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THE ATTITUDES OF ACADEMICS TO ACCOMMODATING PHYSICALLY DISABLED STUDENTS INTO THE UNDERGRADUATE CIVIL ENGINEERING PROGRAMME IN THE FACULTY OF ENGINEERING, THE COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE, UNIVERSITY OF KWA-ZULU NATAL

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ABSTRACT

Disabled students face a number of challenges in accessing equitable education within higher education institutions. The University of Kwa-Zulu Natal, as stated in the Policy on Students and Staff with Disabilities, is committed to making tertiary education accessible and inclusive for all students. However, it has been observed that physically disabled students are underrepresented in the science and engineering fields, as there is a misconception that disabled students cannot fulfill all the criteria required to complete these programs. Therefore, the aim of this study was to explore the attitudes of academics to the possibility of admitting physically disabled students with the Undergraduate Civil Engineering Programme at the University of Kwa-Zulu Natal. A qualitative approach was adopted where data was collected by carrying out in-depth interviews with five permanent full-time academics within the Civil Engineering Programme.

The participants included 2 professors, 2 senior lecturers and one lecturer who have been teaching courses in Civil Engineering at the University of KwaZulu-Natal for periods between 3 and 20 years. The results of the study revealed that the academics interviewed all displayed a positive attitude in accommodating physically disabled students within their program. However, some challenges were identified, which included site/field work in the curriculum. All the participants indicated that these challenges can be met and are willing to provide the support that may be required by physically disabled students. Recommendations were made, that if implemented, will result in changes being made not only to the physical environment, but also as to how curricula can be planned and delivered.
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INTRODUCTION

1.1. BACKGROUND OF STUDY

Though education is a fundamental right of all human beings, the past unjust policies of the government of South Africa excluded certain sectors of our community from receiving equitable education. Disabled people were part of the sector that was discriminated against. The result of this discrimination was that a large percentage of disabled children were not able to access formal education. In the past, disabled people have been classified according to their disability with no reference to their ability. It was assumed that all disabled children needed to attend special schools. A limited number of these special schools are available in South Africa for a large number of disabled children who have been excluded from formal education opportunities. The environment in regular schools does not facilitate the integration of disabled and non-disabled children (ODP, 1997).

According to Crous (2004), there were 64 603 children with impairments in special schools in South Africa (Department of Education 2001:9). However, this is only 18, 75% of the children with impairments and more than 80% are not part of any school system. The situation in higher education is much worse. According to a survey done at three higher education institutions, disabled students only represent 0.4% of the student population (Crous, 2004). It must be noted though that there are still inaccurate statistics as to the prevalence of disability in South Africa.

This lack of access to equitable education for disabled people raised global concerns. Disability groups, nationally and internationally, have been quite vocal in voicing their dissatisfaction regarding this lack of access. In response to these concerns, the relevant legislative bodies of various interest groups, began to focus on the rights of disabled people as being a Human Rights issue and began introducing policies that would promote equality for all persons.
In 1993, The United Nations introduced the Standard Rules on Equalization of Opportunities for Persons with Disabilities, an international document that focuses worldwide attention on the need for ‘equal rights and opportunities for persons with disabilities’. This document was aimed at guiding the efforts of Governments and the United Nations to achieve equal opportunities for persons with disabilities. (http://www.un.org/esa/socdev/enable/dissre00.htm)

Part of the goals of the African Decade of Disabled Persons (2000 – 2009) was to create awareness around disability that is specific to the region and to look for ways to overcome the challenges that will lead to full participation, equality and empowerment. (http://secretariat.disabilityafrica.org/document.php?action=view_doc&doc_id=486)

In South Africa, after the change in government in 1994, legislation was introduced to equalize education opportunities for disabled children. The White Paper 6 on Inclusive Education was one document that was introduced towards building an Inclusive Education Training System for children with ‘special needs’ (Department of Education, 2001). The White Paper 6 on Inclusive Education started to accelerate the process on inclusivity and integration of educational opportunities for disabled children. It has given impetus to those institutions that have already started the process of removing barriers for disabled students.

The University of Kwa-Zulu Natal (UKZN) has, for a number of years, been accessible to disabled students. The University has committed itself to the removal of cultural, physical, social and other barriers that prevent people with disabilities from entering, being employed, using or benefiting from the University (UKZN, 2004). Although support services have been provided, the researcher observed that disabled students continue to experience barriers in meeting academic needs. Disabled students are mostly represented in the Faculties of Arts, Law and Social Sciences and are especially under represented in the Science and Engineering Faculties. There are many reasons why disabled students are under-represented.
It is the view of the researcher, being the co-ordinator in charge of the Disability Unit at the University, that part of the reasons for this is the attitudes and stereotypes regarding the abilities of disabled students. The researcher assumes that many academics are not prepared to look at what support services and programmes are available to make it possible for disabled students to be accepted into the Science and Engineering Faculty. However, as the demographic landscape of postsecondary educational institutions evolves to include disabled students, faculty and staff are becoming increasingly challenged to provide sound instructional and support services to meet the demands of this growing segment of the student population (Fielden, 2001). These negative stereotypes and attitudes may be the serious barriers that disabled students face when applying for entry into the Science and Engineering Faculty.

1.2. LEGISLATION
The White Paper on Higher Education (Department of Education, 1997), states that in order to create equity there is a need to identify existing inequalities which are the products of policies, structures and practices based on race, gender, disability and other focuses of discrimination. A programme of transformation needs to be put into place to redress this discrimination. According to the White Paper 6 of 2001 (Department of Education, 2001, pg 31) higher education institutions are legally committed to “increasing the access of learners with special education needs”. A tertiary institution cannot, on the basis of disability, deny access to a student. It is also the responsibility of the tertiary institution to provide the necessary support and access that the student requires.

The University of Kwa-Zulu Natal’s Policy on Students and Staff with Disabilities (UKZN, 2004) states that the University is committed to making tertiary education and the working environment accessible and inclusive for all students and staff including those with disabilities. The University will provide the necessary support required by the disabled students, as long as it does not cause ‘unjustifiable hardship’ to the institution. (UKZN, 2004).
The Disability Policy of the University of the Western Cape (UWC, 1998) states that 'disabled persons who fulfil academic requirements and who can be accommodated within the existing university structure will be accepted as students with the intention to fully integrate them into the main stream of academic activities'. 'The university will, within its budgetary constraints endeavour to create favourable conditions, especially in the areas of academic support and physical environment of the University, so that disabled students can attain their academic goals.' (UWC, 1998)

According to the Disability Policy on Students with Disabilities at Stellenbosch University, 'no application for admission to the University will be refused on the grounds of disability, on condition that the applicant meets all the relevant academic requirements. The University is committed to assist students with disabilities who comply with the relevant academic requirements, to become fully fledged integrated members of the student community. Where feasible and financially possible, the needs of students with disabilities are catered for in order to make the campus accessible and friendly.

http://admin.sun.ac.za//Student_affairs/disabledpolicy.html

Tertiary institutions within South Africa are now complying with the principle that no one may unfairly discriminate against a person on the grounds of the person's disability as contained in Section 54(1) (a) of the Employment Equity Act (RSA, 1996) and the Constitution of the Republic of South Africa. Therefore, tertiary institutions had to review their criteria for admission and introduce policy and programmes that will enforce this legislation and provide support for disabled students, thus attempting to redress the inequalities of the past. It must be acknowledged, however, that existing policies of the universities, like the University of Stellenbosch, University of the Western Cape and the University of KwaZulu-Natal, in using terms like 'where feasible and financially possible', 'students who can be accommodated within the existing university structure' and 'unjustifiable hardship' do not accept total responsibility in providing a 'discrimination-free' accessible educational environment for all.
However, legislation introduced in the United States of America has ensured equal access to education for individuals with disabilities and resulted in an increase in postsecondary enrolment among students with disabilities (Rao, 2004). The policy of the College of William and Mary provides students with disabilities with reasonable educational accommodation based upon relevant law, the College’s educational standards, and sound ethical practice in disability services. (Policy for Accommodating Students with Disabilities, Office of the Dean of Students, the College of William and Mary, 2004).

The Cape Western Reserve University places emphasis on equal opportunity and diversity for both students and staff with disabilities. Students with disabilities are selected for admission at the university based on academic potential and those students with disabilities that have satisfied all criteria for matriculation. The university’s responsibility is then to ensure that students will not be discriminated against and to make reasonable accommodations for allowing the students to participate in university programs and services.

http://www.case.edu/finmin/humres/eod/disable.html

Disability issues are gaining more recognition in high-level policy documents in New Zealand. The legislation that has been introduced has placed emphasis on the creation of equity for disabled people, especially with regards to employment and education. Disability issues have advanced from discussions on ramps and assistive technology to a more sophisticated rights-based examination of legislative and policy imperatives (Kia Orite Achieving Equity, 2005).

1.3. RATIONALE

In my position as the Co-ordinator of the Disability Unit at the University of KwaZulu-Natal (Pietermaritzburg), I am aware that the university has started making a shift towards creating a barrier-free environment for disabled students. The university has begun to recognise that society has the responsibility to break down barriers facing disabled students and that it is not only the individual student’s responsibility to break down these barriers. However, there are certain areas within the University that are still difficult for disabled students to access.
Disabled students still face a challenge into being accepted into the Science and Engineering Faculties. It is often assumed that disabled students would not 'cope' within these faculties. The question is whether the necessary support services including technological support are provided for disabled students within these faculties. 'Assistive technology in particular has enabled many more disabled students than before to attend postsecondary educational institutions' (Fielden, 2001, pg 4). Access to assistive technology has allowed many disabled students to successfully access material in a form that is most suitable to them.

Disabled students should have equal access of admission into all faculties of the University as long as they meet the necessary academic requirements and are provided with the necessary support services to reach their full potential. However, after being admitted, disabled students still have to cope with the attitudes of their lecturers in accommodating the disabled students into the various programs.

Many academics are not aware of their responsibility to provide the support that is required by disabled students. 'Few faculty have been trained to teach students with disabilities and to design or modify instructional materials or procedures when necessary to make them accessible to students with special needs' (Fielden, 2001, pg 5). Many students experience frustration during their tertiary education stemming from negative attitudes of academics and fellow students, physical barriers on campus or lack of funding to improve services and programs (Johnson, 2006, pg 3). Attitudes from non-disabled individuals often reflect preconceived opinions as to what a person with a disability can and cannot do, or stereotyped judgements of ability and stability.

This study was therefore initiated to explore the attitudes of academics in accommodating physically disabled students who may be admitted into the undergraduate Engineering Programme in the university. The Undergraduate Civil Engineering Programme is offered in the Faculty of Engineering. It is a four year degree offered on the Howard College campus of the University of KwaZulu-Natal. Students accepted into the Faculty are required to
undertake and perform vocation work as assigned by their Head of School and shall submit an acceptable report to their Head of School. (Faculty of Engineering Handbook, UKZN, 2007, pg 23).

Students within the Civil Engineering Programme are required to undertake 11 weeks of vocation work.
The purpose of the study was to look at what are the challenges, if any, facing disabled students and academics within this field and to find mechanisms of meeting these challenges.

1.4. AIM
The overall aim of this study is to explore the attitudes of academics in accommodating physically disabled students in the undergraduate Civil Engineering programme in the Faculty of Engineering.

1.5. CRITICAL QUESTIONS
What are the attitudes of academics on accepting physically disabled students into the undergraduate Civil Engineering programme in the Engineering Faculty?

1.6. DEFINITION OF TERMS:
The following terms are defined for the purpose of this study -

**Physical Disability:** For the purpose of this study, physical disability is defined as any person who has an impairment that affects the spinal cord or the lower limbs that result in locomotive difficulties, which may result in the person using a wheelchair, crutches or other assistive devices.

**Attitude:** Attitude is an individual’s learned predisposition to behave in a consistent manner towards an idea. It is believed that attitude is a construct with three constituent components or dimensions: affective, cognitive, and behavioural (Hustad & Gearhart, 2004). The cognitive component deals with knowledge and beliefs. The affective component deals with experience, feelings and emotions. The behavioural component refers to the course of action an individual will take with regard to an issue.
CHAPTER 2.0

LITERATURE REVIEW

2.1 THEORETICAL FRAMEWORK

'Disability stems from unsuccessful interactions between a person and a particular setting' (Porter, 1994. pg 71).

The two models that have dominated the disability discourse are the medical and social models. The medical model views disabled people as 'lacking' or unable to play a 'full role in society' (Dewsbury et al, 2004). It has not considered the experience of disabled people as important, and the process of the disability experience in the broader sense is considered invalid. The medical model states that the issue of social access is not their responsibility. Disability was understood to be entirely a problem of the individual, with focus of intervention thus being solely on specific individuals (Schneider, 2006, pg 8). As a result of this belief, disabled people have been oppressed and marginalized by society for far too long. This oppression results in social, financial, environmental, educational and psychological disadvantages. This understanding of disability came under sharp criticism by people in the Disability Rights Movement globally, who felt that the medical model perspective was too narrow, individualistic and restrictive.

With the emergence of the social model of disability, changes within the disability field began to take place. The social model, as opposed to the medical model, believes that many of the restrictions imposed on disabled people are a product of a social environment, which fails to take account of certain people. It states that society has to take responsibility for the restrictions placed by society. As a result of environmental and social barriers, disabled people are excluded from the mainstream of society.

Finkelstein (2001), states that 'It is society that disables us and disabled people are an oppressed social group' (Finkelstein, 2001 in Thomas, 2004, pg 571). Disability is a form of social oppression on a par with other forms of oppression in our society associated with gender, race, class and sexuality (Thomas 2004, pg 581).
The social model makes a distinction between *impairment* and *disability*. *Impairment* is the functional limitation within the individual caused by physical, mental or sensory impairment. *Disability* is the loss or limitation of opportunities to take part in the normal life of the community on an equal level with others due to physical and social barriers (Barnes, 1991 in Tregaskis, 2002, pg 458). The social model holds that disability is the outcome of social barriers that restrict the activities of people with disabilities (Thomas, 2004). For disabled students within the higher education environment, this would mean the removal of ALL barriers that restrict access to an equitable and inclusive education. The study attempts to look at some of these barriers and find ways to remove these barriers.

The social model theory encourages disabled people to realize that they have certain rights as well as responsibilities within society and also forces society at large to acknowledge the basic human rights of disabled people. Its analysis started challenging disabled people's own internalised oppression by enabling them to make sense of their experience in a way which explains that it is not, after all, 'their own fault' that they may face discrimination and social exclusion (Tregaskis, 2002, pg 458). This responsibility is, instead, placed at the door of a normalising society that have rigidly developed and maintained structures that cater for those who most closely conform to socially prescribed ideal models of appearance and behaviour (Foucault, 1991 in Tregaskis, 2002). Society is starting to recognise that in order to reduce disability and to meet the needs and rights of disabled people, it is vital to alter the physical and social environment rather than expecting disabled people to fit the existing environment.

The social model theory has brought to the fore the fact that society has to take responsibility for the needs of disabled people, and thus has resulted in changes taking place in attitudes as well as legislation surrounding disability. Legislation has been introduced around employment, education and other aspects in respective of disabled people. The South African Disability Movement and the South African government approach disability from a social model perspective (Howell, 2005, pg vi).
The social model theory has had a profound and practical, as well as theoretical application; however, the critics of this model outline certain limitations. The model ignores the differences various disabled people experience as a consequence of gender, sexuality, race, culture and age. It does not look at how discrimination on the basis of disability interacts with other forms of discrimination. For e.g. disabled people from a particular race group did not have access to basic education, thus leading to them being disadvantaged in many aspects of their daily lives. This might not be the experience of disabled people living in the United Kingdom (where the social model originated).

One of the underpinnings of the social model theory is the distinction between 'impairment' and 'disability'. Shakespeare (2006) states that the social model theory downplays the role of impairment in the lives of disabled people and focuses on the claim that disability can be removed by social change. He claims that, even in the most accessible world, there will always be residual disadvantage attached to many impairments. Shakespeare (2006, pg 34), asserts that although impairment may not be sufficient cause of difficulties which disabled people face, but a necessary one. Social barriers restrict activity of disabled people but so does having impairment. Shakespeare and other disability theorists believe that it is time to move beyond the social model theory; however, there is still no consensus on how to move forward (Shakespeare, 2006).

It is important to remember that one of the ‘fathers’ of the social model, Michael Oliver, never claimed that it was designed as a holistic explanation for all aspects of disabled people’s exclusion, but was instead intended as a starting point for discussion (Tregaskis, 2002, pg 458). This has been adequately achieved. In South Africa, discussion has shifted from the medical model understanding of disability to now look at disability issues from a social model theory perspective.

Tertiary institutions have in the past, been on the periphery of including disabled people. However, with the new legislation and more awareness, this is now changing.
Tertiary institutions cannot exclude any student on the basis of his disability and has to provide the necessary support required by the student.

Educational institutions have realised that they have a responsibility to provide equitable education for all disabled people.

Nationally and internationally, tertiary institutions have begun to create access for disabled students within the university environment. Disabled students, however, experience many barriers within the University environment that still need to be addressed, and these institutions may also be struggling with the challenge of positioning themselves within the constraints of existing disability models.

2.2. DISABILITY

2.2.1. Definition

There are differing views within the disability field as to the definition of disability. For the purpose of this study, disability is defined as the loss or limitation of opportunity to take part in the ‘normal’ life of the community on an equal level with others due to physical and social barriers (Barnes 1991 in Tregaskis, 2004, pg 458).

2.2.2. International Classification Framework

The International Classification of Functioning, Disability and Health, known more commonly as ICF, provides a standard language and framework for the description of health and health-related states. ICF belongs to the World Health Organisation’s (WHO) family of international classifications (Towards a Common Language for Functioning, Disability and Health: ICF, The International Classification of Functioning, Disability and Health). In ICF, the term functioning refers to all body functions, activities and participations, while disability is an umbrella term for impairments, activity limitations and participation restrictions. ICF also lists environmental factors that interact with all these components. ICF can be used for a number of purposes; the most important is as a planning and policy tool for decision-makers.

The idea behind the ICF is to make it a tool for measuring functioning in society, no matter what the reason for one’s impairment.
It acknowledges that any individual can experience a disability and that it is not something that only happens to a minority of humanity. The ICF ‘mainstreams’ the experience of disability and recognizes it as a universal human experience. (Towards a Common Language for Functioning, Disability and Health: ICF, the International Classification of Functioning, Disability and Health)

2.2.3. The Standard Rules on Equalization of Opportunities for Persons with Disabilities

The Standard Rules on the Equalization of Opportunities for Persons with disabilities have been developed on the basis of the experience gained during the United Nations Decade of Disabled Persons (1983-1992). In all societies, there are obstacles that prevent persons with disabilities from exercising their rights and freedoms and from participating fully in the activities of societies. The purpose of the rules is to ensure that all persons with disabilities may exercise the same rights and obligations as others. It is the responsibility of the States to take appropriate action to remove the obstacles facing persons with disabilities.


The Standard Rules consists of 22 rules that summarises the message of the World Programme of Action. The 22 rules consist of four chapters:

- Preconditions for equal participation
- Target areas for equal participation
- Implementation measures
- Monitoring mechanism

The rules cover all aspects of life of persons with disabilities and if implemented by all States will lead to the equalization of opportunities for all persons with disabilities.

http://www.un.org/esa/socdev/enable/dissre00.htm

2.2.4. The American with Disabilities Act of 1990 (ADA)

The ADA is a law which prohibits discrimination of individual’s with disabilities. Its aim is to draw disabled persons into the mainstream of public life, to welcome them
into full participation in society so that they not live isolated dependent lives.
The new law was actually an extension of the Rehabilitation Act of 1973, which
prohibits all recipients of federal funds from discriminating in services and
employment on the basis of disability.
http://www.acm.org/sig_volunteer_info/conference_manual/5-7DIS.HTM

2.2.5. The White Paper 6 on Inclusive Education
The White Paper 6 on Inclusive Education defines inclusive education and training
as 'enabling education structures, systems and learning methodologies to meet the
needs of all learners' (Department of Education, 2001). The Integrated National
Disability Strategy (INDS) states that ‘All South Africans should have equal access to
education opportunities irrespective of the severity of the disability (ies)’. Respect for
diversity should thus be promoted. The INDS also states that all South Africans
should be provided with the resources needed to realize their highest potential.

2.2.6. The African Decade of Disabled Persons
This is a ten-year period (2000 – 2009), which is a ten year period, has been
declared by the African Union to look at mainstreaming disability issues across all
sectors of Governments within all development aid programmes to benefit Africa.

2.2.6.1. Goals and Objectives
The main goal of the Decade is to create awareness around the situation of people
with disabilities in the region and to look at solutions that are specific to the African
experience that will increase full participation, equality and empowerment. This will
be achieved through the building of effective partnerships among Decade
stakeholders, capacity buildings of disability organizations and creating awareness
through education programmes and improved regional communications.
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The legislation discussed above all attempt to mainstream disability and afford equal
opportunities to disabled people in all aspects of their lives.
2.3. BARRIERS TO ACCESS IN HIGHER EDUCATION

Historically, people with disabilities have been under-represented in higher education opportunities and consequently the workforce (Fielden, 2001). Access to higher education can enhance the employability and vocational success of individuals with disabilities (DeLoach, 1992 and Sampson, 1994 in Burgstahler, 1994, pg 1). While there has been an increase in the number of disabled students entering a tertiary institution, there is still a small number that pursue careers in Science and Engineering.

Although, there has been an overall increase in the number of students admitted into universities, many students experiencing disability in many campus communities and are viewed as different in ways that fail to affirm their diversity or to facilitate their inclusion (Porter, 1994). Access is a multi layered issue encompassing the physical, attitudinal and curricular (Shevlin, Kenny, McNeela, 2004, pg 17). Barriers to access for disabled students are still a crucial issue, even though progress has been made by tertiary institutions in attempting to meet the needs of disabled students. Many students with disabilities experience frustration with their postsecondary experiences stemming from negative attitudes from others, physical barriers on campus, a lack of appropriate services and programs and funding to improve those services and programs (Johnson, 2006, pg 3).

Issues of physical, attitudinal and curricular access play an important role in disabled students completing their degrees. Even though legislation has been introduced to provide equal access to education for disabled students, students at tertiary institutions report instances of inaccessibility. Lancaster et al, reported that although small physical modifications were made as needed to facilities e.g. raising a desk or table to fit a wheelchair, students reported awkward access to many other areas of the built environment (Lancaster et al, 2001, pg 9). Ironically, faculty at the same institutions claim that their campus is fully accessible and in compliance with all relevant legislation.
Often, the accommodation provided does not adequately meet the needs of disabled students. While the facilities were in compliance with the relevant legislation, students with limited upper body strength or mobility would have difficulty navigating the doors, narrow walkways and tight turns (Lancaster et al, 2001, pg 9). One of the many negative consequences of having a chronic physical health problem is decreased physical mobility and difficulties in executing everyday activities. It is equally problematic for disabled students to navigate a postsecondary campus that is inaccessible (Johnson, 2006, pg 5).

Issues around the achievements of students with disabilities in higher education have only recently been reported in the literature. Several experts have noted that the achievement of the students is influenced by faculty attitudes and the willingness to provide accommodation for students with disabilities (Leyser et al, 1998). This was supported by Rao (2004), who stated that faculty attitude towards students with disabilities in tertiary institutions are one of the most important contributors to the success of students enrolled in these institutions.

Letroncois (1994) in Rao (2004) described attitude as prevailing and consistent tendency to react in a certain way. Wuzinski (1991) also in Rao (1994) states that attitude is typically denoting a psychological state that predisposes a person to action (Rao, 2004, pg 2). Collins (2000) in Shevin et al, (2004, pg 18) reported that students with disabilities identified attitudinal issues as the most significant barrier to progress, whereas lecturers identified lack of physical access and assistive technology as the greatest obstacles. The recent advancement in adaptive technology has provided the required technical support that disabled students require to achieve their full potential within any faculty at the University.

Undergraduates with disabilities, at the University of Minnesota's Institute of Technology, who chose Science and Engineering majors found 'hostile attitudes of science, mathematics and engineering faculty' to be their most serious problem (Women, Minorities, and Persons with Disabilities in Science and Engineering, 1996).
Ten students with disabilities at Midwestern University in the US were interviewed to investigate students’ perceptions of faculty members’ attitudes. The study found that often faculty members were willing to make instructional accommodation, but the students encountered a less than positive classroom climate (Beilke, 1999, pg 1).

Academics very often have a negative attitude to providing the required accommodation to disabled students. However, there are also a large number of academics that are very willing to provide the required support. Researchers who explored faculty attitudes and willingness to make accommodation found that attitudes were related to a number of selected demographic variables. These include gender information and academic field (Leyser et al, 1998). The authors reported that female faculty members expressed a more positive attitude than males. This was also reported in a study done by Upton et al, (2006) that looked at non-disabled students’ attitudes towards disabled students, which is discussed later on in this study (Upton et al, 2006).

It would seem that institutions support the social theory model. However, in practice the medical model is still ingrained. This could be attributed to attitudes towards disabled people and knowledge of disabled people. Institutional commitment is confined to providing resources (in effect add-ons), that do not include people with disabilities as visible and powerful members of society within the institution itself (Shevlin et al, 2004).

Disabled people do not want special treatment but want the same academic demands to be placed on them that are placed on other students. Porter (1994) stated that it is important to resolve who has responsibility for disabled student’s education. “How the issues are resolved depends on how the meaning of disability is defined. At least two viewpoints can frame this construction. The conventional one, with limited educational relevance, sees a disabled student. The alternative one, with greater educational utility, sees a student with a disability.
The type of support provided to students with disabilities very often depends on the viewpoint held by an institution and faculty concerned.

Some faculty question the nature of reasonable accommodation and doubt their ability to effectively teach students with disabilities, or question whether the student really needs the accommodation at all (Johnson, 2006, pg 4).

Very often the accommodation process involves staff deciding the "appropriate" accommodation for the student. (Lancaster et al, 2001). This minimizes the role of the disabled student in deciding the accommodation that best meets his/her needs. This type of intervention on the path of the academics is still operating from a medical model principle. Most faculty members have little knowledge of the characteristics and needs of students with disabilities (Kraska, 2003, pg 11).

Findings from the study carried out by Leyser et al (1998) indicated that many academics identified limited knowledge and skills for making accommodations for students with disabilities, as well as unfamiliarity with disability laws and university resources as factors influencing their negative attitudes. The academics also identified a major need for training and development activities for the faculty as means of overcoming the negative attitudes. Recent studies have shown that college and universities will provide reasonable accommodation when it comes to ensuring the physical accessibility of buildings, however, there is also evidence that faculty appear uninformed about the needs of students and generally lacking in understanding of what it meant to have a disability. (Greenbaum, Graham & Scales, 1995 in Beilke, 1999)

Data gathered from a survey carried out with 852 non-disabled university students in the United Sates of America were analysed to determine their reported general disability attitudes and their view of the provision of educational accommodation to their peers with selected disabilities. The findings from this study are important as it is vital to understand attitudes of non-disabled students related to disability as it will have an impact in the classroom and may serve to focus educators' attention on these emerging issues. (Upton et al, 2006). This would also impact on how non-disabled students view accommodation provided to disabled students.
The findings indicate that females consistently reported more positive general and specific disability attitudes than males (Upton et al, 2006, pg 10). This could be related to the traditional role of females being the carers and nurturers. This corresponds with the findings of another study discussed earlier.

Results also indicate that participants were in favour of providing educational accommodation to those with more severe and obtrusive physical disabilities rather than to students with disabilities that were not ‘visible’ (Upton et al, 2006, pg 11). This response would prompt the question ‘what do people considered as a real disability’? This type of a narrow understanding of disability and the need for accommodation emphasises the need for disability education programs with faculty and students across all levels of campus life. Upton et al (2006) recommend that comprehensive disability education throughout the post secondary educational environment is needed (Upton et al, 2006, pg 13).

Attitudes towards people with disabilities are related to the amount of direct contact individuals have had with disabled people (Rao, 2004, pg 3). Shevlin et al (2004) stated that both in participants’ talks and in the literature, institutional and professional attitudes towards and awareness of disabilities emerged as the key facts to blocking students with disabilities from achieving their ambitions and performing to their best capacity. Many staff have a positive attitude towards working with students with disabilities but insufficient knowledge or experience to draw on. In situations where lecturers and learners differ on the factors that might influence the success of learners, there is considerable potential for misunderstanding and conflict (Fraser & Killen, 2005, pg 28). They need advice and information about how best to support students (Hall & Tinklin, 1998) and increase the chance of success.

Data from a study carried out by Leyser et al (1998) found that personal contact with individuals with disabilities was associated with increased knowledge of teaching, accommodations, available services and of disability legislation, as well as with willingness to spend more time on making needed adaptations. An analysis of a few case studies of visually impaired and/or blind students studying at tertiary institutions
revealed that they were able to overcome barriers and managed their academic studies fairly efficiently, with the appropriate support and intervention (Shumugam, 2002). Such support and adaptations can be extended to the Science Faculty e.g. adaptations of laboratories. Often students with mobility or orthopaedic disabilities only require a few adjustments of furniture or equipment in the classroom to accommodate their needs (Fielden, 2001). This often does not mean a huge expense on the path of the tertiary institution.

Along with the absence of comprehensive support programs, lack of student preparedness for college, negative attitudes of faculty are cited as primary reasons students with disability fail at postsecondary level (Deshler; Ellis; & Lenz, 1996 in Beilke, 1999). Faculties that had more information on disability issues had a more positive attitude than those that had less information and certain faculties e.g. education appeared to be more positive than faculty in business and social science (Leyser et al 1998).

It was also found that seasoned academics often regressed to their traditional ways of teaching and this made disabled students to believe that these lecturers would never learn to ensure that disabled students receive what was transmitted to them (Borland & James (1999) in Shevlin et al (2004). Several respondents indicate that a small number of staff in their institutions have an elitist attitude towards higher education. They tend to be the older members of staff. They do not see why they should admit students to higher education that cannot meet the same criteria as everyone else (Hall, Tinklin, 1998, pgs 7 & 8). Shevlin et al, (2004) attributed these difficulties to the ideological conflict between the social and medical models of disability within institutions.

One of the other problems experienced by disabled students is that certain types of disabilities have to be proven. Students that have disabilities that are not ‘visible’ are placed in a different situation, in that their needs are not appropriately responded to (e.g. dyslexia, rheumatoid arthritis). Students experience the demands of academic requirements as well as their disability.
Leyser et al (1998) reported that faculty members express a willingness to provide various teaching accommodations but not to the extent of what faculty perceived as lowering certain course standards. Further studies indicate that students feel that the instructors’ level of willingness to make accommodation was in the ‘good’ or ‘excellent’ range, however, they would be less supportive of certain accommodations e.g. allowing misspelling and allowing students to give oral tape recorded presentations rather than written presentations (Leyser et al, 1998).

A study was carried out at a Northwestern University, where thirty six students’ with disabilities were asked to describe the basis of their academic success or failure. The findings indicated that students found that accepting one’s disability, social support and campus climate such as family support, interaction with other students and faculty and university support programmes were considered to have an effect on academic success. Students focused on the importance of a sense of integration into an academic community, or a sense of belonging (Nelson, et al, 2006). Holmberg (2001) in Fraser & Killen (2005) suggests that students who have a strong personal connection with their learning institution are likely to be much more motivated and will study more effectively (Fraser & Killen, 2005, pg 37). Students indicated that developing a professional relationship, being encouraged by, and/or receiving feedback and information from faculty were important to their academic success. This appeared to be more significant to students than actual help from faculty regarding academic concerns (Nelson, et al, 2006).

Academics need to be aware of the exact nature of the students’ disability and the support that is required. Tincani (2005) stated that there are certain strategies that lecturers need to implement that would increase academic success of disabled students viz. accessible syllabus, study objectives, study guides, frequent tests, remedial activities, guided notes, response cards, peer tutoring, fluency building and feedback. The accommodations that are provided for the disabled students are not intended to give the students an advantage but to bring them on par with non-disabled students (Hampton & Gosden, 2004).
It is important to look at disability, not residing with the person, but instead arising from interactions between persons and their environments. Porter (1994) explains that if we look at disability as the outcome of interactions between persons and their environment, then ‘disability becomes interaction-specific rather than person-specific and exists when the nature of the educational task or instructional environment (including teaching and assessment strategies) fails to support adequately the learning characteristics of the student’ (Porter, 1994).

The question that needs to be addressed is ‘why should disabled students continue to accommodate themselves to inflexible teaching and assessment methods’ (Edwards, 2006, pg 1)?

The White Paper 6 states that equity for disabled students means full participation in the process of teaching and learning. The curriculum is thus a substantial element in their struggle for equity of access (Howell, 2005, pg 45).

The curriculum at most tertiary institutions is still not flexible enough to meet the needs of disabled students. Teaching in higher education still remains a largely individualistic process (Howell, 2005). Edwards (2006) states that in Australian universities, the dominant approach to assisting students with disabilities to cope with the demand of their academic course has been the ‘support model’ approach.

The ‘support model’ is the provision of services and accommodations to individual students to overcome the particular problems they face in meeting their academic needs (Edwards, 2006, pg 2). This is also still very evident in South African universities as well. In a survey carried out at three higher education institutions in South Africa regarding the academic support needs of disabled students, students indicate that the help required is not with regard to their impairments, but the removal of barriers to learning and development by reconstruction of the learning environment (Crous, 2004, pg 246).

Howell (2006) asserts that often the problems experienced by disabled students are ascribed to the lack of necessary assistive devices or technical equipment and limited attention is paid to the teaching and learning process itself and the extent to which it may marginalise or exclude some learners including disabled learners (Howell, 2006 pg 168). Often lecturers are not aware of the needs of disabled students and the best method to meet these needs.
The recent advancement in adaptive technology has provided the required technical support that disabled students required to achieve their full potential within any faculty at the university; however, this has to be part of a more accessible curriculum that creates equity for disabled students and will guarantee success of disabled students within a higher education institution.

Students who have impairment, but work in an environment that is appropriately structured, will not experience any educational difficulty. However, students that do not have an impairment but work in an environment that is inadequately structured will definitely experience educational difficulties. An adequate setting as well as teaching and assessment strategies is vital in the access and retention of students with or without a disability.

Faculties in general and most academics in particular are supportive of the integration of disabled students. However, while postsecondary institutions maybe willing to make physical accommodations for students with disabilities; this does not automatically translate into positive attitudes on the part of faculty members (Beilke, 1999). The challenge for tertiary institutions is to look at how best to accommodate disabled students that will encourage recruitment, retention and throughput of disabled students. The importance of understanding disability and issues related to disability is vital in order to foster a positive attitude to meeting the needs of disabled students. In the discussion above, we have seen how negative attitudes towards disabled students can be a barrier to providing an equitable and inclusive education for disabled students.

One of the other points that has been emphasised in the above literature is the need for disability education training at all levels at a tertiary institution to create an understanding of the accommodation needs of disabled students. Face to face contact between academics and disabled students is central if we want to do away with negative stereotypes and myths regarding disability and the abilities of disabled people. The key to ensuring 'Universal Access' is looking beyond just physical barriers but also focusing on a flexible curriculum.
It has been emphasised that this should be on the agenda of all academic planning at the initial planning stage to ensure the success of disabled students.

A study was carried out by Izzo et al (2006) in the United States of America that looked at ‘promising practice’ that are implemented at 21 institutions that receive a grant to provide support for faculty and administrators in order that a quality education is provided to disabled students. (Izzo et al, 2006). Some of the strategies implemented include academics incorporating a statement in their syllabi stating their willingness to provide reasonable accommodation to disabled students. Some institutions work with advisory committees that discuss issues regarding the quality of education for disabled students. These committees include disabled students, professionals and faculty members.

On-site training has also been mentioned as a promising practice that assists in improving the quality of education for disabled students. The training will also include technology based training. Students and faculty are constantly exposed to advancing technology and it is important to be aware of what is available for disabled students. These disability education programs have been discussed as vital in the above literature. Distance education has been cited as a promising practice and is also becoming an option for many students.

Faculty are using the web as an option to provide material to students. Many of the institution are ensuring that the web sites are that utilised by students are accessible to disabled students as well (Izzo, 2006).

In order to change negative attitudes and stereotypes and for tertiary institutions to fully operate from a social model principle, mechanisms have to be put into place. It is imperative to look at ‘best practice’ methods implemented by other tertiary institutions to guide us in providing an education that will result in the complete integration of disabled students without any discrimination, in all faculties within tertiary institutions.
CHAPTER 3.0

METHODOLOGY

3.1 RESEARCH DESIGN

The researcher adopted a qualitative research methodology, specifically ethnographic design, in obtaining data. The ‘Ethnographic methods are means of tapping local points of view, household and communities “funds of knowledge”, a means of identifying significant categories of human experience up close and personal’ (Genzuk, 2005). The approach to data collection is ‘unstructured’, in the sense that it does not involve following a detailed plan set up in the beginning, nor are the categories used for what people say and do pre-given or fixed. This does not mean that the research is unsystematic, but simply that, initially, the data are collected in as raw a form and as wide as front as feasible. The focus is usually a small number of cases, perhaps a single setting or a group of people of relatively small size (Hammersley, 1998, in Papaikonomou & Nieuwoudt, 2004).

Ethnography involves a continuous attempt to place specific encounters, events, and understandings into a fuller, more meaningful context. It is not simply the production of new data, but rather the way in which the data is transformed into a written or visual form (Tedlock, in Denzin, et al, 2003). A qualitative treatment describes what processes are occurring and details differences in the character of these processes over time (Breakwell et al, 1995). The qualitative analysis method using interviews was most suitable for this study as it has the flexibility and breadth to obtain the necessary information.

3.2. RESEARCH SETTING

The research was undertaken with the academics of the Civil Engineering Programme within the Science Faculty at the University of Kwa-Zulu Natal. The Engineering School is located across three campuses of the University viz. Pietermaritzburg, Westville and Howard College.
There are five Engineering programmes viz. Mechanical, Civil, Bioresercches Engineering and Environmental Hydrology, Electrical, Electronic and Computer and Chemical Engineering. For the purpose of this study, the Civil Engineering Programme has been selected because the researcher observed that there are not many physically disabled people within this profession.

3.3. SAMPLE
The purposive sampling method has been used. The full-time and part-time lecturers in the Civil Engineering Programme were targeted and invited to take part in the study. Lecturers who have spent less than six months working in the department were excluded in order to ensure that those who were interviewed have acquired some experience in working in the department. Initially, there were thirteen academics within the department, however, since the beginning of 2006 there were only nine and these were targeted to be part of the study. However, only five responded and agreed to be interviewed. The Civil Engineering Programme is based at the Howard College campus of the University of KwaZulu Natal.

3.4. DATA COLLECTION
After obtaining informed consent, each participant was interviewed by the researcher in his/her office, or in an environment acceptable to both the researcher and the participant and each interview lasted for about an hour. At each interview, the following information was sort:

a) Age of the participant  
b) Gender of the participant  
c) Years of teaching experience in the department  
d) Years of qualification as a ‘Civil’ Engineer

In addition, the following leading statements were be posed to each participant –

a) Describe what you think about when you hear the words “disabled person”.  
b) Describe what you know about disability and disability issues.  
c) Describe any past experience with an individual with disability.
d) How would you feel if a student with disability is offered admission into your programme?

e) What are some of the challenges, if any, you foresee that the student and lecturer might experience?

f) If you had become disabled later in life – after you had chosen this career – do you think this is the field you would have chosen: what are some of the practical challenges?

g) What would be the best method of creating awareness regarding disability?

The researcher used audiotapes to record the interviews. The participants were informed of the reason to tape the discussion and confidentiality was ensured. The audiotapes were later transcribed. A pilot study was carried out with one participant from another Engineering programme.

3.5. DATA ANALYSIS

The audio tapes were transcribed. Specific themes were identified and categorized according to the relevance of the research topic. These themes taken back to the participants for the purpose of “member check” to ensure validity of the data.

The researcher also had a collection of field notes, interviews which together allowed for ‘triangulation’ in order to test the trustworthiness of the data. (Hall, 2005).

3.6. ETHICAL CONSIDERATION

Ethical approval was obtained from the Ethics Committee of the University of Cape Town. The Dean of the School of Engineering in UKZN also gave approval for the study. A copy of the research proposal was forwarded to the UCT Research Ethics Committee for approval. An information sheet was provided to the participant, which provided information regarding the aims of the study (see appendix 1).
CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. INTRODUCTION:
The data was obtained from interviews held with the academics in the Civil Engineering Programme within the Faculty of Science at the University of KwaZulu-Natal. The length of the interview was an hour. The outcome of the in-depth interviews with the participants in response to each of the leading questions, are presented and discussed in this chapter.

4.2. DESCRIPTION OF THE PARTICIPANTS
Five academics were interviewed. Two females and three males. Two are professors; two are senior lecturers and one lecturer. The ages of the participants ranged from 40 – 60 years. Four of the academics have their PhD’s and all have over ten years experience in the Civil Engineering field. Two of the academics have between twenty to thirty years experience in the field. All the academics have between three and eighteen years experience in lecturing at University of KwaZulu-Natal. The interviews of the participants took place in their respective offices.

4.3. DESCRIBE WHAT YOU THINK ABOUT WHEN YOU HEAR THE WORDS ‘DISABLED’ PERSON’.
All respondents mentioned access and mobility when they hear the words “disabled person.” One person used the phrase “difficulty to cope with the environment”. One person spoke about “physical challenges, which generally do not affect their capabilities”.

“Physically disabled people- (you) think in terms of mobility. Particularly in engineering, very few (disabled) people”. “[In Civil Engineering) everything involves typically a lot of mobility, especially if you working in contracting”. “[For people with disability, it would be) easier to be successful in consulting”. “[Disabled people will find it) difficult to cope with the environment”.

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The automatic response focused on physical mobility; however, disability does not only mean looking at physical access. Issues of disability and access go beyond just physical access. In order for there to be full inclusion and equity of disabled people in society in general and at tertiary institutions in particular, there needs to be an understanding and awareness that physical access, negative attitudes and curriculum issues are barriers to access.

One of the respondents stated that (“A disabled person is) someone who is not able to do what others can do- people who have special needs”. One respondent stated that a disabled person is “someone who cannot perform what a ‘normal’ person can”. However, he went on to say that ‘normal is relative’. “From a disabled person’s point of view, they might not consider what I consider to be normal”. “If a student applies to study Civil Engineering and the lecturer says he/she cannot study because ‘you are not normal’ can instil an inferiority complex about who is normal and not normal”.

The issue of ‘who is normal’ is quite contentious. The majority within society often decides who or what is normal and anything that is different is considered ‘not normal’ or ‘abnormal’. Disabled people, because of their difference, are considered ‘not normal’ by society and as a result have been oppressed and marginalised. Focult (1991) in Tregaskis, (2002), talks about normalising society that has developed and maintained structures that cater for only those that most closely conform to socially prescribed models of appearance and behaviour. This has been entrenched by the medical model way of thinking. However, the social model way of thinking challenges this concept and has place the responsibility at society’s door to create an environment that caters for all people. It is definitely normal for a society to be made up of diverse individuals. In reality, a society that excludes certain individuals is not ‘normal’ because it does not reflect its diversity (Crous, 2004, pg 23). It is notable that the respondent above goes on to question what is normal and from whose point of view we talk about ‘normality’. This kind of debate is healthy as it is interrogating the kinds of attitudes that have dominated disability for many years.
The belief that disabled people have special needs and cannot do what others (non-disabled) can do still exists among many people. This kind of understanding of the needs and abilities of disabled people is clearly a stumbling block in providing effective support to disabled students. Some academics have this impression that they may have to carry an extra burden, extra workloads if disabled students are accepted into their departments since they are ‘not able to do what others can do.’ Stereotyping like this is still very prevalent throughout society. While stereotypes of all kinds can be destructive, stereotypes within the College environment may undermine the scholastic performance of the student.’

(http://www.butler.edu/disability/content/facultyguide.html)

This kind of thinking also reinforces the medical model, which looks at the individual disabled person as having the ‘problem’ rather than looking at this from a social model theory perspective, which looks at the support and accommodation that the institution needs to provide in order for the disabled person to be able to do what others can do.

One participant stated that the “disability does not affect the person’s ability”. This is an important observation as it looks beyond and focuses rather on the ability of the person – for example in an educational setting. This links up with what Porter (1994) stated that we need to look at disability not residing with the person but arising from interactions between the person and their environment. So, if the student meets the academic requirements of the programme, then we need to look at what support the disabled student requires to being successful.

Only one respondent made the distinction between ‘disability’ and ‘impairment’. The distinction between the two was discussed with the respondent. Society disables people as a result of physical and social barriers which limit opportunities to take part in the normal life of the community on an equal level with others. One of the greatest difficulties facing people with disabilities is created when the capacity of disabled
people to be educated and function in society is evaluated by limitations of their
disabilities, rather than their broad range of interests and abilities.
(http://66.102.9.104/search?q=cache:BJ3AOYrTLKQJ.wwm.mmu.ac.uk/academic/studserv/1...2005)

One respondent remarked that a 'disabled person is an embarrassment on the part
of non-disabled students.' This response was very insightful as very often non-
disabled people do not want to interact with disabled people as they themselves feel
that if do they are acknowledging their own vulnerability. Their defence mechanisms
come into play – they would rather create this impression that disabled people are
the 'problem' and an embarrassment and that they (the non-disabled) are not a
problem. Non-disabled people do not like to acknowledge their vulnerability.

Projection is one way non-disabled people deal with disability. It offers the person
one key tool for understanding the psychic mechanisms of prejudice against disabled
people. Disabled people are viewed as threatening or pitiful and who are avoided
because they serve as an uncomfortable reminder to non-disabled people of certain
aspects of themselves which they don't want to acknowledge (Marks, 1999).

Projection is the psychic process by which individuals disown or disallow subjectively
unmanageable feelings by ascribing or attacking these and others (Watermeyer,
2000, pg 32). It is via this mechanism that disabled people "carry" or own the
unwanted or intolerable vulnerability or dependency of others (Watermeyer, 2000).

Projection is used as a defence and an attempt to preserve the identity of the self
(Tregaskis, 2002). This use of negative cultural images of disabled people may also
serve to make non-disabled people feel good about themselves. Shakespeare and
Morris in Tregaskis, 2002 conclude that disabled people are the 'other' because they
represent victory of body over mind, nature over culture and death over life and are
therefore the enemy (Tregaskis, 2002, pg 465)
According to Lifchez & Winslow, authors of ‘Design for Independent Living: The Environment & Physically Disabled’, society isolates those that depict what is unfavourable in life, and this, segregates individuals with impairment (Lifchez & Winslow, 1979, in Yeun, 2006, pg 2). As a result of this, there is discrimination of people with disabilities, and some people even ignore the topic of physical disabilities.

Pam Cuff, an architect, designer and pioneering the movement of accessibility by design in Canada, stated that ‘People were defensive and seemed almost embarrassed that this was an issue


4.4. DESCRIBE WHAT YOU KNOW ABOUT DISABILITY ISSUES.

The issue of access was again discussed. Three people discussed in-depth the accessibility of the building housing the Civil Engineering Programme.

“One of the problems we have is access, the laboratories are not accessible and some of the features were fixed and difficult to change.”

“Civil Engineering not accessible at present”. Another problem – we’ve got an upstairs laboratory – there is no access to the lab”.

However, the respondent went on to say that it is not impossible to make changes to create access to the lab.

It is important for disabled students to be able to work independently within a laboratory (whenever they can), operate a microscope, not only to foster activity-based learning but also to perform independent graduate research or work independently in their chosen career in the science field.

(http://www.vet.purdue.edu/cpr/bsd/AccessScope/background.html)

Providing an accessible environment for disabled students is often restricted by architectural and budgetary constraints (Johnson, 2006). Most tertiary institutions include the statement that reasonable accommodation will be provided ‘within budgetary constraints’ or if it does not cause ‘unjustifiable hardship’. This is often used as a loophole not to create the required access because of the cost involved
and this often excludes disabled students from tertiary institutions and from the Science and Engineering field. Studies suggest that disabled students often experience physical barriers in the postsecondary environment which remains unresolved by institutions (Johnston, 2006).

Singh (2003) in Johnson (2006) found that only 7% of institutions surveyed provide full accessibility to students with orthopeadic disabilities (Johnson, 2006, pg 5). Although some designs make accessibility impossible for people with disabilities, there are several designs that accommodate disabled people but at the same time are inconvenient to others, therefore, designers have invented the idea of ‘Universal Design’, which holds that everything form buildings to city buses should be designed for the use of a diverse range of people (Yeun, 2006).

There was discussion as to how the building can be made accessible. The building can be made accessible even though it might be expensive.

“I am looking forward to improving that. Because of the merger we are doing some alterations, we are putting things like ramps and accessibility in terms of toilets.”

One participant hoped that this will increase the number of disabled students wanting to study Civil Engineering.

“I hope we do get people. At the moment it’s impossible.”

What is emerging from this study is that all the academics are prepared to make whatever changes are necessary to make the programme accessible to students with physical disabilities. Changes are already taking place to make the building physically accessible to disabled students. Both the male and female respondents expressed a positive attitude to accepting physically disabled students into the Programme, acknowledging that certain changes still need to take place. This is in contrast to the study carried out by Leyser et al, (1998) that stated that female faculty members expressed a more positive attitude than males and another study by Upton et al, (2006) that also indicated that female non-disabled students displayed a more positive disability attitude than males.
The participants comprised of younger as well as seasoned academics. Here again, there were no difference in the willingness and positive attitudes to include physically disabled students into the Programme. This is also in contrast to results from a study by Shevlin et al, (2004) which found that seasoned academics often regressed to their traditional ways of teaching. Neither was there an indication of elitist attitude by older staff members as found in a study by Hall & Tinklin, (1998).

Another method of making the Civil Engineering Programme more accessible to all students is through distance learning.

"The other thing that I am doing is starting an initiative involving distant learning activities. I think that could also open up all sorts of opportunities for people who are mobility challenged."

Students can attend a class if they have a broad band connection. They will be able to interact with the lecturers.

The researcher raised the concern that this might disadvantage the students. "I don't think so; I see that as an amazing opportunity."

This view is in agreement with that of Taylor (2000) which discussed distance learning as one of the 'promising practices' implemented at some Universities and it appears that the use of distance education will continue to grow among individuals with disabilities.

One respondent also discussed the site work involved and difficulties that may be experienced by physically disabled students – especially students using wheelchairs. 

Students are expected to do a certain amount of the site work in order to register with the Council Engineers –this is "Part of the post university training for registration with a professional association. There is not much site work involved during their studies - site visits are organised. The challenges of site work will come into play if the individual involved wants to choose the stream, viz. consultancy does not involve that much site/ field work. Disabled students have a choice as to which stream they would like to get into wants they are qualified."
What is emerging is that physically disabled students have a choice of which stream to follow within the broader Civil Engineering field. This choice will be made by the students in consultation with academics – a choice that best meets the students’ needs.

One lecturer, who has had experience with a disabled family member and who worked with "Being a mother with three children, (I also encounter physical barriers) pushing a pram." At shopping centres, people that don’t need to use the lifts and leave parents with prams and people using wheelchairs waiting.
If the principles of ‘Universal Design’ are implemented then the diverse needs of disabled people are met.

The other participants also spoke about physical barriers when discussing issues of disability. Although attitudinal and physical barriers are major areas to be considered, issues of disability must be looked at from a broader perspective. Again we see that people still have a narrow understanding of disability issues, focusing more on the physical barriers. The reason for this understanding may be that one of the major barriers facing physically disabled students accessing entry fields such as the Civil Engineering field are the physical barriers. However, a general understanding of issues of disability will include education, employment, training and advocacy, sexuality etc.

4.5. DESCRIBE ANY PAST EXPERIENCE WITH AN INDIVIDUAL WITH A DISABILITY
All the participants responded that they had some past experience with an individual with a disability, but most stated ‘Not much’. A friend, but not really that much.’

Two had very little experience, one had personal experience because of a family member with a disability and two participants had a friend who was disabled.
One respondent, who had a disabled friend stated that the term 'disabled' "is just a label" and that "we need to facilitate or put up the means in which those people can perform. And we need to do what we are supposed to (do to) assist the disabled person." He went on to say that it does not matter to him that a person is disabled; he takes the person for who he is. "The disability is not an issue. I focused more on the support that needs to be provided to the disabled person."

This response is quite insightful as it indicates that the respondent will focus on the ability of the disabled person and will address the support that the student requires. The need for the accommodation will not be questioned. One of the greatest challenges facing disabled people is when their capacity to be educated and function is society is purely evaluated by the limitation imposed by their impairments. Disabled people are not defined by their abilities but by their impairment. Academics often question whether the student requires the accommodation (Johnson, 2006) and further, staff will decide what is the 'appropriate' accommodation for the student (Lancaster et al, 2001). The appropriate accommodation will lead to the success of the student. It is important to remember that disabled students do not want an advantage over non-disabled students. They do want the relevant support that will level the plains and allow them to compete on the same level as non-disabled students (Lancaster et al, 2001). Accommodation that should be provided in such a way that the rigor of the academic program is not compromised or without giving the students an unfair advantage.

This question was asked to gain an insight to the understanding that the respondents have about disability. Often people (non-disabled) have a clearer understanding of disability issues when they have a personal experience with a disabled person. This was clearly indicated in the previous question where although all respondents had some understanding of disability issues, the respondents who had personal experience with a disabled family member, had a more in depth understanding of issues surrounding disability. Having an in depth knowledge of disability issues and factors affecting disabled people may also have an impact on the support that should be provided to disabled students.
Many academics are not aware of the needs of disabled students. As mentioned earlier in the discussion by Rao (2004), attitudes towards people with disabilities is related to the amount of direct contact individuals have had with disabled people. Ten studies reviewed included experience as a variable in their study. This category of experience looked at previous or current experience teaching students with disabilities, and/or previous contact with people with disabilities in terms of having a relative, close friend, and/or colleague with disabilities. Six studies, reported a significantly more positive attitude of the experienced faculty. The others failed to find a significant effect of experience on faculty attitude (Rao, 2004).

4.6. HOW WOULD YOU FEEL IF A STUDENT WITH A DISABILITY IS OFFERED ADMISSION INTO YOUR PROGRAMME?

All the participants stated that they did not see it as problem if someone with a physical disability was admitted to the programme.

"Would not affect me at all, be just fine. Why should it?"

"Happy."

"Would not have a problem with it. But it would be important to understand the problems we would face."

'I would do whatever, if the person is passionate about doing civil engineering, (to accommodate the person).'

"If we admit – we should provide facilities"

All participants responded that it is important to understand the challenges that will be faced – in particular physical access. Since the present building where the Civil Engineering Programme is housed is not accessible, the physical access challenge is a very real one. One participant spoke about a disabled person that he worked with – the person used crutches. This individual was a qualified civil engineer. However, he never worked at a construction site. This was many years ago when site work was not a compulsory aspect of the Civil Engineering degree. All participants were open to the idea of accepting students with physical disabilities into the programme and discussed ways in which the structure of the building could be altered. As discussed earlier, the building is under renovation and access is a priority.
The adaptation of the aspect of the field/site work was also discussed by four of the participants. One participant asks her students, as part of their projects that focus on structure, asks her students to ensure that the building is accessible. The aspect of site work for Civil engineering students is an important one to consider.

Although the number of civil engineers with disabilities is small, there are many examples of successful geoscientists, from field geologists, geologists with disabilities to biochemists and marine biologists who are blind. However, persons with disabilities such as visual and mobility impairment may face a number of challenges in these disciplines because of the emphasis on field research and visualizations at the undergraduate level. Of equal importance to the physical challenges are the attitudinal barriers, which are likely to play major role when students are choosing a field of study (Locke, 2006).

As discussed, participants stated that changes can be made to the structure of the building, labs. The amount and type of site work can be negotiated with the relevant lecturers who will ensure that the disabled students receive the necessary experience and that the academic quality is not compromised. Although field/site work poses challenges for people with disabilities, hands-on educational activities are critical for greater learning experiences. Physical access to classrooms and laboratories is important, but active participation of students with disabilities is paramount for learning. Interaction between students with disabilities, their teacher, classmates as well as the course material and laboratory equipment is vital for the student to obtain a comprehensive educational experience (Salend, 1998, Mastropieri et al, 1999).

http://www.vet.purdue.edu/cpr/bsd/AccessScope/background.html

One respondent mentioned the need to look at academic challenges “what are the challenges which they face on a daily basis”. “For us to be able to compare what we have here and what facilities are we suppose to put in place, before we can go that way”. Understanding the challenges of the Civil Engineering Programme is vital and these need to be discussed with the disabled student at the onset.
There is progress in that the building is in the process of being made accessible, which is proactive. However, if we look at the principle of 'Universal Access', then we need to look at creating an environment that is accessible to all.

The manner in which disabled students are taught at present is by meeting the individual needs of students. While this is important, as different students have specific support requirements, it is also important that in their planning, tertiary institutions are aware of their diverse population of students and create an environment that will meet the needs of this diverse population. The teaching and learning environment should be accessible to all.

Rather than being an 'add-on', it is imperative that adequate service provision for disable students be viewed fully as the policy and budgetary responsibility of those structures which manage the entire curricular base (Howell, 2006, pg 175).

One of the key areas of development in the draft strategic plan of the University of KwaZulu-Natal is to establish an institution of choice that values students in all their diversity and has a student-centred ethos, providing students with curricular, teachers, infrastructure and support services designed around their need and producing well-educated, competent, sought-after graduates (UKZN Draft Strategic Plan, 2007-2017, pg 12). Hopefully, disabled students are part of this diverse student population. In order to meet the diverse needs of all students, a leaning and teaching environment should be created that will ensure the success of disabled students. The support that disabled students require is not with regard to their impairments as such, but the removal of barriers to learning and development by reconstruction of the learning environment (Crous, 2004).

The academics interviewed are all keen and have displayed a positive attitude towards creating an accessible environment for physically disabled students within the Civil Engineering Programme, however, their understanding of access should be broader and planning should focus not only on physical access but should question whether their teaching and assessment methods meet the needs of disabled students.
Howell (2006) stresses that the ways of thinking about teaching and learning – from methods and materials to assessment instruments and physical environments – which demand examination (Howell, 2006, pg 176). Academics need to be prepared and have a positive inclination to relook at the teaching environment and make changes and adjustments where necessary. Attitudes of faculty is a fundamental vital element in the success or failure of students with a disability (Johnson, 2006, pg 4)

4.7. WHAT ARE SOME OF THE CHALLENGES, IF ANY; DO YOU FOR SEE THAT BOTH THE DISABLED STUDENT AND THE LECTURER MIGHT EXPERIENCE WITHIN THIS PROGRAMME?

All the participants discussed the challenges of site work, mentioned in earlier discussions. All students have to complete eleven weeks of site work to complete their degree. One participant stated that the site work mentioned by other participants is "not site work per say, you have to do vocational work as a requirement of the degree but you don't have to do it on site, you can do it at a consultants office."

"There are basically two broad areas of activity-the contractual side and the consultant side, which would suit different personalities. This is where I would counsel someone who wanted to do an Engineering degree and if they were disabled. It would make it difficult if they wanted to go into the contractual side."

"You find people that are more intuitive in their learning style and thinking style. Their ideas are intuitive and they tend to go naturally towards the consultancy and design. Can design on a laptop and cellphone".

"Civil Engineering almost seems to be moving in this country and I think perhaps internationally in the other direction, more towards small groups working together cooperatively on designs".

This links up with the response from two participants, who stated that Civil Engineering is an extremely broad field and "disabled students can create his own path in the profession."
The site work or vacation work does not have to be in a construction company. Most of the students make a mistake by thinking that vacation work can only be done in a construction company. Effectively, they really work on site (can be a design company)."

Traditional Civil Engineering might involve areas that are difficult for the disabled person to access, however, "you don't need to be that kind of engineer, you can be a researcher, you can be an academic, you can be a design engineer."

"There is scope for somebody who's got physical problems to be able to have to have a career-it would be something that's not necessarily conventional."

This emphasizes the need for the academic and the disabled student to negotiate a career path that is best suited to the student that would not compromise the ultimate career goal of the disabled student nor the academic quality of the degree.

One participant focused on problems that might be experienced during practicals. "They would have a bit of trouble doing some of the prac."

Using some of the equipment may pose a challenge. Although the laboratory may be accessible and at the level of the student in a wheelchair, "some of the equipment could be hazardous." She suggested that since students do work in groups for certain projects, non-disabled students could assist disabled students wherever necessary and this could be an answer to this challenge. Often during classroom/laboratory experiments, students work in groups, disabled students are paired with 'able-bodied' students, who perform the physically intensive work. This "buddy" system or employing laboratory assistants do help students with disabilities to participate to some degree in science labs. (http://www.vet.purdue.edu/cpr/bsd/AccessScope/background.html)

In order for disabled students to gain optimum experience of working in a laboratory to meet the academic requirements, adaptations and modifications may need to be created within the laboratories.
Jay Hatch, associate professor of biological sciences at the University of Minnesota (UMN) was faced with a challenge when a student with severe physical disabilities enrolled in his biology course. The course involved a significant amount of laboratory work and since the student has severe motor limitations and was blind, she would be unable to participate in the same way that other students did. The lecturer and the student worked together to establish course modifications which not only included changes that accommodated her physical limitations. The lecturer created new ways for the student to show that she understood the laboratory concepts and the student went on to accomplish her goal of completing the course as an active participant. The student's goal was, not to sit on the sidelines watching science go by. She wanted to be an active participant in what was happening. All disabled students studying within the science field would want to be actively participating in the programme (Muscante, 2005).

With a little creativity and teamwork between lecturers and disabled students, a learning environment can be created where students will participate fully in the learning process. This can be done by following the principles of "Universal Design", where the goal is not to lower the standard, but to design programs and environments which allow all to participate to the greatest extent possible. The lecturer in Muscante (2005) stated that he discovered that the 'basic goal was to have students understand the process of science', not merely accomplish physical tasks'. Students with disabilities and their faculty must work creatively and cooperatively to address any obstacles to laboratory learning, but these obstacles are by no means insurmountable (Locke, 2006, pg 3). Students with disabilities present tremendous challenges and opportunities for academics to look at new and effective strategies to enhance students learning (Fielden, 2001, pg 23).

Burgstahler encourages faculty to not immediately assume students will fail because they don't look as if they can succeed (Burgstahler in Muscante, 2005, pg 2) http://www.aibs.org/eye-on-education/eye_on_education_2005_01.html). Very often lecturers assume that disabled students do not have the ability to succeed in the science field because they have a disability.
Faculty have to be open minded and give disabled students a chance to succeed and it is vital to consult the students for guidance on how they can best be included in activities.

The academics interviewed are aware of the challenges that face both lecturers and disabled students and are open to make whatever changes are necessary to accommodate disabled students within the programme. There are many options available to disabled students within this field and the lecturers are prepared to work with disabled students to offer them the best career advice. However, it is important to remember that it is not only the students’ responsibility to fit in, but a learning environment has to be created for students to excel in this field. The tertiary institution, operating from a social model principle, has the responsibility to remove the social and physical barriers that might exclude students from accessing this field of study as a career option.

The responses of the participants indicate that there is flexibility within this profession and there is scope for physically disabled students to be accommodated and to succeed. Since there is this avenue to be flexible, the Civil Engineering department needs to promote this Programme to disabled students, in schools for disabled learners and as well schools in the rural areas.

An outreach programme should be planned by the Civil Engineering department; the disability unit and the schools liaison division to encourage physically disabled students that are interested in the engineering and science field to consider this field as a career option.
4.8. IF YOU HAD BECOME DISABLED LATER IN LIFE- AFTER YOU HAD CHOSEN THIS CAREER- DO YOU THINK THIS IS A FIELD YOU WOULD HAVE CHOSEN AGAIN. WHAT ARE SOME OF THE PRACTICAL CHALLENGES?

All the participants responded that they would choose the same career path.

"Of course. Civil engineering is my passion." One participant stated that it will have its difficulties and challenges but these challenges can be met. "Yes, it depends on the strengths that a person has-if a person can overcome his/her own disability and believe in herself and her strengths and being in a wheelchair is not a limiting factor — I could do it. I could motivate to get a lift and adapt my laboratory the way I want it."

This focuses on the aspect of the disabled student being empowered enough to discuss with the faculty what their needs are and how to provide the necessary support. One participant stated that she could get into lecturing or work with computer, writing computer programs. Another participant stated that at the stage he is in his career, it is much easier. He can get other people to do the site work. This indicates that the challenges of site work and other physical barriers can be adapted to allow for inclusion of all students within this field.

"Yes, I would. I would change the emphasis a bit. I like to do fieldwork. It will be a little difficult to do that so I would lean more towards modelling, computer modelling, simulation, that kind of thing."

The responses indicate that there is a future for physically disabled students within this field.

4.9. WHAT WOULD BE THE BEST METHOD OF CREATING AWARENESS REGARDING DISABILITY?

All the participants said that they feel that it is important that disability awareness workshops/seminars are necessary.

"I think so. I even tried to learn sign language."

"Yes. Because I haven't had experience with someone who is severely physically challenged and I am of some of the challenges they face, but not all".

"Yes. I think so. I think education of the general public as well as particularly us here will be very helpful. We are lacking that. The awareness level in our country is not high."
These workshops will create an understanding of disability issues and academics will be prepared to provide an effective service when disabled students do enter the programme. Many staff have a positive attitude towards working with students with disabilities (as indicated in this study), but do not have sufficient knowledge or experience to draw on. They need guidance and information about how best to support students.'
(http://www.scre.ac.uk/resreport/rr85/ch10.html).

The difficulty is that the traditional focus on field/sitework has led to the perception among some faculty and many students that geosciences (or any other science) careers are only for the strong and 'able-bodied' (Locke, 2006). One of the most effective ways to encourage students with disabilities to pursue science is to change the attitudes and behaviour of teachers (McCann in Locke, 2006). Some times lecturers are not comfortable with teaching disabled students because they do not have any previous experience teaching disabled students. They are afraid of being inappropriate. Kraska (2003) states that often faculty members do not have sufficient knowledge of the characteristics and needs of disabled students. This is also emphasised in a study by Leyser et al (1998) that indicated that academics identified limited knowledge and skills required for making accommodation and were also unfamiliar with disability laws and university resources. This contributed to their negative attitudes. Academics identified a need for training and development interventions in order to overcome their negative attitudes (Leyser et al, 1998).

Training and education workshops, dissemination of material focusing on disability issues will definitely have an impact on creating awareness around disability issues and get academics to start looking at and understanding the support needs of disabled students. Although all academics interviewed indicate a positive attitude to accepting physically disabled students into the Programme, their knowledge of disability issues is limited and this needs to be addressed through workshops and seminars as well as face to face contact with disabled students. Members of staff that have some personal experience or knowledge of disability offer positive and appropriate provision for students.
Lack of awareness amongst staff can have serious consequences for students. It can lead to unfair assessment and even failure.


In summary, the data analysed in this study indicated that the academics interviewed all display a willingness to accommodate students with physical disabilities into the Civil Engineering Programme. Some of the challenges that were discussed were those of physical access of the building housing the Civil Engineering Programme, which is in the process of being renovated and access will be created for people using wheelchairs. Site/vocational work was also a challenge that may face disabled students wanting to go into this field. However, this can be negotiated between the academic and the disabled student. As indicated by some of the academics, civil engineering is a broad field and there are many options available to disabled students who would like to choose civil engineering as a career option.

Awareness on disability issues was limited and all academics indicated that they would like to be involved in workshops or seminars that provide more knowledge on disability issues. In order for academics to provide the require support and to create an inclusive teaching environment, they would also require support and guidance. The following chapter will focus on some recommendations in order to deal with the challenges discussed.

4.10. LIMITATIONS TO THE STUDY

The study only focused on the academics within the University of Kwa-Zulu Natal. There is also the concern that the participants may have provided answers they think the researcher would like to hear as she is the Co-ordinator of the Disability Unit at the University. It was quite difficult to secure interviews with some of the lecturers.

The participants were assured that as Co-ordinator, my professional responsibility will be to utilize the information to look at the challenges faced by academics and disabled students and to implement the necessary programmes to address these challenges which will hope to create a more conducive environment for academics as well as disabled students within the Civil Engineering Programme. They were assured of anonymity and confidentiality.
CHAPTER FIVE
RECOMMENDATION AND CONCLUSION

The study highlighted the positive attitude of academics in accepting disabled students into the Civil Engineering Programme, in the faculty of Engineering at the University of KwaZulu-Natal.

5.1. RECOMMENDATIONS:
The challenges that emerged from the study will be discussed under two major categories: Access and Attitudes and Education and Awareness Training and recommendations will be made under each category.

5.1.1 ACCESS
Access was one of the main issues highlighted by the participants. The building housing the Civil Engineering Programme is inaccessible at present for students using wheelchairs. All the laboratories are not accessible and the layout of the laboratories does not ensure easy access and use for physically disabled students. All participants agreed that the building can be made accessible by installing an elevator, although this might be expensive. The building is in the process of being renovated and access for physically disabled students is a priority.

The University of KwaZulu Natal Policy on Staff and Students with Disabilities commits itself to provide reasonable accommodation for students and staff with disabilities. The aim of reasonable adjustment/ accommodation is not to provide competitive advantage to students with a disability. (UKZN, 2004).

There is a common myth that by providing support or reasonable accommodation, disabled students have an unfair advantage over non-disabled students. The provision of reasonable accommodation addresses barriers to access, thereby giving ALL students an equal opportunity to perform to their potential. As mentioned earlier in the discussion, the social model emphasizes that disability is perceived as a form of institutional discrimination and social exclusion, rather than as a product of physical difference between individuals. Barriers are created by society, which creates the disability, not the impairment.
Seymour & Hatch conclude that "the greatest problem of accommodation appear to be the problem of attitude not architecture, not how to adapt facilities or equipment but the willingness to do it (http://www.nsf.gov/sbe/srs/nsf96311/start/start.html)

In order for the University, in general and the Civil Engineering Programme in particular, to be fully inclusive and apply the principle of Universal Design, it is recommended that:

- The building housing the Civil Engineering Programme be made accessible by removing the physical barriers excluding physically disabled students from fully participating in the Programme by installing an elevator in the building.
- Students with mobility or orthopedic disabilities often only require a few adjustments of furniture or equipment in the classroom to accommodate their needs e.g. classroom furniture should be moved to provide easy access for someone who uses a wheelchair.
- In a laboratory setting, equipment should be placed where students using wheelchairs can reach it easily and that safety of the students are ensured (Fielden, 2001). Students should also be encouraged to work in groups wherever possible.
- Computers should also be placed so that someone using a wheelchair and those that have other mobility impairments are able to easily open the doors.
- Access pads should be placed at a level that people using wheelchairs can reach them.

Another major challenge highlighted by the participants is the site work that students have to undergo during the academic career. As mentioned by some participants and discussed earlier, this can be negotiated with the relevant people. Site work is a vital component of the Civil Engineering Programme and students with disabilities will want to experience this area of their studies.

Fieldwork/site work is any structural experience that takes students to learn outside the classroom, where the object of their studies- whether it be a building, a geological site, a museum or group of people- is also the place where they study.

http://www2.glos.ac.uk/gdn/disabil/overview/ch4-1.html.2006.
Activity based learning and hands-on-experimental activities are recommended as a standard of teaching science to all students' at all educational levels in order to provide a more through educational experience.

http://www.vet.purdue.edu/cpr/bsd/AccessScope/background.html

In order for this to happen, it is recommended that:

- When planning curriculum, inclusivity should be a priority. Silver et al argue that accessibility issues should be placed “as an integral component of all instructional planning”.

http://www2.glos.ac.uk/gdn/disabil/overview/ch6-3.html

- Disabled students should, from the outset, be aware of the site work involved so that the required modifications can be discussed and negotiated. It should not be automatically assumed that disabled students will not manage the site work and academics should not automatically suggest alternatives. As discussed in the analysis, some participants mentioned that certain Civil Engineers did not undergo site work (even though this was a while ago). One academic did state that civil engineering students have an option to choose contract or consultancy work and the type of site work will depend on their choice- which needs to be negotiated with the disabled student. ‘The key discussion between the fieldwork organizer and the student to establish what is critical, important and unimportant to both parties’.

http://www2.glos.ac.uk/gdn/disabil/overview/ch6-3.html

- Disabled students that have to undergo site work should be provided with the necessary support. As discussed in the analysis, students should be grouped together (where able), so that disabled students can have some support if required. Disabled students could also employ personal assistants to assist wherever necessary during site work.

Some departments have already embraced diversity and inclusivity as part of their course philosophy, and have built curricula, including fieldwork experiences around this concept (http://www2glos.ac.uk/gdn/disabil/overview/ch6-3html)
This is evident with the Geography department at the University of KwaZulu-Natal (where the pilot study was held), where physically disabled students are provided with the relevant support during course as well as during fieldwork.

Disabled student’s emphasis that they do not have an ‘academic handicap’ and they do not want to be treated as such. The help that they need is not with regards to their impairments, but the removal of barriers to learning and development by reconstruction of the learning environment (Crous, 2004).

The following are some Educational Implications for Students with Physical Disabilities that need to be considered:

- Difficulty moving from one location to another.
- Impaired writing and/or speaking due to physical disability.
- Inability to sit, stand, or walk for prolonged periods of time.
- Difficulty participating in classes involving physical activity.
- May need special assistance in a laboratory situation.
- Difficulty taking traditional paper and pencil exams.
- May require additional time to move from class to class.
- Check for accessibility in and out of the classroom- provide the necessary accessibility e.g. arrange classroom furniture for wheelchair access; arrange workstations (labs. etc.) according to wheelchair height to accommodate the student’s needs.
- Do not hang onto or lean on a wheelchair, it is often considered to be part of the person’s ‘body space’.
- Always ask if help is needed. Do not assume.

5.1.2. ATTITUDE AND EDUCATION AND AWARENESS TRAINING
Attitudes play a large part in the disabled student-faculty partnership (Burgstahler in Muscante, 2005, pg 2). Very often academics and other faculty staff have preconceived ideas about the abilities of disabled students. Howell (2005, pg vii) focused on ways in which higher education institutions respond to the special needs
of disabled students and stated that while adequate financial resources are a key element in creating an enabling teaching and learning environment for disabled students; personal attitudes play an even greater part in facilitating access and asserting equity. Awareness and education on disability issues is vital in changing attitudes surrounding disability. Negative attitudes are one of the most important barriers that limit access for disabled student’s higher education.

From the analysis of the data, it was enlightening to note that all the participants have a very positive attitude towards the inclusion of disabled into the Civil Engineering Programme. Although, one participant mentioned that disabled people ‘cannot do what others can’ (which is probably as a result of limited knowledge of disability issues), all the others started that their impairment does not affect their ability.

A study commissioned by the Centre for Higher Education into equity of access and opportunities with disabilities in the South African public higher education system indicate that attitudinal barriers continue to exist in both the schooling system and the higher education institutions (Howell, 2005). It is believed that academics negative attitudes and refusal to accommodate a disabled student in their classroom often stemmed from fear and lack of awareness.

The academics interviewed all displayed a positive attitude towards accepting disabled students into their programme and indicate a willingness to be flexible within the teaching environment. All participants indicated that they would like more information on disability issues and all responded that they would be happy to participate in education and training workshops.

The overall goal of this training is to raise awareness among faculty regarding the needs of disabled students and to provide an overview of the resources available on campus. Specialised training needs to be planned regularly to demonstrate or discuss appropriate teaching strategies when working with disabled students. This type of training can reduce or eliminate a faculty members concerns about teaching students with disabilities (http://telr.asu.edu/dpg/pparticle2.html)
In order to continue to foster the positive support within the Civil Engineering Programme and to change some of the myths associated with disability within this field, it is recommended that:

- Education and Awareness Training around disability issues be held regularly with academics and non-academics staff at the Civil Engineering Programme, in particular, and within the University in general. This will result in the University creating a teaching and learning environment that is accessible to all students.

- These workshops should become a regular feature of staff induction programs.

- More disabled students should be encouraged to enter into the civil engineering field. These programs should be marketed to disabled students at mainstream schools as well as schools for the disabled (both in the urban and rural areas) as a career choice. Disabled students should be informed about the support offered to them as well as the options open to them within this field. This will give disabled students a better understanding of the requirements within this field and they will be able to make an informed decision regarding their career choice.

- Faculties should include a statement at the beginning of the term that invites disabled students to discuss their accommodation with the academics.

Negative attitudes and stereotypes can play a detrimental role in the experience of disabled students. It can result in the lack of access to support that is so vital for disabled students to succeed in their academic endeavors.
5.2 CONCLUSION

This study has highlighted some of the challenges that may face physically disabled students who would like to enter the Civil Engineering Programme at the University of KwaZulu – Natal. It has also highlighted the positive attitude displayed by the academics within this programme to look at how these challenges can be met to best support disabled.

There is myth that science, medical, technological and applied science courses are not suitable for students with disabilities. Students with disabilities can and do aim for careers that are consistent with their goals and interest. (http://www.ccc.newcastle.edu.au/studentsupport/DisabilityResourceKit/overview%20of...) 

However as seen from the results of this study, many of the challenges that are believed to exist within the science field can be negotiated and met. The main challenge of site work / field work does not appear to be a challenge that will exclude students with physical disabilities from pursuing Civil Engineering as a career choice. The main barrier that excludes students with disabilities from considering the science field as a possible career choice is negative attitudes, myths and stereotypes about the abilities and capabilities of students with disabilities. The positive attitudes displayed by academics within this field needs to be used as a tool within the University to indicate to others how positive attitudes can result in equal opportunities for students with disabilities within the higher education institution. Support for academics from the disability unit, disability education and awareness workshops will assist in expanding the knowledge of staff in tertiary institutions and will lead to a more conducive learning environment for disabled students.

Providing accommodation and support for students with disabilities within higher education institutions should be the responsibility of all within the university and not only that of the student and staff at the Disability Unit.
Accordingly to the principles of education for all, there should be a general approach and everybody in higher education should be trained and involved in the support of all students (Crous, 2004).

In South Africa at present, there is a concerted effort to try and increase the number of woman and people from the previously disadvantages group that enter the science field. This efforts needs to be extended to include people with disabilities. The increased use of technology in science, engineering and mathematics combined with the increased availability of access technologies strongly suggest that the time is right to promote the inclusion of people with disabilities in the science, engineering and mathematics field (Burgstahler, 1994, pg 1).

However, this can only be achieved if people within this field are willing to meet this challenge.
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APPENDIX 1

INFORMATION SHEET

Invitation

I am a student in the postgraduate program in Disability Studies at the University of Cape Town. As part of the requirement for the MPhil degree, I will like to interview the academic staff of the Civil Engineering program at the University of KwaZulu-Natal on their perceptions if disabled students are offered admission into the undergraduate civil engineering programme.

Aim of the study

The aim of the study is to explore the attitudes of academics in accommodating physically disabled students in the undergraduate Civil Engineering Programme in the Faculty of Science at the University of KwaZulu Natal.

Explanation

The interview will be conducted at a venue and time suitable for you, and it will last for about one hour. The information obtained from you will be kept strictly confidential, and will be used only in the preparation of the mini-thesis in fulfilment of the requirements for the award of the MPhil degree in Disability Studies.
APPENDIX 2

MINI – THESIS

The Attitudes of Academics to Accommodating Physically Disabled Students into the Undergraduate Engineering Programme in the Faculty of Engineering in the College of Agriculture, Engineering and Science, University of KwaZulu-Natal

INFORMED CONSENT

I am the Disability Co-ordinator of the Disability Unit at UKZN- Pietermaritzburg campus presently studying for a Masters Degree in Disability Studies through the University of Cape Town. As part of my studies I am required to undertake a research project.

The purpose of the study is to explore the attitudes of academics in accommodating physically disabled students in the undergraduate Civil Engineering Programme in the Faculty of Science. The study will also look at what challenges are facing disabled students and academics within this field and how these challenges can be met.

You will be required to participate in an interview which would last for approximately 1 hour. The interview would be conducted in your office or in avenue that is suitable to you and at a time that is convenient for you and the co-ordinator.

The interview will be taped for the purposes of compiling a report on the findings of the researcher. Please be assured that all information from the interview will remain confidential. You have a right to withdraw from the study at any stage and for any reason.
Thanking you for your willingness to participate in this study.

Kindly sign below.
Yours sincerely,

________________________
NAFISA MAYAT
RESEARCHER

SIGNED ON THIS ______DAY OF _____________2005

NAME: ___________________ SIGNATURE: ___________________

WITNESS: __________________________