuals, an individual, a programme or an activity in a single site (Creswell, 2007). In this inquiry, the focus was on one institution and on a particular programme, that is, the Biological Sciences at the University of Pretoria. Further, the purpose of the inquiry was to illuminate a specific issue, namely widening access to the abovementioned programme.

I chose to use a qualitative case study research design for the following reasons. Firstly, it allows for the use of inductive data analysis and reasoning (Maree and van der Westhuisen, 2007). Secondly, a case study has the potential for rich, thick and context-heavy descriptions of real people in real-life situations (Stake, 2000). Thirdly,

unlike in quantitative research, where researchers distance themselves from the research process, a qualitative inquiry allows for close involvement with the research subject, and thus encourages immersion in the field (Golafshani, 2003). In qualitative inquiry therefore the researcher himself is the primary instrument for data collection, analysis and interpretation (Patton, 2002; Huberman and Miles, 2002). Fourthly, the researcher can use the available methods, strategies or empirical materials to form a *bricolage*, that is, the confluence and use of several methods and strategies to collect data (Denzin and Lincoln, 1998). Fifthly, a qualitative research design is flexible and can be adjusted to accommodate new developments and leads.

Qualitative inquiry, therefore, gave me the opportunity to explore empirical data relating to the concepts of "getting in" and "getting through" and their relationship with access to higher education. However, while this was a qualitative study, some aspects of quantitative research were factored in so as to generate richer data and strengthen the argument.

Quantitative research which is mainly used in sciences is described as a kind of research that relies heavily on numerical data collection (Johnson and Christensen, 2012). This research inquiry uses an experimental and non-experimental research designs. The experimental research designs involve the manipulation of subjects. A non-experimental inquiry describes the phenomenon that has occurred or the relationship between subjects without suggesting the cause-and-effect. Furthermore, there is no manipulation of the conditions that the subjects are exposed to and the researcher makes observations or describes what has occurred including the description of the situation (McMillian and Schumacher, 1997; Ary, Jacobs, Razavieh and Sorensen, 2006; Slavin, 2007). A non-experimental quantitative inquiry design was also employed in this study. A questionnaire was administered to the first year second semester students in Biological Sciences.

4.3. The scope of research

The data collection for this research was conducted over a period of twelve months between 2010 and 2011. It began with thorough preparation, including seeking access to the research site. A letter was written to the faculty of Natural and Agricultural Sciences, requesting an opportunity to conduct research, and permission was duly granted (see appendix 1). My study was confined to three main stakeholder groups. The first stakeholder group were at policy level. These included policy-makers who were the personnel in university top management who crafted the policies of the university and policy implementers, who were personnel in middle management in the admission space of the university who had limited or no contact with students but had a direct link with the administrators at the coalface of policy implementation. The second stakeholder group were first-year lecturers in Biological Sciences. This group was engaged with first-year students who had been selected and placed as a direct consequence of the university's access policy. Thirdly, there were the students themselves, who represented the policy consumers or people in the university who were directly affected by the policy.

4.4. Sampling

One of the critical steps in the trajectory of assembling participants for a study is to identify the relevant persons through the process of sampling. There are two basic types of sampling, probability and non-probability. The former allows the researcher to generalize the results of a study from the population from which it was drawn. This is a characteristic of quantitative research. In qualitative research, however, non-probability sampling is the approach to be followed. This does not allow for direct inferences, but rather for the discovery of "what occurs, the implications of what occurs and the relationships linking occurrences." The most common form of non-probability sampling is purposeful sampling (McMillan, 2000:103-108).

This study used purposive sampling because it gave me the opportunity to select knowledgeable people with rich information related to the topic under investigation. Thus, I used purposive sampling to select the University of Pretoria as site for data

collection and the Faculty of Natural and Agricultural Sciences in which the programme of Biological Sciences is located.

The University of Pretoria is a former white university steeped in strong Afrikaner culture. University of Pretoria enrols approximately 40 000 students with more than 80% of them registered in undergraduate programmes. According to Jansen (2009:3) "the University of Pretoria was one of the key apartheid institutions for higher learning and one that fulfilled its white nationalist duty with considerable fervour for more than hundred years". This university only registered its first black student in 1989. This categorisation makes the University of Pretoria an interesting case to explore. Hence the University of Pretoria was purposively chosen because of its convenient location. Therefore, purposive sampling was employed to reduce expenses and time associated with travelling and accommodation.

Since Biological Sciences is a generic programme, it has a variety of modules from which students can choose, including Mathematics, Science and World Views, People and their Environment, Medical Terminology, Botany, Zoology, Genetics, and Physics. I chose one of the popular modules for data collection, but in order to maintain confidentiality I used only the generic name of the programme, Biological Sciences. I specifically chose the Biological Sciences because I was trained as a biology teacher and taught it at secondary school level. I chose the first-year students because they were new in the university and still needed to find their feet. The first year of tertiary studies is a transitional period from secondary school to higher education and is where the largest dropout occurs (Marnewick, 2012; Schöer, Ntuli, Rankin and Sebastiao, 2010; Letseka and Maile, 2008).

The six policy-makers were made up of five whites and one black. While this was not by design, it reflected the composition of the senior personnel in admissions in the university. The policy-makers interviewed were high-ranking officials in the university, two of them being members of the university's top executive management.

The second stakeholder group comprised of first-year lecturers in Biological Sciences. The racial composition of the lecturers was four blacks and two whites. They included junior lecturers, senior lecturers and a unit director. They had extensive first-year teaching experience ranging from one to ten years.

It is interesting to note that the gender composition of the participants was an equal number of males and females. Although this was not by design, it nonetheless made the study gender sensitive.

The third stakeholder group was the students. In order to identify individuals from under-represented groups as potential participants in a focus group discussion, I decided to administer a questionnaire to the first-year students. It aimed at identifying black students from various locations, such as urban, rural and township areas.

The University of Pretoria is a dual-medium institution and undergraduate degree programmes are offered in two languages, Afrikaans and English. The questionnaire was administered to the English group since it was expected that most of the students from under-represented backgrounds would be in this class. In addition, it was the language with which the students in this group and I were comfortable with. Access was facilitated by the lecturer of the group and I was allowed a generous 30 minutes to distribute and explain the questionnaire to the students. It was the first day of the second semester at 7h30 in the morning, and it was a chilly morning. The class was noisy, as the students were catching up with their friends whom they had last seen the previous semester. A total of 200 questionnaires were distributed; of these, 193 were diligently completed and returned. I used the questionnaires to access additional information such as the students' perceptions of their level of preparedness for university studies in general, as well as their particular experiences at the University of Pretoria. The questionnaires were collected at the end of the period as the students walked out of the lecture hall.

When I analysed the data I realized that the students' responses to open questions (such as: *How would you describe your experiences in BSc in Biological Sciences so far?)* gave me a richer data, beyond my original intention of using of the questionnaire merely to identify under-representation. Consequently, the questionnaires were used to supplement the interview data (Ary, et al., 2006). The questionnaires were analysed, both quantitatively and qualitatively. The University of Pretoria's Department of Statistics used SAS v 9.3 statistical programme to generate descriptive frequencies of the coded questionnaire and the results are presented in the form of graphs in Chapter 5.

4.5. Data collection techniques

This section describes the process of data collection and analysis employed in this study. Data were collected through semi-structured interviews with policy-makers and first-year lecturers, as well as through focus group interviews conducted with first-year second-semester students in the Biological Sciences at the University of Pretoria. The interviews were recorded and transcribed.

4.5.1. Interviews

An interview is a two-way communication process which occurs between two or more people. It involves both a message sender and a receiver, that is, someone who conveys the message and one who receives it. The interview format assumes that the message put across is clearly understood by the receiver. This implies that the questions should be clearly formulated and posed so that the participants will understand them and respond accordingly.

This study relied heavily on interviews and conducting them led to my immersion in the issues and processes of widening access in higher education, with specific reference to Biological Sciences at the University of Pretoria. Semi-structured interviews were used since they gave me more flexibility and an opportunity to probe more deeply for the participants' responses. Face-to-face or one-on-one interviews, as well as focus group interviews, were conducted.

4.5.1.1. Face-to-face interviews

This is a data collection procedure in which the researcher asks structured or semi - structured questions of one participant at a time and records the responses (Creswell, 2012; McMillan and Schumacher, 1997). The advantage of this type of interview is that it enables the researcher to gain the cooperation of the participants. This can be achieved by first establishing a relationship with them. It is vital that the participants should trust the interviewer. Once the relationship has been established,

there is a high probability of enhanced response rates (Leedy and Ormrod, 2001). The chance to probe is a further advantage of face-to-face interviewing, making it possible for the researcher to clarify the questions and to secure more information from the participants (Creswell, 2012; McMillan and Schumacher, 1997). The disadvantage of this type of data collection is that it can be time-consuming.

I conducted face-to-face interviews lasting for approximately 45 minutes to one hour with the policy-makers and the first-year lecturers in Biological Sciences. The interviews occurred at the time and place chosen by the interviewees, mostly at their offices and after hours. The interviews were preceded by telephone calls, emails and formal letters requesting the interviews (see appendix 2), and a consent form was forwarded by email normally a day before the agreed date of an interview. The consent forms were explained prior to the interviews, and confidentiality and anonymity were guaranteed. The interviews were then recorded, transcribed verbatim and later analysed using the qualitative data analysis software called Atlas.ti.

I began the interviews with some biographical questions and a general query about the participants' understanding of *what access to higher education is*. This helped to establish rapport with the respondents. I then proceeded to questions which were more direct and pertinent to the University of Pretoria. These were intended to seek a deeper understanding of the access issues at this institution of higher learning. The second set of questions explored under-representivity in the university, how it was understood by stakeholders in the university, and how the university access policy mediated this issue. The third set of questions was aimed at eliciting responses about the actual efforts of the institution with regard to widening participation. The fourth set of questions related to the participants' views on the institution's culture. These questions were intended to determine whether the institutional culture had an impact on widening participation.

In order to stimulate detailed and more exhaustive discussions on the topic, prompts were used. I pressed to get examples and additional explanations where I felt an answer was inadequate and also to narrow the gap between what was said and what was done in practice. Below is an example of an interview I conducted with a university policy-maker which demonstrates the principles outlined above:

Interviewer	*What does access to higher education mean to you?*
Interviewee	It has to do with the fact that we have to allow students into the university system who will be able to pass and add value to the country after they have finished their studies. So the most important thing is to have students who qualify, really comply with the university's entrance requirements by excellent performance in Grade 11 and 12.
Interviewer	*Picking up on your statement, what is your view on the examination processes of the National Senior Certificate and the final product that you get?*
Interviewee	The University system is developed to accommodate students who have the intellectual capacity and motivation to be successful. We need a senior secondary system which will ensure that we do get students who qualify exactly for that purpose.

The present situation creates expectations with students who should not qualify. What we saw during the past two to three years was that with the inflation rate in marks - which ranges between ten and twenty percent - students may qualify for university entrance with very poor marks. For example, if marks for Mathematics were adjusted with 20% in order to pass, you might have obtained as little as 15% in your final exam and now you will still pass and get university exemption.

The person with those marks will not be prepared enough to be successful at University level. However, the expectation is created that he/she does have exemption and then the University must accept the student so that he/she can further a career. There is an unbalanced view between the Department of Basic Education on the one hand and Higher Education on the other. If this gap or difference is going to widen in the future and it is not addressed, it will create a bigger problem for the universities. |
| Interviewer | *What does the University do to make sure that students that qualify and meet your admission requirements are assisted so that they succeed in their studies? Please* |

provide examples.

Interviewee	It is very difficult for one simple reason – we are not sure if an A symbol is an A symbol any more. Is the C symbol that we receive at C symbol level or is it at E symbol level? It is very difficult for any higher education institution to rely on matric results for entrance purposes.

I think what we will see is that something like the National Benchmark Test may play an important role in the placement process of students in the future. Perhaps it is too early to predict in this regard. You can already see that more and more institutions are opting for information from other sources to add value to the enrolment process. |
| Interviewer | *There seems to be a lack of trust in NSC as a predictor of success in the university studies? Am I right in saying that?* |
| Interviewee | It is not necessarily true. We are talking about two different things now. We are talking about the enrolment process where results are used as a parameter for evaluation and we are talking about university success as another thing once the student is in the system. I can tell you that this university and all other institutions will do their utmost to put plans on the table and assist where they can to make sure that the students who enrolled will be successful but that does not really have anything to do with the matric results. In our Natural Sciences we have a 4-year BSc programme exactly for the purpose of assisting students who do not normally qualify as they do not meet entrance requirements. So we admit a cohort of students who we think will be able to qualify with a BSc degree, with assistance. Without assistance they will not be able to qualify. In the 4-year programme we actually make sure that we assist students with extra tutorials, extra work, and extra assistance upgrading their knowledge to a point where they can participate in a normal programme. So in the first two years of study a lot has been done to ensure that these students will also be able to pass. Whereas under normal circumstances they will not be able to be successful. |

The interviews were followed up by a courtesy call and/or email to thank the participants. I also took this opportunity to clarify nebulous issues that I picked up while transcribing the recorded interviews.

4.5.1.2. Focus group interviews

Focus group interviews are an innovative and evolving strategy for gathering information from a group of people which might otherwise be difficult to obtain (Creswell 2012). There are several advantages of conducting a focus group interview. Firstly, the quality of information is enhanced as a result of interactions among the group members. Secondly, this kind of interview is cost-efficient; within one hour a lot of information can be collected from 6 -12 focus group members. However, bigger groups (that is, with more than 12 members) may become unwieldy and difficult to control for a novice interviewer or moderator. Thirdly, focus group members seem to feel safe and secure among their peers allowing them to volunteer information more readily (Patton, 2002).

However, focus group interviews also have disadvantages. For instance, dominant and talkative individuals may not allow space for others to contribute to the discussions. Some members may be too shy to speak in a group. A further major disadvantage of such interviews is that individuals may not share their more important experiences because they are embarrassed to do so in a group setting, thus reducing the researcher's chance of obtaining quality data (Bogdan and Biklen, 2003). It is imperative that the moderator be skilful in managing the disadvantages inherent in focus groups. This will provide leverage in terms of securing optimal contributions from focus group members.

Table 4.1 below describes the focus group participants for this study in terms of age and gender. Engagement in these interviews was voluntary. It was anticipated that the groups would be representative, but they were limited to blacks from urban, township and rural areas.

I conducted three focus group interviews, two with ten members in each group and one with nine members. The interviews lasted between 45 minutes and an hour. They were recorded, transcribed verbatim and analysed. Putting together the groups

using students was a challenging and often frustrating exercise which required much time and effort.

Table 4.1

Focus group participants' schedule

Focus group 1		Focus group 2		Focus group 3	
Gender	Age	Gender	Age	Gender	Age
Male	18	Male	19	Male	18
Female	19	Female	18	Female	19
Male	18	Male	18	Male	19
Female	20	Female	19	Female	18
Male	18	Male	19	Male	18
Female	19	Female	18	Female	19
Male	18	Male	18	Female	19
Female	19	Female	18	Female	18
Female	19	Female	19	Female	18
Female	19	Female	19		

While they were not insurmountable, the study did face challenges. One of the key difficulties was that the students were unreliable in terms of honouring appointments. They either did not respond to their emails timeously or gave no response at all. If they did respond and agree to meet for an interview at a specific time and venue, they often did not turn up. The mobile numbers given by the students were also not reliable. They either gave me wrong numbers or chose to ignore my calls. Their mobile phones were off most of the time. I then resorted to text messages, as I thought that I was perhaps calling them when they were attending lectures or were in the library. They simply ignored the text messages. I then went back to their lecturers

and pleaded for assistance. I was linked with the student assistant who was in charge of practical sessions. The assistant made an announcement during the practical session that I would be waiting for students in the adjacent room and that those who wanted to participate in the focus group interviews should go there once they had finished with their practical sessions. Once the sessions were done, those willing to be interviewed came through. They arrived in large numbers, so I chose a manageable group of 9 to 10 participants. I asked the others to wait outside the room until I had conducted the first focus group interview, but they did not wait for their turn and instead left. I had to repeat the process until I had the required number of participants.

Conducting focus group interviews was thus a learning curve for me as a researcher. Such interviews call for skill in managing the group dynamics in order to get optimal performance. Furthermore, you need to be ambidextrous, making sure that the tape recorder is working while simultaneously concentrating on asking questions and trying to take notes and crafting follow-up and clarity-seeking questions. So this kind of interview has many processes running at the same time. The lesson perhaps is that novice researchers should seek assistance so that they can focus on asking questions and taking notes, while someone else makes sure that the tape is recording and keeps the group focused.

4.5.2. Document analysis

Documents are a valuable source of data which also serve as a non-interactive way of procuring data from public or private records. Documents for analysis could include diaries, letters, minutes of meetings, memos, reports, emails and websites (Creswell, 2012; McMillan and Schumacher, 1997).

Documents are a rich source of data since they are in words and can readily be subjected to analysis with a view of answering the research question. However, the down side is that they may not easily be accessed (Creswell, 2012).

This case study was about an institution of higher learning, potentially offering an abundance of documents. However, it was vital to seek documents that would address the topic under investigation and help unravel the research questions. I did

not have access to all the documents I wanted, such as the minutes of the University Senate and of the Council, which approved the admission requirements and in essence anchored access to the university. However, I was able to use the university website as a main point of entry and downloaded some important documents, such as the mission and vision of the university, the strategic plan document of the university, its language policy, and its admission requirements, as well as general information. Some of the documents, such as brochures and faculty admission booklets, were procured during my interaction with the policy-makers.

The purpose of conducting document analysis is to corroborate the information gleaned during both face-to-face and focus group interviews, as well as information from the documents analysed. In the main, the documents were used to gain background knowledge of the university, while some, such as language policy, were used or quoted to support an argument or corroborate information.

4.6. Data analysis

Data analysis is a process of engagement which involves organizing, accounting for, and explaining the data. Such explanation can be done in short, noting patterns, themes and categories (Cohen et al., 2007). In qualitative research, the data analysis process typically begins during the data collection phase. Creswell (2012) points out that data analysis requires thorough preparation beforehand. This involves moving much deeper into understanding the data when representing it, as well as interpreting its larger meaning. Invariably, much qualitative data is in the form of words, so the transcriptions from the interviews need to be read and understood in order for the researcher to become familiar with their meaning.

The qualitative data of this study were managed and analysed using Atlas.ti. The first stage of the analysis was that of coding and recoding the recorded interviews line by line. This helped me to discover the recurring themes and to develop ideas and concepts. As an example, Table 4.2 below demonstrates how the question '*What kind of support does the university offer to students?*' was analysed:

Table 4.2 – Text analysis

Interview – policy- maker, 11 April 2011	Code
In addition, if candidates do not acquire the necessary basics in high school it means that Universities must spend substantial resources, including *finance*, to try and *prepare students for university academic life*. This is a very expensive thing to do at university level. In short, in addition to what we have to do at University, *we also have to do things that schools should actually take responsibility for*.	1:5 (67:73) University has to compensate for schools Support is a financial burden to university
Mentoring is applicable to first-year students only. *Tutoring* is presented more widely. However, we have found that some students coming from NSC need *support* in the second and third year also. This is very expensive and we don't have enough resources to do this on top of everything else that is required from us.	1:18 (214:219) Mentoring – first year Support (tutoring) is necessary for second year as well Reason – poor schooling system
Socio-economic and funding issues are big problems. *Support* from parents (emotional and otherwise) is also an issue, while *wrong career choices because of poor career guidance at school level* is a great obstacle to achieving success. In this regard I must mention that NSFAS is one of the best policy interventions in the immediate past. NSFAS is of *great assistance to students.*	1:23 (294:300) Challenges: Parent support Challenges: Poor career guidance Support - NSFAS

The numbers 1:5 (67:73) under the heading `code' above refer to the numbers generated by Atlas.ti. Here, it refers to document number 1, quotation number 5, and lines 67–73. This information is made available in footnotes corresponding with each quotation used, as well as the label, for example:.

Policy-maker 5, 3 March 2011. [Document 11:13 (119:126) Codes: Student recruitment].

Text analysis through Atlas.ti was both rewarding and challenging, as I had to learn the programme and put it to use almost simultaneously. I chose to learn only limited applications of the software as I had to spend more time in the field and the library. At the beginning of the text analysis, I accumulated several codes linked to "support" as a way of developing a deeper understanding of the kind of support the university offered students, especially those from under-represented groups. Figure 4.1 below illustrates the numerous codes associated with support. The number in brackets indicates the number of quotations associated with each code. The tilde (~) indicates that the comment was attached to the code or that this had been merged with other codes or ex-codes.

Figure 4.1: Family – support

Support – psychological assistance {4 – 0} ~

Support – career counselling and social activities {7 – 0} ~

Support – tutors and mentorship programmes {6 – 0}

Support – financial assistance {27 – 0} ~

Support – academic support and foundation programme {6 – 0}

Support – counselling and career support {2 – 0}

The codes were grouped into families, as indicated in figure 4.1 above. The families were then recoded in order to identify the emerging themes which were grouped into categories, as illustrated by figure 4.2 below.

Figure 4.2 – Categories and emerging themes

Academic support {16}

Admission process {15}

Funding {12}

Institutional culture {7}

Orientation period {15}

Psychosocial support {8}

Student readiness {18}

Student recruitment {10}

The categories and the emerging themes were interpreted and used to develop a deeper understanding of widening participation in the Biological Sciences and the concomitant access policies in the university. The numbers in brackets indicate the codes associated with each category. The additional codes addressing this emerging theme are grouped under 'inadequate preparation' for university studies.

4.7. Ensuring validity

Johnson and Christensen (2004:249) argue that "validity in qualitative research refers to the fact that such a research is plausible, credible, trustworthy and therefore defensible." In addition, Janesick (2000) perceives validity in qualitative studies as relating to description and explanation, and building a cogent argument as to whether or not the explanation fits the description. In this study, I reported and described as accurately as possible the events, people, settings, places, times and information obtained from the participants.

According to Stake (2000:443), "triangulation has been generally considered a process of using multiple perceptions to clarify meaning." Leedy and Ormrond (2001) underscore that triangulation plays a vital role in establishing validity, particularly in a qualitative study. In order to ensure trustworthiness, I used triangulation, employing multiple sources of data, such as policy-makers, lecturers and students, as well as

multiple methods, such as face-to-face interviews, focus groups, questionnaires and documents.

I also used member checking/ informants' feedback by giving the participants transcriptions of the recorded interviews. This gave each an opportunity to read through his/her transcription and confirm the accuracy of the record. Some made comments and in some cases made changes on the transcripts, while others indicated that the transcripts had captured and articulated their views accurately. The participants were also given an opportunity to comment on the categories which emerged from the data.

Reflexivity is a critical self-scrutiny by the researcher with a view to identifying any innate bias he or she may have. It operates from the premise that the researcher cannot be completely neutral, objective or detached from the subject of the research. It is therefore imperative to identify any personal bias in order to avoid or minimize it (Lincoln and Guba, 2004; McMillan and Schumacher, 2010).

My own potential bias was minimized by spending sufficient time in the field, approximately a year, as well as by employing multiple data-collection strategies, such as face-to-face interviews, focus group interviews and document analysis. Further, I kept a field journal in which I took notes during and after the interviews to record my thoughts. These notes were integrated with the transcriptions from the recorded data. As the data were managed through the use of Atlas.ti, codes and categories were used as part of the 'audit trail' to minimize any bias (McMillan and Schumacher, 2010).

Thick descriptions were also used to secure a comprehensive and vivid picture of the University of Pretoria and the details of the participants' opinions about widening participation in the Biological Sciences.

4.9. Ethical consideration

Babbie (2001) cautions that it is vital for all researchers involved in social scientific research to be conscious of what is ethically proper and good when conducting such studies. Bernard (2000) adds that the researcher must ensure that the subjects of the study or those being studied are not at risk.

It is therefore imperative for the researcher to obtain clearance from the ethics committee when human (or animal) subjects are involved in any kind of an empirical study. Ethical clearance should be procured prior to entering the research field and engaging with participants. For the present study, clearance was applied for and duly granted by the Faculty of Education's Ethics Committee of the University of Pretoria.

One of the key ethical considerations when human subjects are involved is the issue of informed consent and voluntary participation. The letter requesting participation in an interview and the consent forms were made available to the participants prior to the interview, giving them enough time to decide whether they wanted to take part in the interview or not. See appendix 3 for an example of such a letter. On the day of the interview the participants were asked to read the consent form again and were allowed time to clarify any issue which might not have been clearly understood. They were then requested to sign the consent form to confirm that they agreed to participate in a recorded interview. I emphasized that their participation was voluntary and that they were free to withdraw from the interview or request that the tape recorder be stopped if they so wished. I also guaranteed confidentiality and anonymity by using codes and generic descriptive terms for the participants, such as 'policy-makers', 'first-year lecturers' and 'first-year students'.

It is the researcher's responsibility to ensure that participants are not exposed to any undue physical or psychological harm (Leedy and Ormrod, 2001). I made sure that the interviews were conducted in a safe environment by using a clean, well lit and well ventilated room with chairs arranged in a circle to allow eye contact and easy control of the group. I was careful not to ask questions that sought personal or potentially embarrassing information, as this kind of question would have made them uncomfortable (McMillan and Schumacher, 2010).

4.10. Reflection and concluding comments

The study was not without challenges, as is to be expected with any research project. The main challenge was in gaining access both to the policy-makers and the students. The limited availability of the policy-makers who were senior personnel of the university, affected my data collections plans as I had to reschedule the meetings until such time as they were available. This required persistence, and in some cases I had to insist and refuse to take no for an answer. The students too posed a serious challenge as they were not readily available and did not honour agreed appointments. I have learned to be persistent as well as patient. I believe that these qualities are essential when one is conducting a qualitative research.