



**MAINSTREAMING UNIVERSAL DESIGN IN CAPE TOWN: FIFA 2010 WORLD
CUP™-RELATED ACTIVITIES AS CATALYSTS FOR SOCIAL CHANGE**

by

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DECLARATION

I, Mugendi Kanampiu M'Rithaa, declare that the contents of this thesis represent my own unaided work, and that the thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

7th December 2009

Signed

Date

ABSTRACT

Universal Design (UD), as it is known in the USA and elsewhere, is an inclusive approach to designing for the broader population and is rapidly gaining popularity amongst design practitioners and planners globally. Similar non-exclusive approaches have evolved in diverse parts of the world to counter the systemic disablement and exclusion of vulnerable/special populations of users perpetuated by traditional approaches to design. The transdisciplinary field of UD is informed by concilience in accommodating a wide range of related fields, such as education, landscape architecture, architecture, town and regional planning, industrial/product/three-dimensional design, furniture design, interior design, communication/information/graphic design, interaction design, human-computer interaction (HCI)/usability studies, and ergonomics/human factors engineering. UD proposes a collaborative systems approach that benefits from the synergies of cross-functionalism by approaching the diverse challenges facing society through socially responsible design. In so doing, UD can potentially impact such diverse issues as health, transportation, inclusive education, sports and recreation, entertainment, social welfare, inclusive employment, transgenerational/lifespan housing, inclusive tourism, accessibility, safety, and ecological concerns on sustainability.

The thesis adopts the framework of Activity Theory as a lens through which to investigate how UD can ensure social inclusion and participation by informing the design of products, systems, services, and built environments to accommodate the greatest possible number of users whilst still respecting their diversity. Specifically, the thesis embraces an interpretivist paradigm in its investigation of the relevance and applicability of UD strategies to the City of Cape Town. The research employs a qualitative mixed/multi-methods approach – including a survey of 147 design students at the Cape Peninsula University of Technology (CPUT), and interviews with key informants (design educators, professional designers, local government officials, disability sector practitioners, design activists, and politicians). The urban development projects associated with the FIFA 2010 Soccer World Cup™ offer an historic opportunity for an exploratory case study on how UD strategies can be effectively mainstreamed using this sporting mega-event as a catalyst to effect social change. Simultaneously, action research allows for experimentation in the classroom as well as participation in a 2010-related student competition to investigate the efficacy of UD in multiple contexts. A UD audit of a public park/botanical gardens is also included for discussion. Implications for tertiary-level education of design students, as well as the continuing professional development of graduate designers are discussed herein. The combined settings inform the prerequisites for adjustable UD strategies that are not only relevant and sustainable within Cape Town, but also nationally and much further afield.

KEYWORDS

- Accessibility
- Action Research
- Activity Theory
- Ageing
- Cape Town
- Concilience
- Continuing Professional Development
- Design Education
- Disability
- Diversity
- Equity
- Ergonomics / Human Factors
- Explanatory Legitimacy Theory
- FIFA 2010 Soccer World Cup™
- Inclusive Education
- Mega-Events
- Participation
- Social Inclusion
- Socially Responsible Design
- South Africa
- Sports Tourism
- Sustainability
- *Ubuntu*
- Universal Design (UD)
- Usability
- Vulnerable Populations
- Western Cape Province

IN-TEXT CITATION CONVENTIONS

Dates of publication and page numbers are provided for all authors whose ideas are quoted or paraphrased. Double quotation marks or indentations are used in the case of direct quotations. Exceptions to providing dates and page numbers are where the general focus of an author is referred to or material sourced from the Internet for which no dates and/or page numbers exist. In those instances where multiple references are cited with respect to related opinions/stances in the reviewed literature, the same are listed in chronological order.

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DEDICATION

*"[We're all] products of history and community, of opportunity and legacy."
– Malcolm Gladwell (2008:285)*

The pervading influence and inspirational legacy of my predecessors in design – Selby Mvusi, Jessica Otieno-Gwalla, Nathan H. Shapira, and Sylvester J. Maina – is respectfully memorialised. Moreover, this project is dedicated to all those who have embraced and advanced the values of access, diversity, equity, humanity, inclusiveness and participation for all people, everywhere. *Godspeed...*

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GLOSSARY

Terms/Acronyms/Abbreviations	Definition/Explanation
<i>Accessibility</i>	<i>the extent to which a product, system or environment can be used by a variety of people, especially those with disabilities.</i>
<i>Accessible Design</i>	<i>design focussed on the principles of extending standard design to people with some form of performance limitation to maximise the number of potential customers who can readily use a product, building or service (ISO, 2001:2).</i>
<i>Activities of Daily Living (ADLs)</i>	<i>a set of six basic activities (bathing, dressing, toileting, transferring, continence, and feeding) that a person can perform in the process of self-care.</i>
<i>Activity Theory (AT)</i>	<i>a theory attributed initially to the Soviet psychologist, Lev Semyonovich Vygotsky and his colleagues. AT was further developed by other scholars, including Alexei Nikolaevich Leont'ev and later by Yrjö Engeström used in the analysis of various dynamics in human activities.</i>
<i>ADA</i>	<i>The Americans with Disabilities Act of 1990 (Public Law 101-336 passed on 26th July 1990).</i>
<i>ADPD</i>	<i>(Secretariat of) the African Decade of People with Disabilities; based in Cape Town, South Africa.</i>
<i>Adaptable Design</i>	<i>design that can be changed to fit the user, rather than requiring the user to adapt.</i>
<i>Adaptive Technology</i>	<i>the use of technology to assist individuals who have difficulty accessing systems, products or environments using conventional methods.</i>
<i>Affordances</i>	<i>a concept from ecological psychology based on the paradigm of direct perception. They are specific combinations of the properties of substances and surfaces taken with reference to an observer (Raubal, 2007:1).</i>
<i>African Renaissance</i>	<i>a movement aimed at promoting the revival of an African philosophy and way of life called "Ubuntu" (humanness) as espoused by NEPAD and the AU.</i>
<i>Ageing</i>	<i>a continuous process of progressive change in all structures and functions of the body: the impact of such changes on a person's quality of life is largely dependent on the social and cultural milieu (WHO).</i>
<i>Aids</i>	<i>Acquired Immunodeficiency Syndrome; the most severe manifestation of infection with the Human Immunodeficiency Virus (HIV).</i>

Anthropometry / Anthropometrics	<i>the field that deals with the physical dimensions, proportions, and composition of the human body, as well as the study of related variables that affects them.</i>
Assistive Technology / Assistive Device	<i>piece of equipment, product system, hardware, software or service that is used to increase, maintain or improve functional capabilities of individuals with disabilities (ISO, 2001:2).</i>
AU	<i>African Union (formerly known as the Organisation of African Unity – OAU) composed of fifty-three states in Africa and modelled after the European Union (EU).</i>
Barrier-Free Design	<i>design that seeks to eliminate physical barriers to people with disabilities; often used synonymously with physical “accessibility” in built environments.</i>
BRT	<i>Bus Rapid Transit – a high quality bus-based system that delivers fast, comfortable, and cost-effective urban mobility through the provision of segregated right-of-way infrastructure, rapid and frequent operations, and excellence in marketing and customer services (Wright & Hook, 2007:11).</i>
CoE	<i>Centre(s) of Excellence. A CoE (supported by the DST and NRF) can be conceptualised as a co-ordinating body or organisation that provides strategic oversight and service in developing sustained human resource capital in South Africa (DST, n.d.; 2003; 2004).</i>
Consilience	<i>refers to the joining together of knowledge and information in multi-disciplinary across disciplines and cross-domain contexts to create a unified framework of understanding – it “offers a powerful mechanism for borrowing from other disciplines, thereby extending the scope of what can be known” (Dalcher, 2006:253).</i>
DALY	<i>one of the ways of assessing the impact of Aids other than through the number of deaths is to look at the burden of the disease as disability adjusted life years (DALYs) (Barnett & Whiteside, 2002:282).</i>
DDA	<i>Disability Discrimination Act (of Australia and the United Kingdom).</i>
DEAT	<i>Department of Environmental Affairs and Tourism (South Africa).</i>
Dependency Ratio	<i>the ratio of the economically dependent part of the population to the productive part; the ratio is computed by dividing the number of people who are most likely to be dependent (the young: those under the age of 15, plus the elderly: those aged 65 and older) by the number of people in the working-aged population (ages 15 through 64) expressed as a percentage.</i>

Design for Development	<i>a concept promoted by the SABS Design Institute that recognises, accredits and awards cost-effective products that demonstrate developmental potential and real quality of life improvement in the lives of the people for whom the said products were designed.</i>
Design for Disability	<i>design philosophy and practice that specifically seeks to address the needs of people with disability.</i>
Design for Sustainability (DfS)	<i>a design practice, education and research that in one way or another, contributes to sustainable development (Vezzoli, 2007:39).</i>
Designing for the Broader Average	<i>Maria Benzton and Sven-Erich Juhlines of Ergonomi Design Gruppen have demonstrated that by applying the concept of the “pyramid of needs” it is possible to design for a broader average range of needs, including the special needs of specific groups within the population, resulting in products which offer a combination of performance, functionality and aesthetic appeal (Coleman, 1999).</i>
Design Practitioners	<i>a generic term that includes design educators, students of design, professional designers, and planners of design-specific policies. The professionals in this categorisation include Architects (and Architectural Technologists), Designers (Graphic/Information, Industrial/Product, and Interior), and Town and Regional Planners.</i>
Disability	<i>a physical or mental impairment that substantially limits one or more of the major life activities of such individual, a record of such an impairment, or being regarded as having such an impairment (WHO; Americans with Disabilities Act of 1990).</i>
DPSA	<i>Disabled People South Africa.</i>
DSD	<i>Department of Social Development (South Africa).</i>
DST	<i>Department of Science and Technology (South Africa).</i>
DTI	<i>Department of Trade and Industry (South Africa).</i>
(The) Elderly	<i>those members of the general population aged 65 and older; usually assumed to be dependants. Also referred to respectfully as Senior Citizens.</i>
Emancipation	<i>being freed; the condition or fact of being set free or freed from some restriction (Microsoft® Encarta®, 2009).</i>
Empowerment	<i>feeling of having the right to make one’s own choices, and having the ability to act on them (ibid).</i>
Ergonomics/Human Factors	<i>the science of work: of the people who do it and the ways in which it is done; the tools and equipment they use, the places they work in, and the psychosocial aspects of the working situation (Pheasant, 1996:4).</i>

“Extra-Ordinary” Ergonomics	<i>design criteria responsive to physical, mental and sensory characteristics of human users; takes into account the needs of people with disabilities, as well as those experiencing the effects of natural processes such as ageing and pregnancy (Kroemer, 2006).</i>
FIFA	<i>a French acronym ‘Fédération Internationale de Football Association’ translated into English to read: “International Federation of Association Football”.</i>
Graying Markets/Products	<i>the market segment or products relating to the elderly.</i>
Handicap	<i>as defined by the WHO: disadvantage(s) experienced by the individual as a result of impairment and disabilities.</i>
HEI	<i>Higher Education Institution – includes all tertiary level academic institutions (e.g. universities of technology).</i>
HIV	<i>the virus that progressively weakens the immune system, ultimately leading to Aids.</i>
Human Development Index	<i>the HDI is a summary measure of human development. It measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate (with two-thirds weight) and the combined primary, secondary and tertiary gross enrolment ratio (with one-third weight), and; a decent standard of living, as measured by GDP per capita (PPP US\$). These socio-economic indicators form the basis of the relative rankings of specific countries as published in Human Development Reports by the UNDP.</i>
ICF	<i>International Classification of Functioning, Disability and Health. In 2001, this replaced the previous WHO ‘International Classification of Impairments, Disabilities and Handicaps (ICIDH)’ of 1980 (Pasha & Pasha, 2006:4).</i>
Impairment	<i>as defined by the World Health Organization: any loss or abnormality of psychological, physiological, or anatomical structure or function; any loss of function resulting from injury or disease.</i>
Inclusive Design	<i>the design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible on a global basis, in a wide variety of situations and to the greatest extent possible without the need for special adaptation or specialised design; sometimes used as a synonym for Universal Design.</i>
IRT	<i>Integrated Rapid Transit system.</i>
Life Expectancy	<i>the average number of years a person can be expected to live under current mortality conditions.</i>

<i>(The Principle of)</i> The Limiting User	<i>the limiting user is that hypothetical member of the user population who, by virtue of his or her physical (or mental) characteristics, imposes the most severe constraint on the design of the artefact. In clearance problems the bulky person is the limiting user; in reach problems the small person is the limiting user (Pheasant, 1998:23).</i>
LOC	<i>the Local Organising Committee – the national body responsible for organising the 2010 FIFA World Cup™ events locally.</i>
Mainstream	<i>main current of thought or behaviour; the ideas, actions, and values that are most widely accepted by a group or society, e.g. in politics, fashion, or music (Microsoft® Encarta®, 2009).</i>
Mega Events	<i>international events on a grand scale such as the Olympic Games and World Cup™ typically involving a large number of participants and spectators over a period of several weeks.</i>
MDS	<i>Minimum Data Set: a common set of data items, definitions and standards that should be used to collect and report data. These data should be comparable across geographic regions within the continent and over time (Kowal, Wolfson & Dowd, 2000:2).</i>
Millennium Development Goals	<i>the MDGs commit the international community to an expanded vision of development, one that vigorously promotes human development as the key to sustaining social and economic progress in all countries, and recognises the importance of creating a global partnership for development. The goals have been commonly accepted as a framework for measuring development progress and promotion of gender equality and empowerment of women, among other issues.</i>
Mortality Rate	<i>the number of deaths in a group of people, usually expressed as deaths per thousand.</i>
NEPAD	<i>The New Partnership for Africa's Development.</i>
NRF	<i>The National Research Foundation (South Africa).</i>
The Owl Mark™	<i>a quality mark developed by the Centre for Applied Gerontology (at the University of Birmingham, UK) that recognises and accredits good products for older people (Coleman, 1999).</i>
Participation	<i>the freedom of taking part in any socially acceptable and desirable activity thus promoting (within the participant) a sense of belonging and ownership.</i>
Participatory Design	<i>a design approach that actively incorporates the contribution and participation of (potential) end-users in the design process (Lewis, 2000).</i>

Percentiles	<i>percentile values (as used in normal or Gaussian distribution to depict anthropometric data) are typically more useful than the simpler arithmetic mean in showing the range of a specific dimension and may be used to indicate the number of measurements represented in a given population. For example, a 5th percentile in stature would mean that 'exactly 5% of people are shorter than this' or 'there is only a one-in-twenty chance of encountering a person shorter than this' (Pheasant, 1996:17).</i>
PVA	<i>Public Viewing Area(s).</i>
QALY	<i>one of the ways health economists attempt to measure both quantity and 'quality of life' known as quality adjusted life years (QALYs) (Barnett & Whiteside, 2002:282).</i>
'Reasonable accommodation'	<i>measures mandated by law to be effected in the planning, design and construction of built environments to accommodate people with disabilities with respect to physical accessibility.</i>
Rehabilitation Design	<i>an innovative approach developed by David Guynes and Patricia Moore to the design of health-care and rehabilitation facilities which focus on encouraging independence and an early return to the community as opposed to long-term institutional care (Coleman, 1999).</i>
Retrofitting	<i>the (post-production) practice of fitting or customising products/environments to suit specific applications.</i>
SACN	<i>South African Cities Network.</i>
SADC	<i>the Southern African Development Community; an economic grouping of 15 southern African states including Angola, Botswana, the Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Tanzania, Seychelles, South Africa, Swaziland, Zambia, and Zimbabwe.</i>
Sports Tourism	<i>refers to different sports that throughout history have been the source and/or the principal reason for travel – relative in distance according to the lifestyle epochs of history (Zauhar, 2004:6).</i>
Sustainable Product Design	<i>a design activity that takes into consideration and tries to balance the environmental, social and economic factors in creation of products.</i>
TCC	<i>Technical Coordinating Committee.</i>
Third Age	<i>synonymous with late-adulthood – the period in life when one is classified as being elderly (≥65 years). The First Age is childhood (≤14 years); whilst the Second Age is early through mid-adulthood (15-64 years).</i>

Through Other Eyes	<i>concept developed by Patricia Moore who in her twenties spent three years travelling in over 200 cities throughout US and Canada experiencing life as an 85 year old woman (Coleman, 1999).</i>
Transgenerational Design	<i>attributed to James Pirkel et al., this is an approach to design that specifically considers the mental, physical and sensory changes in ability that occur with age; also known as Lifespan Design (Coleman, 1999).</i>
Ubuntu	<i>a traditional African ideal that finds expression through mutually reaffirming communal interaction, mutual support, group solidarity and humanness.</i>
UNESCO	<i>United Nations Educational, Scientific and Cultural Organization.</i>
Universal Design (UD)	<i>addresses design in the context of needs for all people – of all ages and abilities; associated with Design for All, Design for the Broader Average, Design for Disability, Inclusive Design, Kyoyo-Hin, and Transgenerational Design (Coleman, 1999).</i>
Usability	<i>the extent to which a product or system is can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use (ISO 9241-11 in Baber, 2005:359).</i>
User-Centred Design	<i>the design of products that can be used by specific users to achieve desired goals with effectiveness, efficiency and satisfaction in their given contexts of use. It is participative; system orientated; and acknowledges human diversity (Pheasant, 1996:13).</i>
Vulnerable Population(s)	<i>includes the elderly, orphans, and vulnerable children; any category of the general population susceptible to disability, physical limitation, discrimination or economic disadvantage.</i>
Wayfinding	<i>a system that welcomes, orients and guides visitors in an around a community (Vrooman, 2007:9). Also defined as behaviour that is the purposeful, directed, and motivated movement from an origin to a specific distant destination that cannot be directly perceived by the traveller. It involves interaction between the wayfinder and the environment (Raubal, 2007:1).</i>
WHO	<i>World Health Organization.</i>
(The) Young	<i>those members of the general population aged 14 and younger; usually assumed to be dependants.</i>
ZAR	<i>South African Rands – the official currency of the country.</i>

CHAPTER ONE

WHAT THE STUDY IS ABOUT

1.0 Introduction

This thesis addresses the challenges of mainstreaming *Universal Design* (UD) in a developing context from the perspective of activities and projects associated with the hosting of the greatly anticipated *FIFA 2010 Soccer World Cup™* in *Cape Town*. It will be the first time in FIFA's history for the sporting mega-event to be hosted on the African continent, and consequently South African host cities are mobilising significant capital (human and financial) to deliver a memorable experience for their visitors and residents alike. As expected, tensions arise in an emerging economy's need to deliver world-class facilities, against the existing stark social and developmental challenges that demand urgent redress. The vexing problem of engaging with global imperatives against pressing local realities is a recurring theme in this thesis.

In South Africa, the apartheid legacy of institutional exclusion and the concomitant ills of discrimination and stigmatisation adversely affected disabled people, non-whites, and women. The post-apartheid dispensation has marshalled a host of novel concepts to effect positive change in this regard. However, certain structural (or systemic) and functional (or attitudinal) obstacles remain for the ideals of access, social inclusion, and civic participation to find fuller and more sustainable expression (SAMA, 2006). It is against this backdrop that the potential role of Universal Design is interrogated based on the belief that UD offers a singularly appropriate platform for designers (students, educators and professionals) and policy makers to adequately engage the society in formulating more inclusive and equitable solutions for industrial design products, systems and built environments.

UD as a concept has its roots in the developed world as a response to developments therein. This thesis investigates the applicability of such a global concept in an African city. Further, in view of FIFA's stringent criteria for infrastructural and logistical compliance in host cities, and in the role of such a powerful international actor and its resultant impact on local affairs, particularly when viewed from a uniquely African perspective. The thesis adopts an Activity Theory analytical lens to propose adjustable strategies for the appropriate and sustainable mainstreaming of UD amongst designers, policy makers and other key actors in the city of Cape Town. Ultimately the emerging strategies could be adapted to fit developing contexts in South Africa and beyond.

1.1 Motivation for Choosing this Topic

The motivation for choosing this topic stems from the realisation of the historic import of hosting the FIFA 2010 World Cup™ in South Africa. Further, the author has been offering a Universal Design module in the Department of Industrial Design, CPUT since 2005. The opportunity thus presented itself for an action research-inspired project at CPUT to evolve into a more comprehensive study that could potentially inform plans, policies, strategies, and services for the city of Cape Town. The benefits are two-fold: the possible expansion of the UD module to reach a larger number of design students; and the potential of enabling UD to influence/embrace a wider constituency of residents (and visitors) in the city of Cape Town. There is an intrinsic mutual relationship between CPUT and the City of Cape Town through employment opportunities for the students of the former, as well as joint research activities and consultancy projects between the two organisations. Further, this research is seen as a strategic and functional contribution towards the stated objectives of the *African Decade for People with Disability* (ADPD) which was initially set to end in 2009 (Phiri, 2006).

1.2 The Research Problem in Context

The main research problem revolves around the question of whether there are appropriate strategies for promoting the adoption of UD-related applications in Cape Town's plans for co-hosting matches during the FIFA Soccer World Cup™ in 2010. The fact that UD-related concepts emerged from industrialised countries necessitates interrogation of existing and anticipated strategies of UD promotion from the unique perspective of a city in Africa (such as Cape Town).

1.2.1 Hypothesis of the Study

In setting the objectives of this study, two tentative hypotheses have been formulated:

- i) there is a relationship between the adoption of UD strategies and the inclusiveness (in terms of accessibility and usability) of the products, services, systems and built environments thus designed; and
- ii) there are unique factors in Cape Town that present challenges to the effective adoption and implementation of UD strategies there – these challenges necessitate a dedicated response.

1.2.2 Basic Assumptions

At the philosophical level, this study assumes that the extent to which accessibility and usability of products and built environments is enjoyed by various cohorts of users (especially by

members of vulnerable or special populations) depends on the degree to which appropriate UD strategies would have been incorporated in their design philosophy and praxis. On a more practical level, the study interrogates the relevance of the construction and completion of the Greenpoint Stadium as well as other projects and activities associated with the FIFA 2010 Soccer World Cup™ vis-à-vis the potential for mainstreaming UD in Cape Town.

1.3 Research Question

The main research question and its sub-questions address the following: *How can the concept of Universal Design be promoted in Cape Town in the context of the FIFA 2010 Soccer World Cup™ projects and related activities?*

- *What kind of adjustable strategies are needed to implement the ideals of UD in an emerging economy context?*
- *What kinds of UD-related role players are there in South Africa? What UD-related policies are there in the country? What resources does the country have to support UD applications?*
- *Why has UD not been adopted by planners and professional designers on any significant scale previously?*

1.4 Research Objectives

The overall objective of this study is to propose strategies for effectively mainstreaming UD considerations amongst design practitioners in an emerging economy context.

To achieve this purpose, the specific objectives have been addressed by doing the following:

- Evaluating the current level of UD awareness among selected designers and planners in Cape Town, especially in the light of FIFA 2010 World Cup™-related activities within the city;
- Assessing the applicability of UD strategies that have evolved outside the context of study;
- Proposing appropriate sustainable and adjustable strategies for mainstreaming UD applications in Cape Town with respect to the 2010 sporting mega-event; and
- Contributing to the strategic goals of the African Decade for Persons with Disabilities (1999-2009).

1.5 Significance of the Research

The concept of UD promotes inclusion of all people of all abilities, and consequently considers the breadth of human diversity across lifespan to create design solutions that work for all possible users. This in principle is a noble ideal. In reality however, one finds that a significant number of individuals in Africa in general, and in South Africa in particular, are patently disadvantaged (or even disabled) on account of poorly designed products and inaccessible built environments. This has exacerbated the stigma associated with various vulnerable populations, as well as perpetuating discrimination by excluding a significant number of potential users and consumers. UD has been formally adopted in a number of countries elsewhere in the world. Notwithstanding, there is a dearth of research on UD-related issues on our continent. This study seeks to contribute to such knowledge by investigating the applicability of UD in an emerging economy context. In this regard, it was necessary to examine design strategies from other parts of the world to assess their practicability and applicability to industrially developing (or majority world) contexts (Schumacher, 1973; Shapira, 1991; Parker, 2001; Sandhu, 2002).

South Africa is second only to India in the number of official languages. Though well-intended, the complexity of having 11 official spoken (and written) languages, as well as South African Sign Language (Howell, Chalken & Alberts, 2006:69) is itself a daunting reality from a practical point of view – this is further compounded by the needs of the multitude of foreign visitors and sports tourists expected in major South African cities once the FIFA 2010 World Cup™ mega event unfolds. The urgent need for effective and transparent wayfinding systems, to name one challenge, cannot be over-emphasised.

Further, the history of systemic oppression under *apartheid* provides a unique backdrop to addressing what is potentially an emancipatory vehicle for social inclusion. The status of disabled persons in this country enjoys an enviable measure of political support (Matsebula, Schneider & Watermeyer, 2006). However, the same cannot be said of the plight of other vulnerable/special populations such as the elderly, women, children and foreigners (who are unfamiliar with the local languages and socio-cultural norms). Proposed UD strategies would effectively provide mechanisms that create and sustain an enabling environment of equity for all denizens.

The research study focuses on evolving a strategy for mainstreaming UD applications with reference to the 19th FIFA 2010 World Cup™ which is billed to be the biggest event yet on

African soil. It is expected that by benchmarking the Host City of Cape Town as a best practice exemplar of UD implementation, other cities on the continent would benefit from lessons learnt. Whereas the Olympics, Paralympics and Commonwealth events “have the most specific universal accessibility requirements”, there is a dearth of similar information on specifications for accessibility vis-à-vis the FIFA soccer event (Swart, Wang, Turco, Vollmer, Knott, Parish & McCrae, 2008:8). Through “programmatically accommodation” Koncelik (1998:122) reports that Atlanta, Georgia effectively positioned itself as an accessible city after the 1996 Olympics and Paralympics. Similarly, Munich was linked with Cape Town for “promotional as well as learning purposes” (City of Cape Town, 2007:48). The anticipated mega event offers a historic opportunity as a case worthy of study and suffices as motivation for interrogating the impact of design intervention in the process of introducing new technical systems (Eason, 2005).

The proposed strategies could be readily adapted to similar realities on the continent, and further afield where, as Margolin (2007:115) challenges, *design for development* interventions should be targeted sensitively and “in the most effective ways” so as not to appear patronising or condescending towards local aspirations. Such strategies would promote collaboration and support peer review mechanisms among member states under the aegis of continental organs such as the *New Partnership for Africa’s Development* (NEPAD) and the *African Decade of People with Disabilities* (Chalken, Swartz & Watermeyer, 2006:93). To this end, Schneider (2006:17) identifies the need to develop “policies that abide by principles of Universal Design” as a priority for ensuring inclusiveness.

1.6 Structure of the Thesis

The initial chapters of this thesis introduce the concept of Universal Design (UD), as well as related concepts and developments internationally. Chapter 1 gives an overview of the topic under investigation and covers such specific issues relating to the research focus, context of the study, delimitations, and the significance of the study. Chapter 2 looks at the expected impact of the FIFA 2010 World Cup™ from an African developmental perspective. A discussion on the peculiar challenges experienced by different categories of vulnerable populations is presented in Chapter 3; whilst pertinent practical and theoretical responses to the needs of the identified populations are elaborated in Chapter 4. Chapter 5 examines the concept of UD, and its multi-disciplinary and cross-domain applications in diverse contexts. Chapter 6 discusses the theoretical, conceptual and analytical frameworks used in this study. Chapter 7 explains the rationale for the qualitative approach to the research questions and why the experimental

research method was adopted. Chapter 8 analyses how the data were interpreted using the developed thematic coding framework as well as presenting various data graphically – the chapter also discusses possible implications for a host of actors within the city of Cape Town. Finally, Chapter 9 summarises the main findings, conclusions and recommendations of the research study, and examines their significance to Cape Town’s unique context as well as to other emerging economies. It also outlines the study’s contribution to knowledge and finally, proposes future research topics as informed by the study.

1.7 Summary

The concept of Universal Design is a relatively recent one globally. However, there appears to be little research on the topic in an African context. Further, the anticipated FIFA 2010 World Cup™ has provided benchmarking opportunities for Host Cities, as well as the opportunity to fast-track urban renewal and world-class infrastructural projects. The real value of event is in its catalytic capacity for building a lasting legacy of accessibility and usability for all residents and visitors alike. In alignment with the research question, this study explores the potential benefit of such long-term thinking to the concept of UD.

As stated elsewhere, this research hopes to make a significant contribution to the adoption of UD in related contexts on this continent and beyond. This is done by using Activity Theory as a lens, and in the subsequent proposed adjustable strategies for mainstreaming UD in the city of Cape Town. The fact that the soccer mega-event is being hosted by a country with such a highly publicised history of systemic oppression, discrimination and exclusion offers a set of geopolitical and socio-economic dynamics that are truly unique. These are the very themes that UD interrogates, and will be explored in subsequent chapters of this thesis.

Finally, and most importantly, the Cape Town aspires to be recognised as a world-class Design Capital. The legacy of UD inspired improvements to infrastructure and services would consolidate the city’s standing internationally. Further, the resultant enhancement of the city’s reputation of greater inclusiveness and accessibility would significantly improve its standing as a premier tourist destination.

CHAPTER TWO

AN AFRICAN PERSPECTIVE ON MEGA-SPORTING EVENTS

2.0 Introduction

This chapter presents an overview on the various socio-economic and political imperatives of hosting an event of the magnitude of the FIFA 2010 World Cup™. Whereas many of the issues discussed herein are peripheral to core design practice, the implications must be viewed in the context of the uniqueness of holding such a prestigious event in an African setting. Further, from a technology- and knowledge-transfer point of view, the issues covered are of relevance to many of the projects sponsored by key international actors whose expertise and experience is based exclusively on settings outside of our continent. The chapter concludes with a discussion on the anticipated outcomes and benefits for the Host City of Cape Town.

2.1 Mega-Sporting Events

Bovy (2002:6) states that Europe hosts about 75% of all the World Championships, and further, that there are more than 300 sports mega-events annually. This geopolitical reality formed the basis for South Africa's motivation to host events of such magnitude (Cornelissen & Swart, 2006; Cornelissen, 2009). The nation has the unique distinction of being the only country on the continent to host mega-sporting events of truly global interest. With the exception of the Olympic Games, at the end of 2010, South Africa will have held mega-events for rugby (1995), cricket (2003), and soccer (2010). The successful hosting of the rugby and cricket world cups provided opportunities for nation-building as all South Africans rallied around a common event – a fact often touted by the local organisers of the soccer event (Cornelissen, 2004; 2009).

Arguably, the cost of hosting such events is a prohibitively daunting challenge for most African countries (SAInfo, 2006b; Mafu, 2007; Dentlinger, 2008; du Plessis & Maennig, 2009; van der Merwe, 2009). According to Fick (2006:166) South Africa accounted for 38% of sub-Saharan Africa's gross domestic product in 2004 – the largest of any single country by far. Further, South Africa has the best infrastructure and enjoys the highest standards of financial, communications and information technology-related services. These are prerequisites for hosting any mega-sporting event. The fact that these types of events continue to grow in “overall size as well as in technological and organizational sophistication” (Bovy, 2002:6) impose further logistical challenges for organisers that must meet standards set by FIFA's Technical Coordinating Committee (TCC) (FIFA, 2003; 2004a; 2004b; 2006a; 2006b; 2006c; 2007a; 2007b; 2007c).

Additionally, the political goodwill enjoyed by the country in the post-apartheid dispensation has been tremendous (Cornelissen, 2007). Indeed the personal beneficence and support from the FIFA president, Joseph Sepp Blatter has been evident from the outset (Cornelissen, 2005). Blatter’s constant reassurances on FIFA’s commitment to the 2010 events has been widely publicised in the local media (Cape Argus, 2006; TygerBurger, 2008a). It is clear that the process of compliance for Host Countries is a complex one in view of FIFA’s pervasive influence, economic clout, and prerogative over such decisions (SAInfo, 2004; Dentlinger, 2008). This was the case in the selection of the site of *Greenpoint* stadium in spite of the Metropolitan Council of Cape Town’s distinct (and duly justified) preference for *Athlone* or *Newlands* for the semi-final game (City of Cape Town, 2007; Dentlinger, 2007b; Swart & Bob, 2009). Host Countries (or Cities) cannot however relinquish their social responsibility to another party, no matter how benign or benevolent the declared intent of the external partner is and must take cognisance of their own broader developmental agenda (Cornelissen, 2007; 2009).

2.2 “The Beautiful Game”

Of all the major sporting events, the month-long FIFA soccer event attracts the largest global audience. As reflected in Table 2.1, the actual attendance at each successive tournament has shown a steady growth over a sixty year period from 1930 to 1990, with a marked spike in the 1994 games held in the United States of America (USA) – this was followed by slight declines in 1998 and 2002. The 2006 attendance at Germany’s World Cup™ was the second highest ever.

Table 2.1: FIFA World Cup facts and figures (source: <http://home.netvigator.com>)

Year	Host	Champions	Teams	Games	Goals	Sent-off	Attendance
1930	Uruguay	Uruguay	13	18	70	1	589,300
1934	Italy	Italy	16	17	70	1	361,000
1938	France	Italy	15	18	84	4	376,000
1950	Brazil	Uruguay	13	22	88	0	1,044,763
1954	Switzerland	West Germany	16	26	140	3	872,000
1958	Sweden	Brazil	16	35	126	3	819,402
1962	Chile	Brazil	16	32	89	6	892,812
1966	England	England	16	32	89	5	1,464,944
1970	Mexico	Brazil	16	32	95	0	1,690,890
1974	West Germany	West Germany	16	38	97	5	1,809,953
1978	Argentina	Argentina	16	38	102	3	1,685,602
1982	Spain	Italy	24	52	146	5	2,108,723

Year	Host	Champions	Teams	Games	Goals	Sent-off	Attendance
1986	Mexico	Argentina	24	52	132	8	2,393,031
1990	Italy	West Germany	24	52	115	16	2,516,354
1994	USA	Brazil	24	52	141	15	3,587,088
1998	France	France	32	64	171	22	2,775,400
2002	Korea/Japan	Brazil	32	64	161	17	2,705,566
2006	Germany	Italy	32	64	147	28	3,367,000
Total			361	708	2,063	142	31,051,828

Unlike the 28 sports events of a typical Olympic Games, the soccer World Cup™ tournament focuses exclusively on one sport wherein 32 teams play a total of 64 matches. Another distinction is that whereas the Olympics require dedicated accommodation at an Athletes Village, the soccer event is more relaxed on the issue of proximity with regards to accommodation for the players (Beasley, 1997). This latter factor poses more challenges for transportation logistics, not just for the spectators, but additionally for the players (Beasley & Davies, 2001; Bovy, 2002; 2004; Matheson & Baade, 2004; Davies, 2009).

2.3 A First for Africa

FIFA held its first officially sanctioned tentative competition in Uruguay in 1930 (FIFA, 2006c). In 2010, this will be the first time in the association’s modern history that the African continent will play host to the games. Indeed, the 2010 event is billed as ‘Africa’s’ World Cup™ notwithstanding the fact that the coveted trophy has never been won by an African country. The positioning of the 2010 tournament as an African event is reflected in the campaigns, publicity and branding promoted by both the South African *Local Organising Committee* (LOC) and FIFA – a strategy central to the country’s initial bid to host the 2006 games (Cornelissen, 2005; Czeglédy, 2009). In Figure 2.1 the image portrays the stylised map of Africa whilst using the colours of the South Africa flag; further, the word “Africa” is in red for additional emphasis.



Figure 2.1 Logo of FIFA 2010 World Cup™

(source: www.FIFA.com)

Though neighbouring countries within the *Southern Africa Development Community* (SADC) region will provide additional training venues for teams, and are presently bolstering their infrastructure to ensure that they benefit from some tourist revenue during the World Cup™, the major economic and socio-technical gains from these games will accrue to South Africa and FIFA (SAInfo, 2006a). For example, Zimbabwe (whose economy is recovering from record hyperinflation) has intensified its own campaign to tap into the anticipated tourism windfall and is using the opportunity for public relations redress (Barnes, 2008; Tomlinson, Bass & Pillay, 2009). Granted that South African taxpayers will be paying for the infrastructural developments to successfully host the sports spectacular, it could be argued that the country is entitled to benefiting more from the event than any of its neighbours. In so doing, South Africa will consolidate its political and economic position as the pivotal state within the entire region (Ezeoha & Uche, 2005; Fick, 2006; Cornelissen & Swart, 2006; Daniel, Lutchman, & Comninou, 2007; Czeglédy, 2009; van der Merwe, 2009). In extolling the virtues of *The New Partnership for Africa's Development* (NEPAD), and as a major proponent of the *African Renaissance* and a champion of the anthropocentric ideals of *ubuntu*, South Africa's will be benchmarked by its neighbours for its oft publicised moral aspirations (South Africa, n.d; Mazrui, 1999; Mbigi, 2000; Ibhawoh & Dibua, 2003; OSDP, 2003; Creff, 2004; Davies, 2006; M'Rithaa, 2008). *Ubuntu* (and its relevance to socio-ethical aspirations) is discussed in detail in Section 6.3.3 of this thesis.

Of particular importance for the organisers is the need to keep tournament ticket prices within affordable limits for local fans and those from the rest of Africa (Tomlinson *et al.*, 2009). There are plans to ameliorate this situation by availing free tickets to boost attendance by this category of fans (Kortjass, 2007c; Swart *et al.*, 2009). Sub-Saharan Africa has the unfortunate distinction of having some of the poorest and most oppressed communities on the planet (Gibson, 2004). The region faces often daunting challenges of *poverty*, *instability*, *disease*, *illiteracy* and *corruption* as identified by Pascal Eze (cited in Jere-Malanda, 2008:1). This view often promotes a sense of Afro-pessimism; or "Africa bashing" as described by Frederick Cooper (1997:189, cited in Ibhawoh & Dibua, 2003:61).

The most sustainable long-term benefit for the continent would lie more in the socio-technical (and not necessarily in the economic or political) domain (Wilkinson, 2008; Tomlinson, 2009). The potential of soccer as a unifier of disparate societies cannot be over-emphasised – this despite the corporate elitist perception of the World Cup™ and the fact that the event patently precludes the participation of *female* athletes (Rubin, 2009). Additionally, the mega-events are

situated in urban settings though some benefits in the form of increased tourism and significantly more bookings for accommodation are expected to trickle down to rural and other non-host communities (Atkinson, 2009). Significantly, the vast majority of the continent's 840 million inhabitants are categorised as youth. Notwithstanding, soccer, particularly in the professional sense has had a unique impact on a number of African societies:

- Promising African players (principally from West Africa) have immigrated to more developed countries to advance their careers there – this is one of the most striking effects of globalisation on Africa as described by Akindele, Gidado and Olaopo (2002);
- The extra-ordinarily high wages paid to professional players (particularly in Europe) has directly benefited the communities of the African players in their homelands (for example the role of George Weah with respect to his country Liberia); and
- This commercialisation of sports has created new role models (especially among male youth) – soccer could be promoted as a tool for countering social maladies amongst the youth (such as idleness, juvenile delinquency and related anti-social behaviour) that has adversely affected myriad families on the continent (Takyi & Oheneba-Sakyi, 2006).

The country is using the *FIFA Confederations Cup™ South Africa 2009* (to be held from the 14th to the 28th of June 2009) as a dress rehearsal for the 2010 tournament (FIFA, 2009). The performance so far with regards to the marketing and ticket sales appears to be far below expectations. Ticket sales have been dismal with only about 300,000 out of a total of 640,000 (FIFA, 2009). The importance placed on the Confederations Cup™ led to the high profile endorsement of *Danny Jordaan* (the Chief Executive Officer of the 2010 LOC) and *Ms Baleke Mbete* (the Deputy President of South Africa at the time) flanked by the FIFA 2010 official mascot *Zakumi* (shown in Figure 2.2) who went on a roadshow campaign to a number of soccer-loving locales – including the famous Soweto Township outside Johannesburg.



Figure 2.2 Zakumi – the official 2010 mascot
(source: www.FIFA.com)

2.4 Implications for the Host Country

The global phenomenon of sports tourism is noted by Zauhar (2004:5) as a key economic driver which is of particular importance to a host country. Indeed, as Fridgen (cited in Zauhar, 2004:5) argues, the forces that have shaped tourism have shifted from advances in transport technology to “socio-demographic changes; electronic information and communication systems; more knowledgeable and demanding consumers; [and] de-regulatory market place”. The fact that most of the Host Cities have yet to implement even a basic integrated transport system is cause for concern (Makgetla, 2007). The majority of visitors are from the developed world where sophisticated and efficient systems are almost taken for granted (Walsh, 2001; Matheson & Baade, 2004). It is imperative therefore for a Host City to cater for a range dedicated services for tourists whose primary motivation for visiting a country is their love of soccer (Davies, 2006).

The implications of hosting the 2010 sports mega-event in South Africa include:

- The high cost of building (at least 10) FIFA-standard stadia (Tomlinson, 2009);
- The need for reasonable accommodation of an international standard for the tournament teams and sports tourists (Ormerod & Newton, 2005);
- The provision of reliable and integrated public transportation between all major venues;
- The provision of security for the VIPs from the *FIFA Family* (its top officials) against the backdrop of unacceptable (high) levels of crime in the country; and
- The need to redress some of the spatial apartheid-inspired inequalities as is the case in Cape Town (Sherer, 2000; Boraine, 2004; Cornelissen, 2005; 2009; COHRE, 2007).

2.5 2010 and Cape Town

The *City of Cape Town* previously launched an unsuccessful bid to host the *2004 Olympic Games* (Cornelissen, 2005). The lessons learnt for this process informed the national bid for the soccer mega-event first for the 2006 games (in which Germany emerged the winner) and again for the 2010 event. Cape Town enjoys significant goodwill as a city not only because of its natural beauty (with a number of *UNESCO World Heritage Sites* in its vicinity – including the iconic Table Mountain), but also due to the local government leadership’s commitment to good governance and issues such as environmental sustainability and socio-economic development (UNESCO, 2005). Consequently, the city was voted “one of ten cities that are most likely to become a global sustainability centre by 2020” (SA Good News, 2008).

According to Andrew Borraine (2004:4), Chairperson of both the *South African Cities Network* (SACN) as well as the *Cape Town Partnership* (CTP), the nine major municipalities of Buffalo City (East London), Cape Town, Ekurhuleni, eThekweni (Durban), Johannesburg, Mangaung (Bloemfontein), Msunduzi (Pietermaritzburg), Nelson Mandela Metropole (Port Elizabeth) and Tshwane (Pretoria) – all members of the SACN host 37% of the country’s population. It is worth noting that of the nine Host Cities for the FIFA 2010 World Cup™ (Bloemfontein, Cape Town, Durban, Johannesburg, Nelspruit, Polokwane, Port Elizabeth, Pretoria, and Rustenburg), the majority are SACN members (see Table 2.2).

Table 2.2: Match schedule for 2010 World Cup™ Host Cities (source www.FIFA.com)

	Group Matches									Round of 16				Quarter Finals		Semi Finals		3/4 Place and Final															
	Friday, June 11	Saturday, June 12	Sunday, June 13	Monday, June 14	Tuesday, June 15	Wednesday, June 16	Thursday, June 17	Friday, June 18	Saturday, June 19	Sunday, June 20	Monday, June 21	Tuesday, June 22	Wednesday, June 23	Thursday, June 24	Friday, June 25	Saturday, June 26	Sunday, June 27	Monday, June 28	Tuesday, June 29	Wednesday, June 30	Thursday, July 1	Friday, July 2	Saturday, July 3	Sunday, July 4	Monday, July 5	Tuesday, July 6	Wednesday, July 7	Thursday, July 8	Friday, July 9	Saturday, July 10	Sunday, July 11		
Johannesburg Soccer City	A1		B1				C1		D1			E1											A										Winner
Johannesburg Ellis Park		B2			C2			D2		E2																							Winner
Nelspruit Mbombela						E3				F3		G3																					
Rustenburg Royal Bafokeng																																	
Mangaung/Bloemfontein Free State																																	
Cape Town Green Point	A2																																
Durban Durban																																	
Polokwane Peter Mokaba																																	
Nelson Mandela Bay/Port Elizabeth Port Elizabeth																																	
Tshwane/Pretoria Loftus Versfeld																																	

Match numbers and provisional kick-off times will be confirmed in due course

Despite the significant role these cities play in the socio-economic life of the country, the legacy of the apartheid city form still persists in terms “race, space and poverty; fragmentation and urban sprawl; and poor access and mobility” (Borraine, 2004:7). The *Unicity Commission* (2001) recognised this challenge in Cape Town and proposes a comprehensive strategy for developing a sense of unity and inclusiveness for all its residents. Figure 2.3 shows the logo of Host City of Cape Town in association with the national 2010 one – note the stylised representation of the ocean (and waves), the sun, and Table Mountain.



Figure 2.3 2010 logos for Cape Town and South Africa
(source: www.FIFA.com)

More specifically, the SACN members envision a future in which the following four key elements interact with regards to their respective city populations:

- *PRODUCTIVE CITY* – wherein the local economy provides a majority of residents with means to earn a reasonable living;
- *INCLUSIVE CITY* – wherein residents have the opportunities and capacities to share equitably in the social benefits of city life;
- *SUSTAINABLE CITY* – wherein the city impacts on the envelope of natural resources that sustains the settlement and makes it liveable; and
- *WELL-GOVERNED CITY* – wherein the political and institutional context is stable, open and dynamic enough to accommodate all interests (Boraine, 2004:3; South African Cities Network, 2005; 2008).

Dan Plato replaced *Helen Zille* as Cape Town's *Executive Mayor* in May 2009. During her tenure, Zille received the *2008 World Mayor Prize* topping a list of 820 mayors worldwide (SouthAfrica.info, 2008). Zille emerged from the 2009 national elections in a far stronger position than in any previous elections since she became leader of the *Democratic Alliance* (DA) Party, a position she has held since 2007. This is a significant development as it presents opportunities for further consolidation of political power at three levels: at local government through ensuring the appointment of a dynamic successor to the office of the *Executive Mayor*; at regional government as the incumbent *Premier of the Western Cape*; and at national level as the *Leader of the Official Opposition*. Under Zille's leadership, Cape Town advanced a *participatory approach to governance* by constantly inviting the general public to engage with the City on a variety of developmental issues (Contact Newsletter, 2007b).

Mumford (1979, cited in Sjöberg, 1996:3) identifies three levels of participation. The following is adapted to fit the context of participation vis-à-vis the City of Cape Town:

- *consultative participation* – where certain residents would serve as sources of knowledge, and are consulted on occasion;
- *representative participation* – where residents are selected to represent the residents' views (in an ideal situation the chosen residents are empowered to take part in the guidance of the change process); and
- *consensus participation* – where all residents are invited to take part in *all* stages of the change process (wherein a potentially emancipatory change process is engendered).

The participatory governance espoused by the City of Cape Town would at best approximate representative participation; a situation very different from the consensus participatory approach that an exemplary city such Curitiba (in Brazil) follows (Dobbs, 2001; Steinfeld, 2001; Campbell, 2006). The persistent resistance to plans for rezoning the *Greenpoint Common* is instructive. In this particular case, conservationists/representatives of the *Greenpoint Common Association* took the City of Cape Town to court (in early 2007) to challenge the latter's projections on the environmental sustainability of the project, and further questioned the rationale of building a new stadium (as opposed to refurbishing the existing one) in a city where issues such as adequate housing for its 3.5 million residents should have received priority funding (COHRE, 2007; Dentlinger, 2007a). The case was eventually dropped.

Criticism has also been directed at national and regional government departments for the absence of a national 'green' strategy for 2010 (Ross, 2009). To reduce the adverse impact of hosting the tournament, Cape Town launched its own *Green Goals Action Plan* (based on Germany's pioneering effort in 2006) targeting the nine specific areas: *Energy conservation and climate change; Water; Integrated waste management; Transport, mobility and access; Landscaping and biodiversity; Green building and sustainable lifestyles; Responsible tourism; Green Goal communications; and Monitoring and measurement and reporting* (City of Cape Town, 2008; Zwane, 2008). Cape Town has consistently been at the vanguard of new policy and legislation, as well as in actual planning of 2010-related activities at local government level.

More recently, there has been stiff resistance (often resulting in illegal and violent confrontation) by the commuter taxi drivers' associations who fear loss of jobs, income and control should the City proceed to implement its planned *Integrated Rapid Transit* (IRT) system (Steyl, 2008a; TygerBurger, 2008b). The roll-out of the full IRT system is planned in stages, with Phase 1 which will link the central Cape Town hub (Figure 2.4) to the airport expected to be ready in

time for the 2010 event (Steyl, 2008b). The remaining Phases 2, 3 and 4 expected to be completed in 10 to 12 years (City of Cape Town, 2007; 2009; Department of the Premier, 2008).

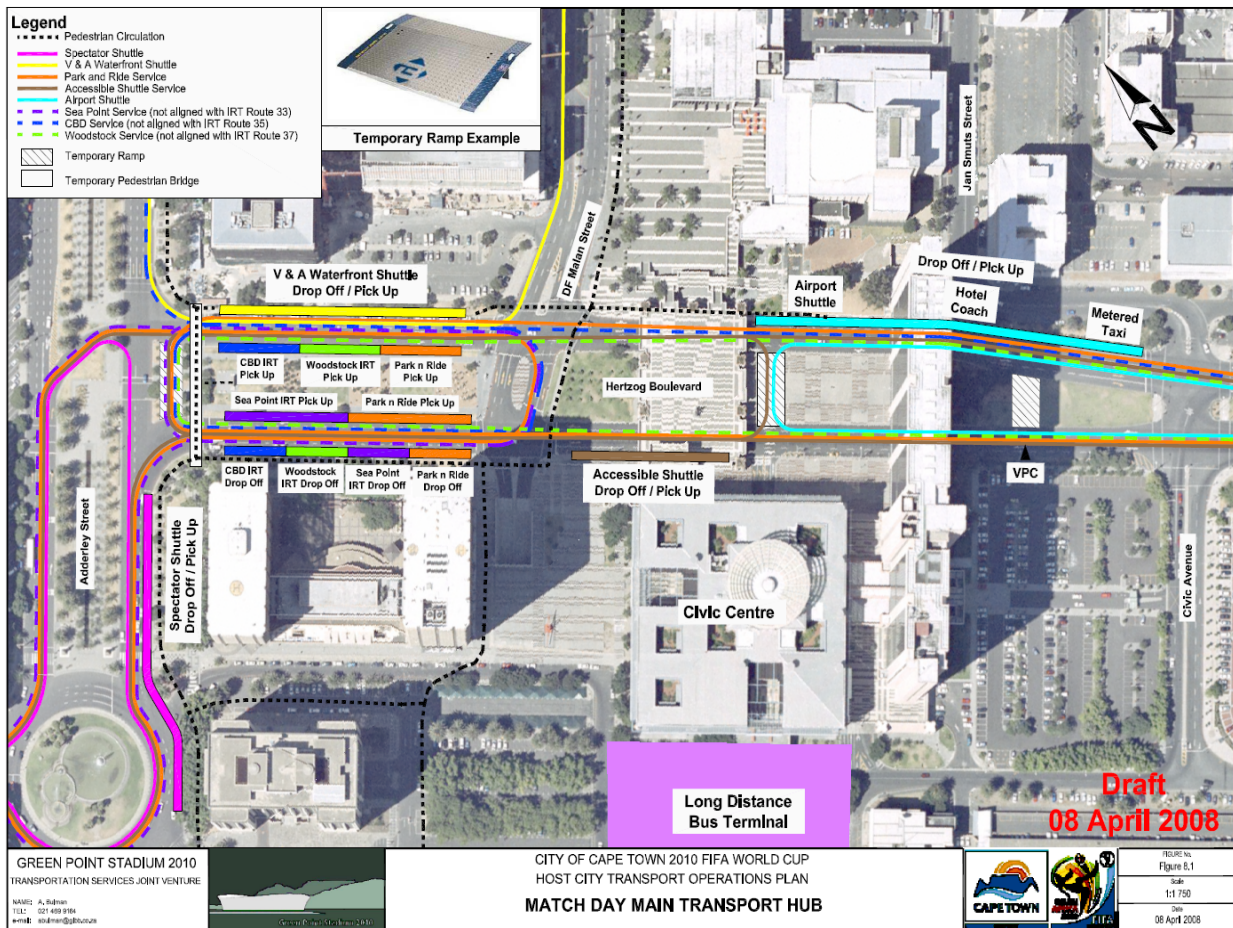


Figure 2.4 Central Cape Town’s main IRT hub
(source: City of Cape Town)

McKenzie (2008) and Fourie (2009) express optimism on an amicable solution being found wherein the taxi operators surrender their old vehicles in exchange for newer, safer and better regulated ones thereby providing a seamless link within the extended/complete IRT system (Figure 2.5). Public participation is critical for any economically viable and micro-level development strategy as is the case of the quasi-formal commuter taxi sector (Theron, 2005). Animated debate and acts of dissention on the part of the taxi operators should be viewed as ‘healthy’ signs from a purely democratic and participatory point of view, provided that the participants function within the law. As Sjöberg (1996:7) argues, participatory design views the groups as being heterogeneous in nature. *Heterogeneity* (herein synonymous with *variety* and *disparity*) subsequently embodies *diversity* and *creativity* within its membership (Stirling, n.d).

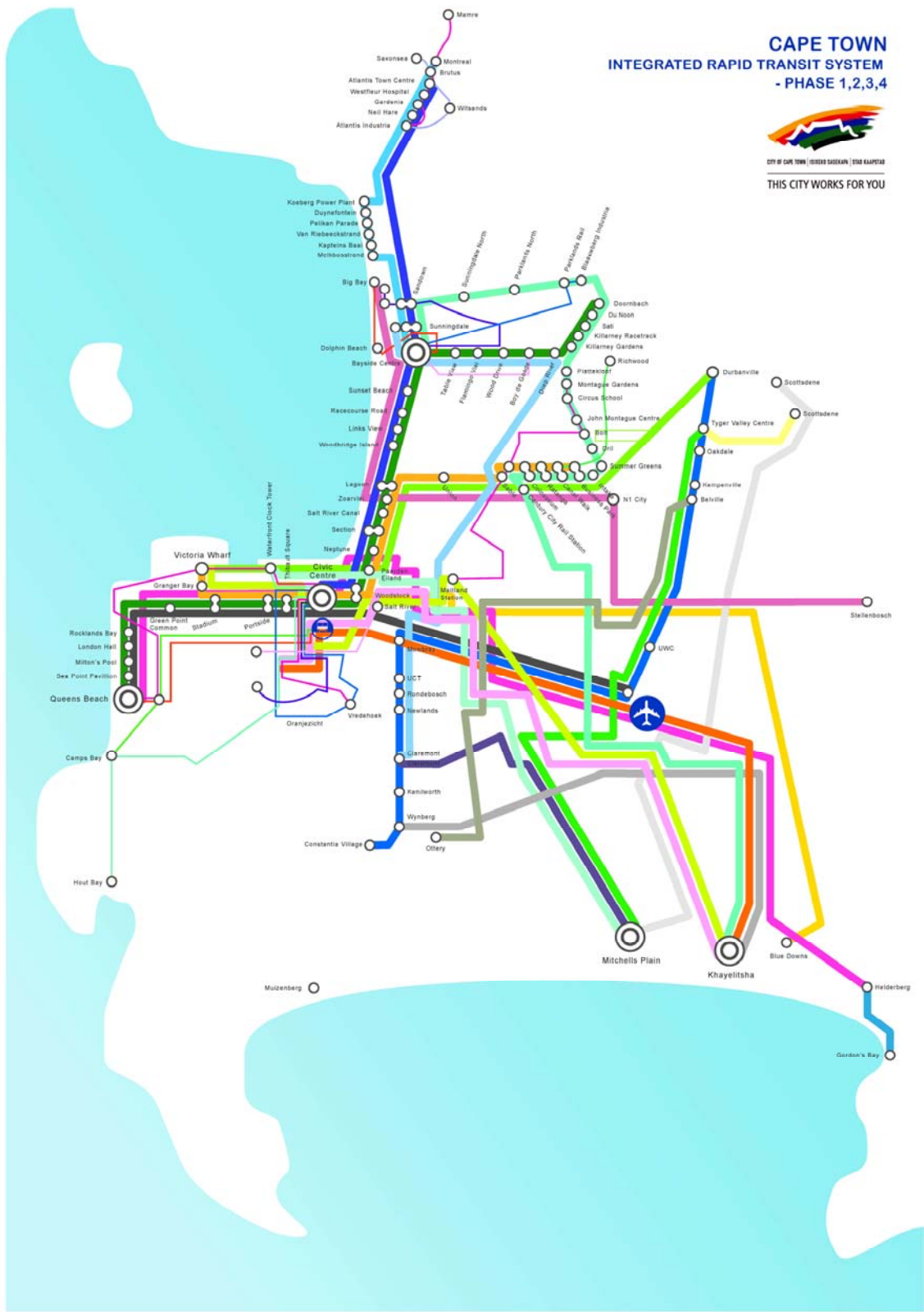


Figure 2.5 Cape Town's complete IRT system – Phases 1-4
(source: City of Cape Town)

Similarly, scathing criticism has been levelled against the *Cape Metrorail* for poor maintenance, lax security, poor accessibility and the confusion commuters experience in the absence of an integrated effective wayfinding system (Prince, 2006; Powell, 2007; Marud, 2008; Smith, 2009). The problems appear not to be unique to Cape Town. At least 1.6 million commuters use the national Metrorail service daily which is run by the *South African Rail Commuter Corporation* (SARCC) (wa ka Ngobeni, 2009). SARCC admits that one-third of its entire rolling stock is too old for refurbishment and consequently plans to introduce 560 new coaches per year over the next decade at a cost of ZAR 7 billion a year (*ibid*). Cape Town’s historic developmental emphasis focused on providing more roads for personal vehicles as opposed to mass transit rail and commuter bus options – the latter two being the more sustainable transportation options. Figure 2.6 shows the major highways linking Greenpoint Stadium to the Cape Town International Airport and beyond.

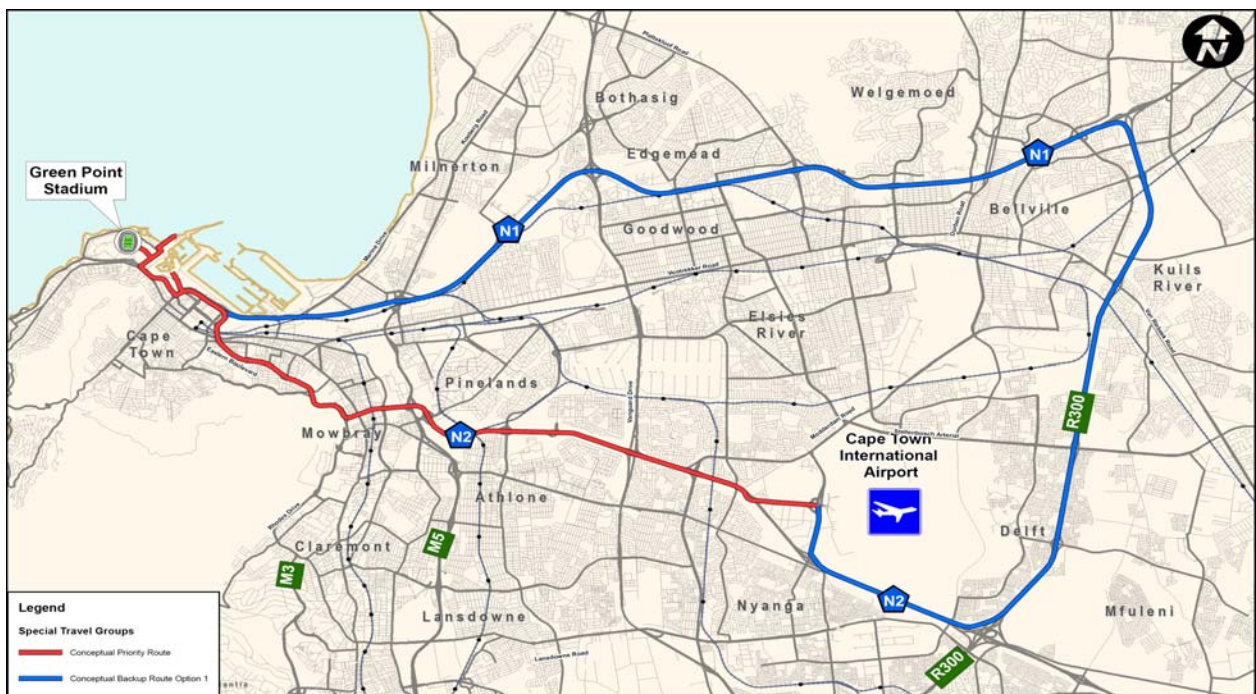


Figure 2.6 Map of Cape Town showing major highways linking the airport and the stadium (source: Donald Cupido – City of Cape Town)

Cities with challenges akin to Cape Town’s include the South American cities of *Curitiba* and *Bogotá* (in Colombia) who introduced world-leading, accessible *Bus Rapid Transit* (BRT) systems (Dobbs, 2001; Steinfeld, 2001; Campbell, 2006; Wright & Hook, 2007). The experiences of the visionary Mayors *Jaime Lerner* of Curitiba and *Enrique Peñalosa* of Bogotá indicate that it would take considerable courage to tackle the “political and technical complexity”

to implement a successful and sustainable BRT system in a city such as Cape Town (Wright & Hook, 2007:639). This system is perceived to be less of a financial risk than the considerably more expensive *Gautrain* heavy rail system between Johannesburg and Pretoria – whose primary target is to reduce congestion via personal vehicles by encouraging motorists to use the high-speed rail transit instead (Cupido, 2008; Verster, 2008). An inaugural test was carried out on a completed section of the Gautrain system in February 2009 amidst much fanfare and publicity.

Bucher (2008) argues for the city to give public transport priority on all municipal roads. The overall benefit for residents in cities adopting sustainable transportation systems is in reclaiming more pedestrianised zones such as those planned for *Public Viewing Areas* (PVA) and the 2010 *Fan Mile* route in central Cape Town as highlighted in red in Figure 2.7 (Boraine, 2007). The *FanFest* venue will be dedicated to non-motorised transport (as elaborated in Figure 2.8) – for cyclists and pedestrians, as well as providing opportunities for small traders to carry out business (Design Indaba, 2007; Cape Times, 2008; Haferburg, Golka & Selter, 2009). Additionally, Cape Town currently offers the *Dial-a-Ride* service as specialised transport for disabled commuters (Swart *et al.*, 2008:51). A more inclusive approach would be to mainstream UD-inspired strategies as “[UD] especially helps those with physical, sensory, and cognitive disabilities [as well as] tourists, visitors, and first-time users” of a BRT system thus ensuring greater accessibility for all users (Wright & Hook, 2007:497).



Figure 2.7 Map of central Cape Town showing the route of the proposed 2010 Fan Mile (source: Andrew Boraine – Cape Town Partnership)

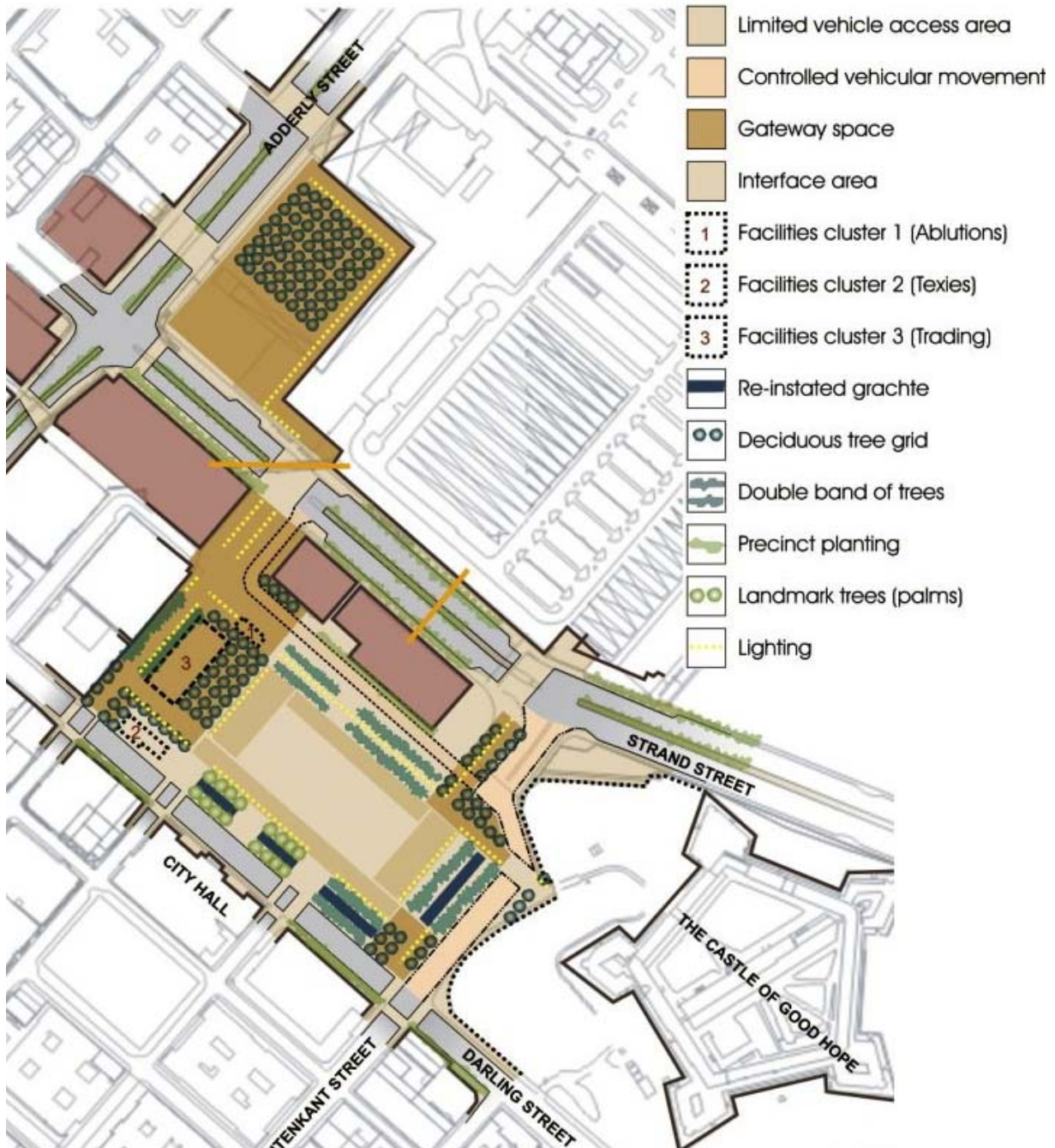


Figure 2.8 Detailed map of central Cape Town showing the main 2010 FanFest venue (source: City of Cape Town)

2.5.1 Building a Sustainable Legacy

The example of visionary actors in a variety of different settings can help consolidate socio-economic and political gains from an event such as the 2010 one. For example, the championing role of *Rudolph Giuliani*, the former Mayor of the City of *New York*, formalised the

central role of UD by engaging the local chapter of professional architects, as well as facilitating the involvement of the *Centre for Inclusive Design and Environmental Access* (IDEA) of the State University of New York (which also hosts *The World of Universal Design* website) in the process of researching and promoting UD strategies in that city (Danford & Tauke, 2001). Similarly, in the city of Curitiba, Brazil, former Mayor Jaime Lerner formed a partnership between the mayor's office, professionals (including engineers), and *Instituto de Pesquisa e Planejamento Urbano de Curitiba* (IPPUC) or the Institute of Research and Urban Planning to address similar challenges (Campbell, 2006).

Despite the fundamental differences in approach taken by the two cities – with New York taking a more traditional route of engaging policy makers and experts prior to disseminating the strategies in a *top-down* manner, whilst Curitiba took a *bottom-up* participatory approach – the impact in the respective cities was marked (Campbell, 2006; M'Rithaa & Futerman, 2007). Cape Town's "public participation process" (as discussed earlier) could provide an effective means of engagement with the residents, provided it pursued an inclusive consensus participatory approach (Sjöberg, 1996; Bühler, 2001; Luck, 2003; Contact, 2007:1; Platzky, 2007). Further, the local partnerships within New York and Curitiba illustrate sustainable tripartite collaboration between such key actors as government planners, professional designers, and design academics – including educators and researchers (M'Rithaa & Futerman, 2007).

The need for sustainable long-term partnerships is particularly significant in view of the argument advanced by Cornelissen and Swart (2006) that the political and corporate elite stand to gain more from the hosting of a sporting mega-event than the local residents, despite concerted attempts to change this perception via FIFA's highly publicised corporate social investment projects (Contact Newsletter, 2007e; Kortjass, 2007a; 2007b; 2007c). They cite the 2002 FIFA World Cup™ co-hosted by the Asian countries of *Japan* and *South Korea* to show that it is a near impossibility to accurately anticipate the benefits of hosting the games stating that the tournament "notoriously under-delivered on the expectations of the respective organisers" due in part to the 'crowding out effect' – where certain regular or expected visitors opt not to visit during the duration of the tournament (Cornelissen & Swart, 2006:110). Other commentators have reported on this phenomenon (Roaf, van Deventer & Houston, 1996; Matheson & Baade, 2004; Matheson, 2006). In reality, there may well be a major shortfall in visitors, in part due to the magnitude of the current global economic recession.

Cape Town is led by a dynamic professional team of city managers and planners (Contact Newsletter, 2007b; 2007d). It is one of the most progressive cities in Africa, and is recognised as a world-class city by the international community (Gosling, 2008). It stands to gain even greater visibility and prestige once the visitors start pouring in for the soccer extravaganza.

Ultimately, the true legacy of hosting the World Cup™ for residents of Cape Town will be in the more accessible and revamped sports facilities as in Figure 2.9 (the Mouille Point Beachfront and Promenade at the top left-hand corner was the site of the Students' Landscape Design Competition discussed in Section 5.2.3.3); a more 'legible' city with respect to wayfinding (Zmudzinska-Nowak, 2003); improved public transportation and road infrastructure such as the major Koeberg Road/N1 Highway interchange (Figures 2.9a and 2.9b); a more efficient and larger airport; faster commuting during rush hour/peak traffic via dedicated *bus-minibus-taxi* (BMT) lanes; upgraded bus ranks and rail stations; technology transfer in construction and mega-events management; logistics; micro-enterprise development and support; a greater eagerness to engage in participatory governance of the city's affairs; and potentially, the pride of having successfully hosted Africa's first World Cup™ (Eason, 2005; City of Cape Town, 2006; 2007; CityNews, 2007a; 2007b; 2007c; M'Rithaa, 2006; M'Rithaa & Futerman, 2007).



Figure 2.9 Map showing the scale of development around Greenpoint Stadium (source: Ovp Associates)



Figure 2.10a Ongoing upgrading of road infrastructure – *before construction*
(source: Donald Cupido – City of Cape Town)



Figure 2.10b Ongoing upgrading of road infrastructure – *after completion*
(source: Donald Cupido – City of Cape Town)

2.5.2 Anticipated Outcomes

South Africa is undoubtedly the most successful country in Africa in terms of bidding for sporting mega-events (Cornelissen & Swart, 2007). Cricket South Africa's recent selection to host the *Indian Professional League* in March 2009 (at extremely short notice) bears testimony to the perceived competence of the country to organise a successful event of such magnitude whilst meeting security and related obligations to players and spectators alike (BBC Sport, 2009). Further, the marketing of the event and exceptionally high tickets sales of for the cricket tournament is worthy of emulation by the *Africa Confederations Cup* and 2010 World Cup organisers. In so doing, the anticipated benefit for nation building via a renewed sense of unity and social cohesion might become a reality, provided that the games are linked to broader goals of economic opportunity, political participation, justice, equity, development, and social inclusion through increased accessibility to all public services (Kearney, 2005).

The potential for nation-building is partly tempered by the dismal performance record of the *Bafana Bafana* national soccer team presently ranked 77th worldwide, and 18th in Africa (Mail & Guardian, 2009). The team needs to improve rather urgently to inspire the level of confidence and national pride that the national rugby (the *Springboks*) and cricket (the *Proteas*) teams have done for the country. Cricket and rugby have arguably been historically better resourced and managed in part due to their association with the ruling white elite in the apartheid era as well as their ability to attract and retain the best players within the country (Desai & Nabbi, 2007). Soccer could potentially be harnessed to engage civil society in participatory nation-building initiatives. The impact of this sense of fraternity could well extend to the rest of Africa riding on the broader foreign policy and pan-Africanist agenda that South Africa has championed via the 2010 event (Ezeoha & Uche, 2005; Fick, 2006; Cornelissen & Swart, 2006; Boon, 2007).

Another possible outcome of the 2010 event would be a renewed and sustainable investment in soccer and related sports tourism potential, particularly as the sport's infrastructural needs will have been met largely due to the construction and upgrading of stadia across the country (Cornelissen, 2009; Swart *et al.*, 2009). Consequently, the newly appointed Operator will be expected to run the completed Greenpoint Stadium (Figure 2.11) in an economically viable and profitable manner so as to justify the significant investment in the said facilities (City of Cape Town, 2007). The benefit of compliance with the stringent and exacting guidelines set by FIFA guarantee exceptional quality of the facilities by (South) African standards (*ibid*).



**Figure 2.11 Panoramic view of the completed Greenpoint Stadium
(source: City of Cape Town)**

2.6 Summary

The recent global recession may make a significant dent on the revenues expected from sports tourists visiting the country. Though the real benefits to the country can only really be determined accurately *ex post facto*, the actual gains may well lie in the legacy projects and participatory processes inherited by the residents of South Africa's Host Cities. These cities have many pressing challenges of a socio-economic and developmental nature. In positioning the 2010 projects within the broader developmental strategies, advances can be made in the provision of long overdue infrastructural upgrades, as well as the opportunity to introduce truly sustainable mass transit systems.

Further, Host Cities in general (and Cape Town in particular) should consolidate gains made from lessons learnt in the planning and implementations thus far to embrace a long-term inclusive and potentially emancipatory consensual participatory approach to matters of public interest so as to facilitate what Sjöberg (1996:3) refers to as "a well functioning dialogue" between city planners and managers on the one hand; and their residents on the other. In this latter scenario, the expression of their viewpoint in the residents' own unique 'voice' would ensure that they have a greater sense of ownership as co-planners of the cities in which they live out their lives.

CHAPTER THREE

VULNERABLE POPULATIONS IN CONTEXT

3.0 Introduction

This chapter provides a general background on definitions and categories of vulnerable populations. The chapter also elaborates on available data from a variety of official sources and discusses the practical implications of emerging demographic trends from a number of contexts. The findings provide a sound basis for the argument for an urgent paradigm shift in dealing with the vulnerable groups; a shift to a unified non-exclusive approach to the patently diverse needs.

3.1 Vulnerable Populations

According to the Microsoft® Encarta® (2009), the adjective 'vulnerable' implies: ***without adequate protection*** – open to physical or emotional harm; ***extremely susceptible*** – easily persuadable or liable to give in to temptation; or ***physically or psychologically weak*** – unable to resist illness, debility, or failure. Though arguably some of these lexical meanings fail to elaborate any direct bearings on design or the built environment, some common features emerge – vulnerable populations typically cannot (for a host of reasons) fend for themselves and are thus open to coercive and manipulative practices by others (Benson, 1997). In reality, in applying a convenient label to such broad and heterogeneous category there is the constant risk of losing the inherent diversity through generalisation for the sake of economy (Stirling, n.d). Subsequently, for the purposes of this study, the vulnerable populations will include the disabled; the elderly; women; the young; as well as foreigners and visitors. Vulnerability resulting from natural disasters will not be considered herein.

Vulnerable populations are identified as specific categories of people who are considered to be patently disenfranchised or are likely to be excluded from participation in all the rights and opportunities that are guaranteed to the general citizenry of a particular place (Jaeger & Bowman, 2005). Membership to such categories/populations may be as a consequence of structural or systemic reasons (such as inadequate support systems that promote equitable socio-economic participation); or due to more mundane and functional reasons (such as a bodily condition that limits a person's ability to function fully within the given social context). Pheasant (1998:23) advances the principle of the 'limiting user' – a concept that seeks to

redress vulnerability within the discipline of Ergonomics/Human Factors. Other targeted responses to the needs of vulnerable populations will be discussed in Chapter Four.

3.1.1 The Disabled

As Madden and Hogan (1997) argue, disability is a complex multi-dimensional term whose working definition (and thus perceived meaning) often changes depending on which audience of actors is being addressed. Further, there is a diverse range of professionals interested in disability for a host of different reasons. These include: “providers of support services; funders and planners of broad disability programs; administrators of legislation outlining the rights of people with a disability; people responsible for income security policy, including the social security and compensation fields; clinicians; and national and international statisticians” (Madden & Hogan, 1997:2). Similarly attempts to understand disability from a variety of geopolitical perspectives is reported elsewhere (DPSA, n.d; Oliver, 1990; 1996; European Commission, 2002; Winam, 2003; DePoy & Gilson, 2004; EIDD, 2004). With respect to the populous sub-Saharan region of Africa, there is a demonstrable link between disability and poverty (United Nations, 2005; Albone, 2008).

To facilitate a common understanding of disability among the various role players, the World Health Organization (WHO) proposed the *International Classification of Functioning, Disability and Health (ICF)* for use in the collection of data, as well as in informing responses to disability among WHO member countries (WHO, 2001; 2002; 2004). The ICF makes a direct link between the issues of disability and a person’s levels of functioning, and more importantly, the ICF acknowledges the impact of environmental factors on the latter (Pasha & Pasha, 2006; Schneider, 2006). Lately, the medical profession has also adopted the ICF paradigm on disability (Leonardi, Bickenbach, Ustun, Kostanjsek & Chatterji, 2006).

According to United Nations (2003) estimates, it is believed that between 10-12% of the world’s population is disabled. As depicted in Table 3.1, the Census 2001 statistics for South Africa however indicate a much lower 5% (Stats SA, 2005a:1) – a figure that might conceal the actual extent of the prevalence of disability in this country in part due to under-reporting as a result of inadequate data capture instruments or due to the social stigma associated with disability (ODP, 1997; Child Health Policy Institute, 2001; WHO, 2002). The *Integrated National Disability Strategy* on the other hand acknowledges a more realistic figure of between 5 and 12% of the general population as being disabled (ODP, 1997).

In other instances, the definitions and underlying assumptions affect an accurate interpretation; as in the working definition used for the *Census 2001* as “a physical or mental handicap which has lasted for six months or more, or is expected to last at least six months, which prevents the person from carrying out daily activities independently, or from participating fully in educational, economic or social activities” (Stats SA, 2002:vi). Of the various disability types recorded, the “prevalence of sight disability was the highest (32%) followed by physical disability (30%), hearing (20%), emotional disability (16%), intellectual disability (12%) and communication disability (7%)” (Stats SA, 2005a:1). A detailed breakdown of available data based on ethnic background of South Africans with disabilities for 1996, 1998, and 2001 is provided in Table 3.1 (Health Systems Trust, 2006).

Table 3.1 Prevalence (%) of disability in South Africa by ethnic background (source: Health Systems Trust)

	Physical Disability		Sight Disability		Hearing Disability		Mental Illness		All Types of Disabilities		
	1996	2001	1996	2001	1996	2001	1996	2001	1996	1998	2001
Ethnicity :											
African/Black	1.6	1.2	3.2	1.4	1.1	0.7	0.5	-	7.5	6.1	5.2
Coloured	0.9	1.3	1.0	0.8	0.4	0.5	0.4	-	3.6	4.5	4.2
Indian/Asian	0.9	1.1	1.5	0.8	0.5	0.4	0.4	-	4.1	4.8	3.7
White	0.6	1.3	0.7	0.7	0.6	0.8	0.3	-	3.3	5.3	4.5
Other/Unspecified	0.8	-	1.3	-	0.6	-	0.4	-	4.4	-	-
All Groups	1.4	1.2	2.7	1.3	1.0	0.7	0.5	-	6.5	5.9	5.0

South Africa had a total of 2,255,982 people with various forms of disability according to the 2001 Census (Stats SA, 2005a:1). The vast majority (1,854,376 or 82.2%) were *African*; 168,678 (or 7.5%) *Coloured*; 41,235 (or 1.8%) *Indian/Asian*; and 191,693 (or 8.5%) *White* (*ibid*). These figures closely mirror those on the ethnic composition of the general population of 79% African; 8.5% Coloured; 2.5% Indian/Asian; and 9.6% White (Stats SA, 2002:17).

The number of females affected was 1,173,939 (or 52%), whilst 1,082,043 (or 48%) were males – percentages that are identical with the general population’s (*ibid*). With respect to age however, there is a marked disparity in the prevalence rates starting with a low of 2% among the young aged 0-9 years, and rising to a high of 27% among senior citizens aged 80 years and above (Stats SA, 2005a:1).

The picture in the Western Cape Province is slightly different. The total figure of over 145,000 people with disabilities suggested in another source appears conservative at best (Western Cape, 2004:2). The *Census 2001* data appears more realistic. It is believed that out of a total

of 186,850 people with disabilities, 96,549 (or 4.4%) were male, whilst 90,301 (3.9%) were female (Stats SA, 2002:12). The total figure works out to 4.1% of the general population – the second lowest disability prevalence rate of any of South Africa's nine provinces (*ibid*). Tabl 3.2 summarises some of the comparative data available for 1996, 1998, and 2001 on the prevalence rates of various disability types in the various provinces in South Africa.

Table 3.2 Prevalence (%) of disability in South Africa by province (source: Health Systems Trust)

Province:	Physical Disability		Sight Disability		Hearing Disability		Mental Illness		All Types of Disabilities		
	1996	2001	1996	2001	1996	2001	1996	2001	1996	1998	2001
Eastern Cape	1.9	1.5	2.6	1.3	1.1	0.8	0.7	-	7.3	8.9	5.8
Free State	1.6	1.3	5.2	2.2	1.3	1.0	5.4	-	9.8	5.8	6.8
Gauteng	1.0	1.0	2.9	1.0	0.8	0.4	0.3	-	6.2	5.2	3.8
KwaZulu-Natal	1.6	1.3	2.2	1.2	0.9	0.7	0.5	-	6.0	6.7	5.0
Limpopo	1.5	1.0	2.3	1.3	1.1	0.8	0.4	-	6.0	6.3	5.1
Mpumalanga	1.1	1.3	3.6	1.6	1.2	0.9	0.5	-	7.6	4.5	5.8
Northern Cape	1.2	1.6	2.3	1.5	0.8	0.7	0.5	-	5.6	4.5	5.7
North-West	1.8	1.4	3.4	1.7	1.6	0.7	0.7	-	8.3	3.1	5.8
Western Cape	0.9	1.2	3.8	0.8	0.5	0.6	0.4	-	3.7	3.8	4.1
South Africa	1.4	1.2	2.7	1.3	1.0	0.7	0.5	-	6.5	5.9	5.0

Disability when viewed within the broader sense of gross incapacitation reveals a starker picture of the debilitating effects of the HIV/Aids pandemic, and the impact this disease has had on the significant number of people living with Aids, particularly in sub-Saharan Africa (Barnett & Whiteside, 2002; Deacon, Stephney & Prosalendis, 2005; WHO, 2007). Swartz, Schneider, and Rohleder (2006) demonstrate a clear link between HIV/Aids and disability. The malaise, general fatigue and related limitations in functioning at the full-blown stages of the disease would justify this association (ODP, 1997; Barnett & Whiteside, 2002). To put this in perspective, the UNDP (2005) declares that “HIV has inflicted the *single greatest reversal in human development* in modern history”.

The devastating results of high mortality rates within the economically active segment of the population has led to a unique phenomenon of the elderly becoming primary caregivers to not only their infected grown-up children, but also to their affected grandchildren – many of whom end up as Aids orphans (HelpAge, 2002; Albone, 2008). The UNAIDS (2008:13) estimates that Aids has created 12 million orphans under the age of 18 in sub-Saharan Africa – a factor that threatens the sustainability of entire societies as “the natural age distribution in many national populations in sub-Saharan Africa has been dramatically skewed by HIV, with potentially

perilous consequences for the transfer of knowledge and values from one generation to the next”.

There were some 33 million people living with HIV/Aids in the world in 2007 (UNAIDS, 2008:39). Of this total, 0.8% was aged 15-49 – the group considered the most vulnerable or at risk of infection (UNAIDS, 2008:215). Sub-Saharan Africa has 22 million (or 67% of the global figure) living with HIV/Aids, of which 5.0% (the highest in the world) of this total were aged 15-49 (UNAIDS, 2008:32). In South Africa the prevalence rate for the same age cohort is estimated at between 16.7% (Stats SA, 2005b:8) and 18.1% (UNAIDS, 2008:215). It is estimated that 35% of people living with HIV/Aids are in the SADC region, with the seven countries of Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe all having high prevalence rates of 15% (*ibid*). South Africa has the unfortunate distinction of having “the largest HIV epidemic in the world”– with a staggering caseload of 5.7 million people infected as of 2007 (UNAIDS, 2008:40).

The net effect of the HIV/Aids pandemic on health and life expectancy in sub-Saharan Africa has been devastating (Edries & Triegaardt, 2004). For example, in the 38 most-affected African countries (the majority of which are in the SADC region), nearly 10 years of life-expectancy will have been lost by 2020-2025 (UNDP, 2005). Universal access to treatment, such as through the highly regarded *Anti-Retroviral Therapy* (ART) is presently the most practical means of prolonging the lives of people living with HIV/Aids. Despite an initial response of official denialism on the link between HIV and Aids, the South African government has since committed itself “to the 2006 United Nations High Level Meeting on HIV/Aids, to scale up towards HIV prevention, treatment, care and support by 2010 [including] providing universal access to antiretroviral treatment and to services to prevent mother-to-child transmission of HIV” (UNAIDS, 2008:9).

3.1.1.1 Definitions of Disability

There are three important and distinct aspects of the disability process as defined by the WHO (2002):

- *Impairment* is any loss or abnormality of psychological, physiological, or anatomical structure or function
- *Disability* is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being

- *Handicap* is a disadvantage for a given individual, resulting from an impairment or a disability, that limits or prevents the fulfilment of a role that is normal (depending on age, sex, and social and cultural factors), for that individual.

To elaborate further, impairments and disabilities may be visible or invisible, temporary or permanent, and progressive or regressive. Further, there are two main ‘models’ with respect to disability; the *medical* ‘model’, and the *social* ‘model’ (Oliver, 1990; 1996; Jönsson & Certec, 2006a). By placing the problem of disability within societal responses, the following definition by the *Disabled People South Africa* (DPSA) adopted from the British Council of Organisations of Disabled People reinforces its affinity towards the social model of disability (DPSA, 2004):

Disability is the disadvantage or restriction of activity caused by a society that takes little or no account of people who have impairments and thus excludes them from mainstream activity.

The *White Paper on an Integrated National Disability Strategy* (INDS) in South Africa (in keeping with similar trends internationally) adopts the social model of disability (ODP, 1997):

One of the greatest hurdles disabled people face when trying to access mainstream programs is negative attitudes. It is these attitudes that lead to the social exclusion and marginalisation of people with disabilities.

More recently, the *biopsychosocial* ‘model’ proposed by the WHO (and attributed to George L. Engel) seeks to reconcile the two often opposed views of the *medical* versus *social* ones (Pasha & Pasha, 2006). DePoy and Gilson (2004:3) refer to these schools of thought as the “*medical-diagnostic* phenomenon and disability as *constructed*”. Further, DePoy and Gilson (2004; 2006; 2005/2006; 2007) advance the *Explanatory Legitimacy Theory* as a more unified and conciliatory (as opposed to a divisive dichotomous) view of disability. This subject will be the interrogated in more detail in Chapters Four and Six.

3.1.1.2 Categories of Disability

Disability is typically classified by its severity on an individual’s capacity for independent functioning. Traditionally, the vast array of responses have emanated from the need for biomedical or social welfare interventions to facilitate the individual’s need for autonomy (ODP, 1997). The medical model categorises disability into two broad categories:

- physical/sensory:
 - *locomotor* (e.g. ambulatory impairment);
 - *hearing* (e.g. deafness, hardness of hearing);

- *visual (e.g. blindness, macular degeneration, cataracts, poor sightedness);*
- *speech (e.g. speech disorders, language disorders); and*
- mental/intellectual (e.g. dementia, autism, cerebral palsy, Down Syndrome).

Disabilities of the locomotor type (ambulatory aid/device users including wheelchair-dependent disabled persons) are the most visible and by far, the most prevalent in any given population and is occasioned by a variety of causes, such as the following examples:

- arthritis and stroke;
- affections of the cardio-respiratory system;
- injury (e.g. spinal lesions);
- acquired injury (in war or automobile accidents);
- congenital defects/deformations;
- amputations and spinal paralysis;
- slowly progressive degenerative disorders (especially due to the ageing process);
- disease (e.g. poliomyelitis);
- muscular atrophy; and
- cerebral palsy and multiple sclerosis, to mention a few.

Whilst respecting the great heterogeneity within this category, this study focuses on the tacit or experiential limitations brought about by the diverse forms of disability, and not on any specific expressions of individual disabilities (Rowland, 1984; Oliver, 1990; Benson, 1997; Goldsmith, 1997; Healey, 1994; Mace, 1998; Coan, 2003; Kahwaji, 2003; 2005; Dittmann-Kohli, 2007; Ongolo, 2007).

3.1.2 The Elderly

Hansson (2006:10) remarks that “in marketing theory consumers are defined as elderly at the age of 55 or older”. This however appears to be too early a cut-off and not as realistic as the definition by Crews and Zavotka (2006:113) of an *elder* being “a person of 65 years and above”. Further, the elderly are subdivided into three categories: the *young-old* (65-74 years); the *old-old* (75-84 years); and the *oldest-old* (85 years and older) (Berk, 2001:556). The needs of older users (in the Third Age of their lives) vary greatly from person to person as individuals age differently and experience sensory, agility and mobility limitations in different ratios and to different degrees (Benktzon, 1993; Bound & Coleman, 1993; Fisk, 1993; Pirkl, 1994; Koncelik, 1998; Jordan, 1999; Family Practice Notebook, 2000b; Berk, 2001; Goodman, Brewster &

Gray, 2005). The elderly should not be treated as one homogenous group but as one with an inherently rich diversity, whose psychosocial needs should be addressed in a societal transgenerational context (Gardner, Powell & Page, 1993; Norman, 2004; Soares, 2005; Design Council, 2006; Bernard & Scharf, 2007; Dittmann-Kohli, 2007; Ricability, n.d).

According to Mostert *et al.* (1998:39 in: Haldenwang, 2008:128) the United Nations classifies “a population [...] as ‘old’ in demographic terms if more than 7% of the population is 65 years and older, ‘mature’ if between 4 and 7% are 65 years and older, and ‘young’ if fewer than 4% are 65 years”. South Africa is experiencing a very unique longitudinal demographic shift – a phenomenon that reflects similar trends elsewhere in the world (Futerman & M’Rithaa, 2007). Hansson (2006:11) suggests that this “demographic change is [most dramatically] reflected in the ageing populations of USA, Japan and Europe”. The percentage of older people within the general population is increasing in both industrially developed as well as in developing countries (Korenjak-Černe, Kejžar & Batagelj, 2008). Koncelik (1998:117) identifies this as “the single most important change occurring to humanity on this planet”. The World Assembly on Ageing (2002) predicts that by the year 2050, the number of people aged 60 and above will increase from 600 million to almost 2 billion. In developed countries the percentage of older people will rise from 10% to 21% whilst concomitant growth in developing/majority world contexts is expected to be fourfold (*ibid*). The CIA World Factbook (2009) reports that Japan is the most rapidly ageing country with 22.2% of its citizens aged 65 or older. Japan also has the highest life expectancy at an average of 82 years (Population Reference Bureau, 2008:13).

One of the most interesting characteristics of the South African context is that embedded within the general population are four distinct population trends based on the ethnicity of their members. For this reason, one finds specific trends that can be identified with other societies at various stages of socio-economic and political development. With respect to population pyramids, Korenjak-Černe *et al.* (2008:157) identify three main shapes:

- *expansive* shapes are typical for fast-growing populations where each birth cohort (a group of people born in the same year or years period) is larger than the previous one;
- *constrictive* shapes display lower percentages of younger populations; and
- *stationary* shapes present somehow similar percentages for almost all age groups.

This specific impact on the various ethnic groups will be discussed in section 3.2. The population pyramids depicted in Figure 3.1 vividly illustrate how the situation in South Africa is

expected to change successively from *expansive*, through *constrictive*, and finally to *stationary* shapes between 2000 and 2050 (US Census Bureau, 2009).

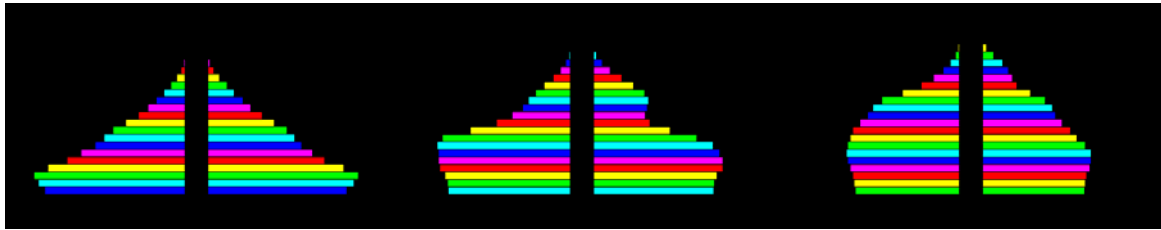


Figure 3.1 Population pyramids for South Africa – 2000; 2025; & 2050

(source: US Census Bureau, 2009)

In South Africa the number of people aged sixty and above was 7.3% of the general population (Stats SA, 2002). This is expected to increase to 10.8% (Kinsella & Ferreira, 1997). Strictly speaking, the category classified as ‘elderly’ begins at 65 (and not 60) as discussed earlier; (Kinsella & Velkoff, 2001). Notwithstanding (and more significantly for this study) the Western Cape Province has the highest population of people aged 80 and above, and the second highest percentage of elderly people living in urban areas at 91.14% (HSRC, 2003:46-47). Haldenwang (2008:130) classifies the total population of the Western Cape (with a median age of 26.7 years and 5.2% aged 65 years or more in 2001) as a “mature population”. The Black African population (1.8%) in the Western Cape Province is classified as ‘young’; the Coloured (4.0%) and Indian (4.5%) populations as ‘mature’; and the White population (13.6%) as ‘old’ (*ibid*). The increase in life-expectancy in South Africa coupled with the fact that disability becomes more prevalent with the natural process of ageing will result in larger segments of the society experiencing some form of disability or limitation in functioning (ODP, 1997). This correlation between ageing and disability is confirmed by Stats SA (2005a:17):

There are striking differences at the younger ages (below 30 years) where 63% of non-disabled persons belong in this age range compared to 35% of disabled persons. This in itself implies that a higher proportion of disabled persons are older. Of the non-disabled population, only 12% were 50 years or older, while 37% of the disabled were in this age category.

According to estimates, there were 8,643,354 elderly people living in the SADC region in 2008, averaging 3.83% of the entire population (CIA World Factbook, 2008). Mauritius and The Seychelles (at 7.1%) have the highest proportion of elderly people, whilst Zambia (at 2.3%) has the lowest (*ibid*). South Africa (at 5.4%) has the largest number of senior citizens – with 40.8% of the total elderly population being male, compared to a more sizeable 59.2% being female

(*ibid*). The complete listing and breakdown of elderly population figures for the fifteen member SADC states is listed in Table 3.3.

Table 3.3 Number of elderly people in the SADC region (source: CIA World Factbook)

Member State	Persons Aged 65 and Above			Percentage of Total Population
	Male	Female	Total	2009 Estimates
Angola	153,678	195,043	348,721	2.7%
Botswana	31,155	45,547	76,702	3.9%
Congo (DRC)	699,667	1,021,070	1,720,737	2.5%
Lesotho	42,074	63,915	105,989	5.0%
Madagascar	280,677	348,591	629,268	3.0%
Malawi	162,863	220,390	383,253	2.7%
Mauritius	36,309	54,465	90,774	7.1%
Mozambique	257,119	361,772	618,891	2.9%
Namibia	36,894	45,667	82,561	3.9%
Seychelles	2,321	3,913	6,234	7.1%
South Africa	1,075,117	1,562,860	2,637,977	5.4%
Swaziland	15,261	25,938	41,199	3.7%
Tanzania	513,959	663,233	1,177,192	2.9%
Zambia	114,477	164,199	278,676	2.3%
Zimbabwe	194,360	250,820	445,180	3.9%
SADC Total	3,615,931	5,027,423	8,643,354	Av: 3.93%

The elderly in most developing countries are viewed as dependants (on the government and the general working population) as these elders often require support for institutional/medical care, welfare, and social security – this is a huge challenge for any country, not least developing ones (Edelson, 1991; ODP, 1997; Barnett & Whiteside, 2002; HelpAge, 2002; 2006; 2009; HSRC, 2003; Gibbs, 2005; Cohen & Menken, 2006; Albone, 2008; Box, 2008). The design focus for senior citizens should be to facilitate autonomy and accessibility via independent lifestyles and progressive ageing-in-place strategies (Blaikie, 1993; Haigh, 1993; Sandhu, 1993; Woudhuysen, 1993; Pirkl, 1994; Coleman, 1999; Demirbilek, 1999; Hitchcock, Lockyer, Cook & Quigley, 2001; Huppert, 2003; Owen & Johnston, 2003; Austad, 1997; Demirbilek & Demirkan, 2004; Baars, 2007; Futerman & M'Rithaa, 2007; Gross, 2008; Haldenwang, 2008).

3.1.3 Women

Women account for about 52% of South Africa's population (a feature not uncommon to most other countries) and have a life expectancy of between 7-11% higher than that of men (HSRC, 2003:82). This fact alone should justify greater attention to the specific accessibility needs of women. As elaborated in Figure 3.2, the ratio of female to male in the South African general

population is equal in the first two age cohorts (0-9 years). Between the ages of 10 till 64, the ratio is slightly higher for females, whilst the ratio increases steadily to 2:1 from age 80 onwards (Stats SA, 2002:30).

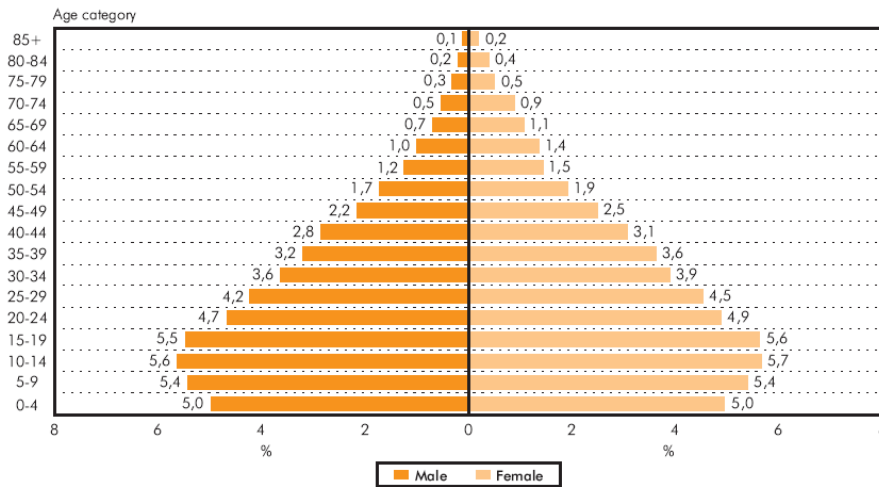


Figure 3.2: Distribution of total South African population by age group and sex (source: Stats SA, 2002:30)

Women (as well as the young and certain categories of the elderly) are typically smaller than men and have less physical strength (Benson, 1997; Pheasant, 1998; Kroemer, Kroemer & Kroemer-Elbert, 2001; Kroemer, 2006). Despite this fact, women play a key socio-economic role in the African family as providers (Macharia, 2006). They also act as default primary caregivers for the majority of families (Takyi & Oheneba-Sakyi, 2006). Women are often the unfortunate victims of violence typically meted out by their men folk (Vetten, 2007). Further, as Weisman (1994) argues, women are often subjected to embarrassment and inconvenience when they are forced to use inappropriate or inadequate public amenities and facilities typically designed by male designers and architects. This view is supported by Papanek (1971), Shapira (1991), Whiteley (1993), Owen (2004), and Davey, Wootton, Thomas, Cooper and Press (2005) in their respective critiques on the need for *socially responsible design* interventions. Any design response that targets women would naturally impact upon a much larger section of the communities they live in (ODP, 1997; Edries *et al.*, 2004; M'Rithaa, 2008).

3.1.4 The Young

Young people (or persons aged 14 and below) make up 29.1% of the general population (see Figure 3.4 for regional comparisons). They are considered dependants whose greatest cost to a social welfare system is in the form of educational support. The cost increases with the

special needs required for the support of children with disabilities (Batshaw, 1997; Child Health Policy Institute, 2001; Disability, 2003).

Table 3.4 Number of young people in the SADC region (source: CIA World Factbook)

Member State	Persons Aged 14 and Below			Percentage of Total Population
	Male	Female	Total	2009 Estimates
Angola	2,812,359	2,759,047	5,571,406	43.5%
Botswana	352,399	340,058	692,457	34.8%
Congo (DRC)	16,161,301	16,038,024	32,199,325	46.9%
Lesotho	373,159	368,271	741,430	34.8%
Madagascar	4,523,033	4,460,473	8,983,506	43.5%
Malawi	3,272,790	3,258,893	6,531,683	45.8%
Mauritius	147,136	142,121	289,257	22.5%
Mozambique	4,829,272	4,773,209	9,602,481	44.3%
Namibia	381,904	375,059	756,963	35.9%
Seychelles	10,201	9,732	19,933	22.8%
South Africa	6,447,623	6,370,909	12,818,532	29.1%
Swaziland	15,261	25,938	41,199	39.4%
Tanzania	8,853,529	8,805,810	17,659,339	43.0%
Zambia	2,685,142	2,659,771	5,344,913	45.1%
Zimbabwe	2,523,119	2,473,928	4,997,047	43.9%
SADC Total	53,388,228	52,861,243	106,249,471	Av: 38.35%

Education is often viewed as a long-term investment by a country and thus as being a lower economic cost than that of supporting the elderly (Illich, 1973). Barnett and Whiteside (2002:196) argue that orphans and the elderly are the two main categories of dependants brought about by HIV/Aids and that the epidemic “has altered and will progressively alter the demographic structure of many societies; [leading to many] children-led households; [with] grandparents as primary caregivers due to absence of parents; [and instances wherein] some children and elders also get infected (not just affected) by HIV/Aids”.

Apart from its association with Aids, disability is also linked to violence and war (OSD, 1997). Masakhwe (2004) identifies (armed) conflict as a major contributor to disability on our continent. For example, anti-personnel landmines have orphaned and maimed many children as a result of the protracted armed struggles in Angola and Mozambique – vast sections of these two countries are yet to be declared mine-free and subsequently safe for civilian habitation. An inclusive response to the accessibility needs of the young in South Africa would

most likely be benchmarked by its immediate neighbours in the SADC region with similar socio-political challenges. Such responses must of necessity adopt a multi-generational (or transgenerational) perspective to ensure success. This is particularly true for African populations which have lost the bulk of their working population to the ravages of war, disease, poverty and related social ills.

3.1.5 Foreigners and Visitors

Rendall and Salt (2005 in: Marindo, 2008:151) define foreign-born individuals “by birthplace and not [by] nationality or ethnicity”. Foreigners, non-citizens and visitors contribute significantly to population diversity and complexity (Marindo, 2008). Stats SA (2006:1) reports that 727,272 foreign travellers “from mainland Africa, overseas and unspecified countries, arriving through all ports of entry” visited South Africa in 2006 – an increase of 26.6% when compared to the 574,364 people that visited in 2005. These figures do not reflect the vast number of refugees many of whom crossed illegally into South Africa following the protracted political strife and virtual economic collapse in Zimbabwe. Further in 2006, 657,019 of these travellers departed from the country – this revealed an increase of 22.9% when compared to the 534,648 during a similar period the year before (*ibid*). Table 3.5 elaborates a number of tourism-related terms as used in this context.

Table 3.5 Key terms used with respect to tourism (source: Stats SA, 2006:3)

Key term	Definition
Tourism	<i>comprises the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited. The usual environment of a person consists of a certain area around his/her place of residence plus all other places s/he frequently visits</i>
A tourist (overnight visitor)	<i>a visitor who stays at least one night in collective or private accommodation in the place visited. An international tourist is an international visitor who stays at least one night in collective or private accommodation in the country visited. A domestic tourist refers to a domestic visitor who stays at least one night in collective or private accommodation in the place visited</i>
Traveller	<i>any person on a trip between two or more localities. An international traveller refers to any person on a trip between two or more localities in different countries</i>
Visitor	<i>any person travelling to a place other than that of his/her usual environment for less than 12 consecutive months and whose main purpose of the trip is other than the exercise of an activity remunerated from within the place visited</i>
An international visitor	<i>any person travelling to a country other than the one in which s/he has his/her usual residence, but outside his/her usual environment, for less than 12 consecutive months and whose main purpose of the trip is other than the exercise of an activity remunerated from within the place visited</i>
Overseas traveller	<i>a foreign traveller visiting South Africa (SA), excluding travellers from mainland Africa and from ‘unspecified’ countries</i>
Foreign traveller	<i>a person who resides outside SA and visits the country temporarily</i>
South African resident	<i>South African citizens and/or any person with permanent residential permit</i>

During the same period, about 73.6% of these travellers (particularly from neighbouring SADC countries) chose to enter South Africa by road compared to via air (24.6%), with only 1.8% entering via “rail, sea and unspecified modes of travel” (*ibid*). The vast majority of those who flew into the country arrived through *O.R. Tambo International Airport* in Johannesburg (79.9%) whilst some 34,557 (or 19.3%) arrived through *Cape Town International Airport* (*ibid*). Similarly, the vast majority of continental visitors expected for the 2010 events will enter by road, and the overseas ones will arrive by air.

With eleven languages (plus South African Sign Language), South Africa is second only to India (which has 23) in the number of official languages recognised in the country. The initial excitement at inclusiveness (through embracing diversity) soon reveals a daunting challenge – that of communication and navigation via effective wayfinding systems (M’Rithaa & Futerman, 2007). In the Western Cape Province, the official languages are Afrikaans, isiXhosa and English (in rank order). The growing complexity of urbanscapes and the increasing number of foreigners visitors will demand an inclusive and inspired response to the diverse needs of visitors with varying degrees of visual as well as general literacy (Hine, Swan, Scott, Binnie & Sharp, 2000; Watermeyer, 2002; Baldwin, 2003; Zelek *et al.*, 2003; Zmudzinska-Nowak, 2003; CRC, 2004; Wyman, 2004; Fraser, 2007; Gill, 2007; Vrooman, 2007). Cape Town thus needs to become more open, ‘legible’, and inclusive to evolve into a truly universal city (M’Rithaa & Futerman, 2007).

3.2 Implications of Shifting Demographics

South Africa’s population is variously estimated at 46.9 million (Stats SA, 2005a:8) or 48.3 million (Population Reference Bureau, 2008:14) and is projected to reach 51.5 million by 2025 and 54.8 million by 2050 – a growth rate of 13% between 2008 and 2050 (Population Reference Bureau, 2008:14). This growth is expected to be driven predominantly by the African sub-population which reveals trends typical of most industrially developing countries, including the vast majority of those found in the SADC region. The country has a relatively low fertility rate of 2.78% (Stats SA, 2005b:8), although variance between the different main ethnic groups reveals a sliding scale of 3.0% for African; 2.3% for Coloured; 1.9% for Indian/Asian; and 1.7% for White groups (Stats SA, 2005b:5). The Census 2001 population distribution is given as: African – 79.0%; Coloured – 8.9%; Indian/Asian – 2.5%; and White – 9.6% (Stats SA, 2002:13). With the exception of the Indian/Asian group, the 2005 mid-year estimates show slight differences in the population distribution as illustrated in Figure 3.3 (Stats SA, 2005b:9).

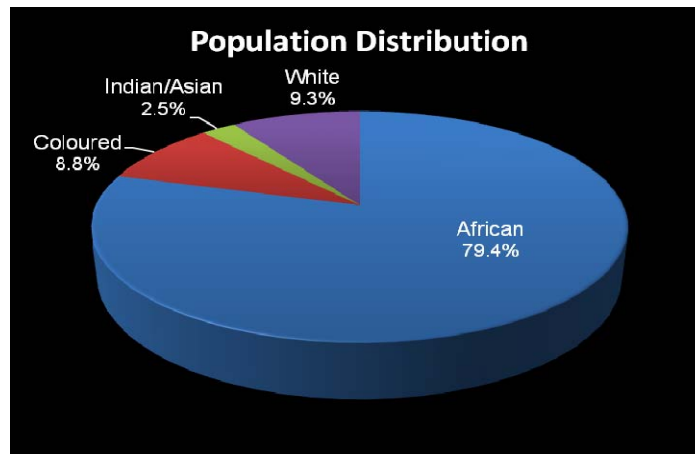


Figure 3.3 Population distribution by ethnic background in South Africa
(source: Stats SA, 2005b:9)

Of the 4,524,335 people (or 10.1% of all South Africans) who live in the Western Cape, 26.7% were classified as Africans; 53.9% as Coloured; 1.0% as Indian/Asian; and 18.4% as White (Stats SA, 2002:7;8;12). This composition is radically different from the national one. Further, the Human Science Research Council (HSRC, 2003:46-47) reports that the Western Cape Province has the highest population of people aged 80 and above, and the second highest percentage (at 91.14%) of elderly people living in urban areas.

As discussed in section 3.1.2, South Africa's population is expected to progressively age. Globally, this demographic trend will mean that up to 25% of the population will comprise of senior citizens in 2014 (Futerman & M'Rithaa, 2007). In the developed countries (particularly in the USA, Canada, Australia, New Zealand and the United Kingdom), the unique demographic phenomenon of *baby-boomers* (those born from 1946 to 1964) will demand a more proactive response to the needs of an actively ageing generation of elderly (Coleman, 1993; Pirkl, 1994; Goodman *et al.*, 2005; Transgenerational Design Matters, 2006). The impact of ageing will be more profound as life expectancy rises in developing countries such as South Africa.

Korenjak-Černe *et al.* (2008:157) argue that "besides births and mortality, also other processes, depending on social or/and political policy and events (migrations, birth control policy, war, life-style, etc.) have strong influence on age-sex structure of the population, that reflect also on the shape of the population pyramid". Korenjak-Černe *et al.* (2008:158) further

identify four stages of the *demographic transition model* (DTM) and their corresponding characteristics with respect to shapes of population pyramids:

- Stage 1: *expanding* – high birth rate; high death rate; short life expectancy;
- Stage 2: *expanding* – high birth rate; fall in death rate; slightly longer life expectancy;
- Stage 3: *stationary* – declining birth rate; low death rate; longer life expectancy; and
- Stage 4: *contracting* – low birth rate; low death rate; longer life expectancy.

By analysing the shapes of South Africa’s population by ethnic background (in Figures 3.4 and 3.5), one identifies a unique diversity in the shapes of their respective population pyramids (Stats SA, 2005b:12). The shapes of the four population pyramids roughly correspondence with the four stages of the DTM as elaborated by Korenjak-Černe *et al.* (2008). Broadly speaking, the African population pyramid corresponds to Stage 1 with the highest birth rate, high death rate (associated with HIV/Aids), and a relatively short life expectancy; whilst the Coloured one shows features of Stage 2 with a high birth rate, falling death rate, and slightly longer life expectancy (see Figure 3.4). The African and Coloured populations exhibit features typical in developing countries with the Western Cape’s general population pyramid being most like that of the latter – who coincidentally are the most populous group there (*ibid*). On the other hand, the Indian/Asian population pyramid corresponds to Stage 3 with a marked decline in birth rate, lower death rate, and longer life expectancy; whilst the White population pyramid exhibits the classic contracting shape of Stage 4 with the lowest birth rate, lowest death rate, and longest life expectancy of all four population sub-groups (as shown in Figure 3.5).

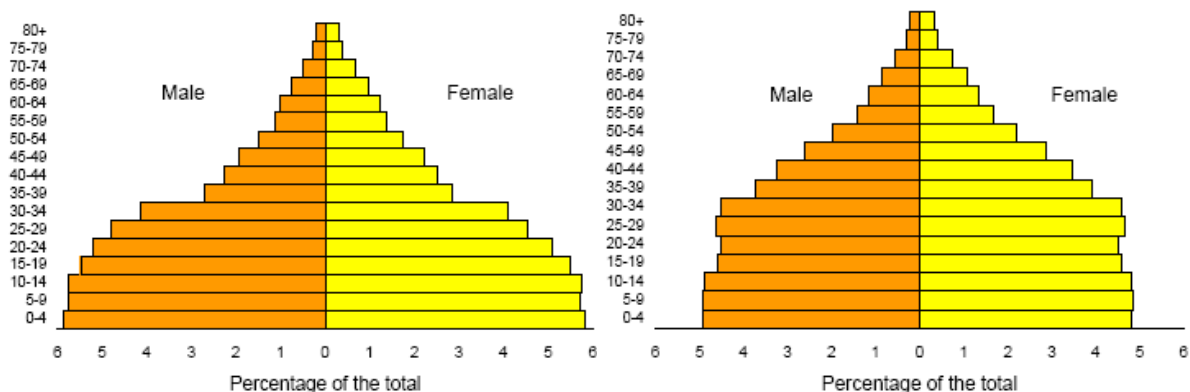


Figure 3.4 Population pyramid of the African (left) and Coloured (right) populations (source: Stats SA, 2005b:12)

The Indian/Asian population pyramid is typical of more stable developing countries; whilst the White population pyramid's contracting shape is virtually identical to that found in industrially developed countries where the socio-economic impact of ageing is most pronounced (*ibid*). As Korenjak-Černe *et al.* (2008:166) observe, “the divide between the undeveloped and developed countries is increasing” – that divide is most dramatic when one compares the demographic realities of the African and White population sub-groups in South Africa.

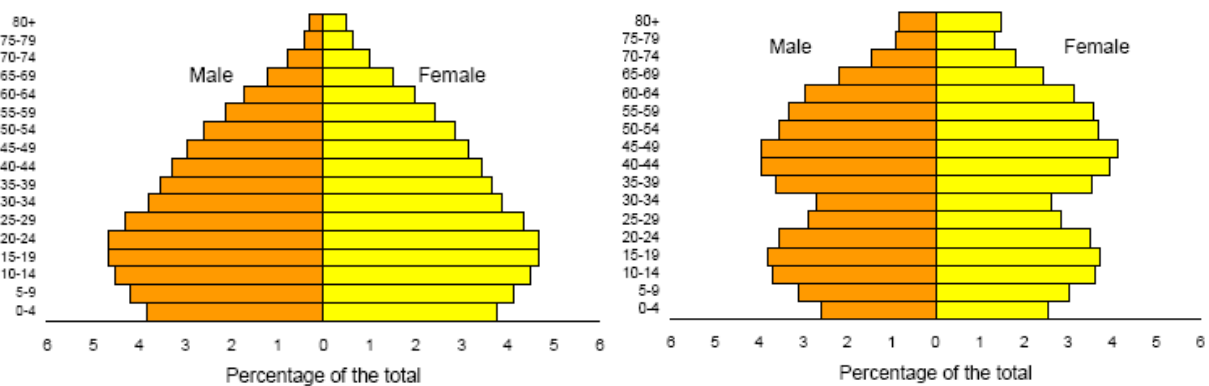


Figure 3.5 Population pyramid of the Indian/Asian (left) and White (right) populations
(source: Stats SA, 2005b:12)

The Western Cape Province's elderly population also has the highest amount of disposable income compared to similar age cohorts in other parts of the country (Stats 2002). Additionally, the relatively higher percentage of the White population living in the Province, (*vis-à-vis* the national distribution) means that the impact of general ageing will be more marked in the Western Cape before the phenomenon takes hold in the other provinces (Stats 2002; Stats SA, 2005b). This presents an opportunity for the Province to effectively develop and pilot more inclusive and long-term design strategies that ultimately benefits all its residents (Haldenwang, 2008). Current technological advances also allow unprecedented possibilities for innovation through benign interventions to better address the needs of the elderly and people with disabilities (Chapman & McCartney, 2002). Further, life expectancy is steadily rising due to improved access to healthcare resources and life-enhancing facilities. Additionally, the Western Cape is a popular destination for both domestic and international tourists requiring greater accessibility and usability of products, systems and built environments. Consequently,

children, pregnant women, and foreigners (with unfamiliar native languages, cultural practices and lifestyles) all stand to gain from more accommodating and inclusive provisions.

3.3 Summary

This chapter discussed the size and complexion of the various vulnerable populations in South Africa in general, and the Western Cape Province in particular. The exclusion and discrimination of people with disabilities (who make up 5% of the population) leads to *disablism*. Further, there is a moral imperative to include people living with Aids (some 11% of the population) in this discussion as they often experience stigma and discrimination from other members of society just like people with disabilities. *Ageism* is the equivalent negative reaction with respect to the elderly (who make 5.4% of the population).

Similarly, *sexism* is the exclusion of women (who make up around 52% of the population) from mainstream participation whether tacitly or otherwise. The young make up 29.1% of the total population and are often ignored in decision making. The great influx of foreigners (and countless refugees) particularly from neighbouring countries further compounds the situation. The combined vulnerable population is undeniably significant. There is a strong argument for (and merit in) identifying and pursuing a common design response to redress the three ills of stigmatisation, discrimination and exclusion from full social participation. Countering these negative attitudinal and structural responses requires courage and commitment – these are some of the sub-themes that will be further expounded upon in the next chapter.

CHAPTER FOUR

RESPONSES TO THE NEEDS OF VULNERABLE POPULATIONS

4.0 Introduction

This chapter elaborates on pertinent practical and theoretical responses to the needs of the various categories identified as vulnerable populations in the previous chapter. The chapter provides a general overview on formal responses from a variety of international settings with reference to South Africa's geopolitical realities. It concludes by aligning local and global interventions that aim to promote greater inclusiveness of all members of the human family.

4.1 Models of Disability

This section discusses disability in the light of some of the influential schools of thought in a somewhat chronological order. The use of the term 'model' in this section is used to describe such broad paradigmatic approaches (or schools of thought) and does not reflect the stricter and more conventional usage in a scholarly sense – wherein models can be described, controlled and predicted along empirical lines (Bailey, 1987; Microsoft® Encarta®, 2009).

4.1.1 Medical Model

The *medical model* is also frequently described as the *individual model* or the *medical-diagnostic phenomenon* (according to DePoy & Gilson, 2004). This is the approach taken by the vast majority of medical and related professions. Paradigmatically, this model approaches the issue of disability as being a problem that can be 'fixed' in the individual, failing which prescriptions are made on optimal rehabilitative interventions for the disabled person (Nichols, Haworth & Hopkins, 1981; McWilliams, 1984; Oliver, 1990; Barnes, Mercer & Shakespeare, 1999; Imrie *et al.*, 2001; Werner, 1998; Goldsmith, 2000; DePoy & Gilson, 2006; Gilson & DePoy, 2006; Schneider, Barron & Fonn, 2007). This approach has tacitly endorsed the removal of certain people with disabilities from mainstream society who are then placed in specialised institutions – a practice that has spawned a variety of the exclusion of such members via special education, protective workshops, and sheltered employment (Oliver, 1990; Barredo, 2006; Opperman, 2006; Deglon, 2008; South Africa, 2008d).

A criticism of the medical approach is its patent prescriptiveness in perpetuating *expertism* – wherein the principal actor (the medical specialist or 'expert') decides on behalf of the 'ignorant, passive, voiceless and powerless patient or victim' what the appropriate course of action

should be (Illich, 1973; Foucault, 1980; Imrie *et al.*, 2001; Manjra, 2005). Further, by removing and excluding people with disabilities from general society, it becomes increasingly difficult to re-integrate the former back into mainstream activities. This has the net effect of increasing stigma and discrimination towards the disabled by treating them as objects (as opposed to as subjects) in the given activity. In the context of this thesis, the medical model is viewed as being ontologically opposed to the social model which is described in the next section. This could be linked to the differing paradigms that inform the medical (objectivist/positivist) view on disability, as opposed to the social model which is informed by a subjectivist/post-modernist epistemology (Crotty, 1998; Krauss, 2005).

4.1.2 Social Model

Oliver (1990; 1996) argues that the circumstances of people with disabilities and the discrimination they face are socially created phenomena that have little to do with the impairments of disabled people. Oliver (*ibid*) argues passionately on the failings and limitations imposed on people with disabilities due to systemic use of the *individual (or medical) model* of disability in a variety of social and professional milieu. He proposes the “*sociological approach*” (now known as the *social model* that is attributed to him) to counter the resultant stigmatisation and marginalisation of the disabled (*ibid*). DePoy and Gilson (2004) refer to this model of disability as being *constructed*. It is now widely accepted in the majority of professional contexts that the *social model* supersedes the *medical model* and the main drive is presently on changing the society and environment to allow people with disabilities full participation in every possible respect (EDeAN, 2006). Internationally, this (social) model finds ample expression in a host of policies that seek to enforce equity and challenge discriminatory practices (M’Rithaa, 2006).

In view of the emancipatory rhetoric espoused by the postmodernist perspective of the social model of disability, various oppressed minority groups have thus found a collective voice to counter discrimination as well as to speak out against systemic exclusion from mainstream activities (Oliver, 1990; Weisman, 1994; Zola, 1994; Sjöberg, 1996; Barnes *et al.*, 1999; Edries *et al.*, 2004; Dittmann-Kohli, 2007). Zola (1994) draws parallels between *disablism* and *racism* whilst Healey (1994) presents a phenomenological reflection on age and *ageism*. Such voices also include those of the “disabled, elderly, infertile [women, and people who are] HIV-positive” and various groups representing other vulnerable populations (Whyte & Ingstad, 2007:14). Further, the use of language and related nomenclature to discuss and describe people with

disabilities has been duly addressed with emphasis on one’s autonomous personhood, and discouraging the labelling of people by the disability they experience – this latter response tends to perpetuate stigmatisation, discrimination and social exclusion (DPSA, 2004; Bickenbach & Wasserman, 2006; Appendix A).

The disability rights movement believes therefore, that the 'cure' to the 'problem' of disability lies in restructuring society and redefining societal attitudes, as opposed to the *medical/individual model* that tends to isolate the individual with disability (Zola, 1994; Oliver, 1996; Benson, 1997; ODP, 1997; Sinclair, 1998; Barnes *et al.*, 1999; Jaeger & Bowman, 2005; George & Duquette, 2006; Whyte & Ingstad, 2007). To illustrate this conceptually dichotomous view of disability, Oliver (1990:7-8) rephrases and contrasts census survey questions used in the United Kingdom (originally phrased from an ostensibly medical view) with his own interpretation from a social perspective (Table 4.1).

Table 4.1 Conceptual dichotomy between medical and social perspectives on disability (source: Oliver, 1990:7-8)

<i>Office of Population, Censuses and Surveys</i>	<i>Mike Oliver</i>
Can you tell me what is wrong with you?	Can you tell me what is wrong with society?
What complaint causes you difficulty in holding, gripping or turning things?	What defects in the design of everyday equipment like jars, bottles and tins causes you difficulty in holding, gripping or turning them?
Does your health problem or disability prevent you from going out as often or as far as you would like?	What is it about the local environment that makes it difficult for you to get about in your neighbourhood?
Does your health problem or disability make it difficult for you to travel by bus?	Are there any transport or financial problems which prevent you from going out as often or as far as you would like?
Does your present accommodation have any adaptations because of your health problem or disability?	Did the poor design of your house mean that you had to have it adapted to suit your needs?

The human rights-evoking *social model* has a strong following internationally (Buchanan, 2001; Buden, 2002). The dominant view in South Africa too is that “disability is a social construct and most of its effects are inflicted on people by the social environment” (SAHRC Report, 2002:9).

4.1.3 Architectural Model

This model is attributed to Selwyn Goldsmith (1997). Epistemologically, this model would fit the constructivist phenomenological standpoint that is greatly enriched by the fact that Goldsmith himself was an architect with a disability who relied on a wheelchair for ambulation (*ibid*). The *architectural model* builds upon the principles of *barrier-free design* and *accessible design*

(*ibid*). This model encourages architects to take responsibility for the built environment and in so doing counter various forms of “architectural discrimination” (Goldsmith, 1997; 2000).

Consequently, *product design* (practically synonymous with *industrial design* in this context) is also challenged to adopt bottom-up approach thus helping to create products with “*de-disabilizing effects*” for disabled users (Goldsmith, 1997:156; 2001:25.3) – a theme that resonates with the challenge posed by Victor Papanek (1971) to industrial designers to similarly take responsibility for the harm occasioned by their profession. Goldsmith (1997:119-120) is also critical of the *microist* perspective (that “what suits the disabled is good for everyone”) and instead calls for a *new paradigm* that avoids stigmatisation by adopting a *macroist* view (that “what suits everyone is good for the disabled”). The *architectural model* is ontologically allied to the *biopsychosocial* one and aligns conceptually with “universal design [whose] aim is that buildings should be convenient for all their users, with *architectural discrimination* being avoided” (Goldsmith, 2000:5).

4.1.4 Biopsychosocial Model

The debate on the *medical* versus *social* model should not be seen as antagonistic to the practice of *adaptive design* which focuses on retrofitting products and environments “to the special needs of those with disabilities” (Pirkl, 1994:227). There are countless people with disabilities whose plight has been demonstrably ameliorated by benign medical interventions. Notwithstanding, the debate has brought into sharp focus the significance of the perspective of people with disabilities. Consequently, the quest for an inclusive ‘universalist’ model became urgently apparent. Whyte and Ingstad (2007:13) suggest that a “universal view of disability as something everyone can experience in the course of a life” tended to reconcile the opposing views on disability. In 1980, the World Health Organization (WHO, 2001) formally issued the *International Classification of Impairments, Disabilities and Handicaps* (ICIDH) as “a tool for the classification of the consequences of disease” – a tool steeped in the medical model.

The *International Classification of Functioning, Disability, and Health* (ICIDH-2 or ICF) was published by the WHO in 2001 as a response to the need for a more balanced multi-purpose classification protocol (Pasha & Pasha, 2006) – this more holistic approach is called the *bio-social model* (Imrie *et al.*, 2001) or more commonly as the *biopsychosocial model* (WHO, 2004; Pasha & Pasha, 2006). The ICF takes cognisance of this factor by accommodating the biopsychosocial and environmental factors in the classification of disability (WHO, 2002:3):

ICF puts the notions of 'health' and 'disability' in a new light. It acknowledges that every human being can experience a decrement in health and thereby experience some disability. This is not something that happens to only a minority of humanity. ICF thus 'mainstreams' the experience of disability and recognises it as a universal human experience. By shifting the focus from cause to impact it places all health conditions on an equal footing allowing them to be compared using a common metric – the ruler of health and disability.

The ICF is however criticised over the low representation and participation among developing countries (with only one informant from Africa) as well as its scant interrogation of cultural factors during the development of the instrument (Whyte & Ingstad, 2007). Notwithstanding, these limitations, the ICF offers data collectors and researchers a common rubric with which to address the multi-dimensional nature of disability thus allowing for greater cross-disciplinary application, increased accuracy in international comparative studies, and more realistic benchmarking potential amongst the 191 countries that subscribe to the ICF (WHO, 2002; Boonzaier, 2006; Leonardi *et al.*, 2006; Pasha & Pasha, 2006). Table 4.2 summarises the main features of the *medical*, *social* and *bio-(psycho)social* models.

Table 4.2 Contrasting medical, social and bio-social models of disability (sources: Oliver, 1996:34; Barnes *et al.*, 1999:30; Imrie *et al.*, 2001:34)

<i>medical model</i>	<i>social model</i>	<i>bio-social model</i>
personal tragedy theory	social oppression theory	bio-social theory
personal problem	social problem	personal/social problems
individual treatment	social action	individual/social action
medicalisation	self-help	medical/self-help
professional dominance	individual/collective responsibility	collective responsibilities
expertise	experience	expert/lay experiences
adjustment	affirmation	
individual identity	collective identity	individual/collective identities
prejudice	discrimination	prejudice/discrimination
attitudes	behaviour	
care	rights	care combined with rights
control	choice	control combined with choice
policy	politics	political and policy change
individual adaptation	social change	individual adjustment and social change

4.2 Responses to the Needs of the Vulnerable

This section discusses the different cases that justify specific responses to the issue of disability in South Africa as well as their international precedents.

4.2.1 The Legal Case

The *Americans with Disabilities Act* (ADA) of 1990 is widely believed to be the most significant legislation of its kind internationally (Welch & Palames, 1995; Goldsmith, 1997; Koncelik, 1998; Vanderheiden & Tobias, 1998). This pivotal law prohibits discrimination and requires all private and public institutions to promote accessibility in all spheres of public life – such facilities, services and transportation (Jaeger & Bowman, 2005). Jaeger & Bowman (2005:42) report:

The ADA prohibits discrimination against persons with disabilities by various private and public institutions, including state governments, and provides a mechanism for legal protection and remedies [and] also prohibits discrimination by private organizations providing public accommodations, which traditionally has included hotels, restaurants, offices, housing and shopping centers, among many others.

Casserley and Ormerod (2003) also highlight the legal imperatives for designers and other professionals in the United Kingdom (UK) with respect to the *Disability Discrimination Act* (DDA) of 1995 and the *Special Educational Needs and Disability Act* (SENDA) of 2001 in that country. The former is almost identical in discourse, scope and spirit with the ADA, as well as that of the similarly named *Disability Discrimination Act* (DDA) enacted in 1992 in Australia (DDA, 1996; Madden *et al.*, 1997).

In South Africa, the highest law of the land is the *Constitution of the Republic of South Africa* (Act No. 108 of 1996). Section 9 of the *Bill of Rights* of The Constitution explicitly prohibits discrimination on the grounds of race, gender, age and disability among others, and instead seeks to uphold human dignity through the promotion of diversity and tolerance among all its citizens (South Africa, 1996). Adherence to this constitutional imperative is promulgated through the *Promotion of Equality and the Prevention of Unfair Discrimination Act* (Act No. 4 of 2000) which binds “the State and all persons” (South Africa, 2000:6). However, this Act exempts “any person to whom and to the extent to which the *Employment Equity Act* (Act No. 55 of 1998), applies” (*ibid*). This will be discussed further in the next sub-section.

4.2.1.1 Disability-specific Legislation

The *Promotion of Equality and the Prevention of Unfair Discrimination Act* (hereinafter referred to as the *Equality Act*) follows the spirit of the pioneering ADA of the USA, as well as the DDA of Australia and the United Kingdom (M’Rithaa, 2006). The *Equality Act* takes cognisance of two important factors (South Africa, 2000:6):

- (a) *The existence of systemic discrimination and inequalities, particularly in respect of race, gender and disability in all spheres of life as a result of past and present unfair discrimination, brought about by colonialism, the apartheid system and patriarchy; and*
- (b) *the need to take measures at all levels to eliminate such discrimination and inequalities.*

The *Equality Act* draws on recommendations of the *Integrated National Disability Strategy* to spell out the legal obligations and implications of the Act on all role players in the public and private domains (SAHRC Report, 2002). Further, the *Equality Act* provides for the establishment of ‘equality courts’ to determine ‘fairness or unfairness’ within the ambit of the Act (South Africa, 2000:8). The courts seek to determine culpability based on discrimination on ‘prohibited grounds’ (*ibid*). As discussed previously, exceptions are made if there is proof that ‘the discrimination is fair’ – such as in the legally sanctioned transformational measures of affirmative action to redress gender, race or disability imbalance in employment equity (South Africa, 1998; 2000). For purposes of clarity, the following definitions as provided by the *Equality Act* are reproduced in Table 4.3 (South Africa, 2000:4-5):

Table 4.3: Definitions and Interpretations of Terms Used in the Promotion of Equality and Prevention of Unfair Discrimination Act (source: South Africa, 2000:4-5)

Term	Definition
age	includes the conditions of disadvantage and vulnerability suffered by persons on the basis of their age, especially advanced age
discrimination	means any act or omission, including a policy, law, rule, practice, condition or situation which directly or indirectly:- (a) imposes burdens, obligations or disadvantage on; or (b) withholds benefits, opportunities or advantages from, any person on one or more of the prohibited grounds
equality	includes the full and equal enjoyment of rights and freedoms as contemplated in the Constitution and includes <i>de jure</i> and <i>de facto</i> equality and also equality in terms of outcomes
harassment	means unwanted conduct which is persistent or serious and demeans, humiliates or creates a hostile or intimidating environment or is calculated to induce submission by actual or threatened adverse consequences and which is related to:- (a) sex, gender or sexual orientation; or (b) a person’s membership or presumed membership of a group identified by one or more of the prohibited grounds or a characteristic associated with such group
HIV/Aids status	includes actual or perceived presence in a person’s body of the Human Immunodeficiency Virus (HIV) or symptoms of Acquired Immune Deficiency Syndrome (Aids), as well as adverse assumptions based on this status

prohibited grounds	are:- (a) race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth; or (b) any other ground where discrimination based on that other ground — (i) causes or perpetuates systemic disadvantage; (ii) undermines human dignity; or (iii) adversely affects the equal enjoyment of a person's rights and freedoms in a serious manner that is comparable to discrimination on a ground in paragraph
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The *Equality Act* also prohibits potentially discriminatory practices by the design professions such as (South Africa, 2000:7):

- (a) denying or removing from any person who has a disability, any supporting or enabling facility necessary for their functioning in society;*
- (b) contravening the code of practice or regulations of the South African Bureau of Standards that govern environmental accessibility; and*
- (c) failing to eliminate obstacles that unfairly limit or restrict persons with disabilities from enjoying equal opportunities or failing to take steps to reasonably accommodate the needs of such persons.*

The need to promote *universal access* is clearly inferred as one of the objectives of this Act (South Africa, 2000:7; SAHRC Report, 2002:8). The mandate to provide 'reasonable accommodation' through relevant *South African Bureau of Standards* codes and regulations fails given the rather generalised and unenforceable phrase that "every effort be made to provide such facilities" (South African Standard, 1990:152). Notwithstanding, there has been an attempt in *Part S: Facilities for Disabled Persons* at providing professional architects with guidelines on access provision in buildings (South African Standard, 1990; Ormerod *et al.*, 2005). Other requisite standards and building codes have been developed to complement *Part S* (South African Standard, 1993; South African National Standard, 2004). Recent revisions of ambiguous language and pertinent technical guidelines vis-à-vis national building codes and regulations appear to have removed the legal loopholes that previously frustrated the implementation of universal access (C. Thompson, 2008; P. Thompson, 2008).

To date there has been one recorded case of successful litigation through an *equality court* in South Africa in which a police station in Port Elizabeth was sued for being inaccessible to people with physical disabilities (Opperman, 2006; P. Thompson, 2006; Wetzel, 2008). There may well have been a much larger number of cases reported. The low visibility of such court cases may be attributed to complainants agreeing to settle such matters out of court as is the case in the USA and United Kingdom (Koncelik, 1998; Dong, Keates & Clarkson, 2003;

Casserley & Ormerod, 2003). By agreeing to settle out of court, disability and accessibility activists are denied vital ammunition to effectively counter such discriminatory practices which consequently continue unabated – further excluding disability concerns from the mainstream (Koncelik, 1998; Peters, 2000; Boonzaier, 2006; Opperman, 2006).

Koncelik (1998) asserts that emphasis on legislative compliance often leads to the adoption of the bare minimum requirement as the law is seen to be punitive in spirit – a more proactive approach would be to use incentives (as opposed to the threat of the law) to encourage voluntary compliance (Coleman, 2006). This latter approach is a more sustainable one that lends additional support for the ‘business case’ discussed in Section 4.2.4.

Other disability-specific legislation include the *Employment Equity Act* of 1998 which sets a minimum benchmark for designated organisations to have 4% of all their employees as being people with disabilities – *i.e.* those with “long-term or recurring physical or mental impairment[s] which substantially limits their prospects of entry into, or advancement in, employment” (South Africa, 1998:10; 2003b:8). The Act (*ibid*) and supplementary *Technical Assistance Guidelines for Employment of People with Disabilities* (South Africa, 2003b) legally enforces ‘reasonable accommodation’ wherein employers take “affirmative measures consistent with the purpose of this Act” – *ipso facto* in redressing equity imbalances in the workplace (South Africa, 1998:14).

Whereas the imperative for transformation in employment equity through *affirmative action* is an urgent issue for the country, the nobler objectives of the *Broad-Based Black Economic Empowerment Act* (BBBEE) of 2003 are compromised by the failure to take cognisance of long-term ‘side-effects’ on the national repository of intellectual and human capital (South Africa, 2003c). A more creative (and sustainable) strategy is required – a critical review of achievement of transformational goals achieved thus far, as well as an extrapolation of present trajectories by factoring in alternate scenarios – such as the potential benefits of *mentorship* and proactive *succession planning* in *performance management* systems for incumbent employees irrespective of their racial profiles (Macpherson, 2001).

The present dispensation perpetuates distrust of *positive discrimination* measures – a legacy of apartheid-era race and labour relations (Sherer, 2000; Kahn, Blankley, Maharajh, Pogue, Reddy, Cele & Du Toit, 2004). There are ethical implications in the current practice of

excluding 'white males' indefinitely whilst concomitantly seeking redress for practically every other group (Akers, 2008). Consequently, *affirmative action* policies need to be reviewed to resolve the apparent tensions arising from a desire to correct historical distortions in the country's human resource capacity, with the urgent need to promote diversity whilst recognising professional excellence as a means to forestall the debilitating effects of an unabated brain drain (Bagshaw, 2004; Kahn *et al.*, 2004; Akers, 2008).

UNESCO (1999; 2003a; 2003b) promotes the provision of *inclusive* educational modes of learning over the traditionally dichotomous practice of so-called 'mainstream' versus 'special' schools. Impetus for *inclusive education* through 'full-service' schools and colleges (to accommodate students with disabilities) is found in *The Higher Education Act* (South Africa, 1997a). Importantly, this Act encourages co-operation between public Higher Educational Institutions so as to share and benefit from best practices (South Africa, 1997:38.1). Integral to this co-operation is a critical examination of the physical environment as well as the philosophy and practice of teaching and learning (Welch & Jones, 2001; Western Cape, 2004; Boud & Falchikov, 2005; Howell, 2006; Inclusive Education Western Cape, 2006). In mainstreaming inclusive education over a twenty year period, e-learning, smart technologies, and distance learning options would need to be incorporated for greater accessibility consequently reducing the number of (excluded) students requiring *special education* interventions to learning – a system which has its roots in the *medical* model of disability (South Africa, 2001).

4.2.1.2 Political Implications

Historically, the needs and rights of previously politically marginalised, socio-economically disenfranchised and vulnerable sections of society were neglected by the apartheid regime in South Africa (Howell *et al.*, 2006). Further, the apartheid dispensation left behind "a discriminatory and weak legislative framework which has sanctioned and reinforced exclusionary barriers" (ODP, 1997). Subsequently, DPSA aligned itself with the political struggle for self-determination of blacks in the country as they shared kindred political and moral aspirations (Rowland, 1984). Upon the advent of democratic rule in 1994, the DPSA successfully lobbied for its agenda to be included in all official policy formulation – a fact that was strengthened by the *Office on the Status of Disabled Persons* (OSDP) being integrated into the *Office the Deputy President*, Thabo Mbeki (ODP, 1997; OSDP, 2003; Matsebula *et al.*, 2006). DPSA's pervading influence has led to the formation in May 2009 of the new *Department of Women, Youth, Children and People with Disabilities* headed by Ms Nolutshando

Mayende-Sibiya; as well as the appointment of “the first person with a disability in Cabinet as Deputy Minister for Public Works” Honourable Henrietta Bogopane-Zulu (Matsebula, 2009). The influential *Integrated National Disability Strategy* was proposed to guide the implementation of the ideals of equity and inclusiveness as enshrined in the *Bills of Rights* by countering “the key forms of exclusion responsible for the cumulative disadvantage of people with disabilities [namely] poverty, unemployment and social isolation” (ODP, 1997). When Thabo Mbeki succeeded Nelson Mandela as president in 1999 the disability desk concurrently moved to the *Office of the State President* thereby consolidating the political power it had gained from its propinquity to the most powerful office in the land (Matsebula *et al.*, 2006).

South Africa’s political commitment to the disability movement led to the establishment of the Secretariat for the *African Decade for Persons with Disabilities* (APDP) in Cape Town (South Africa, n.d; OSDP, 2003; United Nations Enable, 2004a; APDP, 2006; Chalken *et al.*, 2006). The mandate of the ADPD was recently extended by the *Africa Union* for an additional decade – till 2019 (Dube, 2008). Disability continues to enjoy growing recognition and integration into the majority of local/municipal, regional/provincial and national/state legislation and policy formulation. *The Declaration of Bamako* on Inclusive Education acknowledges the fact that the New Partnership for Africa’s Development (NEPAD) omitted specific mention of the promotion of people with disabilities and seeks to remedy the situation (Inclusion Africa, 2002).

Notwithstanding, the mainstreaming of disability issues should be achievable provided there are clear, measurable goals set by the NEPAD Disability Desk within the framework of ADPD’s extended tenure – given the Secretariat’s track record of effective high (Ministerial) level lobbying for the successful implementation of disability-specific policies in Africa thus far (Disability, 2003; USAID, 2005; Dube, 2008). The APDP is also a key actor in a number of international initiatives, including the *New EU-Africa Strategy* that was finalised in December 2007 (DPOD, 2008). According to DPOD (*ibid*), “the strategy pays particular attention to persons with disabilities in the fields of health and education. The adopted strategy gives recognition of the need for full access to health and education services for women, children and men with disabilities as well as in the context of the Millennium Development Goals”.

4.2.2 The Human Rights Case

A number of countries and regions have adopted human rights responses to issues of ageing, disability and allied social concerns (Hevi, 2004). For example, Europe adopts a human rights

and ethics-informed standpoint for its design-related interventions thereof (European Commission, 2002; EIDD, 2004; EDeAN, 2006). South Africa has a rich and well-publicised human rights tradition. The *South African Human Rights Commission* (SAHRC Report, 2002:7) adopts a stance similar to that of other progressive societies in stating rather categorically that:

Inaccessible environments deny people with disabilities their rights to equality, dignity and freedom, amongst other fundamental human rights. Lack of physical access, both to and within built environments, is a major factor contributing to the ongoing exclusion of people with disabilities from mainstream society.

The United Nations (UN) General Assembly set the moral foundation upon which subsequent human rights responses to disability (including the SAHRC one cited above) are based following celebrations to mark the end of the *Decade of Disabled Persons* in 1993 (United Nations Enable, 2004b). The UN cannot enforce rules (as in the legal case discussed previously), but it nonetheless behoves member-states to exercise good faith and a sense of moral obligation and natural justice. In the *Standard Rules for the Equalization of Opportunities for People with Disabilities* (hereinafter referred to as Standard Rules), the UN underscores the right to equal participation by all people through a comprehensive series of 22 Standard Rules categorised under three sections covering *Preconditions for Equal Participation*; *Target Areas for Equal Participation*; and *Implementation Measures* (*ibid*).

The *Target Areas for Equal Participation* category consists of a set of 8 Standard Rules: Rule 5 – *Accessibility*; Rule 6 – *Education*; Rule 7 – *Employment*; Rule 8 – *Income maintenance and social security*; Rule 9 – *Family life and personal integrity*; Rule 10 – *Culture*; Rule 11 – *Recreation and sports*; and Rule 12 – *Religion* (*ibid*). These target areas all incorporate the need for persons with disabilities to enjoy the same human rights afforded to every other citizen.

Standard Rule 5 specifically covers the need for accessibility within the physical (or built) environment, as well as access to information and communication (*ibid*). In South Africa, this latter element is addressed by the principles of *Batho Pele* (literally meaning [putting] “people first” in seSotho) – a “practical implementation strategy for the transformation of Public Service Delivery” that forms the basis of the public sector’s service charter to its people – whom it views as customers – and is expressed as eight principles, including those of *Access and Information* (South Africa, 1997b; 2004b). The principles embodied in *Batho Pele* are strongly influenced by the human-centred ethos of *ubuntu* which is discussed in Chapter 6.

4.2.3 The Welfare Case

The modern industrial society is associated with the centrality of work “not simply because it produces the goods to sustain life but also because it creates particular forms of social relations” (Oliver, 1990:85). Unfortunately, for people with disabilities and other physical limitations (including gender and age-related ones), equal and gainful contribution in such social relationships was not possible due to the emphasis on productivity over participation (Illich, 1973; Oliver 1990). In South Africa, African and Coloured people (broadly classified as ‘Black’) were also excluded due to job reservations put in place to favour the white elite during the apartheid era (ODP, 1997; Sherer, 2000). This in effect led to the exclusion of people with disabilities, women, children, the elderly, and Blacks from accessing economic opportunities thus leading to high levels of dependency amongst these groups.

Exclusion led to dependency, which in turn resulted in a welfarist response from the State in an attempt to redress these imbalances (South Africa, 2008c). South Africa is ranked as “an upper-middle income country based on average income [yet], some of the nation’s social indicators are comparable to those of the poorest countries of the world” (Samson, MacQuene & van Niekerk, 2005). Further, official unemployment in South Africa stands at 26%, and poverty presently affects close to half of the entire population of a country with “one of the most severe measures of inequality in the world” (*ibid*). This situation has been further exacerbated by the current global economic downturn/recession with the national mining industry being worst affected.

The *Department of Social Development* (previously named the *Department of Social Services and Poverty Alleviation*) offers a wide range of social grants including “old-age; disability; child-support; foster-care; care-dependency and war veterans’ grants; and temporary grant-in-aid relief” (South African Government Information, 2008). Parliament provided the Department with the necessary legal backing by enacting specific legislation such as “the *Children’s Act* (2005) and the *Old Persons Act* (2006) which facilitated transformation in services provided to children and older persons” (South Africa, 2008c:17).

As of September 2007, a total of 12 million people (including some 8 million children) in South Africa were receiving non-contributory social assistance – “the country’s most effective poverty-alleviation programme” (*ibid*). The number of people dependent on one type of social grant or other represents a staggering 25% of all South Africans – a daunting challenge for any country (Mbeki, 2009). The greatest beneficiaries would appear to be children (particularly in rural and

peri-urban settings) – through enabled access to schooling as well as superior nutrition (Samson *et al.*, 2005). Whereas the efforts by the country to redress poverty, inequality and unemployment are laudable, the figure has “increased from ZAR 42.9 billion in 2002/03 to ZAR 74.2 billion in 2005, representing an increase of 20% a year [and] from 2.9% of gross domestic product in 2003/04 to 3.3% in 2006/07” (South African Government Information, 2008). Barnett and Whiteside (2002) support community-based (as opposed to statutory support) as the most sustainable care model for the care of orphans in South Africa. Table 4.4 compares the cost of various care models in this regard (Gow & Desmond in: Barnett & Whiteside, 2002:207-208):

Table 4.4 Cost of orphan care in South Africa (in Rands) (source: Gow & Desmond, in: Barnett & Whiteside, 2002:207-208)

<i>Care Model</i>	<i>Annual cost (minimum increase standard)</i>	<i>Increase</i>	<i>Reason for increase</i>
<i>Community-based support structures</i>	276	—	—
<i>Home-based care and support</i>	306	+30	<ul style="list-style-type: none"> • Process for identification • Process for placement and grant access
<i>Informal fostering non-statutory foster care</i>	325	+19	<ul style="list-style-type: none"> • Higher degree of supervision • Smaller scale
<i>Statutory adoption and foster care</i>	410	+85	<ul style="list-style-type: none"> • Security of accommodation • Quality of accommodation • More administration
<i>Unregistered residential care</i>	956	+546	<ul style="list-style-type: none"> • High staff to child ratio • Provision of emergency care • Care of sick children
<i>Statutory residential care (caring mainly for HIV positive children)</i>	2590	+1634	<ul style="list-style-type: none"> • Very high staff to child ratio • Care only for sick children • Meet statutory requirements for a children’s home • High overheads • On-site medical care • On-site preschool education

Further, as Nattrass (2007:179) argues, “despite this relative generous level of social assistance, pressure on the welfare system continues to grow – most notably on disability grants which rose from about 600,000 in 2000 to almost 1.3 million in 2004”. Large numbers of people living with Aids and tuberculosis continue to claim disability grants “as the disability grant is the only social grant available to adults of working age” (*ibid*). Unfortunately the grant system attracts unscrupulous and opportunistic individuals and is thus not immune to abuse. Due to the high HIV/Aids prevalence and exceptionally high unemployment levels in the country, the welfare case in South Africa is ultimately unsustainable – it offers only short-term financial relief and is attracting ever more people, thereby perpetuating dependency and promoting an entitlement syndrome amongst the general populace (Mbeki, 2009).

Oliver (1996:77) also advances an argument against the welfare case in view of the fact that “providing welfare services on the basis of individual need has aided the process of excluding disabled people from society rather than facilitated their inclusion”. Similarly, Samson *et al.* (2005) are critical of the means-test used to determine eligibility for specific social grants and instead propose that a more inclusive approach be taken thus eliminating the need for the means-test altogether. Further, Samson *et al.* (*ibid*) support the introduction of the *Basic Income Grant* – “a universal grant to all South Africans” introduced in a phased manner. With the *Basic Income Grant* (*ibid*):

No means test would be required: everyone in the country, rich and poor, would receive the grant, which would therefore act like a tax rebate for upper-income recipients. The universal character of the grant would, it is argued, economise substantially on the government's scarce administrative resources, while at the same time eliminating the economic costs arising from the distortionary nature of the means-test. The scheme has been advocated widely by civil society groups, and also by the Minister for Social Development.

4.2.4 The Business Case

The business case views the different categories of vulnerable populations as potential customers for more inclusive goods and services. This would appear at first to be obvious, save for the fact that a vast number of businesses in South Africa have failed to grasp this potential. Opperman (2006) approximates for example, that for every person with a disability interested in using a restaurant, at least another four ‘temporarily able-bodied’ (or non-disabled) people typically accompany the disabled person. An accessible restaurant would effectively be attracting the business of four ‘companion customers’ in addition to the disabled customer by ensuring the access needs of the latter. The same applies to businesses that are child-, elderly- or gender-sensitive and/or responsive (Mueller, 2001, 2003; Owen & Johnston, 2003; O’Herlihy, 2005).

Any inclusive business strategies that anticipates and reasonably accommodates the needs of the elderly would in effect be an enlightened response to the needs ‘of our future selves’ (Coleman, 2001; 2006). Further, people with disabilities offer useful and usable skills to the open labour market, and their inclusion would greatly enhance the intellectual capital or human resource capacity of progressive businesses (Oliver, 1996; Coleman, 2001; Coy, 2003; Barredo, 2006; Deglon, 2008). Coy (2003:159) reinforces this argument by stating thus:

Simply, failure to recruit people with disabilities and to provide an accessible workplace is to deprive an organisation of a pool of talent and skills that could be of great benefit. Moreover, failure to provide an accessible workplace also results in both a loss of staff who develop physical impairments during the course of their careers and long periods of absence from the workplace during recovery from illness or injury; these scenarios are where significant costs are incurred.

4.3 Global Trends

There is a growing awareness of the needs of groups considered as marginalised, vulnerable and/or minorities within societies. Attention to such groups has resulted from the very public commemoration of such significant milestones and events as:

- *The UN Decade of Disabled Persons – 1983-1992;*
- *The African Decade of People With Disabilities – 1999-2009;*
- *The Year of the Disabled in Europe – 2003;*
- *The International Women’s Day – 8th March;*
- *The UN Autism Awareness Day – 2nd April;*
- *World Health Day – 7th April;*
- *The International Day of the Family – 15th May;*
- *The International Children’s Day – 1st June/20th November;*
- *The International Refugees Day – 20th June;*
- *The International Day of the Left-Handed Person – 13th August;*
- *The International Day of the Older Person – 1st October;*
- *World Aids Day – 1st December;*
- *The International Day of the Disabled – 3rd December; and*
- *Human Rights Day – 10th December.*

Instructively, there have been spirited debates and campaigning to extend the *compulsory retirement age* – a sign that people can, and want to work for as long as they opt to. In the United Kingdom, the debate has been on pushing this age to 65. Gribben (2009) reports that robust responses such as these serve to "ensure that older British workers are judged on their skills and abilities rather than their age." Similar debates have been reported in a diverse number of other industrially developed and developing countries such as Australia, India, Japan, Kenya, and the USA. This is in part due to the dual phenomena of general life expectancy increases in tandem with lowered fertility rates – this leads to fewer members of

society being in the active labour force at any given time. Increasing the age of retirement also reduces the dependency of a large number of people on social grants and related welfare services – a welcome reality for many states grappling with ageing populations (World Assembly on Ageing, 2002; Samson *et al.*, 2005; UNFPA, 2008). Closer to home, an accessible and inclusive dedicated park for disabled children was recently opened in Johannesburg (Africa News Update, 2008).

A number of countries have pursued strategies to ensure equity in wages paid to disabled employees. For example, in Denmark the emphasis is on ensuring “spaciousness of the labour market” (Knudsen, 2009). Consequently, the move from sheltered to *supported employment* in the open labour market has raised the employment rate of disabled persons in Denmark to an impressive 57%, whereas the employment rate for the general population stands at 80% (*ibid*). Employers are offered subsidies ranging from half to two-thirds thus encouraging them to pay full (market-related) wages to their employees with disabilities (*ibid*).

Momoza (2009) reports of a similar change in the Western Cape’s *Department of Social Development* (DSD) vision for protected and sheltered employment of persons with disabilities. This shift implies a departure from the traditional view of the disabled as passive recipients of grants to one of recognising the vast human capital potential that should be harnessed (Department of Social Development, 2007). Subsequently, people with disabilities should no longer be viewed as a liability or burden, but as patently creative co-producers of desirable social capital (Fransolet & M’Rithaa, 2009). The DSD initiated the Disability Workshops Development Enterprise (DWDE) to facilitate the implementation of a *co-operative model* that should ultimately convert the 42 participating protected/sheltered workshops into viable micro-enterprises able to compete in a sustainable manner in the open labour market in the province and beyond (Department of Social Development, 2006; Deglon, 2008; Momoza, 2009).

4.4 Summary

This chapter noted the various responses to the needs of *vulnerable populations* in general, but focussed on the different ‘models’ and cases vis-à-vis disability in particular. Globally, the *human rights* concerns for *social justice* for all categories of people is adding impetus to ensure that key actors in the public and private sectors uphold these stated principles. Further, by challenging the *medical* or *individual model*, the prevailing attitudes of the so-called experts,

specialists and professionals towards vulnerable groups is brought under scrutiny as a result of the pervasive influence of the *social model*.

Technological advancements are expected to influence requisite changes in the fields of education, employment and social services. Technology now enables people with disabilities to access learning better and perform tasks that were previously thought impossible, whilst the concept of a compulsory retirement age no longer seems ethically defensible. Finally, the law is seen to enforce the adoption of minimum standards, whereas the social welfare case perpetuates dependency – these two are high-maintenance options requiring complex fiscal, logistical and organisational support. The business case on the other hand is intrinsically more sustainable and has a self-regulating dynamic, whilst simultaneously ensuring greater diversity and enhancing practicable innovation. This latter case informs the discussion on UD in the next chapter.

CHAPTER FIVE

UNIVERSAL DESIGN AND RELATED CONCEPTS

5.0 Introduction

This chapter explores the developments and scope of applications of several concepts leading up to a discussion on their relevance to the main focus of this thesis, namely, *Universal Design* (UD) with respect to various design professions. A number of commentators acknowledge the fact that the design profession has often (knowingly or otherwise) been ‘part of the problem’ in perpetuating exclusionary practices. Consequently, a number of cross-disciplinary specific concepts have been formulated to redress the situation from diverse geographic and professional milieu.

5.1 Design Responses to Counter Exclusion

The various cases discussed in Chapter Five resulted in a spirited effort to make ‘offending’ professions (and by extension, key professional actors) accountable for the systemic exclusion of various vulnerable populations from participating in mainstream social activities (Buden, 2002). Design is a powerful tool in the shaping of artefacts and should be harnessed to tackle the problem of design exclusion. As Edeholdt (2004, cited in Jönsson & Certec, 2006b) categorically asserts, “design has *direction* [and] at its core, it deals with how things *should* be, what they *should* become, rather than how they *are*”. Dalcher (2006:253) acknowledges the ‘wicked’ nature of the discipline in that “design is neither orderly nor linear; it implies a continuous and active search to resolve trade-offs and satisfy changing constraints”. Designers should aspire to be ‘part of *the* solution’ – “good design enables, bad design disables” (EIDD, 2004). This section addresses the responses of the design professions to this challenge.

5.1.1 Accessible Design

Accessible design attempts to make products, places and spaces “more usable by people with disabilities” (Vanderheiden, 2001:65.4). Wijk (2001) suggests that the term *accessibility* implies an interim, transitional or stop-gap measure – the antithesis of an *integral* or *integrated* approach (*ibid*; Sandhu, 2001). The limitations of accessible design have been noted by Steinfeld (1994, cited in Imrie *et al.*, 2001:14) who states that:

accessible design acknowledges that people with disabilities have a right to access and use of products and [built] environments, but it doesn't go far enough because it doesn't express social integration.

Wijk (2001) blames the educational training of designers and architects that depended on idealised and unrealistic anthropometric representations of end-users thus perpetuating the fallacy of “training in the average”, as opposed to an emphasis on a more sophisticated appreciation of anatomical/physiological, psychological and anthropological diversity.

5.1.2 Barrier-free Design

Barrier-free Design (BfD) emerged as a response to what Gleeson (2001 in Imrie *et al.*, 2001:153) refers to as ‘architecture of apartheid’. This is essentially a systemic problem resulting in poorly planned and designed built environments which buttressed structural and attitudinal barriers to people with disabilities (Goldsmith, 1997; Mace, 1998; Imrie *et al.*, 2001; Danford & Tauke, 2001). As expected, this concept was widely used in the architectural profession and initially focussed on the needs of wheelchair users. BfD is closely allied to *Universal Access* (UA) which is elaborated in Section 5.1.9. Additionally, BfD complements the concept of *reasonable accommodation* – whose aim is to “reduce the impact of the impairment on the person’s capacity to perform the essential functions” required of them (South Africa, 2003b:13). The limitation of BfD is however very similar to that of accessible design in the treatment of disability as a *special provision*, as opposed to being a core criterion in the design ethos (Goldsmith, 1997; 2000; 2001; Imrie *et al.*, 2001).

5.1.3 Design-for-All

This concept originated in Europe and finds expression through the *European Universal Design Principles or European Concept for Accessibility* (Wijk, 2001; European Commission, 2002; EIDD, 2004; Coleman, 2006; EDeAN, 2006; Klironomos, Antona, Basdekis, & Stephanidis, 2006). In its present usage, *Design-for-All* (DfA) is virtually synonymous with *Inclusive Design* and *Universal Design* – which evolved in the United Kingdom and the USA respectively (Næss, 2003; Design Council, 2006; EDeAN; 2006; Tiresias, 2006). Whilst noting the ontological propinquity between UD and DfA, Hansson (2006:27) links the latter specifically with “discussion about accessibility and disabled people”, and further that DfA “is a prioritized area within the European Union and on governmental levels in the member countries” (*ibid*). This political goodwill and support is unique to DfA and characterises its mode of diffusion and dissemination – in the case of UD (and *Inclusive Design*), consumers and professional designers are the main promoters. DfA is defined as the “means of designing, developing and marketing mainstream products, services, systems and environments to be accessible and usable by as broad a range of users as possible” (Build-for-All, 2006:9).

According to the *EIDD Stockholm Declaration* of 9th May 2004, DfA “is design for human diversity, social inclusion and equality [– a] holistic and innovative approach [which] constitutes a creative and ethical challenge for all planners, designers, entrepreneurs, administrators and political leaders” (EIDD, 2004). DfA envisages achieving these goals in three specific ways (Build-for-All, 2006:9):

- *by designing products, services and applications that are readily usable by most potential users without any modifications;*
- *by designing products that are easily adaptable to different users (e.g. by adapting their user interface); and*
- *by standardising interfaces of products to be compatible with specialised equipment (e.g. technological aids for disabled persons).*

The three tiers of DfA render the approach versatile and comprehensive in both scope and reach, whilst allowing for greater design flexibility (Coleman, 2006; Build-for-All, 2006).

5.1.4 Design for Disability

According to Clarkson, Coleman, Keates and Lebbon (2003:599), *Design for Disability* can also be described as *Design for Special Needs* and is related to the medical model of disability in that it “mainly focuses on aids and adaptations to everyday equipment and buildings [with] the underlying intent [being] essentially prosthetic, with origins in post-trauma rehabilitation, particularly of war veterans”. This approach to design has since been superseded by the philosophy and practice of *inclusive design*, particularly in Europe (*ibid*).

5.1.5 “Extra-Ordinary” Ergonomics

According to Wilson (1990:3), the approach of *ergonomics* is about “designing for people”. Much of the scope of this thesis relates to what Davis (2006:2) describes under *organisational ergonomics* as it focuses on investigating the introduction of new systems and work paradigms vis-à-vis UD. *Ergonomics* actively places people at the centre of its endeavour, and is patently *user-centred*, yet it inadvertently failed to take cognisance of *special human needs* until recently (Danford & Tauke, 2001). Indeed, Davis (2006) specifically equates the three concepts of *ergonomics*, *user-centred design* and *inclusive design*. Wells, Norman, Frazer, Laing, Cole and Kerr (2003:5) state unequivocally that “ergonomics is human-centred design”. The hypothetical principle of the *limiting user* as elaborated by Pheasant (1998:23) approximates a

concession towards “extra-ordinary” individuals, but it places constraints on its own usefulness by focusing exclusively on *reach* and *clearance* (in relation to *anthropometric* characteristics).

Anthropometrics, as an indispensable branch of ergonomics, concerns itself with measurements pertaining to the human body such as body size and strength (Pheasant, 1996:7). Kroemer, Kroemer, and Kroemer-Elbert (2001) attempt to ameliorate this situation by proposing ergonomic design guidelines for special populations. Subsequently, Kroemer (2006) presents a dedicated work on “extra-ordinary” ergonomics with a focus on “*Small and Big Persons, the Disabled and Elderly, Expectant Mothers, and Children*”. Kroemer (2006:1) states that “the common user population is not a unitary, homogenous assemblage but rather a group of individuals with diverse characteristics and varying capabilities”.

Further, in acknowledging the fallacy of designing for “regular use by normal adult” user populations, “extra-ordinary” ergonomics intrinsically embraces the great diversity of such human factors as “strength, mobility and endurance” (*ibid*). The resultant anthropometric data on “extra-ordinary” populations is particularly useful to designers with regards to changes that occur with natural growth, ageing and pregnancy – *i.e.* data pertaining to children, the elderly and women. It is however not possible to generalise the changes occurring amongst people with permanent disabilities as there is a far greater diversity than is commonly appreciated (*ibid*). Table 5.1 (Kroemer, 2006:77) summarises the diverse constituency discussed herein.

Table 5.1 “Extra-ordinary” trends and changes in functioning (source: Kroemer, 2006:77)

	Energetic Capabilities (metabolism, circulation, respiration)	Biomechanical Capabilities (strength, power, mobility, endurance)	Sensations, Perception, Decision Making, Controlling Actions	Capabilities to Endure and Function in Heat and Cold	Stress Tolerance
PREGNANCY	<i>reduced, diminishes further with run of pregnancy</i>	<i>reduced, diminishes further with run of pregnancy</i>	<i>no change except in taste and smell</i>	<i>reduced, diminishes further with run of pregnancy</i>	<i>reduced, diminishes further with run of pregnancy</i>
CHILDHOOD	<i>much smaller but increases</i>	<i>much smaller but increases</i>	<i>not systematically known</i>	<i>much smaller but increases</i>	<i>not systematically known</i>
AGEING	<i>reduced, diminishes further with ageing</i>	<i>reduced, diminishes further with ageing</i>	<i>reduced, diminishes further with ageing</i>	<i>reduced, diminishes further with ageing</i>	<i>depends on individual and circumstances</i>
WITH PERMANENT DISABILITY	<i>no general statements possible, depends on the individual</i>				

The focus of “extra-ordinary” ergonomics is on those groups that are patently disadvantaged when data for the ‘average’ or ‘50th percentile’ individual is used as a reference for the entire

population of user, irrespective of patent physiological and psychological differences. These “extra-ordinary” groups “who differ from this normative adult model [include]: pregnant women, children, and ageing and old persons, as well as those with disabilities” (Kroemer, 2006:4).

5.1.6 Inclusive Design

Inclusive design has a long and well-documented relationship with the study of *ergonomics* (Coleman & Pullinger, 1993; Coleman, 2006). Indeed, in 1993 the journal *Applied Ergonomics* dedicated the 1st issue of its 24th volume to the subject following a successful conference which was “organized jointly by the Ergonomics Society and DesignAge on 6 May 1992 at the Royal College [...] entitled *Designing for our future selves* in recognition of the fact that we all age and that it is inappropriate to regard older people as anything other than ourselves in the future” (Coleman & Pullinger, 1993:3).

Tiresias (2006) defines *inclusive design* as “the design of mainstream products and/or services that are accessible to, and usable by, as many people as *reasonably* possible on a global basis, in a wide variety of situations and to the greatest extent possible, without the need for special adaptation or specialised design”. Gill (2004:3) and other commentators leave out the words in parenthesis in their functional definition of inclusive design. Further, the inclusion of the word ‘reasonably’ in the definition could either be read as an exit clause/disclaimer, or as an emphasis on the intent to achieve this noble ideal (Tiresias, 2006). As mentioned in Section 5.3, this term is considered synonymous with DfA and UD (Næss, 2003; Design Council, 2006; EDeAN, 2006; Tiresias, 2006).

Jordan (1999:174) defends *inclusive design* for its ability to “eliminate much of the social stigma associated with products for use by the disabled”. Similarly, Clarkson, Keates, Coleman, Lebbon and Johnston (2000:4) acknowledge the host of diverse terms used to describe the ‘goal of non-exclusive design’ and adopt the term *inclusive design* to refer to ‘designing for the whole population’. Imrie *et al.* (2001) see *inclusive design* as an advancement on the principles of UD and liken the approach of the former to that of *social design* as conceived by Sommer (1983, in Imrie *et al.*, 2001:18).

For heuristic purposes, two useful tools, the *Inclusive Design Cube* (Clarkson *et al.*, 2003:99; EDeAN, 2006) and the *Universal Design Pyramid* (Goldsmith, 2000:3), demonstrate that with a change in design thinking it is indeed possible to significantly increase the number of potential

users accommodated by products and built environments (Figures 5.1 and 5.4 respectively). Keates and Clarkson (2003a; 2003b) present a three-dimensional *inclusive design cube* as an extension of the *user pyramid* proposed by Maria Benktzon (1993). The *inclusive design cube* according to Clarkson *et al.* (2000:6) is meant for use as a “diagnostic tool” in seeking to expand the market potential of products.

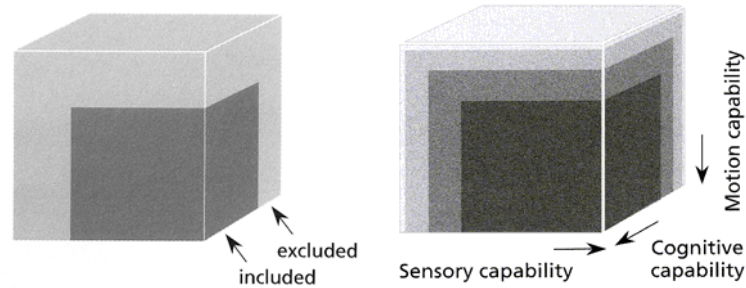


Figure 5.1 The Inclusive Design Cube
(source: Keates & Clarkson, 2003b:100)

5.1.7 Kyoyo-Hin

The term *Kyoyo-Hin* is functionally synonymous with *Inclusive Design*, *Design-for-All*, and UD (CUD, 1997; Kyoyo-Hin, 2001; Design Council, 2006; EDEaN, 2006). Related fields include *user-centred design*, *human-centred design*, *ergonomics*, *usability studies*, *design for disability*, *rehabilitation design*, *gerontechnology*, *transgenerational design*, and *lifespan design*. *Kyoyo-Hin* emerged as a dedicated response to the needs of the rapidly ageing population in Japan, before adopting broader strategies to include other vulnerable groups. The significant elderly population there led *Kyoyo-Hin* and *Kyoyo Services* to integrate UD with *accessibility design*, *lifespan (transgenerational) design*, and *adaptive (adjustive design)* (Kyoyo-Hin, 2001). The accepted practice is that “*Kyoyo-Hin* and *Kyoyo Services* are designed to be used by as many people as possible, including the elderly and those with disabilities” (*ibid*). The relationship between proprietary and general products vis-à-vis *Kyoyo-Hin* is depicted in Figure 5.2.

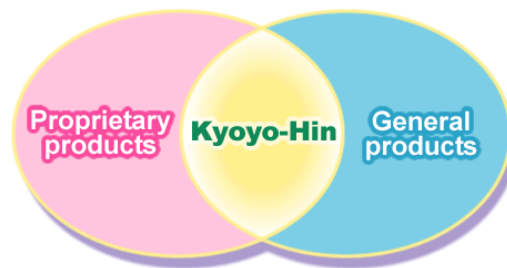


Figure 5.2 Kyoyo-Hin and Kyoyo Services
(source: Kyoyo-Hin Foundation, 2004)

Japan's contribution to UD includes the formulation of ISO Guide 71: *Guidelines for Standards Developers to Address the Needs of Older People and Persons with Disabilities* (International Organization for Standardisation, 2001). Further, Japan has embraced UD as an effective vehicle to extend its own technological and marketing advantage and currently hosts the secretariat of the *International Association of Universal Design* (IAUD) in Yokohama (IAUD, 2006). The IAUD was inaugurated on 28th November 2003 with the objective of reviving the recession-hit Japanese economy and promoting UD among key actors in industry, government and academia in the spirit of *The International Universal Design Declaration* reproduced in Appendix C (Tsutatani, 2005; IAUD, 2006). Major companies such as Canon Incorporated, Fuji Photo Film Company Limited, Mitsubishi Motors Corporation, Sony Corporation, and Toyota Motor Corporation have taken UD seriously – as reflected in their active membership in the IAUD (IAUD, 2006). The IAUD has also been instrumental in propagating the convergent UD activities such as the prestigious *Ron Mace Award* (which recognises special achievement in UD), as well as the highly publicised *Design for the Twenty-First Century* competitions aimed at emerging (student) designers (Tsutatani, 2005).

5.1.8 Transgenerational Design

Koncelik (1998:127) argues that the effects of ageing is not uniform “in the onset of changes or in the continuum of change” – the elderly are not a homogenous group with identical needs. Other commentators also emphasise the diversity and variance associated with the phenomenon of ageing (Benktzon, 1993; Pirkl, 1994; Jordan, 1999; Goldsmith, 2001). Further, according to Sixsmith and Sixsmith (1993), our individual differences in functioning and aptitude become more pronounced with the natural progression of ageing.

James Pirkl is credited with formulating the concept of ‘transgenerational design’ (Clarkson *et al.*, 2003:600; Jordan, 2008). This is one of the “practice-based strategies’ that influences design practice (Coleman *et al.*, 2003:15). The emerging discipline of *Gerontechnology* is cited as a specific response to the phenomenon of population ageing – a collaborative effort “between European and North American academics and the practice and education-based programmes supported by the Helen Hamlyn Foundation in the UK” (Coleman *et al.*, 2003:10). *Transgenerational Design* is also known as *Design for Lifespan* (*ibid*). A useful biopsychosocial indicator of the capacity for independent living among the elderly is the *Katz Scale* which measures the *activities of daily living* (ADLs). The ADLs are a set of six basic activities – *inter alia*; *bathing, dressing, toileting, transferring, continence* and *feeding* (Family Practice

Notebook, 2000a). The *instrumental activities of daily living* are a further refinement of the ADLs and include more community-focused activities such as *transportation, housework, cooking and shopping* (Lawton & Brody, 1969; Family Practice Notebook, 2000c).

PirkI (1994:42) argues that products and environments are usually directed toward a single disability, “thereby failing to accommodate the combined effects of multiple losses” associated with ageing. Additionally, Koncelik (1998:117) exhorts designers to “relate the human factors of ag[e]ing” to the products that they design. Similarly, the *empathic design* approach employed by Patricia Moore (2001) seeks to sensitise designers towards the needs of the elderly (and other vulnerable populations). This expression of empathy has resulted in the development of such creative approaches as *Design by story-telling* (Moggridge, 1993) and useful interactive tools such as the *Third Age (or Empathy) Suit* (as shown in Figure 5.3). The *Third Age Suit* was created to simulate ageing-related ambulatory and sensorial limitations and was used in the design of the Ford Focus automobile (Steinfeld & Steinfeld, 2001; Mueller, 2003).



Figure 5.3 The Third Age Suit
(source: Mueller, 2003:327)

5.1.9 Universal Access

Universal Access refers to the ability of all people to have equal opportunity and access to a service or product from which they can benefit, regardless of their social class, ethnicity, background or physical disabilities (Obrenović, Abascal & Starčević, 2007). It is a vision, and in some cases a legal term, that spans many fields, including education, disability, telecommunications, and healthcare. It is tied strongly to the concept of human rights (Swart *et al.*, 2008:9). One thus can argue that *universal accessibility* is the (interactive) affordance that is achieved through active and tangible expressions of UD – or in other words – the effective implementation of UD principles results in *universally accessible* places, spaces and products.

5.2 Universal Design

According to Vanderheiden (2001:65.3), UD is “the process of looking at the design of a product from a general perspective, which would include all users”. Story (2001:10.3) defines UD as “the design of all products and environments to be usable by people of all ages and abilities, to the greatest extent possible, without the need for adaptation or specialised design”. This is the widely quoted official definition as phrased by the Center for Universal Design at the North Carolina State University (CUD, 1997; 2006; Story, 2001). The visionary pioneering work of Tim Nugent of the University of Illinois at the Champaign Urbana campus set the foundation for what would eventually become known as *Universal Design* (UD) (Goldsmith 2000:4). Through their passion and commitment, Tim Nugent, Ron Mace (Clarkson, Coleman, Keates & Lebbon, 2003:13; McGuire, Scott & Shaw, 2006:167), and Selwyn Goldsmith (Clarkson *et al.*, 2003:13) are acknowledged as champions of the UD movement.

UD claims its roots in *barrier-free design* (Mace, 1998) which according to Pirkl (1994) is synonymous with *accessible design*. Other sources suggest that UD has its origins in *barrier-free design* as well as *universal accessibility* in the field of architecture (Kyoyo-Hin, 2001; Preiser & Ostroff, 2001; CUD, 2006; EDeAN, 2006) with the actual definition accredited to Ron Mace who first coined the term “*Universal Design*” in 1985 (Kyoyo-Hin, 2001; Preiser & Ostroff, 2001; Kennig & Rhyl, 2002; Clarkson *et al.*, 2003; Centre for Universal Design, 2006; EDeAN, 2006). Inclusive design, on the other hand – as discussed earlier – evolved from collaboration between *design* and *ergonomics* research and symposia (Coleman, 2006). Coleman (2003:10) notes the unique orientation of the related concepts in that “in Europe the focus has been on social inclusion, in the US on individual rights, and these drivers have resulted in a range of philosophic, academic and practical approaches”.

At its inception UD emerged out of more immediate practical and pragmatic concerns within “the disability and design communities” (Crews & Zavotka, 2006:116), whilst inclusive design was informed primarily by the realisation of potential implications of future trends (such as ageing) that was supported by data on human factors (Taylor, Roberts & Hall, 1999). This might explain the assertion by Koncelik (1998:149) that UD practice is informed by an “intuitive approach”. Koncelik (*ibid*), while conceding that UD is a “useful philosophic device”, is critical of a cavalier “one-size-fits all” approach and instead calls for product variation (as opposed to “product universality”). This latter consideration is reflected in the multi-pronged strategy of *Design-for-All* as discussed earlier (Coleman, 2006; Build-for-All, 2006). Moalosi (2007) on the

other hand argues against seeking universality as a value and suggests that such an ideal is untenable (or undesirable) in our present post-industrial era, particularly where user- and context-responsive solutions are considered to be of paramount importance.

Notwithstanding, UD has enjoyed considerable recognition and popularity internationally (Aslaksen, Bergh, Bringa & Heggem, 1997; Adaptive Environments, 2006; Coleman, 1999; Balaram, 2001; Danford & Tauke, 2001; Gomes, 2005; Hansson, 2006), whilst Pirkl (1994:228) concurs with this view as he relates the ambit of transgenerational design exclusively to the natural process of ageing but describes UD as an “unreachable design ideal” notwithstanding the fact that Pirkl’s definition of transgenerational design is virtually identical to that of UD.

Goldsmith (2001) uses the *universal design pyramid* (in Figure 5.4) first elaborated as the *user pyramid* by Benktzon (1993) to encourage inclusion by expanding the base of potential beneficiaries of more accessible built environments by mainstreaming products of a *universal* (as opposed to *special*) appeal. The *universal design pyramid* as a heuristic device elaborates the concept for “design for the broader average” whilst acknowledging that certain categories of users will always require carer assistance and/or assistive devices to facilitate functioning (Coleman, Bendixen & Tahkokallio, 2003:15). The underlying assumption however is still valid – that by considering the needs of the entire population (including those individuals with severe limitations in functioning) right from the outset, it is possible to significantly increase (and profit from) the expanded constituency of potential users in so doing. DePoy and Gilson (2004:46) however caution against the danger of commodifying a sensitive issue such as disability as “reproduction of human experience removes it from community and human interaction and places it in the arena of economic consumption”.

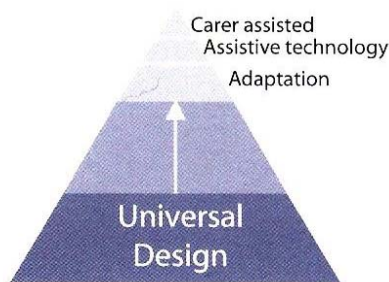


Figure 5.4 The Universal Design Pyramid
(source: Kose, 2003:313)

There appears to have been a phase of divergence and competition as different proponents sought to clarify their unique perspective on the UD debate. Further, one must take cognisance of the fact that a number of these UD-related concepts developed in isolation and completely independently of one another in response to the unique localised challenges identified in those contexts. This phenomenon is not uncommon as a reading on the birth and growth of *Ergonomics/Human Factors* reveals. As Kose (2003:311) argues “‘design for all’ should be the basic assumption of the design profession, and everything should have been designed with that idea in mind”. Common UD-related concepts are summarised and presented in Table 5.2.

Table 5.2 Comparison of definitions of UD and related concepts (various sources)

Concept	Definition
Universal Design (UD)	<i>“Universal design is an approach to the design of all products and environments to be usable by everyone, to the greatest extent possible, regardless of age, ability, or situation. It serves people who are young or old, with excellent or limited abilities, in ideal or difficult circumstances. Universal design benefits everyone by accommodating limitations” (Universal Design Education Online, 2006).</i>
Inclusive Design: mainly in the UK	<i>“Inclusive design is not a new genre of design, nor a separate specialism, but an approach to design in general and an element of business strategy that seeks to ensure that mainstream products, services and environments are accessible to the largest number of people” (Design Council, 2006).</i>
Design for All: Europe; India	<i>“Design for All is a process whereby designers, manufacturers and service providers ensure that their products and environments address users irrespective of their age or ability” (EDeAN, 2006; Design for All Institute of India, 2006).</i>
Kyoyo-Hin and Kyoyo Services: Japan	<i>“Kyoyo-Hin and Kyoyo services are designed to be used by as many people as possible, including the elderly and those with disabilities” (Kyoyo-Hin, 2001:3).</i>
Design for our Future Selves: mainly in the UK	<i>“Concept developed by DesignAge programme to encourage young designers to engage with design for ageing populations. Became the theme for many events at the RCA and of an annual competition resulting in many concept exemplars of age-friendly design” (EDeAN, 2006).</i>
Transgenerational Design: mainly in the USA	<i>“The practice of making products and environments compatible with those physical and sensory impairments associated with human ageing and which limit major activities of daily living” (Transgenerational Design Matters, 2006).</i>
Gerontechnology: mainly in USA and Europe	<i>“Concept developed at Technical University of Eindhoven, The Netherlands (NL), with US and Finnish colleagues. Combines human factors, social sciences, gerontology and engineering. Applying technology to address age-related factors. Consumer/market oriented approach” (EDeAN, 2006).</i>
Universal Access	<i>“Universal access/access for all: to information and communications technology (ICT). Also used in assistive technology to refer to specialist interfaces and control devices to make ICT products accessible to people with high levels of impairment” (EDeAN, 2006).</i>

The experiences of the cities of New York (in the USA) and Curitiba (in Brazil) serve as best-practice exemplars of the positive psychosocial impact that the adoption of integrated strategies of UD engenders – particularly with respect to perceived quality of life for their respective residents. Levine (2003:10) reports of the enthusiasm with which the publication of *Universal Design New York (UDNY)* was received internationally – way beyond its intended audience which in part is due to the special focus on *technical solutions* to problems identified

primarily in products and in the built environment. The information is presented as “*accessible*” against *UD* considerations – attesting to ‘superiority in coverage’ in adopting UD principles, as compared to the implementation of traditional baseline guidelines on accessibility (*ibid*).

The implementation of effective UD strategies would involve a trans-disciplinary approach in which designers, among others, could play a significant part (Zimmerman, 2006; Kurvinen, 2007). One would expect designers to adopt this progressive approach with little resistance or opposition. Clarkson, Keates, Coleman, Lebbon, and Johnston (2000:1) report however, that there is little industry awareness of the efficacy of adopting inclusive design strategies even in more progressive industrially developed economies like the UK. The situation is exacerbated in South Africa as few professional designers are aware of the (potential) benefits of UD. Koncelik (1998:122) reports of the “alternating panic and jubilation” that designers (including architects) went through soon after the ADA was promulgated in the USA. Similar dynamics would be anticipated in this country should inclusive considerations become a professional imperative.

One of the principal reasons for reluctance to embrace UD is that of perceived high cost of implementation. Subsequently, Kroemer (2006:1) argues that applying a UD approach to the design of everyday artefacts “is often impractical and expensive”. This association of UD “as a consumer market driven issue” is acknowledged by Mace (1998) as well as by Danford and Tauke (2001:19) and reiterated by Levine (2003:17). There is an attempt however to temper this fact by postulating that disability should be everyone’s concern – everyone is bound to experience some form of functional limitation with the natural progression of ageing. Hansson (2006:203) cautions that “if consumers are neglected in marketer’s consumer conceptualisation they experience design exclusion as they likely will be excluded from the design process as well”.

5.2.1 Principles of Universal Design

The seven *Principles of Universal Design* were developed by a cross-disciplinary team at the *Centre for Universal Design* at the *North Carolina State University* and with the current *Version 2.0 (4/1/97)* being published in 1997 (Centre for Universal Design, 1997; Appendix B). They provide a practical set of guidelines for designers, planners and architects to ensure that the resulting designs are universally usable. The *Principles of UD* are widely diffused and lend themselves easily to consumer marketing applications and in the development and utilisation of

“designed artifacts” in myriad contexts (Hanson, 2006:8). Though there is a stated intent to be as inclusive as possible, the authors/originators (*ibid*) acknowledge that:

The Principles of Universal Design are not intended to constitute all criteria for good design, only universally usable design. Certainly, other factors are important, such as aesthetics, cost, safety, gender and cultural appropriateness, and these aspects must also be taken into consideration when designing.

A number of related principles and guidelines have been developed elsewhere, with the *Principles for Kyoyo-Hin and Kyoyo Services* being the closest semantically (Kyoyo-Hin, 2001). The seven *Principles of Universal Design*, and the five *Principles for Kyoyo-Hin and Kyoyo Services* are virtually identical in scope and wording. Table 5.3 offers a helpful comparison and further demonstrates the similitude of the said principles.

Table 5.3 Comparison of Principles of UD (Centre for Universal Design, 1997) and Principles for Kyoyo-Hin and Kyoyo Services (Kyoyo-Hin, 2001)

Principles of Universal Design	Principles for Kyoyo-Hin and Kyoyo Services
1. <i>Equitable Use</i> . The design is useful and marketable to people with diverse abilities.	1. Adaptation to various types of physical and mental disabilities for easy use by as many people as possible.
2. <i>Flexibility in Use</i> . The design accommodates a wide range of individual preferences and abilities.	
3. <i>Simple and Intuitive</i> . Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.	3. Operation and use by means that are intuitively understood and require little psychological strain
4. <i>Perceptible Information</i> . The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.	2. Easily comprehensible communication using plural means (visual, aural, tactile, etc.).
5. <i>Tolerance for Error</i> . The design minimizes hazards and the adverse consequences of accidental or unintended actions.	5. Concern for safe use in all aspects, including material, structure, function, procedure, and environmental features
6. <i>Low Physical Effort</i> . The design can be used efficiently and comfortably, and with a minimum of fatigue.	4. Easy use with little physical burden (e.g., can be handled with little effort, easy accommodation of motion and approach, etc.)
7. <i>Size and Space for Approach and Use</i> . Appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility.	

5.2.2 Universal Design Applications in Education

Papanek (1995:210) in his discussion on “*Design Education for All*” proposes four distinct ways in which design could benefit education that can be summarised as follows:

- *offering courses of study to design students at Higher Education Institutions (HEIs);*
- *educating and sensitising the youth on design-related matters;*
- *addressing physical barriers within the built environment; and*
- *(re)designing educational software for student-centred learning applications.*

Ormerod *et al.* (2005:293) on the other hand views the task of the 'enlightened' designers as being complex in nature, and states that:

the context within which designers operate should not be under-estimated. Lawson (2004) suggests that the difficulty in achieving good design is that designers do not solve well-formulated problems but ones which are ill-structured, open ended and often referred to as wicked. [...] overall, it can therefore be concluded that while designers are keen to ensure that buildings and their environments facilitate social inclusion, there are significant barriers to achieving this, particularly due to lack of understanding of disability and how a person with a disability interacts with a building, and how the regulations and legislation can support this interaction rather than just providing a minimum standard.

The student/learner-centred *Outcome-Based Education* (OBE) system is the formal educational paradigm that has been formally adopted in South Africa (Makoni, 2000; Malan, 2002; Volbrecht, 2003; Tisani 2004; Favish, 2005; Winberg, 2008). The implementation of OBE in countries such as Australia Canada, New Zealand and the USA and has led to an acceleration in the rate of globalisation and massification within the higher education landscape (Olivier, 1998). According to Malan (2000:22), OBE is "*currently favoured internationally to promote educational renewal*". This new dispensation requires that educators engage with and manage diversity within a dynamic and fluid multi-cultural environment that has greater interconnectivity with the rest of the world. Subsequently, OBE encourages more accessible educational praxis such as *lifelong learning* – this imperative introduces rather unique challenges to curriculum development and implementation (Smith & Spurling, 1999; Gough, 2000; Knapper & Cropley, 2000; Granville & Dison, 2001; Bogdan & Biklen, 2003; South Africa, 2003a; 2004a). Further, the *Higher Education Act* (South Africa, 1997a) and the *White Paper on Special Needs Education* (South Africa, 2001) recognise the non-discriminatory and destigmatising benefits of *inclusive education* (as opposed to *special education*) and makes provision for adoption of this measure right through the different levels of education – themes that inform the UD ethos.

The *UD Educators' Network* (2006) provides an opportunity for exchange between UD educators across the globe, as well as hosting an extensive database of useful links and resources. Similarly, though an array of options is available to UD educators including; *UD for Learning* (UDL); *UD for Instruction* (UDI); *Universal Instructional Design* (UID); and *UD for Education* (UDE), the first two are the more commonly used (McGuire, Scott & Shaw,

2006:167; 172). McGuire *et al.* (2006:172) caution against using confusing terminology which is essentially a “*befuddling of adjectives with no specific meaning*” and emphasise that although UDL emphasises an inclusive vision of UD, there is need for responsibility and recognition that some students will still require individualised special education services and supports. Kennig and Rhyl (2002) have compiled an extensive database on institutions teaching UD-related courses around the world thereby underscoring the versatility and efficacy of UD to diverse contexts globally.

One of the most effective strategies for mainstreaming any new idea is by influencing fledgling and/or future professionals in the targeted fields of endeavour. The motivation for sensitising and exposing design students to a non-exclusive design discourse is such a pre-requisite, and the following statement by the Design Council (2006) elegantly articulates this view;

Inclusive Design is important to the designers of tomorrow – and those who educate them. Future consumer markets will be more diverse than ever in terms of age and physical ability. In the past, design education looked at special needs design for special needs groups. This attitude is changing. Now the focus is on better mainstream solutions for everyone, supported by new design research techniques to make the development process more user-centred.

5.2.3 Case Studies on Universal Design in Cape Town

This section discusses three case studies from the specific vantage point of UD. The first is based on action research – in the form of an experiment during a dedicated module on *UD for Product Design Students* at the Cape Peninsula University of Technology. The second is an exploratory UD audit of the *Kirstenbosch Botanical Gardens*; whilst the final one is a participatory action research case study based on the 2010-related *Mouille Point Promenade and Beachfront Student Landscape Design Competition*. The findings and implications of these cases are also interrogated as they provide valuable insights in the formulation of adjustable UD strategies for the metropolitan area of the City of Cape Town.

5.2.3.1 Case Study One: UD for Product Design Students

This case study is based on a classroom experiment (discussed in further detail in Section 7.2) that was used to test the validity and reliability of adopted outcome-based assessment and evaluation methods that include self-, peer-, and facilitator-assessment modes in the context of a newly introduced dedicated module on “*Universal Design for Product Designers*” offered to students in their third year of study for a *Diploma in Three-Dimensional Design* at National

Qualifications Framework (NQF) Level 6 (SAQA, 2005a; 2005b). Further, implications for *design education* in general and *inclusive education* in particular, were interrogated with reference to a majority world context such as South Africa's (*ibid*). The stated exit outcome/competence for each student would be the following:

- *identify special human needs in a product, system, or practice;*
- *apply The Principles of UD to actual design problems;*
- *use UD strategies to mediate and solve product design-related problems; and*
- *justify specific UD considerations in (re)designed solutions.*

The *problem-based learning* activities as advanced by Biggs (2002) required students to:

- *identify one example of a product that they had previously designed and made a 3D model of;*
- *make a detailed case study and critique of their chosen example using UD principles;*
- *identify specific ways in which they could improve the chosen example to accommodate otherwise excluded users; and*
- *incorporate suitable and justifiable UD considerations in their redesign solution(s).*

The researcher made presentations to students on “*Special Human Needs*” and “*UD Perspectives in Context*”. One of the presentations to the 32 students included a guest lecturer from the *Cape Town Society for the Blind* who made a presentation on “*The Pathology of Blindness*”. Students were given access to both hard and soft copies of all presentation materials. At the end of the module, students also received feedback from two CPUT lecturers (who sat in as observers and repertoires for the duration of the module), one focusing on their presentation and communication skills, whilst the other focused on technical competency in their proffered (re)design solutions. Similarly, each student was assessed by at least three of their peers on their presentations and submissions (Luca & McLoughlin, 2002). The modes of formative assessment included:

- *5-10 minute presentations highlighting specific points of UD intervention;*
- *sketches with accompanying notes on A4 format detailing and justifying specific UD considerations in the redesign of the selected product;*
- *peer-assessment of presentations on the dates specified (at least three per presenter);*
- *self-assessment of their presentation and submitted projects;*
- *assessment by the facilitator; and*
- *feedback on the module submitted to the facilitator.*

81% of students submitted self-assessment evaluations, whilst 94% of students received peer-assessment. Students were required to submit self- and peer-assessments and assign a grade or mark corresponding to the formal grading system at the Department of Industrial Design, CPUT. Botha and du Plessis (2007) support this approach of *self-appraisal in learning*. The said grades were correlated to *Not Yet Competent: 0-49%*; *Competent: 50-74%*; and *Highly Competent: 75-100%*. All participating students attained competency at the end of the module with 84% being assessed as “competent, and 16% as being “highly competent”. A statistical analysis of the actual marks awarded indicated an average standard deviation of 1.7 (*ibid*).

Students’ responses to self-assessment evaluative questions indicated that the majority (31%) felt they did *best* on applying appropriate UD principles to their chosen products. Interestingly, the majority of students (22%) felt that the *hardest part* of the assignment in applying appropriate UD principles to their chosen products. Of great significance for UD was the finding that the majority of students (50%) responded in their self-assessment that they felt that the *most important* thing they learned in doing the assignment was the sensitivity they developed towards the needs of (potential) ‘differently-abled’ users of their chosen products; whilst 32% of their peers felt that the application of UD principles to selected products was the *most important* thing the student learned (*ibid*).

The case-study at CPUT vindicated the usefulness of using a triangulated means of assessment and evaluation of a UD module (Creswell, 2002). Due to the short duration in which the module was presented, students were encouraged to explore the possibility of applying UD principles in all future assignments. Indeed as Kennig and Rhyll (2002:9) propose, “ultimately, Universal Design should not be taught as a separate course in the graduate program since this would be against the principles of an integral and inclusive approach. UD should rather be part of all relevant courses and assignments”. Subsequent interaction with the same group of students at CPUT confirms that they are indeed implementing UD principles in their design work. It would be instructive to follow up on the progress of the same students once they are employed in industry and align the resultant feedback with pedagogic practice.

According to available records on student enrolment at CPUT (2007) indicate that less than 0.2% of the total enrolment were individuals with disabilities. This figure on students with disabilities works out to one-thirtieth of the national average of 5% (Health Systems Trust, 2006) and about one-sixtieth that of international prevalence figures of 10-12%. Given that

CPUT is now the largest HEI in the Western Cape Province (with some 33,000 students enrolled); these statistics reveal the enormity of the challenge of increasing access to students with disabilities – a task that underscores the critical role of the institutional Disability Units presently located at the two largest campuses at Bellville and Cape Town. CPUT is committed to the establishment of Disability Units on all its campuses in the long-term (Hornea, 2008).

Students' experiential learning – as advocated by Chang, Tremblay and Dunbar (2000), as well as by Thapar, Warner, Drainoni, Williams, Ditchfield, Wierbicky and Nesathurai (2004) – was provided before, during and after the UD module via a wheelchair for their exclusive use. Students reported that they experienced the disabling effects of many barriers that they would have otherwise been unaware of. Students also wrestled with moral and ethical/philosophical dilemmas as to whether designers in majority world contexts should concern themselves with promoting 'design for need' in a prescriptive manner. There was consensus around the view postulated by Whiteley (1993:170) that “*design, fun and imagination*” are fundamental to the design process, and that “*Form Follows Fun*” (Papanek, 1995:151). Further, Rose and Strangman (2007) assert that *UD for Learning* is a proactive pedagogic strategy that elicits positive emotion and motivation by accommodating the three main *cognitive learning networks* (recognition, strategic and affective) to enhance effective learning. The products designed by participating students illustrate how UD was incorporated in products (Figures 5.5-5.6).

Figure 5.5 shows a *paraffin container* incorporating Braille. By including the needs of people with visual disabilities in the redesign of the paraffin container, the students demonstrated the efficacy of the UD ethos in an unobtrusive yet aesthetically sound manner – in this instance the end-product demonstrates the principles of *Perceptible Information* and *Tolerance for Error*.



Figure 5.5 Paraffin container
(source: © K. Golin & C. Fouche)

The *universal bathtub* shown in Figure 5.6 is designed along UD principles (with particular emphasis on *Low Physical Effort*) so that the bathtub walls rise around the user thereby eliminating the strain of getting in and out of the tub. This design also allows professionals and other caregivers to assist in bathing people with disabilities who sometimes might require such assistance – this is a good example of applying ergonomics to HEI contexts (Mokdad, 2005).



Figure 5.6 Universal bathtub
(source: © D.J. Coetzee & P. Kleinschmidt)

Though the case study on the UD module was of a diagnostic type, it did reveal promising examples of how UD can be effectively incorporated within design curricula. The implications from this case study are that:

- UD is relevant to design curricula in a majority world context;
- UD principles naturally complement the *Inclusive Education* paradigm;
- UD should be integrated into all design-related programmes offered to students; and
- UD requires dedicated strategies to mainstream it into other spheres of life.

5.2.3.2 Case Study Two: UD for Public Parks

This case study was carried out under the title: “Wayfinding at the Kirstenbosch Botanical Gardens: the makings of an inclusive legible space”. The *Kirstenbosch National Botanical Gardens* are a unique and priceless national heritage whose benefits and pleasures should be accessible to all visitors. The case study evaluated the effectiveness of wayfinding systems at the Kirstenbosch Botanical Gardens via a *Universal Design Audit Checklist*¹ (Levine,

¹ The Checklist is not designed for use as an audit for accessibility code compliance, but rather to complete an audit of a design in process or facilities already in use. Copies of the Checklist used are available online at www.ap.buffalo.edu/idea

2003:212-225). The UD Audit Checklist (Appendix D) forms the basis of the discussion on the challenges of implementing inclusive and accessible provisions in a majority world context.

The Kirstenbosch National Botanical Gardens are set in a picturesque site on the eastern slopes of Cape Town's world-renowned *Table Mountain*. The estate is home to the *world's first* indigenous botanical garden having established been in 1913 with the specific objective, according to the *South African National Biodiversity Institute* (SANBI, n.d), "to promote and conserve the flora of southern Africa".

The expansive estate covers 528 hectares of nature reserve of which 36 hectares (or approximately 7% of the total area) forming a cultivated landscaped garden (*ibid*). Kirstenbosch is an integral part of the famed *Cape Floristic Region* (popularly known as the Garden Route). The Cape Floristic Region is one of the county's eight *World Heritage Sites*. These UNESCO-recognised sites are places on earth that are considered to be of "outstanding universal significance to humanity" (SANBI, n.d; UNESCO, 2005; 2007).

Kirstenbosch boasts several public venues for exhibitions, weddings, dining, meetings, parties, shopping and conferences as well as unique features like the *Fragrance Gardens* and an accessible *Braille Trail* to accommodate disabled visitors (SANBI, n.d). According to the Estate Manager, *Augustine Morkel* (2007), there were some 648,238 visitors during the 2006/2007 period. This figure includes visitors who enjoyed free entry but excludes concerts. Of this number, about 3% (or just under 19,500) of the visitors were people with disabilities (including physical and sensory disabilities). Approximately 5% (or just over 32,400) were elderly people (*ibid*). Kirstenbosch subscribes to the concept of *Batho Pele* (introduced in Section 4.2.2) which naturally complements the people-centred philosophy of *ubuntu* (discussed in Section 6.4.3). *Batho Pele* forms the basis of the public sector's service charter to its people whom it views as customers and is expressed as eight principles: *Consultation; Service Standards; Access; Courtesy; Information; Openness and Transparency; Redress; and Value for Money* (South Africa, 1997). Consumer advocacy is encouraged as it makes service providers more accountable and customer/user-centred as exemplified by Kirstenbosch's management.

As a response to the expressed special needs of visitors, the management at Kirstenbosch National Botanical Gardens began an inclusive process of adapting certain sections of the garden where the highest traffic of disabled and elderly visitors frequent to

make their experience more comfortable and rewarding. These adaptations are in the form of smoothed/paved walking surfaces, ramps, handrails, and innovative footpath wayfinding designs. The accessible area is essentially confined to the flatter sections in and around the main garden. Though the initial landscaping design work was done as early as 1988 (South Africa, 1998), most of the accessible projects have been carried out much more recently (over the last 5 years) on an *ad hoc* basis in consultation with representative organisations such as those representing people with various forms of disabilities (Morkel, 2007). The signage system (which is primarily in English) is complemented by printed brochures and maps highlighting areas for botanical or recreational preferences. Official printed material as well as some of the interpretational and directional signage incorporates the other two major languages (*Afrikaans* and *isiXhosa*) spoken in the *Western Cape Province* – South Africa has *eleven official languages* (or twelve if *South African Sign Language* is included).

Botanical gardens are often described as “living museums”. Kirstenbosch is described as the “flagship” of the *National Botanical Institute* (NBI) as well as being the *largest* and *most prestigious* of the country’s eight botanical gardens forming an extensive nation-wide network administered by the NBI (SANBI, n.d). It has in excess of 4,500 plant species in cultivation, including many that are endangered (*ibid*). There have been 9 curators of the gardens since 1913 (Morkel, 2007). As mentioned earlier, Kirstenbosch forms part of the Cape Floristic Region which is mandated as a World Heritage Site to protect its *ecological processes*, and its *biodiversity and threatened species* (SANBI, n.d; UNESCO, 2005). It is internationally acclaimed as one of the world’s great botanical gardens and offers accessible specialised tours organised for visitors with disabilities from across the globe (Accessible Travel & Leisure, 2007; SANBI, n.d). Tourism is a key economic driver in the province (South Africa, 2008a; 2008b).

Consumer advocacy and a participatory approach led to an organic process of accessible provision, beginning in 1988 under the auspices of the *Department of Public Works and Land Affairs* (South Africa, 1988). The multi-disciplinary project team included professionals from the disciplines of architecture, landscape architecture, ecology, engineering and cartography (*ibid*). The project reflects concern for the ecological integrity of the gardens as well as several considerations for wheelchair users in keeping with *Part S* of the South African Standard: *Facilities for Disabled Persons* (South African Standard, 1990).

Following the demise of *apartheid* and the emergence of a more progressive democratic dispensation in 1994, previously excluded groups of people were encouraged to engage in all aspects of public life (ODP, 1997; SAHRC, 2002). Consequently, current South African legislation supports these aspirations by explicitly prohibiting unfair discrimination on grounds of *disability* or *age* (among others) (South Africa, 2000). Similarly, specific national building regulations and code of practice address accessibility needs of people with disability (and by extension a multitude of other user including women and children) (South African Standard, 1990). *The South African Museums Association* (SAMA, 2006) also has guidelines for *public programmes and visitor services* in which issues of “equitable and universal access, [...] inclusiveness through multi-cultural approaches, multi-lingual programmes and diversification of resources” listed as basic standards and transformation indicators.

In order to promote greater access, Kirstenbosch offers free entry to senior citizens on Tuesdays (SANBI, n.d). Several challenges however must be surmounted to enable the vast majority of South Africans to access and enjoy this priceless heritage right in ‘their neighbourhood’. These challenges include language and literacy and the impact of these and other factors on the provision of an accessible and inclusive wayfinding system in the context of Kirstenbosch.

5.2.3.2.1 The Makings of a Legible Space

The concept of legibility is usually associated with literacy in general, and textual references in particular. The idea that places and spaces should be legible is attributed to Kevin Lynch in his influential book *“The Image of the City”* (Zmudzinska-Nowak, 2003; Fraser, 2007). Lynch is also believed to have first documented *human wayfinding* (Imrie *et al.*, 2001; Runhaar, 2002; Zmudzinska-Nowak, 2003; Fraser, 2007). His goal was to develop means by which city forms could be evaluated based on the concept of *imageability* in the practice of city design (Runhaar, 2002; Zmudzinska-Nowak, 2003). Imageability, according to Runhaar (2002) “is a term that is used to describe how individuals experience places [-] a person’s experiences are defined by what they remember and understand about a particular space”. A related concept is that of *affordances* (a concept from ecological psychology), which Raubal (2001; 2007) defines as, “what an object, or an assemblage of objects, or an environment enables people to do”. On the other hand Norman (1998) coined the phrase *knowledge in the world* to describe external information that people depend upon for wayfinding as guidance, and further elaborates the applicability of the concept of affordance to mundane everyday objects.

Wayfinding behaviour generally involves interaction “between the wayfinder and the environment” to reach a targeted destination whereas affordances are based on the “paradigm of direct perception” (Raubal, 2007). Raubal (*ibid*) further argues that affordances are measurable aspects of the environment, though such measurements can only be done from the vantage point of the visitor. Additionally, whilst citing other studies, Raubal (*ibid*) states that an individual’s “culture, social setting, experience, and intentions also determine her perception of affordances”. Zmudzinska-Nowak (2003) lists legibility and comprehensibility as “humanistic aspects of place” and concurs that these attributes are perceived subjectively by different individuals. Zmudzinska-Nowak (*ibid*) further argues that the concept of the *ideal environment* is culture-specific. Read (2003) also underscores the importance of colour in such context.

Harrell, Bowlby, and Hall-Hoffarth (2000) corroborate this view and report further of older visitors having difficulty in orientation. Further, they report that men are more likely to use *cardinal indicators* (such as ‘north’ or ‘south’) when giving directions, whilst women are more likely to reference *landmarks* when giving directions (*ibid*). Yielding (2003) also notes several practical limitations associated with ageing. These assertions should inform the development of a more intuitive and multi-sensorial wayfinding system (Cornell, Sorenson & Mio, 2003).

Singer and Ritz (1996) recommend that signage should avoid using ambiguous or complicated language that is “beyond the sixth grade reading level” to accommodate visitors with lower levels of literacy. Subsequently, interactive legible spaces (that facilitate intuitive wayfinding) should intrinsically incorporate affordances and innovative of features that enhance their imageability (Popovic, 1999). The said wayfinding system would need to be culture, age, gender, literacy and context-sensitive to achieve efficacy.

5.2.3.2.2 Universal Design and Wayfinding

The ideal of UD is to pursue a ‘non-exclusive’ design agenda to tackle stigmatising and discriminatory attitudes such as sexism, ageism and disablism. In so doing, UD seeks to contribute to the goal of social inclusion. The seven principles of UD (CUD, 1997; Danford & Tauke, 2001) were developed by a multi-disciplinary team just over a decade ago and offer a practical tool for assessing products and built environments. The scope of UD ranges from micro (singular products) to macro (involving entire cities, such as New York) (Danford & Tauke, 2001). As discussed earlier in this chapter, related concepts of “non-exclusive design” include *Design for All* (in Europe), *Inclusive Design* (in the United Kingdom) and *Kyoyo-Hin* (in

Japan). *Transgenerational Design* focuses on the needs of the elderly with a view to expanding the consumer base to include other age cohorts. Whilst acknowledging certain differences in epistemological interpretations between these related concepts, the aforementioned terms shall be assumed to be functionally synonymous with UD in this thesis.

Specifically, UD views wayfinding as being of essentially two main forms: *architectural*; and *graphical* (Danford & Tauke, 2001). Architectural wayfinding elements include:

- *paths/circulation*: the key organising element of a site or building;
- *markers*: an object that marks locality;
- *nodes*: a point at which subsidiary parts originate;
- *edges*: determine where an area begins or ends; and
- *zones/districts*: regions with a distinguishing character that assists in the general identification of place.

The above-named elements are virtually identical to the elements of wayfinding attributed to Kevin Lynch namely: *paths*; *landmarks*; *nodes*; *edges*; and *districts* (Zmudzinska-Nowak, 2003). Figures 5.7 and 5.8 illustrate examples of architectural wayfinding elements at Kirstenbosch.

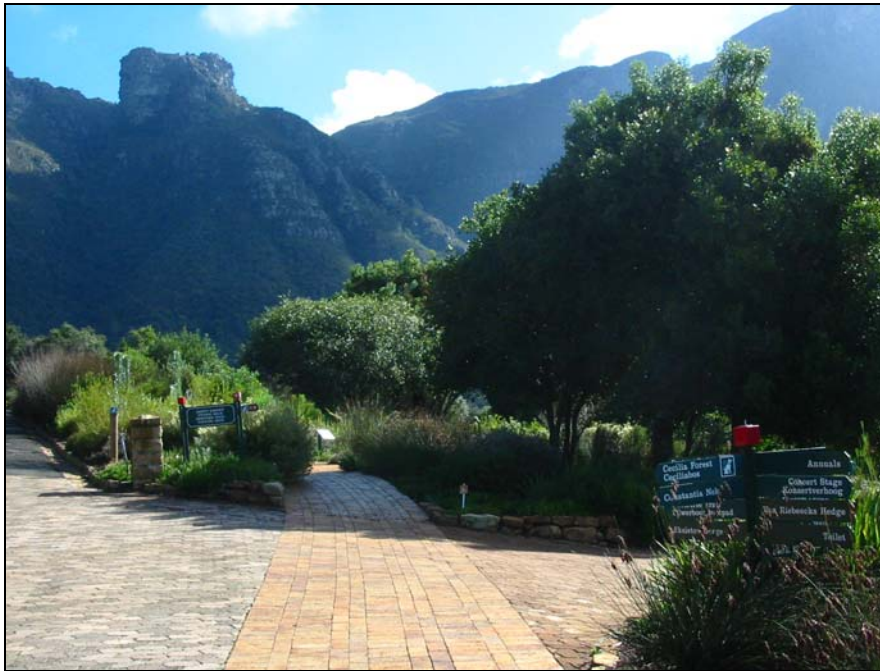


Figure 5.7 Paths (intersecting)



Figure 5.8 Landmark (mountain) and node (sculpture)

Graphic wayfinding elements include (Danford & Tauke, 2001):

- *orientation;*
- *directional information;*
- *destination identification;* and
- *situation and object identification.*

Figures 5.9, 5.10, 5.11 illustrate examples of graphical wayfinding at the gardens.



Figure 5.9 Directional signage at nodal intersection



Figure 5.10 Destination signage (in green)



Figure 5.11 Situational warning signage (in red)

The UD Checklist and Audit discussed herein covers the afore-mentioned elements, examples of which are illustrated using UD principles further on in this thesis (Danford & Tauke, 2001).

5.2.3.2.3 Wayfinding in Context

The search for the *ideal environment* or *legible city* should be at the heart of every city's strategic planning for urban regeneration (Wyman, 2004). The historic opportunities of hosting the forthcoming FIFA 2010 World Cup™ is a natural catalyst for the implementation of an integrated and comprehensive accessibility strategy in participating host cities (Contact Newsletter, 2006; 2007f). Fraser gives the example of “Legible London” where the city took advantage of the opportunity of hosting the 2012 Olympics to engage in a similar process (Fraser, 2007). Fraser (*ibid*) speaks of the innovative wayfinding maps in Philadelphia that are conveniently “always the right way up” for viewers. Coleman *et al.*, (2003) present the interesting project of Marjala (a suburb of the Finnish city of Joensuu) in its quest to become a “city-for-all”. The emphasis in this particular case is transgenerational and embraces the issues of ageing and disability.

Wayfinding should be user-centred. As Yielding (2003:105) points out, “*it is the consumer who bears the brunt of poor design, who may be irritated or inconvenienced by ill-thought-out products or badly designed environments every day. It is the consumer who has to adapt to poor design and negotiate a way around it. So design should, by right, be a major consumer issue.*” People with disabilities and the elderly are particularly vulnerable to the disabling effects of bad or insensitive design. Yielding (*ibid*) further identifies a number of compounding factors in relation to elderly consumers such as: small print on labels/signs; poor colour contrast (such as pale grey on white); instructions in small hardly legible print; an absence of tactile feedback on hand controls; poorly lit display panels; and complicated menu systems.

For a place to be truly legible it must be easily and readily *deciphered* by everyone. In terms of wayfinding it implies a system of guides, signs, maps and directional devices which can be understood by whoever is seeking direction. Wyman (2004) states that designers should use wayfinding systems “to reference the history, culture and essence of a place” and goes on to propose that an effective system can be “a visual ambassador”. The tension between cultural sensibility and universal interpretability needs to be addressed to achieve legible spaces that also reflect local design inspiration (Algotsson & Davies, 1996). Subsequently, the design of wayfinding must be appropriate to both the constraints imposed by the planned physical setting, users-specific needs, as well as being sensitive/responsive to cultural nuances (Norman, 1998; 2004; Moalosi, 2007).

5.2.3.2.4 Legible Kirstenbosch...

All the buildings constructed at Kirstenbosch since 1995 have been designed for universal access, but not explicitly with UD in mind. Most of the accessible facilities have been implemented by a number of architecture firms and were initiated upon reviewing responses from visitors' surveys (Morkel, 2007). A more professional and effective model of environmental and product assessment is proposed by Yielding (2003). This would entail having a system of checklist assessments carried out by three assessors: a *disabled person* who is experienced in the range of disabilities under review; an *ergonomist*; and a *UD specialist (ibid)*.

The area of garden between the *Main Entrance* and the *Visitors Centre* is where most people (especially people of disability and the elderly) move around. Owing to the site located on the slopes of the mountain, some of the upper sections are too steep for disabled access. There is, however, a golf cart tour, which takes place at an hourly interval beginning at 09.00 am every day at a cost of ZAR 50.00 (and includes a guided tour through the gardens) (Morkel, 2007).

Language does pose a problem to certain international visitors. The fact that the wayfinding signage is essentially in English presents a challenge to other local visitors whose first language is either *Afrikaans* or *isiXhosa* – these are the languages predominantly used in the *Western Cape Province*. There has been a phased introduction of brochures and maps incorporating these two regional languages. There is an ongoing process of translation into other languages that are commonly used both nationally and internationally.

An audio system called *My Guide™* which uses radio technology may be rented on request at the *Ticket Office*. The system is a form of *electronic travel aids* (ETAs) as described by Gill (2007). *My Guide™* is presently available in two languages (namely *English* and *German*) and comprises a handset (Figure 5.12) that receives radio frequency transmissions via radio beacons (Figure 5.13) identified by red markers placed along the *Braille Trail* (Figure 5.14). The trail is designed in such a way as to return the visitor to the point from which the journey began. The system is one-way and therefore limited in terms of user interactivity needs – one can only access a pre-set menu.



Figure 5.12 My Guide™ handset in use



Figure 5.13 Beacon for My Guide™ with cardinal direction



Figure 5.14 Braille Trail

The *Braille Trail* (Figure 5.14) was specifically established to cater for people with varying visual disabilities and uses a contrasting red guide rope with information boards located along it that explain the different aspects of the trail. Each board is marked by a large red block along the route and the actual information is displayed on the front in a visual and text format and on the top in Braille (Figure 5.19). The trail itself offers a multi-sensorial experience of nature in the form of aural and tactile activities and information relating to the immediate environment of the small forest area. The start and finish of the *Braille Trail* are located very near to each other on the same main pathway and directly opposite the *Fragrance Garden* (Figure 5.15) to reduce the distances visitors need to traverse to access these amenities. The *Fragrance Garden*, with its array of smells from the indigenous *fynbos* (*Afrikaans* for ‘fine bush’), has been designed to appeal to visually disabled visitors as well as the general public for an enhanced experience. It offers reasonable support via a sturdy guide and support rail and information boards, which have both text, images and Braille, posted along the path. The plant bed is also raised to (standing) waist height in order to facilitate greater interaction between visitors and the flora.



Figure 5.15 Fragrance Garden

The garden is located within a short distance of the facilities at the *Main Entrance*. Ablution facilities are well catered for enabling access for wheelchair users as well as for mothers with babies. There is adequate wheelchair access at the building sites, with handrails on all the staircases for unstable individuals. Wheelchairs are at hand at both the *Main Entrance* and the *Visitors Centre* for anyone that may need their use. The signage, facilities and specialised paths are specific to Kirstenbosch and are not found in any other garden in the country (Morkel, 2007).

As discussed previously, the seven UD principles were used to audit the gardens (*ibid*; CUD, 1997). The UD Audit Checklist covers such issues as *site*, *building*, *environment systems*, *communication systems*, and *programme spaces* (Danford & Tauke, 2001). Overall, Kirstenbosch averaged a satisfactory 70% in terms of its general level of usability and accessibility from a list of thirty criteria. The general impression is that the architectural wayfinding is well-articulated, though specific aspects of graphical wayfinding require intervention to become more effective. Certain spaces had the highest scores for usability: including *access points*; *parking*; *pathways*; *lobby*; *reception area*; *amenities* (such as drinking fountains and telephones); *work stations*; and *public assembly*. The following illustrations (Figures 5.17-5.23) serve to exemplify the Principles of UD as elaborated with brief descriptors.

1. **Equitable Use:** *the design is useful and marketable to people with diverse abilities* (CUD, 1997). The main entrance offers access via a ramp and steps. This allows equal access irrespective of whether one has a disability or not (Figure 5.16).



Figure 5.16 Principle 1: Equitable Use

2. **Flexibility in Use:** *the design accommodates a wide range of individual preferences and abilities (ibid).* The turnstiles at the crowd control gates are designed to swing away to allow wheelchair access (Figure 5.17).



Figure 5.17 Principle 2: Flexibility in Use

3. **Simple and Intuitive:** *use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level (ibid).* The garden route map shows two views of the same site by using easy to identify landmarks (Figure 5.18).

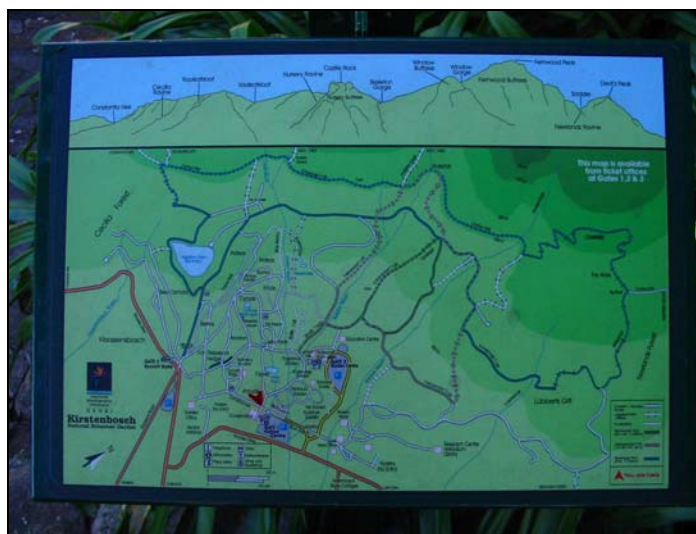


Figure 5.18 Principle 3: Simple and Intuitive Use

4. **Perceptible Information:** the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities (*ibid*). The signs along the trail provide information in both text and Braille (Figure 5.19).



Figure 5.19 Principle 4: Perceptible Information

5. **Tolerance for Error:** the design minimizes hazards and the adverse consequences of accidental or unintended actions (*ibid*). The paths at this node eventually converge to the same destination irrespective of the route one chooses (Figure 5.20).

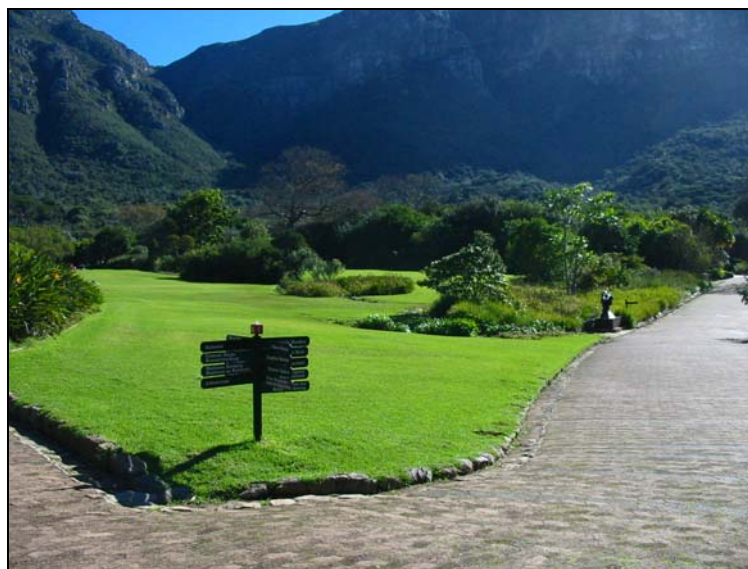


Figure 5.20 Principle 5: Tolerance for Error

6. **Low Physical Effort:** *the design can be used efficiently and comfortably, and with a minimum of fatigue (ibid).* The sink taps, toilet flush handle and baby changing panel require less physical effort than standard fittings (Figure 5.21).



Figure 5.21 Principle 6: Low Physical Effort

7. **Size and Space for Approach and Use:** *appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility (ibid).* There is clear signage and sufficient space for approach and use at the entrance (Figure 5.22).



Figure 5.22 Principle 7: Size and Space for Approach and Use

5.2.3.2.5 Towards More Inclusive Interactivity

Imrie *et al.* (2001) criticise *tokenism* and ‘*expertism*’ by professionals due to oversimplification of bodily diversity because such sources tend to reinforce disablism. Designers and human factors practitioners should adopt more participatory approaches in engaging with (potential) users (or visitors in this case) to create effective and sustainable experiences (Zalk, 2001; Wilson, Haines & Morris, 2005). Mamoru (2001) supports this view with respect to ‘*the concept of an integrated society*’ or ‘*universal society*’ goals in *Japan*. To attain these ideals, *Urban Parks Access Committees* include users with disabilities as active members (*ibid*).

Hine *et al.* (2000) describe the four major dimensions of social exclusion as: *Physical; Economic; Temporal; Spatial; and Psychological*. These dimensions should be factored into the design of an effective wayfinding system that is cognisant of human needs.

Miyake (2001) discusses simple cost-effective solutions such as rain shelters, using an aluminium guide pipe embedded in a route/path as a practical and less invasive alternative to more elaborate directional tactile surface tiles found in built environments (CRC, 2004). Miyake further argues that flowerbeds with strong fragrances and cascading water should be avoided as they tend to disorientate and inconvenience people with visual impairments whom he views as having the most difficulty navigating parks. This particular suggestion would appear to contradict the ideals of the Fragrance Garden at Kirstenbosch though the fundamental issue is one of degree, not direction. Further, Miyake suggests provision of companion seating on benches for those accompanying wheelchair users (Matheson, 2006). Some of the provision are more common-sense and would include rain shelters to shield visitors from the elements.

Robb (2001) discusses the importance of “nature outings” for people with disabilities and supports the business case for provision of accessible amenities in outdoor areas. He shows the impact of legislation in countries such as *Australia, Sweden, Canada, the UK, and the USA* in promoting and enforcing accessibility. The challenge even in these countries is the lack of ‘full’ accessibility. It should be noted however that the *Americans with Disabilities Act of 1990* (ADA) of the USA does allow for exceptions “*where compliance would cause substantial harm to cultural, historic, religious, or significant natural features or characteristics*” (Robb, 2001:20.9). The same would apply to Kirstenbosch, particularly in the natural environment section dedicated to the protection and preservation of indigenous flora.

Gill (2007) identifies three specific needs of people with visual disability which would appear to be universal in nature: *the ability to avoid obstacles on the path of travel; the ability to stay on desired route; and the ability to identify when the destination is reached*. Further, transgenerational provisions would enable elderly visitors to live fuller lives. Goodman *et al.* (2005) report that the elderly have greater difficulty maintaining *extra-personal orientation*, and identify three aspects of daily living that promote mobility among the elderly, namely: *maintaining social connectivity, accessing local facilities and remaining independent*. Navigation or wayfinding is an important factor in maintaining mobility and independence. Elderly people often experience declines in *cognitive, perceptual, motor abilities and special orientation* (*ibid*; Harrell *et al.*, 2000). This results in difficulty in memorising maps, as well as making distance and direction judgements about novel environments (Goodman *et al.*, 2005).

Pictograms are recommended as they offer specific benefits over text (Singer & Ritz, 1996; Murungi, 2003). Signs and symbols generally offer the benefits of instant communication and elimination of cross-language barriers (Wyman, 2004). However, they have the possible drawbacks of being subjective (and limited to context-specificity) and open-ended interpretation (and therefore multiple meanings) (Wyman, 2004; Singer & Ritz, 1996). There is need to use iconography judiciously and to take cognisance of cultural context and content (Moalosi, 2007). Indeed as Wyman (2004) asserts, “one symbol is too much if it does not communicate effectively”. Practical solutions include: increased contrast in colour; larger displays and contact points such as buttons; simple menu structures; minimise cognitive demands; and simplified hierarchy of information/tasks. This in turn will make wayfinding systems more accessible and user-friendly to all.

Wayfinding research should in the future focus more deeply on commonalities and differences between wayfinding in the real world compared to *wayfinding in electronic and virtual spaces* (Wood, 1993). Finding the particularities with regard to *human spatial cognition* will help designing more user-friendly wayfinding systems (Raubal, 2007). In proposing a *perceptual wayfinding model*, Raubal (2007) distinguishes between the human *cognizing agent* (who can perceive, decide, and act), and the inanimate *non-cognizing objects* (such as signs, counters, and gates). This is a useful distinction as it supports the assertion by Singer and Ritz (1996) that the role of *industrial designers, cognitive psychologists and ergonomists* (human factors engineers) is pivotal in making wayfinding easier as humankind progresses in to the new millennium. A truly multi-disciplinary team would need to include information/graphic designers,

interaction designers, architects, and a whole host of related professions. In order to be inclusive, such a team would engage with consumers in a participatory manner.

Baldwin (2003) argues that the focus should transcend the *product*, and instead focus on *process* and *platforms*. His argument is valid in the context of the incredible speed at which previous technologies are supplanted by newer, smarter, and more efficient ones. Further, there is an increasing degree of convergence – a phenomenon that blends smart products and technologies. Inherent in this challenge is the need to train a new kind of design specialist – one equipped with superior *environmental literacy* (*ibid*). The example of the haptic glove developed as a *tactile-sensory navigation aid* for persons with visual impairments illustrates the direction and pace at which wayfinding technologies are developing (Zelek *et al.*, 2003). In this example, the portable tactile glove works in conjunction with a wearable computer and camera system.

Traditional assistive aids (such as guide dogs and long canes) are fast becoming obsolete as computer-assisted devices become more ubiquitous subsequently affording users greater independence. Baldwin (2003) criticises the often touted *business model* and instead calls for a more enduring *service model* that offers “lifelong education and training, location-based services, technical support, upgrades and new technologies at reduced cost”. This latter approach would suit Kirstenbosch well and grant it opportunities for implementing seamless wayfinding technologies that fit into a comprehensive integrated city-wide system for a ‘Legible Cape Town’ beyond the FIFA 2010 World Cup™ projects (Contact Newsletter, 2007a; 2007c).

5.2.3.2.6 Implications for UD in Public Parks

South Africa is categorised as a *middle income* country with majority world challenges such as scarcity of funding and significant income disparities (SAMA, 2006). The unique challenges that the country faces include: multiple languages and concomitant multiplicity of cultures; low-levels of literacy; a large technology chasm between the privileged and the marginalised members of society; and the urgent need for empowerment of previously disadvantaged individuals. These geopolitical realities will mean that institutions must compete for scarce resources for public infrastructural improvements. On the other hand, the future could see increased inclusiveness even of the so-called *bottom-of-the-pyramid* if current design practice embraces contextual realities to offer cost-effective creative solutions for a sustainable future (Prahalad, 2005). These opportunities include: increased use of culture-sensitive (yet

universally appropriate) pictograms; audio and tactile customisation for electronic travel aids; exciting possibilities evolving from the rapid convergence of diverse technologies; falling costs of high technology options; and of course, its priceless natural and cultural heritage.

The challenge at Kirstenbosch is fairly representative of the situation in public places and spaces in South Africa. There is an urgent need to promote inclusiveness and embrace the diversity that is integral to the country's social fabric. Indeed as is argued in this thesis, interaction between people from otherwise diverse backgrounds can and should be enhanced through creative and progressive adoption of inclusive practices that also incorporate accessible web-based resources (Theofanos & Redish, 2003). A more holistic UD strategy targeting the needs of visitors with lower literacy levels, the disabled, the elderly; and non-English speakers demands a context-sensitive response to make Kirstenbosch (and by extension Cape Town) truly inclusive and legible. As noted by Gill (2007), despite the successful implementation of a proliferation of wayfinding systems, there is a lack of synchronisation or harmonisation within different wayfinding systems and services which ensure that users are not confused by different variants in every new context they encounter.

This latter consideration underscores the need for a sustainable multi-disciplinary *product-service-system* approach to the design of effective wayfinding systems (Vezzoli, 2007; Vezzoli & Manzini, 2008). The universal value of Kirstenbosch should be accessed and enjoyed by all, more so when viewed in the context of the expected increase in eco- and geo-tourism (as well as community-based tourism) in the wake of 2010. It is noteworthy that the drive for inclusiveness at the gardens was driven by a combination of consumer advocacy, and proactive management. The example of Kirstenbosch aptly illustrates the efficacy of inclusive empathic interventions over detached and exclusive knowledge.

5.2.3.3 Case Study Three: UD in a Students' Design Competition

According to Kamal Pezeshki (2008), "the *Mouille Point Promenade and Beachfront Student Landscape Design Competition* is most probably the first student competition in Cape Town which [specifically] refers to the forthcoming 2010 FIFA World Cup. Thus a successful implementation might be crucial for follow-up contests and further collaborations between the City and academic institutions with regard to the 2010 World Cup". The competition was planned to initially include postgraduate landscape design students of the University of Cape Town (UCT) in partnership with the *Department of Environmental Resource Management* of

the City of Cape Town. Other actors would include ward councillors, and officials from both local and regional (provincial) government. A key actor was a local professional landscape architect whose firm *OvP Associates* would oversee the successful implementation of the winning designs on behalf of the City of Cape Town. The author successfully negotiated with the organisers of the competition for the inclusion of undergraduate design students of the Cape Peninsula University of Technology (CPUT).

Whereas the invitation of CPUT student participation in principle was more inclusive, having students at varying levels of experience and competence from two very different institutions proved to be a challenge. The author was formally appointed on the planning and coordination team (as an academic partner) and tasked with promoting the competition at CPUT. Subsequently, a host of design-related disciplines (including architectural technology, landscaping technology, interior design, town and regional planning) at CPUT were contacted through their heads of department to foster 'transdisciplinarity' (Toft & Joubert, 2005). Advertising posters and a data package with requisite materials and resources were compiled in CD-ROMs for distribution and dissemination amongst all design sub-disciplines. Further, a series of seminars was organised to brief the teaching staff and students in which the key actors and other significant role players were also in attendance.

The following assessment criteria were proposed to guide the participants in their preparations (Pezeshki, 2008):

- *Integration*: a winning design illustrates well-devised and organic linkages of the promenade and beachfront with the urban park, with considerations regarding safe crossings of the Beach Road, as well as integration of the lighthouse and establishing accessibility for all age groups, including disabled persons – creating a playground on site to attract children though needs consideration;
- *Sustainability*: a winning design contains elements of efficient energy use, waste separation, and responsible water use, it covers the topics of the durability and recyclability of the chosen elements as well;
- *Creativity*: a winning design is innovative in its intention and presents the state of the art;
- *Feasibility*: a winning design does not contain exaggerated daydreams, which won't be feasible; and
- *Design quality*: a winning design is presented in a high-value layout as well as a high grade illustration.

Due to intractable internal schedules, priorities and timetable-related challenges, only one of the design-related departments at CPUT – the *Department of Interior Design* – was able to participate in the competition. Consequently, the researcher renegotiated with the central coordination team to have two separate judging categories (Appendix G) to reflect the different competencies of the UCT and CPUT students with the former focussing on landscaping, and the latter on urban furniture considerations. The cooperation of the Head of Department and

two of his teaching colleagues was pivotal in their students' commitment, completion and submission of entries. The author was invited on two occasions during the competition period to make presentations and to give specific input with regards to UD principles. The 3rd Year Interior Design class submitted a total of 22 individual entries (including two collectively compiled analysis and site plans). An example of the entries is shown in Figure 5.23.

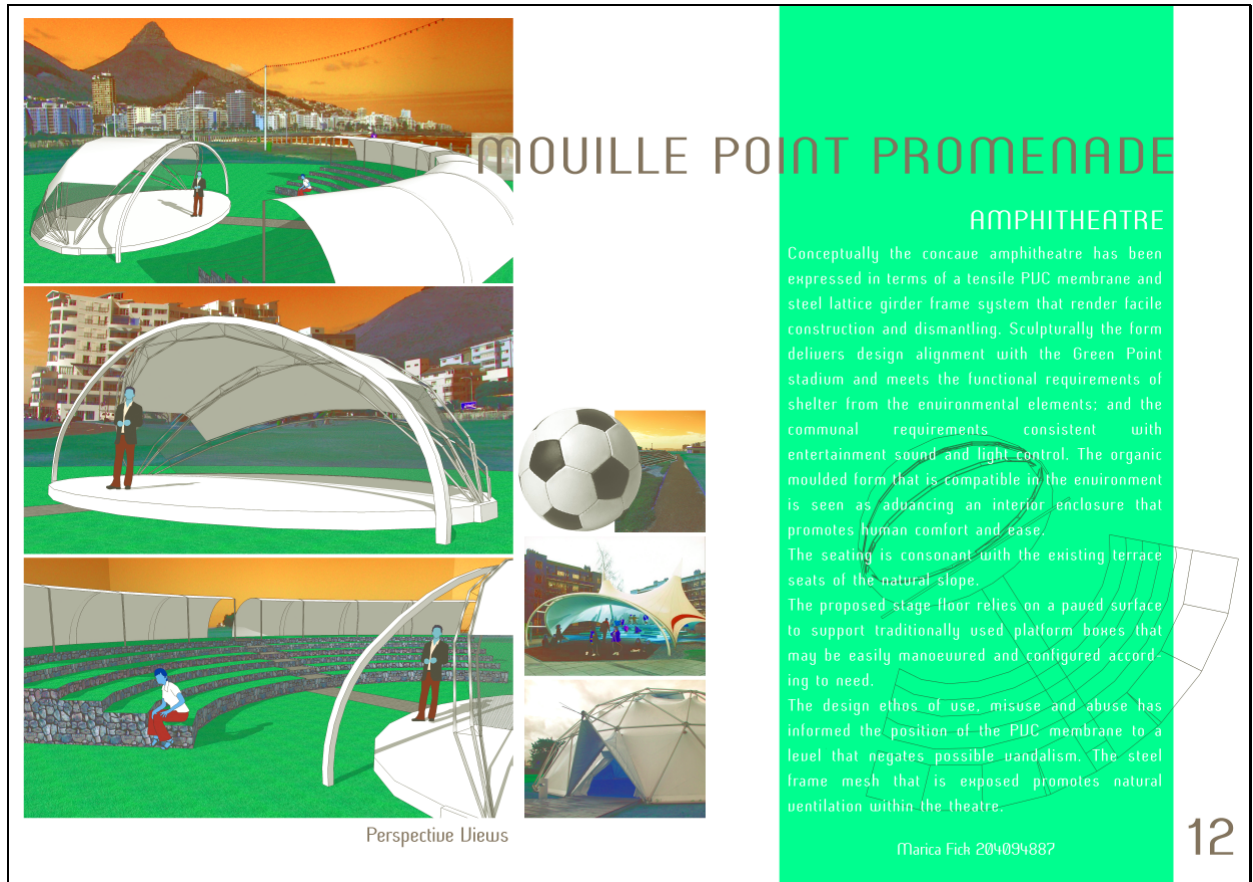


Figure 5.23 Sample of submission for 2010 Students' Design Competition

(source: © Marica Fick)

5.2.3.4 Summary on Case Studies

The three cases discussed in this section provide an overview on the potential role of UD in a number of settings, and in this particular case; industrial/product design education, public parks, and (student) landscaping design competitions. Further, the role of UD vis-à-vis specific design disciplines is illustrate as communities of actors include *students of industrial/product design* and *design educators* (in the first case); *architects, landscape designers, and graphic designers/visual communicators* (in the second case); and *students of interior and furniture*

design as well as *landscape architecture*, *professional landscape designers*, *urban planners*, and *design educators* (in the third case). In two of the instances, the opportunity for action research presented themselves and the role and influence of the author is clearly evident. In the case of the Kirstenbosch gardens, the role of the author is *ex post facto*, in the form of an audit on an existing design intervention. The common theme evolving is that it is possible to incorporate UD thinking at various stages of any design process though the impact is arguably greatest if such intervention/input is employed at the inception or commencement stage. A detailed analysis using an Activity Theory lens will be discussed further on in Chapter 7 to elaborate on the students' design competition to better elaborate on this assertion.

5.3 Convergence of Concepts

The terms *Inclusive Design*, *Design for All*, *Kyoyo-Hin* are for the purposes of this research treated as synonyms of UD (CUD, 1997; Design Council, 2006; EDeAN, 2006; Kyoyo-Hin, 2001:7) in their quest for non-exclusiveness. Indeed as Keates & Clarkson (2003a:440), the said design approaches “are fundamentally derived from user-centred design theory”. Critics have argued about the assumption that UD seeks to offer universal solutions for everyone whilst lauding the aspiration of UD to include all users by incorporating and moving beyond the needs of disabled users (Hansson, 2006). This is not practically feasible, and is conceded by the originators of the Principles of UD (CUD, 1997; Story, 2001).

Notwithstanding, the usefulness of UD is recognised by the majority of commentators (Pirkl, 1994; Mace, 1998; Clarkson *et al.*, 2000; Keates, Clarkson, Harrison & Robinson, 2000; Coleman *et al.*, 2003; Hansson, 2006; Jönsson & Certec, 2006a). The Oxo™ *Good Grip* range of household consumer products is a good example of the benefit of UD-thinking in product design. Further, Koncelik (1998) acknowledges the extreme popularity of UD within the design professions) whilst Imrie *et al.* (2001:16) note the importance of the “potentially progressive” principles of UD in the quest for transformation in the lives of all people. As a compromise, Fletcher (2002 in: Hansson, 2006:31) proposes that UD be seen as “an orientation to design in which designers strive to incorporate features that make each design more universally usable”.

Dalcher (2006:254) argues that “universal access relies on formulating and promulgating the principles, methods and tools of universal design in order to develop technologies that are accessible and usable by all citizens”. Dalcher (*ibid*) further highlights the role of *consilience* in the convergence of UD-related concepts:

Consilience helps to draw together hitherto unrelated streams and brings to the surface assumptions that underlie and underpin entrenched thinking processes. Linking together the theories and facts from across several disciplines provides a common ground that strengthens the overall case as each discipline continued to operate in an isolated mode (in the evolutionary sense).

The fundamental ethos of UD is informed by a desire to engage diverse consumer groups by mainstreaming products and services targeted at them (Hansson, 2006), as well as promoting the ethos of “full social membership” (Sinclair, 1998:510). There is also a growing realisation in both industrially developed and developing contexts of the need for progressive and sustainable strategies that promote social equity and cohesion (Vezzoli & Ceschin, 2008). UD forms a critical component of resultant strategies. Such collaborative and trans-disciplinary strategies in South Africa would need to focus on all key actors with academia playing an pivotal role as it equips future designers with requisite skills to formulate appropriate and sustainable solutions (Winberg, 2006; Vermeulen & M'Rithaa, 2007; Broom, 2008; Chisin, 2008; de Villiers, 2008; P. Thompson, 2008; Smith, 2008; Snaddon, 2008; Tapela, 2008).

The convergence of the different UD-related concepts has more recently enjoyed greater visibility through the ubiquity supported by internet-diffused networks such as the *International Association for Universal Design* (IAUD, 2006) based in Japan, as well as the *Global Universal Design Education Online Network* (GUDEON, n.d) and the *World of Universal Design* (WUD, n.d) – both based in the USA.

5.4 Summary

This chapter explored the evolution of design-specific concepts and responses to the issue of ‘exclusion by design’ and how these ideas relate to and influence the multi- and trans-disciplinary field of UD from a global perspective. Subsequently, the relevance of UD within the scope of this thesis has been discussed. Whereas this chapter primarily dealt with the more pragmatic aspects of non-exclusive design practices, Chapter 6 will deal with the more theoretical underpinnings and linkages with respect to UD.

CHAPTER SIX

THEORETICAL, CONCEPTUAL & ANALYTICAL FRAMEWORKS

6.0 Introduction

This chapter presents the theoretical, conceptual and analytical frameworks underpinning this study. A synopsis of the literature review on the concept of UD in the previous chapter provided insights into the theory and concepts, which inform the study. A theory is expected to perform two major functions, namely, explanation and prediction of phenomenon. Whereas Activity Theory is the analytical lens employed in this study, it must however be emphasised that other theories and/or concepts are viewed as pertinent to this study. As discussed in the previous chapter, UD is a relatively new concept within industrially developing (or majority world) contexts and should be adopted, tried and tuned to suit a country (or region's) socio-economic priorities, industrial aspirations, and geopolitical realities.

6.1 Activity Theory

Bedny, Seglin and Meister (2000:168) describe Activity Theory (AT) as “a psychological paradigm that was a foundation for the study of work behaviour in the former Soviet Union [and that] AT assumes a distinctive human psychology defined by goal directed behaviour”. Bedny *et al.* (*ibid*) further state that “in AT, goal-orientation mobilises cognitive, behavioural and motivational components into an integrated system composed of discrete cognitive-affective units that includes goal-oriented feed-forward and feedback components”. The first generation of AT is also known as cultural-historical activity theory (CHAT) and originated in the Union of Soviet Socialist Republics (USSR) and was initially developed by Russian psychologist Lev Semyonovich Vygotsky (1896-1934) (Korpela, Mursu & Soriyan, 2001). Figure 6.1 illustrates the three main components of this theory.

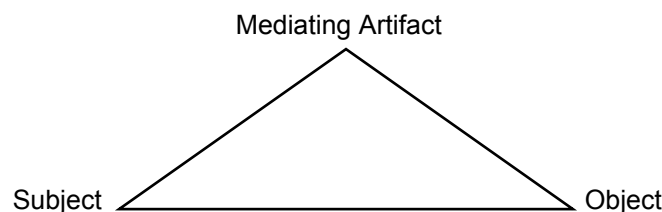


Figure 6.1 1st Generation Activity Theory
(source: Vygotsky, 1981)

Vygotsky makes an important contribution – particularly in the context of learning, instruction or testing – in his concept of the *zone of proximal development* (ZPD) (Bedny *et al.*, 2000). According to Vygotsky (1978:86 in: Bedny *et al.*, 2000:171) the ZPD is the gap between a child’s, “actual development as determined by independent problem solving... [and] potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers”. Bedny *et al.* (2000:171) further state that based on this notion:

... [Vygotsky] calls for dynamic assessment, a two-step process. First, the child performs at the limits of his solitary competencies, then again assesses his difficulty limits of his problem solving with the aid of an adult or peer expert. The difference between independent and assisted solutions enables one to assess his ‘learning potential’ as real ability. This method affords one the opportunity to assess the ZPD.

AT was further refined by Sergei L. Rubinshtein (1889-1960), Alexei Nikolaevich Leontiev (1903-1979) and Alexander Romanovich Lurija (1902-1977) (Vygotsky, 1981; Engeström *et al.*, 1990; Engeström, 2000). Engeström *et al.* (1990) identify the key elements of Leontiev’s three-level model which is based on a hierarchical conception of activity (see Table 6.1). Yrjö Engeström (1999; 2000) attributes the second generation of AT (shown in Figure 6.2) to Leont’ev and expands the ‘social infrastructure of activity’ to demonstrate the efficacy of AT in the visibilization, analysis and redesign of work.

Table 6.1 Leont’ev’s Three-Level Model (source: Engeström *et al.*, 1990)

Unit	Directing factor	Subject
activity	object / motive	collective
action	goal	individual or group
operation	conditions	non-conscious

The dynamic interacting (and mediating) elements of an activity system and their inter-relatedness are elaborated in Table 6.2 (Engeström *et al.*, 1990).

Table 6.2 Elements of an activity system (source: Engeström *et al.*, 1990)

Element	Description
Subject	<i>the individual or group whose point of view is taken in the analysis of the activity</i>
The object (or objective)	<i>the target of the activity within the system</i>
Instruments	<i>internal or external mediating artifacts that help to achieve the outcomes of the activity</i>
The community	<i>comprised of one or more people who share the objective with the subject</i>
Rules	<i>regulate actions and interactions within the activity system</i>
The division of labour	<i>how tasks are divided horizontally between community members as well as referring to any vertical [or hierarchical] division of power and status</i>

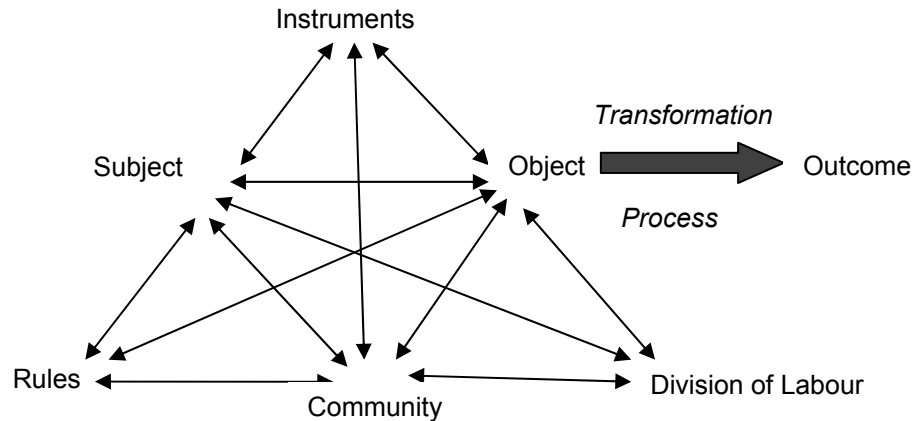


Figure 6.2 2nd Generation Activity Theory
 (source: Engeström *et al.*, 1990)

AT draws inspiration from 18th century philosopher Immanuel Kant’s discourse on the centrality of phenomenology and activity in developing knowledge and experience, as well as Georg Wilhelm Friedrich Hegel (of the 19th century) who drew attention to the manner in which “reality develops by means of the reconciling (synthesis) of contradictions (between thesis and anti-thesis) (King, 2004:120). AT also follows in the philosophical tradition of dialectic materialism and power advanced by Karl Heinrich Marx and Friedrich Engels in the mid-nineteenth century (Marx, 1972; Mursu, 2002; King, 2004). AT’s provides a practicable philosophical framework for the study of humans at both the individual and social levels (and the links therein) as developmental processes. Of particular significance is the cultural-historic impact of prior influence and epistemological precedents in shaping the activities that people engage in individually and collectively.

AT views conscious learning as a product of activity – this underscores the importance of the latter to understanding human motivation and consciousness. Further, as Decortis, Noirfalise and Saudelli (2000:30) attest, AT “sees the division of labour as a mediator between the community and the object in the process of transforming the object into outcome”. This collective or collaborative object-orientedness of activity is critical to the appreciation of *ubuntu* which essentially relies on a voluntary, participative, co-operative and egalitarian ethos with a lateral (or horizontal) power structure to function properly. In *ubuntu* there is no power or control over other humans – only potential influence. The pertinent attributes of *ubuntu* will be further elaborated in Section 6.3.3.

Osiris (n.d) argues that AT's usefulness lies in that it "provides a broad conceptual framework that can be used to describe the structure, development and context of tasks that are supported by a [work] system". Osiris (*ibid*) further elaborates on the five basic principles of AT as follows: *the hierarchical structure of activity; object-orientedness; internalisation/externalisation; mediation; and development*.

AT has found application in a wide range of disciplines including *design* (Lauche, 2005), *organisational ergonomics* (Bedny *et al.*, 2000; Decortis, 2000; Eason, 2005), *work study* (Engeström, Brown, Engeström & Koistinen, 1990; Engeström 1999; 2000), *information systems* (Korpela *et al.*, 2001; Collins, Shukla & Redmiles, 2002; Korpela, Mursu, Soriyan, de la Harpe & Macome, 2006; Mursu, Luukkonen, Toivanen & Korpela, 2007), *human-computer interaction* (Nardi, 1999), *co-operative education* (Engel-Hills, Garraway, Nduna, Philotheou, & Winberg, 2005; van Aalast & Hill, 2006; Garraway, 2008), *information communication technology* (Lim & Hang, 2003); as well as *leadership and professional development* (Hansson, 2002). Sjöberg (1996) applies AT in an exploration of links between the 'Scandinavian approaches' to participatory design and information systems. Korpela, Mursu, Soriyan, Hakkinen and Toivanen (2008) build upon Engeström's mediational structure to advance *Activity Analysis and Development* (ActAD) as a further refinement of AT within the information systems domain (see Figure 6.3).

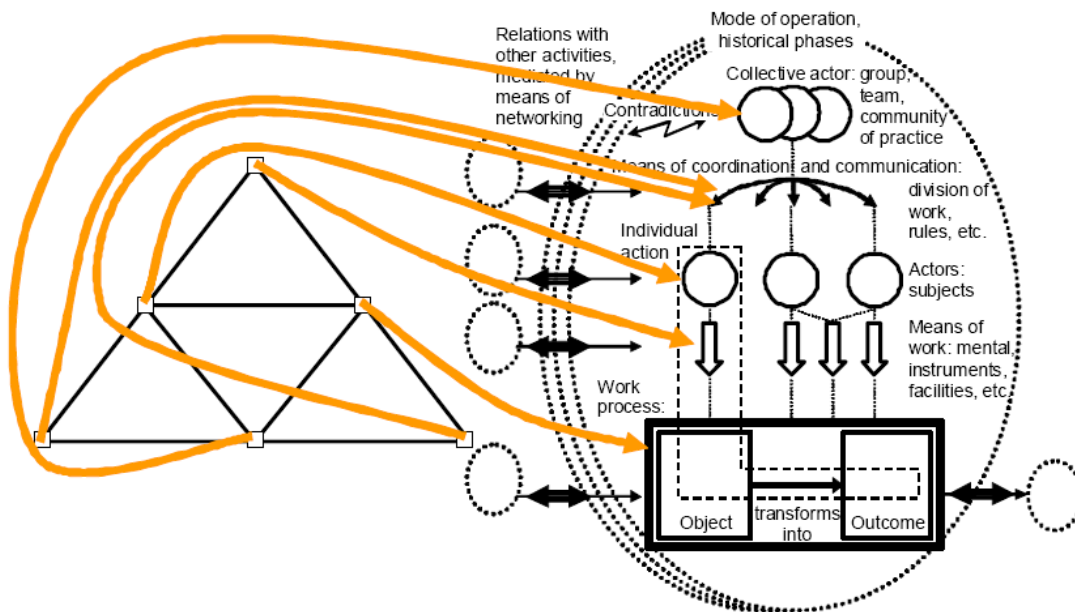


Figure 6.3 Elements of a work activity using an ActAD lens
(source: Korpela *et al.*, 2008)

6.2 Explanatory Legitimacy Theory

Explanatory Legitimacy Theory as posited by Elizabeth DePoy and Stephen French Gilson is a post-modernist framework that draws on various cultural-historical debates to analyse human diversity (DePoy & Gilson, 2004; 2006; Gilson & DePoy, 2006). This theory adopts a ‘universal ideology’ to interrogate the grand category of disability as well as to challenge the categorisation of people along nomothetic lines – a popular approach aided by the pervasive application of the Gaussian or ‘normal’ (bell-shaped) distribution curve in representing statistical and anthropometric (or physical anthropological) data with respect to human populations. Further, DePoy and Gilson (2007) emphasise the role of community in proffering judgement and legitimacy to group membership. This recognition of the pivotal role of community in shaping individual and group identity is indispensable to the discourse on *ubuntu* as has been argued elsewhere in this thesis.

Of particular import to this thesis, the inclusive, non-discriminatory and category-expanding outlook of the Explanatory Legitimacy Theory explicitly links universal access to UD (DePoy & Gilson, 2005/2006:130):

Universal access is based on universal design principles. Different from accommodation strategies, which provide problem specific adaptations and special responses, universally accessible resources, whether physical, sensory, or virtual, are designed from their inception in forms that all people, to the extent possible, regardless of age, disability, ethnicity, primary language, or other diversity characteristics can access without the need for special adaptation.

Gilson and DePoy (2006:700) criticise the “value based use of phrases such as *normal* [which do] not provide the conceptual clarity sufficient for distinguishing description from axiology”. Rather, the authors (*ibid*) prefer non-stigmatising value-free terms such as *typical* and *atypical* as these suggest “magnitude rather than desirables”.

Explanatory Legitimacy Theory is comprised of three interactive elements; *description*, *explanation*, and *legitimacy* (DePoy & Gilson, 2004; Gilson & DePoy, 2006):

- The first element, *description*, encompasses the full range of human activity (what people do and do not do, how they do what they do), appearance and experience. Two intersecting dimensions of description: *typical/atypical* and *observable/reportable*, are particularly germane to disability;

- The second, element of explanatory legitimacy is the set of *explanations* for doing, appearing, and experiencing; and
- Third and most important in defining and determining the value of groups and their members is *legitimacy*. Legitimacy is comprised of two sub-elements: *judgement* (about acceptability and worth) and *response* (by an individual, community, social group or policy formulating body).

The key contribution of the Explanatory Legitimacy Theory (as summarised in Table 6.3) is the elegant manner in which it offers a sound theoretical underpinning for UD by reconciling the ontological and epistemological conflicts of the *medical/individual* versus the *social* model debate. This point is particularly germane to the practice of industrial design – a discipline that borrows almost in equal measure from the objective/technological as well as the subjective/social domains. Further, the Explanatory Legitimacy Theory accommodates the descriptive components of *activity* – the primary focus of Activity Theory.

Table 6.3 Elements of Explanatory Legitimacy Theory (adapted from: DePoy & Gilson, 2004)

Description - typical/atypical - observable/reportable	Explanation - for doing; appearing; and experiencing	Legitimacy - value of groups and their members
Activity	Medical-diagnostic (medical or individual model)	Judgement
Appearance	Constructed (social model)	Response
Experience	–	–

Explanatory Legitimacy Theory offers a sound theoretical argument for the provision of universally accessible features, irrespective of the explanation for the user’s special needs. For example, in the case of an elevated ramp in a building, a woman pushing a baby’s pram, or a deliveryman with a trolley full of wares, or a person in a wheelchair, or an elderly person using an ambulatory aid would all equally benefit from this singular infrastructural provision – the legitimacy of each of these descriptive categories of users (in terms of judgement and response) leads to the self-same inclusive solution – in this case, the ramp.

6.3 Other Concepts Informing this Study

Three other pertinent concepts inform this study. The first two (*Participatory Design* and *Design for Sustainability*) are drawn from design-related fields, whilst the last one (*ubuntu*) is of geopolitical and socio-ethical relevance to the context of study. Whereas the first two concepts have not been integral to the actual research process followed in this study, they are included here for consideration in the development of context-responsive UD strategies.

6.3.1 Participatory Design

Participatory Design (or PD) as the name suggests acknowledges the need to engage (potential) users, consumers or other key actors in the design process. PD is premised on the fact that such actors should be viewed and accepted as 'co-designers' or 'co-producers' of desirable design solutions (Ehn, 1988; Ehn *et al.*, 2002; Buxton, 2007; Moalosi, 2007; Vezzoli & Manzini, 2008). *Participatory Ergonomics* pursues an analogous co-operative focus within its own community of practice (Haines, Wilson, Vink & Koningsveld, 2002; Kogi, Kawakami, Ujita & Khai, 2005). Within the context of participation, inclusion and democratisation, PD is congruent with an inclusive and collaborative process of 'design by all'.

Sjöberg (1996:26) reports that PD evolved from the *Participative Design* approach in Australia with an aim at "developing self-managed design groups to create an evolutionary process involving democratization of the working situation". Demirbilek (1999:38) however states that PD "was first used for the development of communal areas, mainly in architecture and urban planning". Sjöberg (1996:29) tracks the development of 'participation in information systems development' (the precursor to PD) and identifies a number of similar approaches that go by such names as: *user-centred design*; *joint application design*; *co-operative design*; *work-oriented design*; and *collective resource approach*.

Futerman and M'Rithaa (2007) distinguish between 'participation as means' and 'participation as an end' – the latter is inherently more rewarding and emancipatory for participants. *Emancipation* resulting from participation is the ultimate goal in this context in keeping with the post-modernist paradigm of moving beyond mere *empowerment* – the latter is essentially a renegotiation of existing power imbalances (Balcazar, Keys, Kaplan, & Suarez-Balcazar, 1998; Wanger & Burnette, 2003). Moreover, PD is now a widely accepted effective tool for resolving the needs of previously excluded groups, including the disabled and the elderly (Demirbilek, 1999; Demirbilek & Demirkan, 2004). Within the practice of *ubuntu*, participation is considered a core response to action by all community members (M'Rithaa, 2008; 2009). Shutte (1993:47) argues that participation has deeper meaning in intra- and inter-personal developmental dynamics, and reinforces this view with the statement that "I participate, therefore I am".

6.3.2 Design for Sustainability

Design for Sustainability (DfS) is a branch of design that addresses social, ethical, environmental and economic equity with respect to developmental and technological

imperatives (Findeli, 2008). *Sustainable development* seeks to promote advancements that benefit humanity without negatively impacting the potential livelihoods of future generations on our planet (Margolin, 1996; Khumomotse, M'Rithaa & Moalosi, 2002; Findeli, 2008). Vezzoli (2007:39) defines DfS as “a design practice, education and research that, in one way or another, contributes to sustainable development”. This objective of DfS has been extended to address design for social equity and cohesion in line with guiding *United Nations* principles (Vezzoli, 2007; Vezzoli & Manzini, 2008). The *International Council of Societies of Industrial Design* (ICSID, 2002) incorporates this holistic notion of activity in its definition of design:

Design is a creative activity whose aim is to establish the multi-faceted qualities of objects, processes, services and their systems in whole life cycles. Therefore, design is the central factor of innovative humanisation of technologies and the crucial factor of cultural and economic exchange. [...] Design concerns products, services and systems conceived with tools, organisations and logic introduced by industrialisation – not just when produced by serial processes.

Design as a creative activity is not the purview of professional practice exclusively. Indeed there is growing evidence of bottom-up grassroots expressions of social innovation by *creative communities* (Manzini, 2007). Manzini (2009:49) describes these ‘creative communities’ as “emerging number[s] of creative people who invent and enhance new and more sustainable ways of living and producing”. Importantly, these creative communities differ in composition from traditional communities in that within the former, *members elect to belong* based on shared goals and objectives in order that the entire community functions and lives more sustainability. Traditional communities on the other hand *find themselves linked* by culture, customs or blood ties – factors that could pose a threat if they fail to take cognisance of individual liberty and responsibility (Shutte, 1993; Bhengu, 1996). This thesis supports the view that promoting emerging creative communities would orientate emerging elective communities in Africa thus enabling them to leapfrog into more sustainable ways of being and doing.

An encouraging development in DfS is the emerging cross-disciplinary field known as *Service Design*. Service Design moves beyond the traditional paradigm of three-dimensional artifact production and consumption to a more progressive one of interrogating ways in which design can address more subtle tacit needs such as that of ‘satisfaction’ as well as other social and relational needs (Cipolla, 2009; Manzini, 2009). Cipolla (2009:233) describes emergent ‘relational services’ as those that are “deeply and profoundly based on the quality of interpersonal relations between and among participants”.

For the vast majority of African communities, the currency of exchange is trust. People come first! In this manner the relational interdependence of community members is reaffirmed and perpetuated. Further, this mutual interdependence transcends a materialist agenda (Shutte, 1993). In Africa, women form the relational superstructure through which convivial social interactions happen (Tisani, 2008). As caregivers and key economic contributors, African women render indispensable services to their families and to their communities at large – an investment in women leads to concomitant benefits for the entire community (M'Rithaa, 2008). As Cipolla (2009:233) elaborates, in an interpersonal service model, “no participant can be easily replaced, because together they produce [...] community, a common story”.

There is ample evidence of the pivotal socio-economic role played by women, particularly in the informal economic sectors known as *jua kali* (which in kiSwahili means ‘[in the] hot sun’) in Kenya (Macharia, 2006, Orwa, 2007); and the *second economy* in South Africa (du Toit & Neves, 2007). A strategy for enhancing the quality and efficacy of relational services would of necessity need to engage with women. There are a vast number of (mainly women-driven) *ad hoc* cooperatives facilitating micro-lending clubs and group savings/purchasing schemes on the continent wherein typically, a handful of members enjoying deeply interpersonal relationships function essentially on mutual trust. Such a voluntary group is known variously as *motshelo* in Botswana; *chama* in Kenya; and *stokvel* in South Africa. Many have gone on to formalise their membership into *bona fide* long-term investment companies (M'Rithaa, 2009). As stated earlier on though, the goal of community membership is not driven merely by economic interest, but the spirit of conviviality and trust that facilitates and perpetuates such social interaction (Illich, 1973; Cipolla, 2009; M'Rithaa, 2009).

Further, as du Toit and Neves (2007) argue, the aim of policy makers should not be to absorb the (informal) *second economy* into the so-called (formal) *first economy*. Eliminating the former would be counterproductive in the long term. Rather, progressive policy should strengthen the *second economy* by providing for greater resilience and reduced associated risk factors that act as barriers for entry therein. In view of the extra-ordinarily high unemployment rates in most Sub-Saharan economies, this latter approach would aid in the absorption of a higher proportion of the available labour force (Orwa, 2007). Developmental policies that place emphasis on the potential contribution of service systems (and not just products) would ultimately promote more sustainable communities and consequently, facilitate greater social equity and cohesion (Vezzoli, 2007).

6.3.3 Ubuntu

van Niekerk and M'Rithaa (2008; 2009) argue that *ubuntu* could be viewed as the African variant of Aristotelian *virtue ethics*. The essence of this universally applicable ideal is variously transmitted via folklore and wise sayings or proverbs – a popular medium not very dissimilar to the practice in the East (Asian cultures). An example from the Zulu language in southern Africa illustrates this concept: “*umuntu ngumuntu ngabantu*”. This can be literally interpreted as “a person is a person through other persons”, or in other words, “*I am because we are*” (Mbigi, 1997; Creff, 2004; Bhengu, 2006) – or to put a twist on Cartesian logic; “we are, therefore I am”, and “we think, therefore I can”. The important point here is that there is an inextricable link between the individual and his or her community. The benefit of voluntarily relinquishing self-serving pursuits and self-indulgence is that doing so allows the individual enjoyment of a more wholesome and meaningful life – an ideal that Hursthouse (2007) relates to the Aristotelian concept of *eudaimonia*. Such quality of life is experienced within a nurturing, supportive and mutually affirming community setting utilising local socio-ethical know-how (Varela, 1999).

Strictly speaking though, *ubuntu* does not fit the Western model of formalised knowledge but is flexible as well as being context-, and content-dependent. It is negotiated, adjustable, and thus by extension, versatile (van Niekerk & M'Rithaa, 2008). As Boon (2007:26) points out:

Ubuntu is not empirical. It does not exist unless there is interaction between people in a community. It manifests itself through the actions of people, through truly good things that people unthinkingly do for each other and for the community. One's humanity can, therefore, only be defined through interaction with others... It is believed that the group is as important as the individual, and a person's most effective behaviour is in the group. All efforts working towards this common good are lauded and encouraged, as are all acts of kindness, compassion and care, and the great need for human dignity, self-respect and integrity.

Aristotelian virtue ethics posits three different forms of knowledge, namely; *episteme*; *techne*; and *phronesis* (Jönsson & Certec, 2006c:179). Whereas *episteme* (from which epistemology or the theory of knowledge is derived) and *techne* (technology or technique) have found greater acceptance (and indeed attained some degree of prestige), the same can not be said of *phronesis*. Jönsson and Certec (*ibid*) argue that *phronesis* has remained generally underappreciated as “there is no active, contemporary equivalent” meaning assigned to its understanding. Hursthouse (2007:4) approximates the closest definition of *phronesis* (with respect to *ubuntu*) as “moral or practical wisdom”. As designers trained in an essentially neo-

Bauhaus model, the articulation and practice of *episteme* and *techne* modes of knowledge happen essentially by default, in part due to the inherent philosophical bias towards Western thinking. This thesis takes the view that *phronesis* and *ubuntu* are not as dissimilar as would appear initially – both are “about values and reality, about people and their actions” (*ibid*).

Further, as Jönsson and Certec (2006c:180) assert, *phronesis* “is not scientific in the epistemological sense, since epistemology is primarily concerned with scientific knowledge that is universal, constant in time and space, context-independent and based entirely on analytical rationality. The knowledge relativism that is an integral part of *phronesis* is thus almost unforgivable in an epistemological approach”. This view is supported by Ehn and Badham (2002:6) who challenge designers to re-interrogate their present notions of *phronesis* by going back to a time when the “virtue of *phronesis* had not yet been suppressed”. They argue that *phronesis* lost out in part due to “the fragile and unpredictable nature of human action” (*ibid*). Notwithstanding, Ehn and Badham (*ibid*) have shown the efficacy of such reasoning to interaction and participatory design wherein they describe *phronesis* as an “Aristotelian vision of ethical life [and] practical wisdom”. Jönsson and Certec (2006c:181) ascribe the renewed interest in *phronesis* to the fact that “the epistemological and the technological alone are not able to stand for all that is relevant in [...] design”. From the view point of *ubuntu*, the defence of *phronesis* would be just as valid for the former. Ehn and Badham (2002:6) present the following rationale:

In phronesis, wisdom and artistry as well as art and politics are one. Phronesis concerns the competence to know how to exercise judgement in particular cases. It is oriented towards analysis of values and interests in practice, based on a practical value rationality, which is pragmatic, and context dependent. Phronesis is experience-based ethics oriented towards action.

van Niekerk and M'Rithaa (2008; 2009) suggest that *ubuntu* as an African form of ‘ethics by consensus’ is ontologically allied to the concept of *phronesis*. Further, *ubuntu* is a pragmatic concept that bridges the Western and Eastern concepts of ethics whilst simultaneously offering a dynamic platform for debate and engagement of individuals and their communities (elective or otherwise). As members of local communities and societies, no one can stand outside of the same. The responsibility of (design) educators extends beyond interpreting paradigmatic changes and necessitates that we “integrate them into the education system so that they become meaningful, and take root in the consciousness of the people of South Africa” (Tisani

2004:174). Tisani (*ibid*) places a greater responsibility on higher education practitioners as the onus on production of new knowledge “falls directly on their shoulders”. Tisani (2004:175) emphasises the importance of engaging African *indigenous knowledge systems* as a transformational tool. Other knowledge systems should not be discarded, but similarly critically engaged with where there is proven efficacy of their value. Higgs (2007:669) concurs by placing emphasis on *reason* (or rational thinking) as a universal human phenomenon.

To put this discourse in perspective, traditional societies in sub-Saharan Africa have relied on various expressions of *ubuntu* (which is an isiZulu word) since time immemorial (Forster, 2006). *Ubuntu* is also known as *utu* in kiSwahili (spoken in Central and Eastern Africa) and *botho* in both seTswana and seSotho (spoken in Southern Africa). *Ubuntu* is evident through various forms of self-reliance and mutual assistance such as *bataka kwegaita* (communal solidarity) among the Banyakore people of Uganda, *boipelogo* (self-reliance) in Botswana, *harambee* (pulling together) in Kenya, and *ujamaa* (familyhood) in Tanzania (M’Rithaa, 2008). Similarly, in Ghana, *nobwa* (reciprocal assistance) is an invitation to family, friends or neighbours to join in the activity of ploughing the host’s farm in the knowledge that should any of the participants require assistance in future, the host would answer the call to action accordingly (M’Rithaa, 2009). These values are still alive on the continent and in The Diaspora wherever an authentic African presence is detectable. Bhengu (1996:5) describes *ubuntu* as “a way of life that contributes positively towards the well-being of a people, community or society”. As Desmond Tutu (1999:34-35) elaborates:

Ubuntu is very difficult to render into a Western language. It speaks to the very essence of being human. When you want to give high praise to someone we say, “Yu, u nobuntu”; he or she has ubuntu. This means that they are generous, hospitable, friendly, caring and compassionate. They share what they have. It also means that my humanity is caught up, is inextricably bound up, in theirs. We belong in a bundle of life. We say, “a person is a person through other people”. [...] I am human because I belong, I participate, I share.

As Tutu (*ibid*) alludes, response to the call of *ubuntu* is through participation – everyone is invited, and everyone can contribute towards the goals and common wealth of the community. A person reaffirms their personhood through interaction with, and contribution into the lives of others (Shutte, 1993; Bhengu, 1996; Tambulasi & Kayuni, 2005). This people-centred, inclusive and participative spirit of *ubuntu* is what Africa shares with the rest of humanity (M’Rithaa, 2008). It infuses the network of relationships that provide resilience against the ever-changing socio-economic and geopolitical landscapes. It is this spirit that guided South

Africa's emergence as a united democratic country in 1994 after forty years of apartheid rule.

In contemporary Pan-African politics, *ubuntu* is the catalyst for the much touted *African Renaissance* – a principal objective of the *New Partnership for Africa's Development* (NEPAD) initiative under the aegis of the Africa Union (Maloka, 2001). The stated long-term objective of NEPAD is the eradication of “poverty in Africa and to place African countries, both individually and collectively, on the path of sustainable growth and development and thus halt the marginalisation of Africa in the globalisation arena” (Ezeoha & Uche, 2005:6). Closer to home, the philosophy of servant leadership and people-centredness guides *Batho Pele* (elaborated in Sections 4.2.2 and 5.2.3.2). *Batho Pele* as an operational strategy of *ubuntu* underpins the national and provincial governments' commitment to transparency, accountability and service delivery (South Africa, 1997a). As Creff (2004:8) states: “the extent and importance attributed to values shared by *ubuntu* and servant leadership are significant”.

Table 6.4 Characteristics of social capital (adapted from: Padovan, 2008:273-274)

Characteristic	Description
Participation in networks and groups	<ul style="list-style-type: none"> • <i>interlocking networks of relationships between individuals and groups</i> • <i>social and interpersonal engagement through a variety of formal and informal associations that are both voluntary and equal</i>
Reciprocity and exchange	<ul style="list-style-type: none"> • <i>combination of short-term altruism and long-term self-interest</i> • <i>the individual provides a service to others, or acts for the benefit of others at a personal cost, but in the general expectation that this kindness will be returned at some undefined time in the future</i> • <i>in a community where reciprocity is strong, people look after each other's interests</i> • <i>reciprocity and exchanges increase trust and contributes to the development of long-term obligations between people</i>
Trust and confidence	<ul style="list-style-type: none"> • <i>trust entails willingness to take risks in a social context based on a sense of confidence that others will respond as expected and will act in mutually supportive ways, or at least that others do not intend harm</i> • <i>trust eases interpersonal relationships and reduces the transaction costs between people and so liberates resources</i> • <i>it can also create a social obligation – trusting someone engenders reciprocal trust</i> • <i>trust reduces the uncertainties present in social life, ensuring social equilibrium subsequently becoming an indicator of social sustainability</i>
Social norms	<ul style="list-style-type: none"> • <i>common rules and social norms are the mutually agreed norms of behaviour that place group interests above those of individuals</i> • <i>individuals can take responsibility and ensure their rights are not infringed</i> • <i>social norms are usually unwritten but commonly understood formulae for determining what patterns of behaviour are expected in a given social context – they also define what forms of behaviour are valued or socially approved</i>
The commons	<ul style="list-style-type: none"> • <i>the combined effect of trust, networks, norms and reciprocity creates a good community, with shared ownership over resources known as 'the commons'</i> • <i>to maintain the commons the presence of a sense of personal and collective efficacy is needed</i>

The value of *ubuntu* in the development of *social capital* has received wide acceptance in the business/socio-economic (Mbigi, 1997; 2000; Boon, 2007) and political/socio-ethical spheres of life in (South) Africa (Bhengu, 1996; 2006; Mazrui, 1999; Tutu, 1999; Maloka 2001; Creff, 2004; Tambulasi & Kayuni, 2005). Participation is a universal imperative in the development of personal and social capital (Chapman, 2002). Padovan (2008:272) asserts that “social bonds, social norms, trust and other social features play an important part in sustainable livelihoods”. Padovan (2008:273) further identifies five characteristics of social capital: *participation in networks and groups; reciprocity and exchange; trust and confidence; and social norms*. These characteristics are further elaborated in Table 6.4 and are coincidentally the self-same core elements of the *ubuntu* ethos (Bhengu, 2007; M’Rithaa, 2008).

6.4 Summary

UD evolved as a response to practical (as opposed to theoretical) imperatives. This meant that for a while no singular theoretical framework appeared to adequately elaborate the discipline – it could be argued that practice preceded theory. Recently though, the Explanatory Legitimacy Theory (discussed in Section 6.2) offers the most elegant theoretical framework for explaining UD. Activity Theory on the other is as an appropriate analytical lens for interrogating the way in which individuals and groups negotiate new tools for dealing with specific socio-technical challenges – in this case – in the adoption and dissemination of novel practical tools such as UD Principles. Additionally, *ubuntu* offers a unique socio-ethical perspective on a context-specific application of the aforementioned – more space was dedicated to the discussion on *ubuntu vis-à-vis* design as this perspective is potentially an original contribution of this thesis. Further, this thesis argues that incorporating the *ubuntu* ethos in appropriate UD strategies would inherently result in the mobilisation and development of sustainable social capital. Finally, some pertinent concepts provide lateral and vertical dimensions to the understanding and application of UD to ensure a more participatory process of engagement with all key actors in a quest to evolve context-responsive and truly sustainable strategies in a majority world setting.

CHAPTER SEVEN

RESEARCH METHODOLOGY

7.0 Introduction

This chapter discusses the basis for the chosen epistemological orientation and describes the research methodology employed in achieving the objectives outlined in Chapter One of this thesis. The chapter provides a description of the sources of data and the methods used in collecting the required data sources. Additionally, it also provides a brief description of the analytical methods employed in analysing the information gathered during the various phases of the study.

7.1 Contextualising Research Perspectives

Hitchcock and Hughes (in Maree and van der Westhuizen, 2007:31) suggest the three following lenses to examine the practice of research:

- *Ontological* assumptions (which give rise to);
- *Epistemological* assumptions (which give rise to); and
- *Methodological* considerations (which in turn give rise to e.g., [methods of] instrumentation and data collection).

A realist ontological assumption assumes “that social reality can be understood from an *external* point of view (the *realist* position that abstract objects have an objective existence: reality is of an objective nature, out there)” (Maree & van der Westhuizen, 2007:31). Alternatively, reality can be understood “merely through words and names created in the mind and within levels of individual consciousness (the *nominalist* or “in name only” position) (*ibid*). This thesis adopts the latter nominalist viewpoint as elaborated in Table 7.1.

From an epistemological standpoint, this study adopts a *qualitative* (rather than *quantitative*) vantage. Schwandt (2001:213) describes qualitative inquiry as that which “aims at understanding the *meaning* of human *action*” and further distinguishes qualitative data (as being non-numeric data in the form of words) from quantitative data (which is essentially numeric data). Further, this study follows the *applied research* (as opposed to *pure/basic* research) route. Pure (or basic research involves the formulation and testing of hypotheses and theories that need not be linked to actual applications (Fielding & Lee, 1998). Applied research on the other hand is typically problem-based often locating its focus in real-life social

challenges – action research mobilises available tools and resources to address the same (Badenhorst, 2007). This study is a response to perceived systemic exclusion of certain categories of potential users and consumers as a result of typically apathetic design praxis.

The *nominalist* (interpretivist) epistemological stance adopted in this study assumes that “the meaning of human action is inherent in that action, and that the task of the inquirer is to unearth that meaning” (Schwandt, 2001:134). Interpretivism “foregrounds the meaning that individuals or communities assign to their experiences. [...] the social context, conventions, norms and standards of the particular person or community are crucial elements in assessing and understanding human behaviour” (Jansen, 2007:21). The study is subsequently influenced by the *postmodernist* theoretical perspective. *Postmodernism* in this context “assigns value to multiple meanings rather than the single, authoritative voice of the expert/scientist. [...] It values ‘voice’, the subjective and multiple voices of individuals and communities rather than predetermined rules for action” (Jansen, 2007:22).

Bailey (1987:24) defines a *paradigm* as “a perspective or frame of reference for viewing the social world, consisting of a set of concepts and assumptions”. This study assumes that it is not only desirable, but a matter of human dignity that all people should be able to enjoy access to all products, systems and public built environments of their choice. It further recognises the discrimination, stigmatisation and exclusion of people not fitting the standard definition of ‘average’ or ‘normal’. Consequently, this view places the onus on designers to ensure that *universal access* is guaranteed through the mainstreaming of the concept of UD. The different research premises are summarised in Table 7.1 (Maree & van der Westhuizen, 2007:33-34).

Table 7.1 Delineation of paradigmatic assumptions and perspectives (source: Maree & van der Westhuizen, 2007:33-34)

Ontological dimensions	Epistemological dimensions; paradigm/perspective	Nature of relationship between researcher and what is being studied
Realist stance: external reality is stable; general laws govern universe	Positivist (modern)	Researcher is an objective, detached observer
Nominalist stance: informants' internal and subjective experiences are important	Interpretivist (postmodern)	Researcher is empathetically and (inter-) subjectively immersed in the research
Reality is constructed by persons; researchers need to analyse the informants' discourses	Constructivist (postmodern)	Researcher is suspicious of object of study; political undertones can be identified; constructs own version of events

Bailey (1987:32-33) differentiates between *method* and *methodology* as follows:

By “method” we simply mean the research technique or tool used to gather data. [...] Furthermore, some of the differences in the method between the physical and social sciences are differences of degree rather than kind. [...] By “methodology” we mean the philosophy of the research process. This includes the assumptions and values that serve as a rationale for research and the standards or criteria the researcher uses for interpreting data and reaching conclusions.

The researcher chose to follow an action research methodological approach as the subject of UD was new to many of the informants in this study (Leedy & Ormrod, 2001). Schwandt (2001:3) states that Kurt Lewin (1890-1947) coined the term ‘action research’ to describe “a particular kind of research that united the experimental approach of social science with programs of social action to address social problems”. In this context, “social problems (as opposed to a scientist’s own theoretical interests) should serve as the impulse for social research” (*ibid*). Nieuwenhuis (2007:74) refers to the “typically cyclical [nature of action research] in terms of data collection and analysis”; whilst Schwandt (2001:3) notes the use of “a spiral of interlocking cycles of planning, acting, observing, and reflecting” – a useful device ideally suited to this study (as the researcher could investigate a number of related contexts in an iterative manner). Further, the FIFA 2010 World Cup™ is an historic event from an African perspective that presents a unique opportunity to contextualise this study with respect to UD.

Notwithstanding, the merit of employing action research has often met with challenges (and strong opposition) within the research domain (Goulding, 1998). For example, Nieuwenhuis (2007:74) reports that action research “was viewed with caution, partly because of its lack of focus on the positivist standards and partly because of its limitation in the number of sites used to conduct the research”. Schwandt (2001) notes similar criticism within the social scientific community, especially on the grounds that action research “blurs an important distinction between theory and practice”. To reduce the potential for researcher bias and to ensure the validity of the study, mixed/multi- methods (triangulation) were employed.

This study utilises an assortment of qualitative methods to aid in the investigation of the issues at hand and includes the following (Bailey, 1987; Wilson, 1990; Crotty, 1998; Schwandt, 2001):

- experimentation;
- observation;
- case studies;

- survey using questionnaires (with appropriate rating and ranking scales);
- workshop/focus group discussions;
- interviews (structured and semi-structured); and
- desk review of available literature.

7.2 Experimental Design and Sampling Method

Bailey (1987:214) identifies two approaches to social research concerned with establishing relationships between variables: *correlational analysis* and *experimentation*. The fundamental difference in the two approaches is that in correlational studies researchers “typically have very little control over the research environment. [...] In such a case the researcher’s control is limited almost entirely to statistical data manipulation”. In contrast, the researcher “is present on the scene when the data are collected and exercises considerable control over the experimental environment. This control over the research process allows the experimenter to attempt to establish causation rather than mere correlation, and thus the establishment of causation is the goal of the experimenter” (*ibid*).

Bailey (1987) further distinguishes between ‘pure’ experimentation and quasi-experimentation – the latter utilise ‘partial’ experiments lacking one or more of the factors/characteristics of pure experiments (*ibid*). The steps taken in a typical experimental process include the following (Bailey, 1987:221):

- Select subjects;
- Select experimental environment;
- Pre-test;
- Administer experimental stimulus (test factor); and
- Post-test.

Of the various forms described, the *Universal Design for Product Designers* module (described in Section 5.2.3.1) followed a ‘one-group pre-test post-test design’. Such a design has all the steps listed above but has no control group (Bailey, 1987). The choice of this variant of experimentation was due to tight time constraints within the academic timetable (a one-week dedicated week). The UD module was designed to determine whether students/learners would be interested and/or motivated in utilising Principles of UD in their projects once they were exposed to the same. Table 7.2 gives a detailed breakdown of the project activity plan followed by the researcher. Two fellow lecturers (who were in charge of the experimental group of

students) played the role of observers and repertoires to reduce the possibility of bias as well as to enhance the validity of the findings from the study. This experimental study informed a larger multidisciplinary survey to establish whether the findings could be triangulated (and ultimately generalised).

Table 7.2 Experimental procedure (author’s construct)

DAY	STAGE	PROJECT ACTIVITY PLAN: Universal Design for Product Designers module		
		<i>In core lecture during the dedicated module in the Third Year Design Studio – done in a group setting</i>	<i>Design exercise during the dedicated module (individual)</i>	<i>Homework for the following day – done individually</i>
One	<p>Pre-test</p> <p>Introduction, discussion of module objectives, and handouts on Principles of Universal Design</p> <p><i>Researcher as an active participant observer</i></p>	<ol style="list-style-type: none"> 08.45-9.00 – responses by learners on knowledge of and/or use of UD 09.00-09.20 – PowerPoint presentation: <i>Special Human Needs</i> (Researcher) 09.20-09.30 – Discussion on the exclusion of “extra-ordinary” populations and elaboration of terms and concept relevant to UD 09.30-10.15 – PowerPoint presentation: <i>Principles of UD</i> (Researcher) 10.15-10.30 – Interactive discussion on learner’s personal experiences with respect to vulnerable populations 10.30-11.00 – 30 minute break 12.00-12.45 – PowerPoint presentation: <i>The Pathology of Blindness</i> (Guest Lecturer) 10.15-10.30 – Interactive discussion and questions relating to guest lecture populations 13.00-13.45 – Lunch break 13.45-14.30 – Small group (of up to 6 members per group discussions) with facilitator and two lecturers as observer and discussants 14.30-14.40 – ‘Health’ break 14.40-15.30 – Continuation of small group discussions 15.30 – End of formal contact for Day 1 	<p>Sketches and notes</p> <p>Identification of 3D project (done previously) for analysis and (re)design using Principles of UD</p>	<p>Identification of various vulnerable populations – this exercise may also be done in a small group setting</p> <p>Self-initiated visits to see first-hand the challenges experienced by vulnerable groups with special reference to the elderly and people with disabilities</p> <p>Learners to take turns to use provided wheelchair during the course of the day to access all facilities in the Design Building to experience limitations and barriers within the built environment</p>
Two	<p>Self-directed learning and group discussions by learners</p> <p><i>Researcher as a non-participant observer</i></p>	<ol style="list-style-type: none"> 09.00-09.45 – Implementation of Principles of UD in furniture design project (facilitators: Lecturers 1&2) 09.45-10.45 – learners to participate in and complete institutional student Satisfaction Survey Breaks and schedule for remainder of the day (to be decided by Lecturer 1) 	<p>Sketching, drawing and dimensioning of various proposal under the guidance of the 3rd Year coordinators (Lecturers 1&2)</p>	<p>Discussion of problems facing vulnerable populations</p> <p>Learners to continue the use provided wheelchair during the course of the day to access the built environment</p>
Three	<p>Learners present their (re)design interventions</p> <p><i>Researcher as a participant observer</i></p>	<ol style="list-style-type: none"> 09.00-11.00 – First Group of learners .present, discuss and answer questions for 5-10 minutes each (facilitator: Researcher; observers: Lecturers 1&2) 10.30-11.00 – Tea break 11.00-13.00 – Continuation of presentations by learners 13.00-13.45 – Lunch break 13.45-15.30 – Continuation of presentations by learners 15.30 – End of formal contact for Day 3 	<p>Sketches and notes</p>	<p>Formulation of design concepts to resolve identified problems by integrating Principles of UD</p> <p>Learners to continue the use provided wheelchair during the course of the day to access the built environment</p>

<i>Four</i>	Learners present their (re)design interventions <i>Researcher as a participant observer</i>	<ol style="list-style-type: none"> 09.00-11.00 – Second Group of learners .present, discuss and answer questions for 5-10 minutes each (facilitator: Researcher; observers: Lecturers 1&2) 10.30-11.00 – Tea break 11.00-13.00 – Continuation of presentations by learners 13.00-13.45 – Lunch break 13.45-15.00 – Feedback Session and Comments on UD Module and Assignment by Lecturer 2 at the end of the final presentation. 15.00 - Wrap up and concluding remarks at the end of formal contact for Day 4 	Sketches and notes	<p>Learners to continue the use provided wheelchair during the course of the day to access the built environment</p> <p>Learners to submit evaluation forms on UD module for quality assurance purposes</p> <p>Learners to make appointments for feedback on summative assessment for following week</p> <p>Complete Self-Assessment of UD module for submission on Day 10</p>
<i>Ten</i>	Learners submit Self-Assessment forms(Post-test	<ol style="list-style-type: none"> 09.00 – Deadline for submission of Self-Assessment of UD Assignment write-up Commence grading and documentation (Researcher) Learners finalise appointments for feedback interview with researcher 	Learners encouraged to apply UD in their future projects	Final submission on UD module and related assignments
<i>Twelve-Fourteen</i>	Learners receive feedback from Researcher	<ol style="list-style-type: none"> Researcher completes documentation and analysis of assignments and notes key outcomes of feedback sessions for further research purposes 		

7.3 Role of Researcher

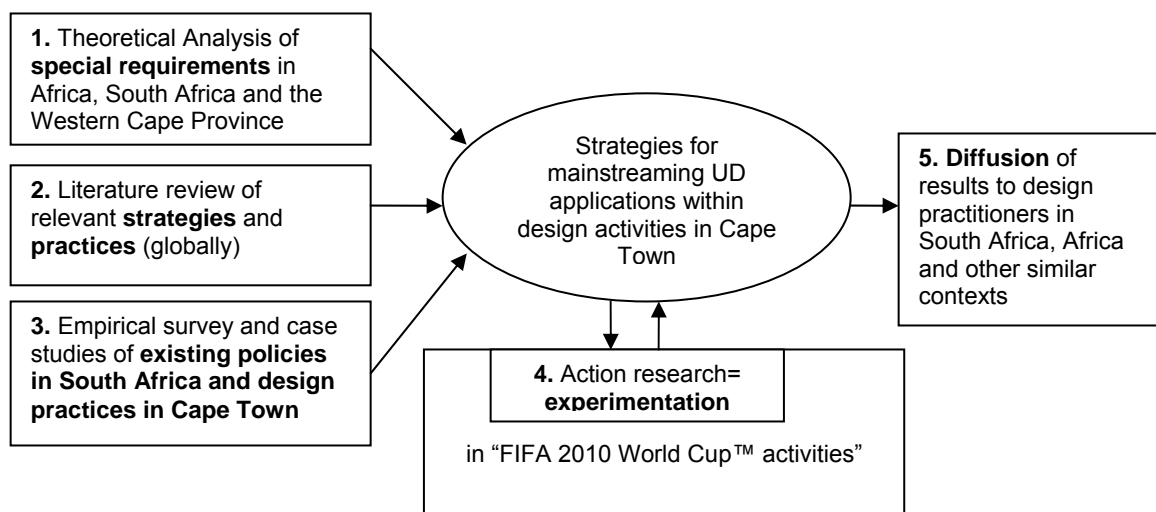
Consistent with action research practice, the role of the researcher was that of an active facilitator/participant observer in the case of the one-week classroom experiment and focus group discussions. During the 2010 student competition, the initial and final contact sessions with students, as well as briefing presentation to adjudication panellists is in a similar capacity as a participant observer. However, the researcher assumes a non-participant observer status during stages within the various research studies that require only observation and recording/documentation of observations and informant responses. The administration of questionnaires for the student survey was carried out with research assistants and thus required minimal involvement of the researcher (save for the pre-testing/piloting stage).

7.4 Research Activities

This research primarily employs qualitative methodological approaches drawn mainly from the fields of ergonomics and social sciences and utilises both deductive and inductive processes as relationships between certain variables are not always explicit (Gray, 2004). As the emphasis of this study is on promoting change within design praxis, an action research orientation provides such an opportunity to carry out pertinent case studies, engage with various actors involved in the FIFA 2010 World Cup™ projects in Cape Town, interview design educators and professionals, as well as carry out experimentation using student projects at

CPUT in alignment with the theme of UD and/or the mega event. The said study and student projects focus on trans-disciplinarity and *collaborative design* teamwork across various design-related sub-disciplines (such as architecture; graphic/information design; industrial design; informatics; interior design; and town and regional planning) in the Greenpoint Stadium and urban park projects. The potential role of leaders or champions in promoting change (in this case the adoption and mainstreaming of UD strategies) was also investigated.

The empirical research is positioned within an Activity Theory (AT) framework (Engeström, 1999; 2000; Decortis, 2000; Collins *et al.*, 2002; Korpela *et al.*, 2006). As discussed earlier on in Chapter 6, AT provides a practical analytical lens to view the activities of multiple actors in developmental contexts. Apart from the on-going literature and databases search (with specific reference to UD-related activities globally), the following research methods (as shown in Figure 7.1) were used:



**Figure 7.1 The overall research design
(after Korpela *et al.*, 2006:18)**

7.4.1 Observational Methods

Direct observation of an unobtrusive nature coupled with expert analysis (involving walkthroughs of drawings and models, guidelines, audits and checklists) was used to complement analysis of available archival data and published information (Wilson, 1990). Further, similar observation and documentation of students' PowerPoint™ presentations during

the classroom experimentation were used to determine the levels of UD adoption and interrogation by participants.

7.4.2 Database Methods

This process involved consulting books, journals, newspapers, internet-based resources, and other published information available from the case study (such as drawings, plans, and strategic documents). Advice from experts was also obtained to validate available raw data.

7.4.3 Subjective Methods

This included the use of scaling, rating, and ranking tools to measure such cognitive outcomes as acceptability, knowledge and practicability of UD strategies by participating informants/respondents (Sinclair, 1990:62-63). Nominal scales – those used to capture only one specific variable or dimension (such as gender) were used for participant demographic data in the student survey (Bailey, 1987). The Likert scale was adopted for use measuring more subjective responses during the classroom experimentation and questionnaire survey (Oravec, 2002). Bailey (1987:466) notes that Likert scaling is “a type of summated rating scale designed to aid in elimination of questionable items from the scale” (see Section 7.6 for more elaboration).

7.4.3.1 Personal Interviews

Semi-structured questionnaires were administered to key informants in the expert/reference group for primary interview purposes to compliment questionnaires, as well as to identify potential gaps in information. The responses were open-ended and based on informants' experience. The decision Delphi technique was employed in those instances where consensus on key issues was desired.

7.4.3.2 Questionnaires

The questionnaires used for interviews with experts consisted of both closed and open-ended questions, which were used to gather qualitative information with respect to the study (Denzin & Lincoln, 2005). Structured and semi-structured questionnaires were administered to design practitioners (including student designers, professional designers, and design educators) to determine their level of engagement with UD-related concepts. Gray (2004) proposes the use of quota sampling techniques to complement general convenience samples to ensure the inclusion of typically under-represented categories of subjects such as female students or

students with disabilities. Table 7.3 provides a breakdown of the sample population and selection for the student survey (see Appendix F for student enrolment figures).

Table 7.3 Sample population and selection (author’s construct)

Study Discipline	Total student population	Anticipated number of informants to be sampled	Actual number of informants sampled for survey
Architectural Technology	99	20 (20.2%)	29 (29.3%)
Graphic Design	239	48 (20.1%)	44 (18.4%)
Industrial Design	157	32 (20.4%)	38 (24.2%)
Interior Design	106	22 (20.8%)	21 (19.8%)
Surface Design	80	16 (20.0%)	0 (0%)
Town & Regional Planning	167	34 (20.4%)	15 (8.98%)
Total	848	172 (20.3%)	147 (17.3%)

7.5 Workshops and Focus Groups

Workshops and focus group discussions were held during strategic phases of the research in collaboration with key actors drawn from local and provincial government, industry (professional designers and manufacturers), the disability sector, and collaborating academia (from CPUT, and interested individuals from other higher education institutions in the Western Cape Province). Boonzaier & M’Rithaa (2007) ran a participatory workshop that served to stimulate debate on different perspectives on UD-related concerns and to promote broad-based participation (see Appendix O for a summary of issues arising at the workshop at the 2007 DEFSA conference). The researcher also attended two conferences, one national and another international to share emerging outcomes of the study.

7.6 Data Collection Methods

With the product analysis survey method, photographic capture, voice recording, and questionnaires were used as the main tools or instruments of data collection to generate quantifiable data (Denzin & Lincoln, 1998). Questionnaires primarily employed Likert scales due to the relative unfamiliarity of UD in the context being researched. Further, Maree and van der Westhuizen (2007:167) concur that a Likert scale “is very convenient when the researcher wants to measure a construct” as well as allowing for the “ordinal measure of an informant’s attitude” in terms of the “strength of feeling or attitude”.

7.6.1 Coding Framework

Interviews and resultant responses were recorded, transcribed, coded and analysed using appropriate conventions (Sapsford & Jupp, 1996; Durrheim, 1999). Table 7.4 shows the main thematic coding and analytical protocols used in this research, as well as their properties, codes, descriptions, interpretation parameters, and examples from interview transcripts. The related data is represented graphically in the final chapter of this thesis. Three research assistants operated independently as coders to ensure inter-rater reliability and validity of the data (Strauss & Corbin, 1997; Boyatzis, 1998).

Table 7.4 Thematic coding framework (author's construct)

Theme	Property	Code	Example	Description	Interpretation Parameters
Identification with Vulnerable Populations	Personal Factors	PER	<i>"I believe it is the right thing to do: I call it 'vulnerable'".</i> <i>This sector of community [senior citizens] has made an invaluable contribution to society.</i>	Personal attitudes towards vulnerable members of society	Personal operations or actions that influence an individual's attitude towards vulnerable populations
	Social Factors	SOC	<i>"DAWN: Democratic Alliance Women's Network with a specific focus and emphasis on women and gender issues. They look at empowerment programmes, network opportunities amongst women and the like. The same applies to children... [...] We also have the DA Youth".</i>	Past or prevailing practices by society towards its vulnerable members	Group activities that influence an individual's attitude towards vulnerable populations
	Political Factors	POL	<i>"...the Democratic Party gave room for the individual to express your views, your opinions, and as we know, liberal democratic [values] are underpinned by the rights of the individual, rather than using a group as means to gain power but rather focusing on the individual".</i>	Factors related to the way in which formal and informal power structures are formed and organised	Structural responses to issues relating to the vulnerable
	Technical Factors	TEC	<i>"And when I speak of short-term, they will look at building a new road (and we've seen that in our own area where we live which I've now done) but they will look at particular issues such as new roads, or a new community hall – things that are very important – because that contributes to the functionality of your particular area where you live, work and play".</i>	Technical factors that focus on design interventions for vulnerable populations	Factors dealing with the application of scientific knowledge to solve practical design problems
Familiarity with UD-related concepts	Identification	IDT	<i>"Destination identification! The people at the City Health Department have made Bothasig Clinic a pilot project for me (as Chair of the Health Portfolio).</i>	Specific association of symbols with approximate meaning	Accurate identification of Principles of UD symbols
	Definition	DFN	<i>"But what is vulnerable, or who are deemed to be vulnerable? [These are] the youth, senior citizens, and the disabled. Those are the three categories which I describe as being the most vulnerable sectors of our society..."</i>	Familiarity with the inherent meaning(s) of UD-related concepts	Descriptive statement of understanding of UD-related concept(s)
	Knowledge	KNW	<i>"That is why I say this is what inspires me and</i>	Formal understanding	Declaration of

			<i>when you look at each of those individually, their needs are almost the same, or rather, let me say, the outcome-based approach of these three are almost the same because they need something from society to keep them going”.</i>	of UD-related concept(s)	knowledge of UD-related concept(s)
	Application	APL	“They [City Health Department] have used a user-friendly integrated colour-coding [at the new Bothasig Clinic] as a way-finding system to make it easier for visiting (out) patients find the venue more accessible”.	Specific Principles of UD used	Declaration of actual use of UD principles
Participation/Interest in 2010 Projects	Events	EVT	“2010 is maybe a vehicle (or catalyst), while we appreciate that 2010 will come and go. We need to see if 2010 is outcome-based, whether we would be able to see a lasting benefit for the people of Cape Town – all people of Cape Town... ”	Specific or anticipated operations, actions, and activities	Declaration of interest or involvement in 2010-related activities
	Logistics/ Planning	LOG	“The DA also has a Disability Desk. We also have a dedicated DA Member of Parliament tasked specifically to deal with issues relating to People with Disabilities, because when one introduces legislation, one must never ignore the right of the disabled”.	Specific operations, actions, and activities	Planning that impacts directly on 2010 projects
	Policy	PCY	“...something which we are pushing from the DA will be the Extended Family Tax Allowance”.	Actual policies that relate to related issues	Formulation of policies leading up to and/or beyond 2010
	Projects	PJT	“So what we’ve done is now we’ve introduced a pre-packed system [for chronic medication]”.	Specific or anticipated operations, actions, and activities	Declaration of interest or involvement in 2010-related projects
Integration of UD Principles	Individual	IDV	“Universal Design is an exciting and creative concept which aims to achieve more-or-less what we have set out ourselves to achieve”.	Interest in using UD Principles	Declaration of personal commitment to adopting/using UD Principles
	Professional	PRO	“...in the month of October and November we [in the DA] have ‘Senior Citizens’ Month’ and other awareness events, and our proposals to influence the powers that be”.	Professional body’s interest in using UD Principles	Declaration of professional body’s commitment to adopting UD Principles
	Group	GRP	“Where the DA shares your views on how to influence legislation, how to influence policy in our country. To speak in favour and to the benefit	Group’s interest in using UD Principles	Declaration of group’s commitment to adopting/using UD

			<i>of these people (these sectors of society) then the DA can benefit”.</i>		Principles
	Community	COM	<i>“And if the DA can benefit, people ultimately also benefit”.</i>	Community’s interest in using UD Principles	Declaration of communal commitment to adopting UD Principles
Promotion of UD concept	Self	SLF	<i>“I’m also saying that we have a duty, and a responsibility (I’m going to give this to you) to take special care of our senior citizens (we are only taking about seniors now, but this can apply to the disabled and the youth)”</i>	Personal interest in promoting UD	Declaration of personal commitment to promoting UD adoption
	Organisations/ Institutions	ORG	<i>“This could be a long-term relationship (with UD) and one can only benefit and the people [of my Ward] will ultimately benefit”.</i> <i>“I am going to set up an appointment with our [DA] policy advisors and possibly the [Executive] Mayor [of Cape Town]”.</i>	Strategic interest in promoting UD	Declaration of organisational / institutional commitment to promoting UD adoption
	Champions	CHP	<i>“The Executive Mayor, Helen Zille (as leader of the DA) leads by example by reaching out to refugees. She was instrumental in organising a summit on refugees in Cape Town in 2007 involving all stakeholders”.</i>	Names of key actors to champion UD at various levels of society	Identification of potential candidates for championing UD concept in Cape Town
	Media	MED	<i>“This is a copy of a speech I delivered on Friday [18th April] morning. Today I’m speaking at the Tygerberg Service Centre for the Aged, Friday the 18th of April [2008]...”</i>	Specific or anticipated operations, actions, and activities	Employing strategies for promoting UD adoption

Key

PER – Personal Factors
IDT – Identification
EVT – Events
IDV – Individual
SLF – Self

SOC – Social Factors
DFN – Definition
LOG – Logistics/Planning
PRO – Professional
ORG – Organisations/Institutions

POL – Political Factors
KNW – Knowledge
PCY – Policy
GRP – Group
CHP – Champions

TEC – Technical Factors
APL – Application
PJT – Projects
COM – Community
MED –Media

7.7 Data Evaluation Methods

The data analysis was conducted side-by-side with data collection, data interpretation and narrative report writing. Information on the number of returns and non-returns of the survey was concurrently reported. This information was presented in tabular format with special attention to the number of informants and non-informants (see Table 7.2 as an example). *Summarising*, *explicating* and *structuring* types of content analysis as described by Gray (2004:328-329) was done on available documents (such as draft policies, plans and legislation) and used in conjunction with other typical desk review methods on relevant categories, labels and words such as “accessibility”, “disability”, “inclusive/universal design” and “usability”. Similarly, the above data informed the pre-coding and thematic analysis of data drawn from additional loci of the study.

Simulation, systematic observation and discourse (conversational) analysis were used in the experimentation aspect of the research as they are complimentary to the action research setting in the classroom (Krippendorff, 1980). Foster (1996:59) notes that observation offers advantages over interviews and questionnaires in that it allows for recording of human behaviour directly “without having to rely on the retrospective and anticipatory” responses of informants. Bailey (1987) however cautions against the danger of “reactivity”. Bailey (1987:31) describes a reactive research as “one whose application causes a reaction on the part of the persons being studied in such a way that the data are affected”.

Within practical limits, different sources and methods of data collection and evaluation were employed to permit triangulation, especially with “why” questions thereby enhancing interpretability (Silverman, 1993). This is particularly prudent in the case of work system analysis and specific task analysis (Stammers, Carey & Astley, 1990). The keeping of an updated “audit trail” by means of a *reflexive journal* aided in the process of evaluation (Kelly, 1999).

The data analysis was based on ‘reduction’ and ‘interpretation’ – that is, voluminous amounts of information was reduced to certain patterns, categories or themes prior to interpreting this information by using specific schema (Sapsford *et al.*, 1996). During data analysis, information was organised categorically and chronologically, reviewed repeatedly and continually coded; then analysed with *Microsoft Excel*[™]; and version 13 of the *Statistical Package for Social Sciences* (SPSS)[™] software. The research necessitated an iterative approach as many of the studies overlapped with time. An open relationship also permitted key role-players to feed into the process at their convenience throughout the entire research process.

7.7.1 Testing of Pictograms

Pictograms for seven *Principles of Universal Design* developed by Beth Tauke (Danford & Tauke, 2001) were presented in Question 6 in the students' survey questionnaire (see Appendix L). This was a supplementary component to the study as the researcher sought to know whether indeed the pictograms were as 'universally applicable' to contexts outside of their original locus of development. As such, informants were required to simply assign a semantic label to the pictogram that best reflected (or approximated) the theme of the said label/principle.

7.7.2 Case Studies and Exemplars

The case study of Kirstenbosch Botanical Gardens (discussed in Section 5.2.3.2) and data base of UD exemplars were documented photographically. Additionally, the *Universal Design Audit Checklist* (Appendix D) was used to carry out an exploratory accessibility audit in Kirstenbosch. The said images are presented in CD-ROM format in folders appropriately labelled under the seven *Principles of Universal Design* appended to this thesis.

7.7.3 Students' Design Competition

The visual and text-based submissions of proposal for landscaping and furniture design solutions from the 2010 Students' Design Competition (discussed in Section 5.2.3.3) are also presented in CD-ROM format and can be made available by the researcher.

7.8 Ethical Considerations

There are many role players and interested parties in a research of this magnitude. It was thus essential to consider ethical issues relating to each of them. These key actors include:

- the participant, informant or subject – for the purposes of this study, the preceding terms as well as actor, collaborator, interviewee, respondent, and the observed are represented by the single term *informant* as “used to identify the individuals that a researcher studies” (Schwandt, 2001:126);
- the researcher; and
- the sponsoring body.

7.8.1 Ethical Issues Relating to Informants

Any research must be ethical especially when dealing with issues of subjects involved in the study, whether they are human beings or animals. The following measures were taken to ensure that the study is ethical:

- The informants were not compelled into participating in the study. A signed consent form (Appendix E) was one of the pre-requisites for participation.
- Any informant who chose to withdraw from the study and revoke the information she/he supplied to the investigator was granted their wish without prejudice.
- Information collected is confidential so as to protect the informants from any (potential) psychological harm.
- Information on personal details by informants was optional and treated with due confidentiality.
- Names of the informants (or their organisations) were not used in the findings if doing so could harm their reputation or jeopardise their work. Explicit requests were made to informants to allow their names to be included in this thesis.
- The informants were not deceived but were told the truth about the intent of the study. Informants were not seduced into the research by giving them any incentives to participate in the study. Instead the importance of the study was emphasised to them.
- After analysing data and finishing the report, the informants were provided with the findings so as to clear any misconceptions arising during the data collection phase.

7.8.2 Ethical Issues Relating to the Researcher

The researcher was ethical when dealing with the research and the following issues were taken into account:

- The investigator endeavoured to ensure that the data collection procedure and interpretation was not biased.
- Appropriate methodology was used when conducting the study.
- The results of the report were communicated correctly without bias.
- There was no information obtained from the subject in any adverse manner to them.
- The investigator endeavoured to uphold accepted and expected code of ethics principles incorporating among others, the guidelines of beneficence, respect for human dignity and justice.

7.8.3 Ethical Issues Relating to the Sponsoring Organisation

The primary source of the funding for this study came from the Cape Peninsula University of Technology (CPUT) from conception to completion. There was no chance of manipulation of the study by the sponsor because the research was not commissioned by nor conducted for the

sponsor but for academic purposes. Advice was sought from the Doctoral Supervisors concerning unforeseen ethical implications.

7.9 Summary

This study benefited from an action research approach as it allowed access to students at the Cape Peninsula University of Technology, Cape Town to participate in quasi-experiments and design competitions addressing UD. Further, thematic codes emerging from the qualitative data generated during the various stages of this research greatly enriched the understanding of prevailing attitudes towards UD, and adoption of the same in planning and general design practice. The next chapter will elaborate on the specific implications of the findings from this study, not only in the context of the anticipated FIFA 2010 Soccer World Cup™, but future aspirations for an 'Inclusive Cape Town'.

CHAPTER EIGHT

DATA ANALYSIS AND DISCUSSION OF FINDINGS

8.0 Introduction

This chapter introduces the detailed data analysis protocol and discusses the dynamics between various actors involved in activities relating to the FIFA 2010 Soccer World Cup™ in Cape Town. The actors involved in this study include design students, design educators, project planners, professional designers, as well as experts drawn from the fields of politics and indigenous knowledge systems (IKS). In the case of the student survey, the data from structured questions is recorded statistically, whereas semi-structured and open-ended responses were thematically coded using sentences as the main units of analysis, before being broken down further into statements (which are viewed as specific thought units) – in turn made up of contextual use of phrases, clauses or words (Weber, 1990). Similarly, all interviews were coded and analysed thematically.

8.1 Identifying Universal Design Exemplars

The criteria for identification of specific typologies or exemplars was aligned with the seven *Principles of Universal Design* advanced by Story (2001) and the Center for Universal Design (1997), and elaborated in the UD poster (Appendix B). Initial visits to various parts of the city of Cape Town included Metrorail platforms and stations; bus and multi-passenger taxi (minibus) stations; Kirstenbosch Botanical Gardens; and public buildings (including entrances, lobbies, and toilets). Photographic documentation focussed on functional accessibility and usability. The case study (in Figures 5.8-5.23) shows some of the exemplars, whilst the CD-ROM appended at the end of this thesis contains a more comprehensive database of collected exemplars.

8.2 Roles of the Principal Actors

As summarised in Section 6.1, the three-level AT model proposed by Leont'ev utilises *operations* (directed by *conditions* at the *non-conscious* level of the subject), *actions* (directed by *goals* at the *individual or group* level of the subject), and *activities* (directed by objects/motives at the *collective* level of the subject) – this study primarily focuses on the last two levels as they deal with group level activities (Engeström *et al.*, 1990). Further, Engeström (*ibid*) defines the subject as *the individual or group whose point of view is taken in the analysis of the activity*; and the object (or objective) as *the target of the activity within the system*. This thesis adopts designers as the keystone subjects (though other principal actors' points of view is acknowledged), and identifies the object (or objective) as that of mainstreaming UD in Cape Town.

8.2.1 Activity Analysis: UD in Academic Settings

The quasi-experiment was carried out in a classroom/design studio for third year product design students. The UD module was designed to articulate into a dedicated week within the 'Technology 3' course. The objective was to engage with students to ascertain their willingness to incorporate UD in the (re)design of three-dimensional artifacts/products. The key actors within this design education setting (as illustrated in Figure 8.1) included the following:

- Industrial design lecturers;
- Product design students; and
- Members of the disability sector.

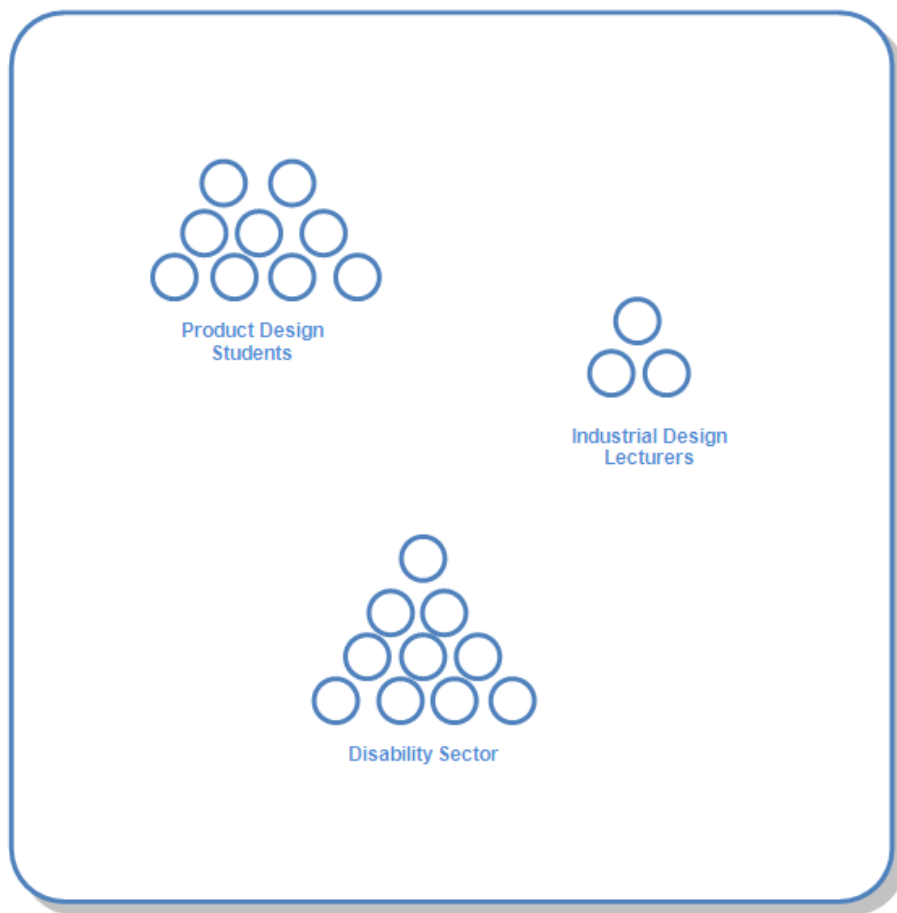


Figure 8.1: Actors within the educational environment

The specific group level actions of the various actors (shown in Figure 8.2) were:

- Industrial design lecturers: *planning and coordination of teaching, learning and research activities;*
- Product design students: *class participation and submission of assignments;* and

- Members of the disability sector: *advocacy on disability-related issues, as well as offering expert advice – in this instance with specific reference to the needs of people with visual and sight disabilities.*

Typically, members of the disability sector operate independently of educational settings (except in the *special* and *inclusive education* milieu). In the case of CPUT, the disability sector's expertise was not formally incorporated into the curricula as guest lecturers and content specialists prior to the commencement of this dedicated module. A manager from *The Cape Town Society for the Blind* (CTSB) was invited as a guest lecturer for the UD module.

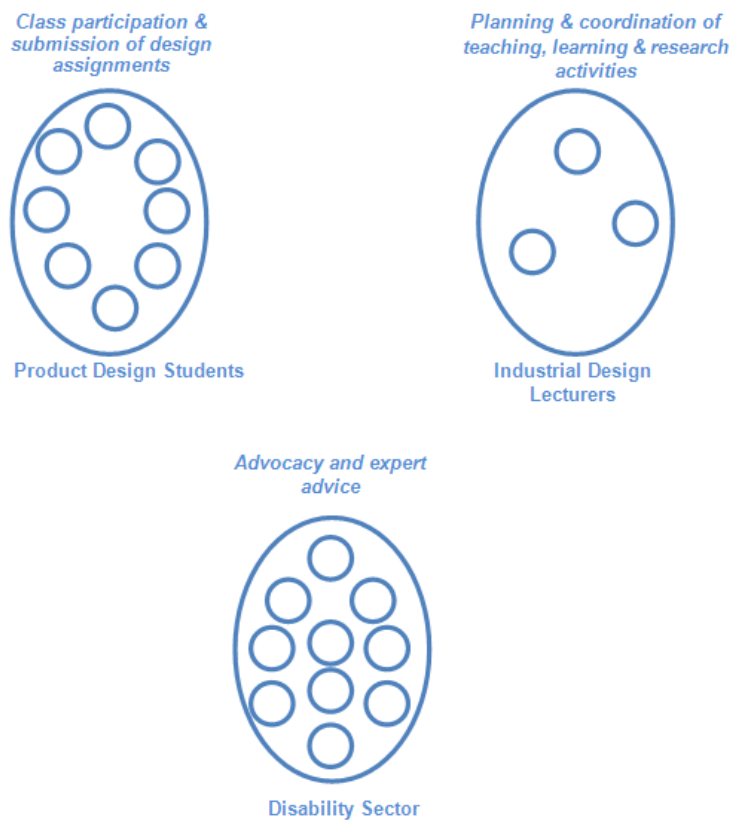


Figure 8.2: Group activities within the educational environment

At the organisational level, the interaction of these actors happens in the Cape Peninsula University of Technology – specifically at the Department of Industrial Design at the Cape Town Campus. The following illustration (Figure 8.3) shows the broadly defined activities.

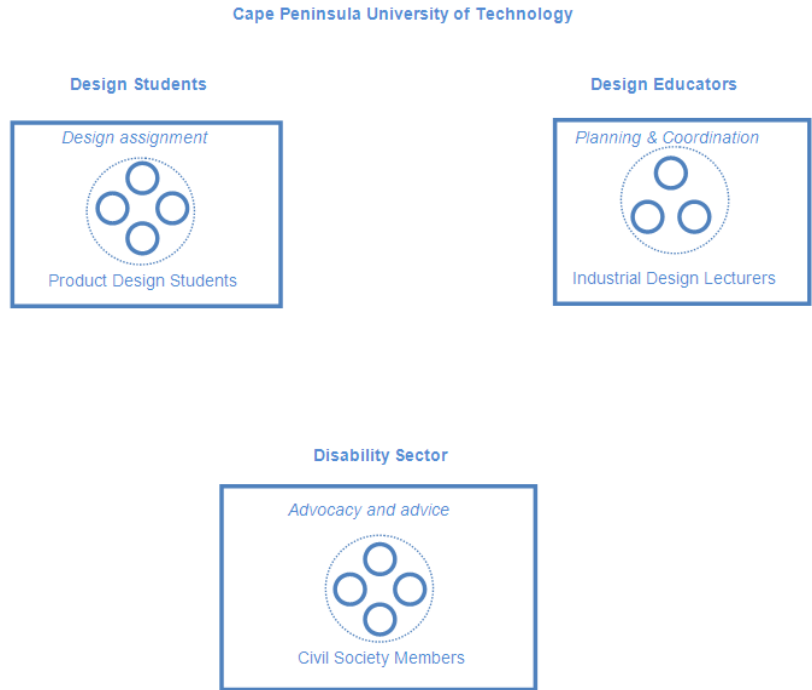


Figure 8.3: Organisational level activities within the educational environment

Similarly, the societal level activities are located in Cape Town. The various groups are illustrated in Figure 8.4.

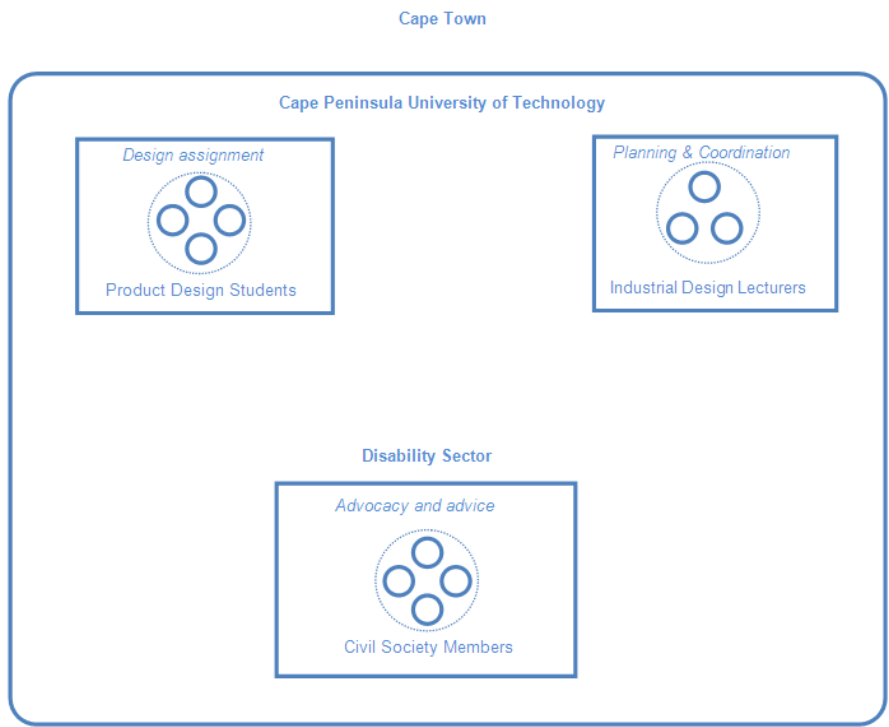


Figure 8.4: Societal level activities within the educational environment

An overview of the operations and actions of various actors shows the linkages inherent in such activities (Figure 8.5). The dashed red lines indicate communication flows that need to be strengthened so that future collaboration can be sustained.

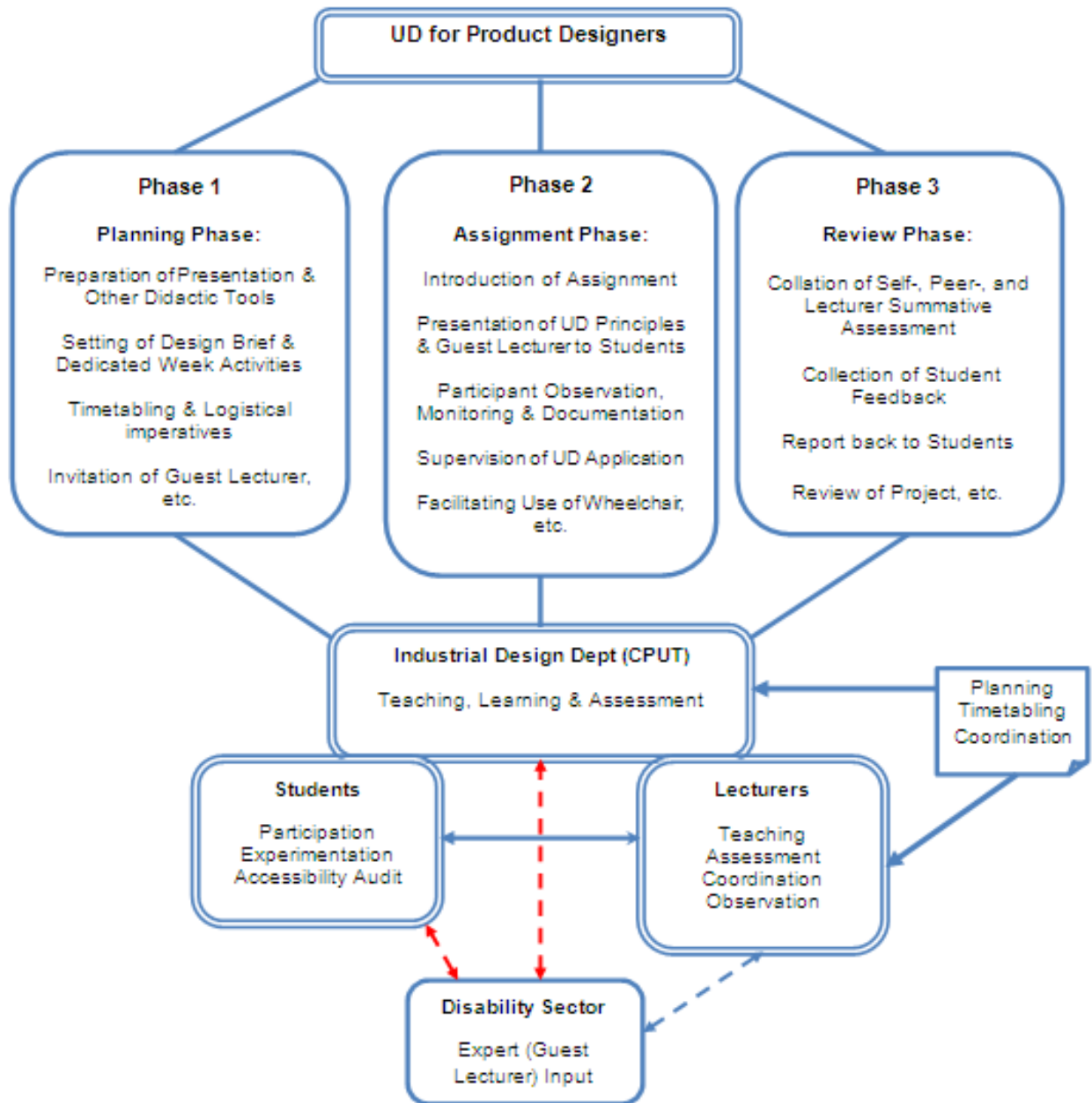


Figure 8.5: The educational environment: an overview

The following activity analysis (Figure 8.6) elaborates on the abovementioned. Students typically rely on their lecturers almost exclusively for all content input relating to a design brief. The contradictions or tensions arising here are that the failure on the part of the student to consult more widely with experts results in design apathy – the resultant design solutions lack empathy and authenticity. Further, the disability sector relies principally on governmental and non-governmental policy documents for direction. The disability sector on its part rarely engages academia in their quest for pertinent data and related information. Such traditional sources are usually dated and lack currency and authority.

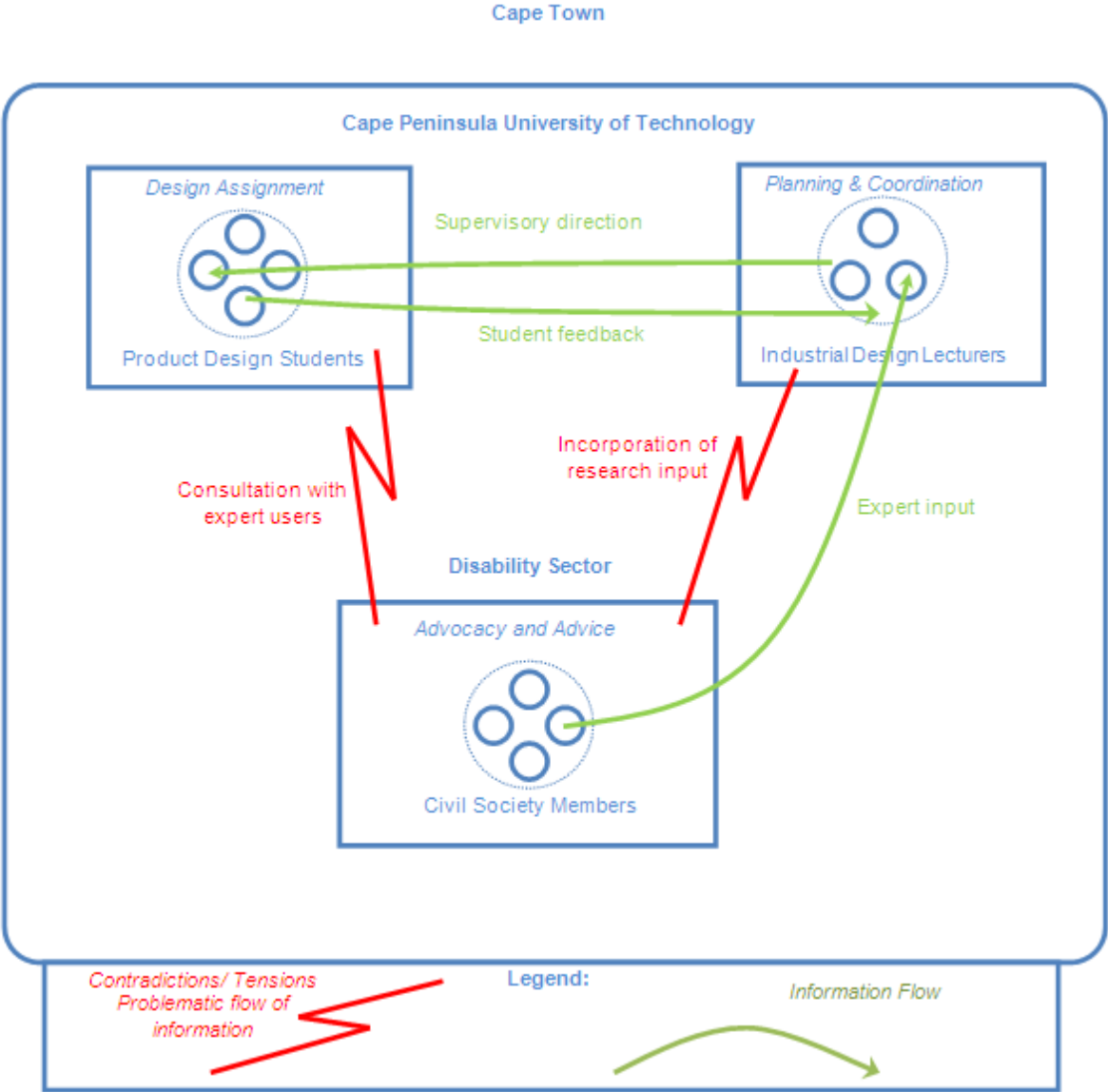


Figure 8.6: Activity analysis of the educational environment

The activity analysis reveals the following implications:

- Design activities focusing on people with special needs should incorporate the perspective of the end-users, preferably as advisors or content experts;
- Lecturers should facilitate (non-prescriptive) contact between students and industry;
- Greater collaborative (action) research should be encouraged between the disability sector and higher education institutions. Such collaboration could also be extended to student projects to sensitise and expose the learners to emerging trends; and
- Mainstreaming of UD was a unifying object amongst community members.

8.2.2 Activity Analysis: UD in Public Parks

Kirstenbosch Botanical Gardens (as discussed earlier in Section 5.2.3.2) is the most prestigious of a large network of national botanical gardens and public parks under the National Botanical Institute administered by the South African Biodiversity Institute. The UD Audit performed by CPUT was not solicited by the management of Kirstenbosch, but was rather inspired by the quest to validate the efficacy of UD in public parks. The research focussed on the accessibility and usability of the features incorporated in the gardens to address UD-related concerns raised by specific categories or groups of visitors. These groups included:

- foreign visitors (speaking languages other than one of the 11 official ones);
- local visitors from every walk of life; and
- people with disabilities (particularly those experiencing physical and visual limitations in functioning).

A number of actors playing a variety of roles impact upon the Kirstenbosch Gardens setting. The actors in this particular environment (as illustrated in Figure 8.7) include:

- Kirstenbosch Botanical Gardens management – represented by the Estate Manager;
- the South African National Biodiversity Institute (SANBI);
- the educational community – comprising of design educators, researchers and students;
- professional landscapers – as well as architects, ecologists, engineers and cartographers;
- contractors, suppliers and other service providers; and
- members of the disability sector – especially those specialising in physical and visual disability.

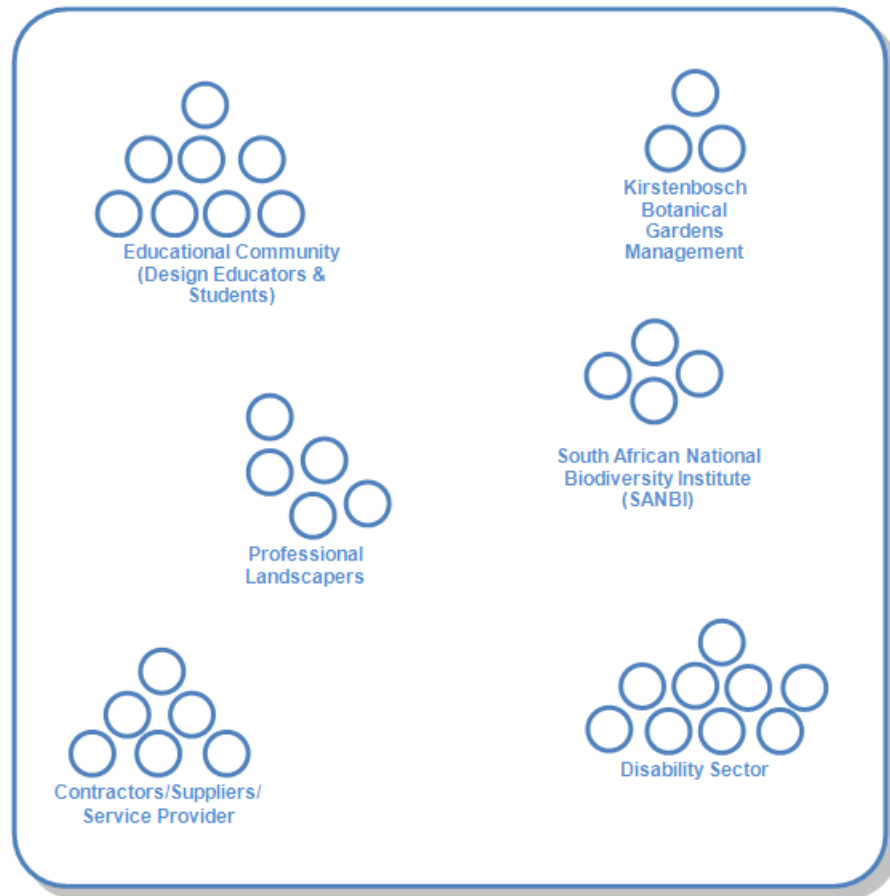


Figure 8.7: Actors within the botanical gardens environment

At the group level, the actions of the various actors (as shown in Figure 8.8) include:

- Kirstenbosch Botanical Gardens management: planning, negotiating and coordinating accessibility projects;
- the South African National Biodiversity Institute (SANBI): strategic planning, direction/oversight and funding of projects;
- the educational community: planning, research and execution of UD audit;
- professional landscapers: responsibility for design-related activities and formulation of detailed design briefs;
- contractors, suppliers and other service providers: supply, implementation and commissioning of accessible technologies and infrastructure; and
- members of the disability sector: advocacy on disability-specific needs and expert advice on user needs.

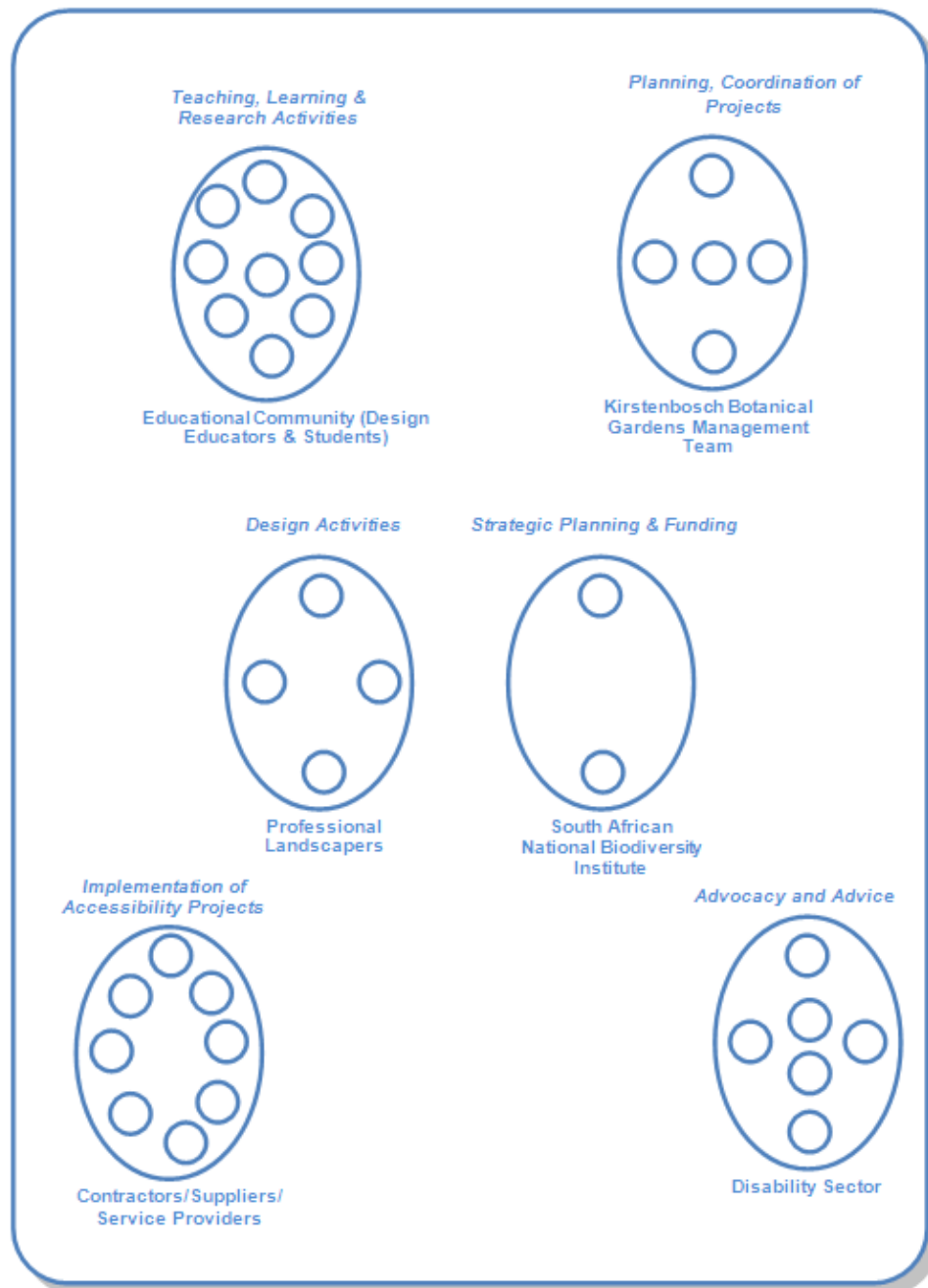


Figure 8.8: Group activities within the botanical gardens environment

Each of the groups organises its own rather specialised activities which in turn are coordinated by the Kirstenbosch Gardens management team. The organisational level activities are set in Cape Town as illustrated in Figure 8.9. The key actors include CPUT, Kirstenbosch Gardens, SANBI,

professional landscapers, suppliers/service providers, and civil society members from the disability sector.

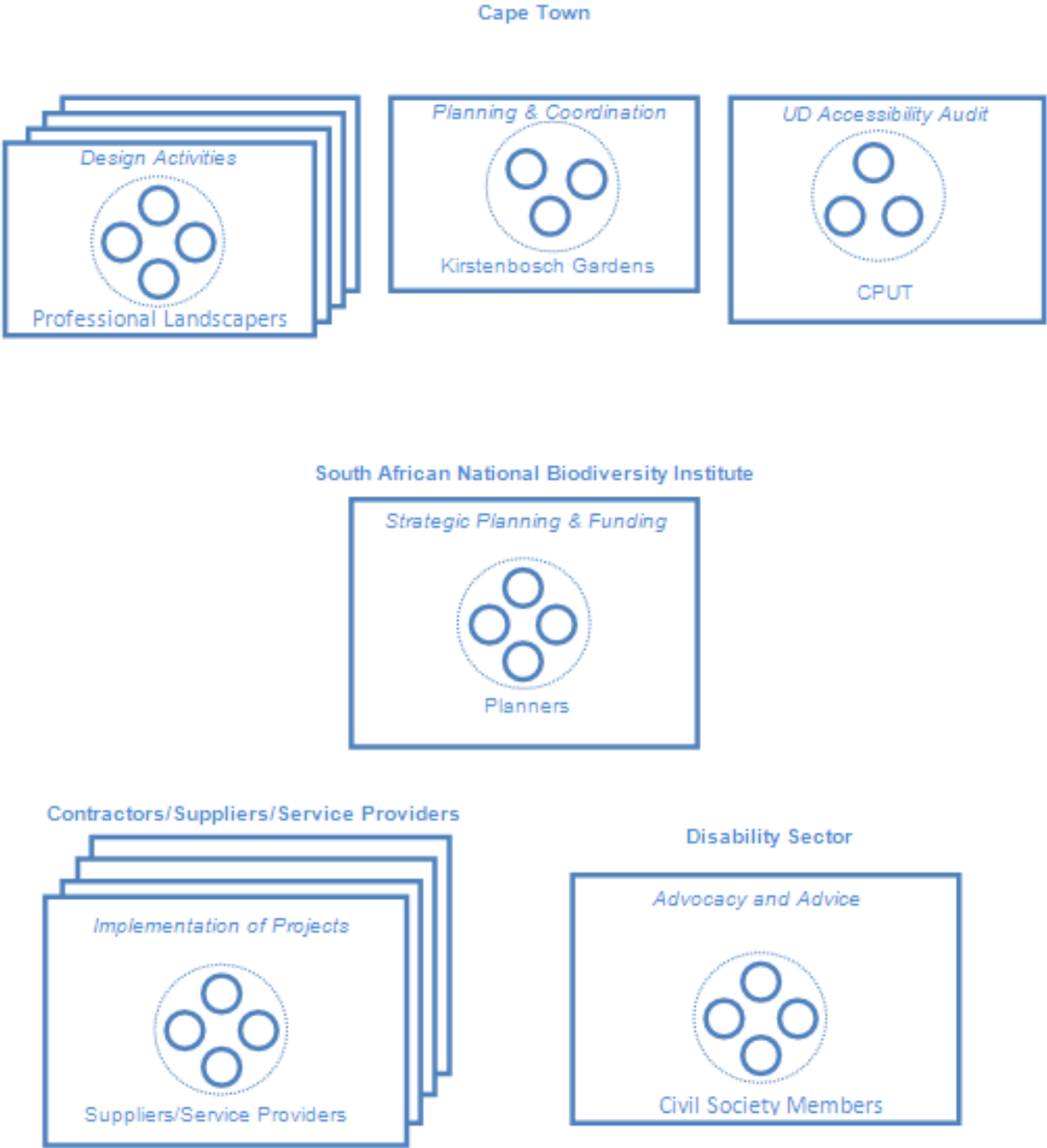


Figure 8.9: Organisational level activities within the botanical gardens environment

The societal level activities are set nationally (in South Africa). The various groups are shown in Figure 8.10. The national coverage of the South African Biodiversity Institute provides an ideal

platform for coordinating strategic and logistical planning activities that mainstream more inclusive and accessible public parks and botanical gardens.

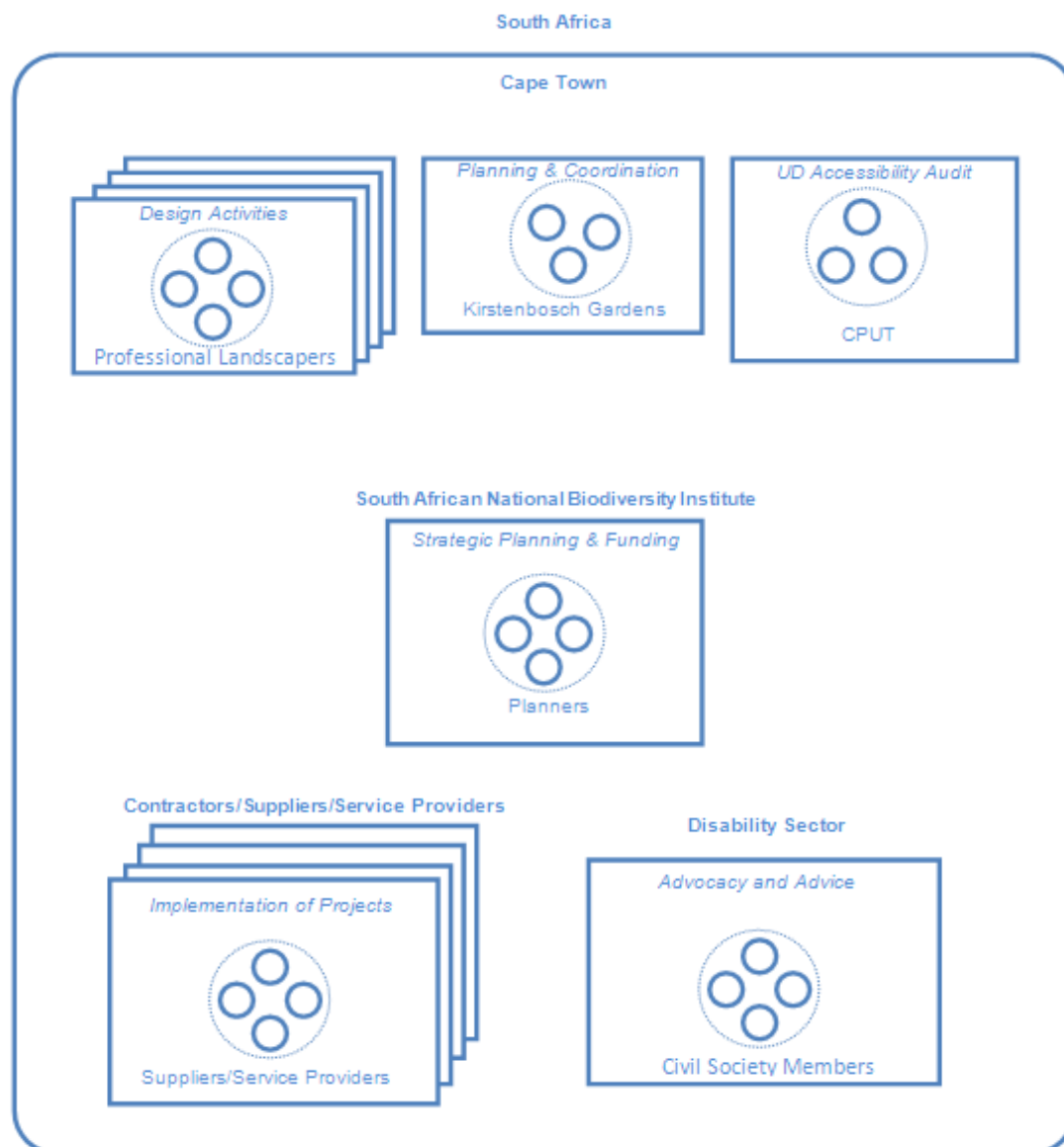


Figure 8.10: Societal level activities within the botanical gardens environment

Figure 8.11 presents an overview of the pertinent operations and actions of the key actors in the Kirstenbosch Gardens accessibility enhancement development. The role of CPUT was in an *ex post facto* capacity in performing an audit of the infrastructural and technological developments at the botanical gardens. The dashed red line indicates a lack of a synergetic link between CPUT and suppliers, particularly those involved in the provision of inclusive and accessible technical products and systems. The engagement of a technically-orientated programme such as the disciplines of architectural technology, interior design, industrial design and graphic design would

potentially lead to the development of locally sourced and context-responsive design solutions as opposed to the over-reliance on (often prohibitively expensive) imported solutions.

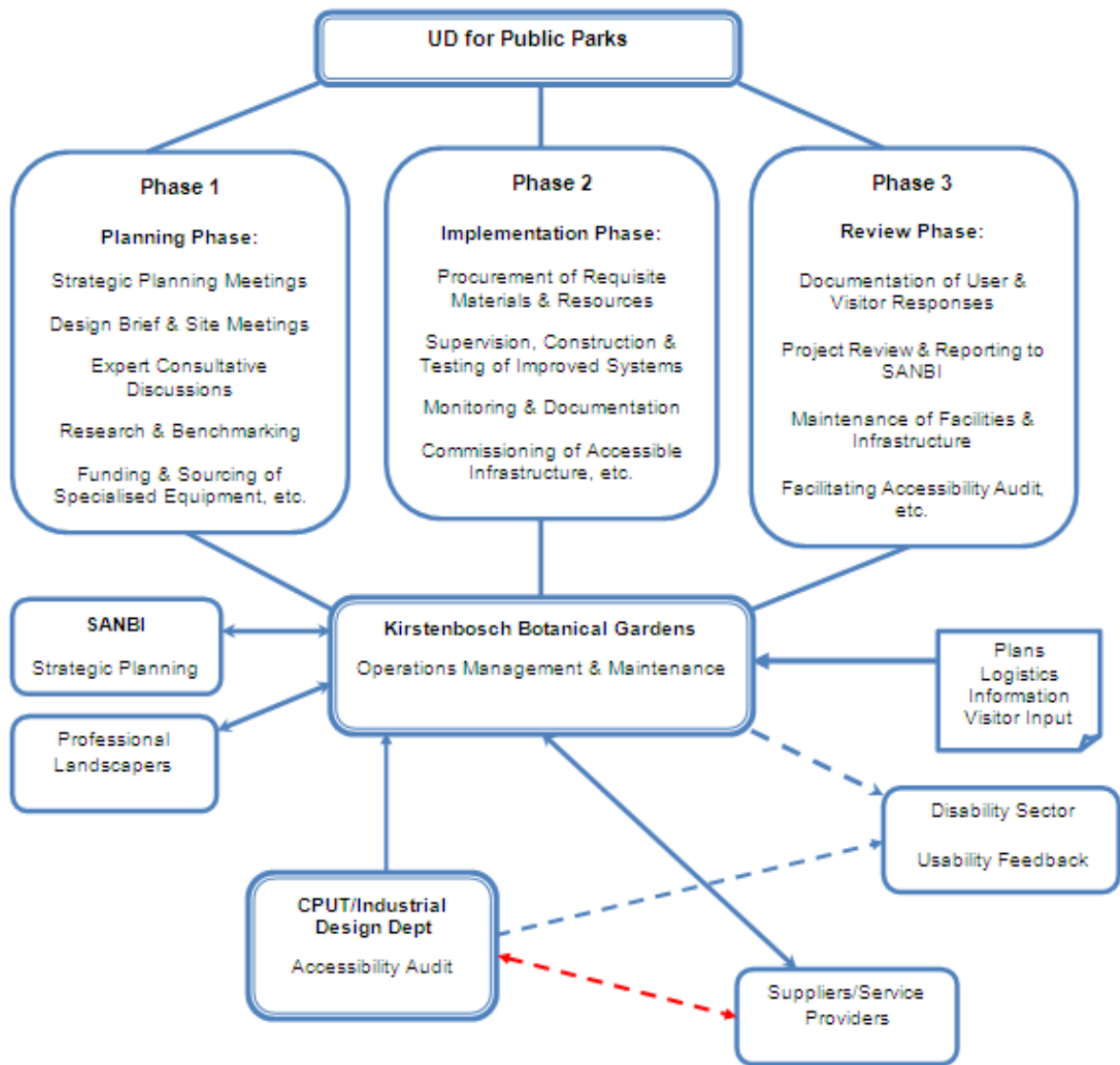


Figure 8.11: The botanical gardens environment: an overview

The activity analysis in Figure 8.12 reveals a number of issues with implications for mainstreaming UD in public parks and botanical gardens. The role of the management teams operating the public parks is pivotal as this is where all the energies are focussed – they are the custodians of the object of the activity. In the case of the Kirstenbosch Gardens, an open-minded and responsive management engaged various actors is focusing on the task of revamping the gardens to improve usability and accessibility for foreigners, the elderly, and people with

disabilities. Certain contradictions/tensions were identified around three key areas: participation; consultation; and communication. An elaboration follows:

- *participation*: there needs to be greater interaction between CPUT and design professionals for the latter's input to be incorporated in academic projects;
- *consultation*: professional designers rely on technical guidelines as opposed to direct user-expert input. Further, CPUT needs to maintain stronger links with suppliers; and
- *communication*: service providers and the disability sector should actively exchange information in a participatory manner.

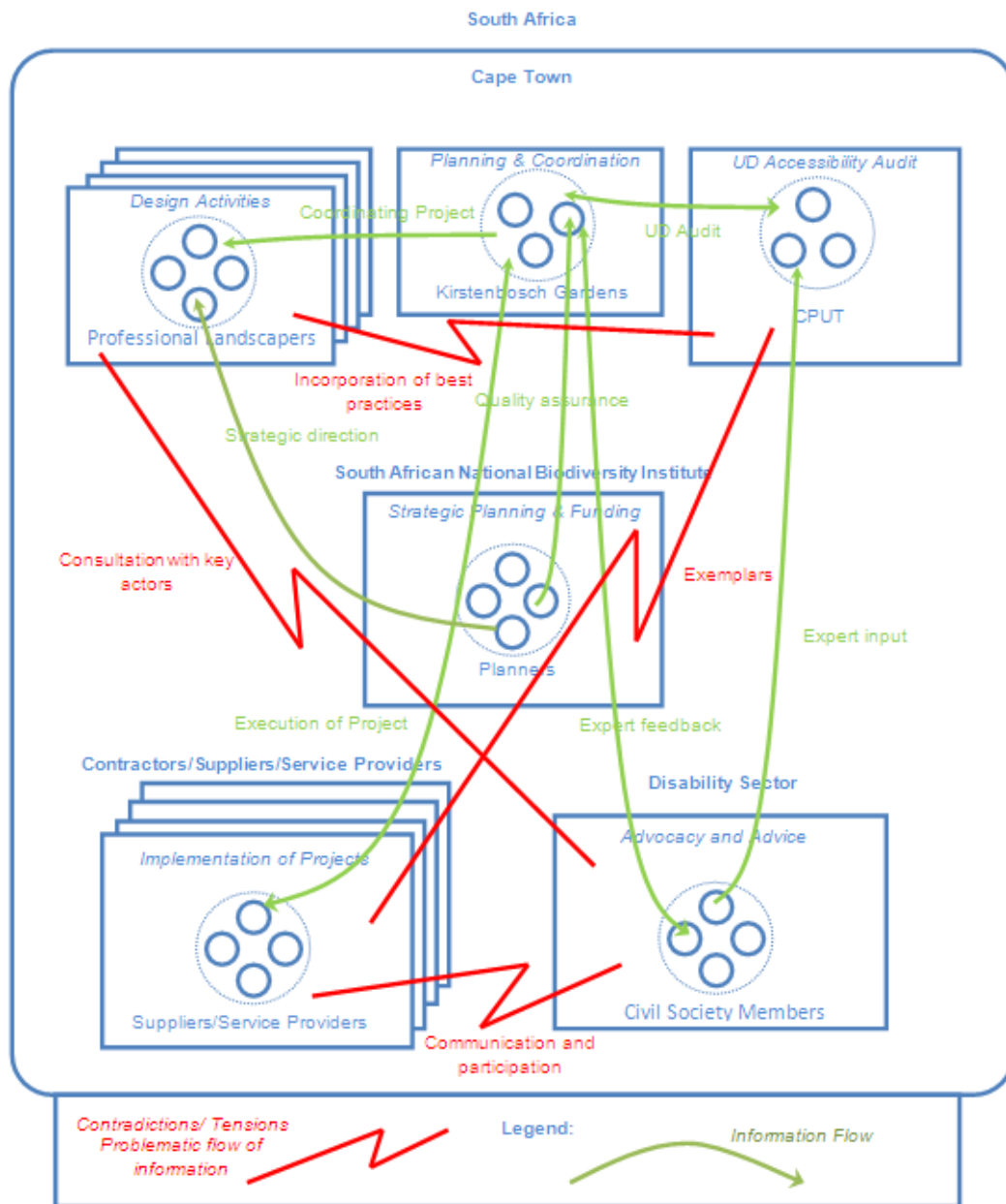


Figure 8.12: Activity analysis of the botanical gardens environment

8.2.3 Activity Analysis: UD in the Public Domain

The *2010 Green Goal Mouille Point Promenade and Beachfront Student Landscape Design Competition* was conceived by the *Department of Environmental Resource Management (DERM)* of the City of Cape Town and coordinated by local government officials from the City, as well as foreign consultants with experience of the *Green Goals* initiative first unveiled during the planning for the FIFA 2006 World Cup™ hosted by Germany (Pezeshki, 2008). Abigail Joustra (2008) reported that the competition was envisaged to elicit creative design proposals from students in landscaping design and allied fields.

The project was highly complex in that it involved the coordinated operations and actions of a relatively large number of primary and secondary actors (Figure 8.13). These include members of the DERM technical team, members of the educational community represented by the *University of Cape Town (UCT)* and *CPUT*; and professional landscape designers. Further, other actors indirectly involved in this domain include the *Department of Education (DoE)* and allied institutions such as the *South African Qualifications Authority (SAQA)* and the *National Research Fund (NRF)*; professional bodies representing various design disciplines; members of the disability sector and other industry partners; as well as independent contractors and allied service providers.

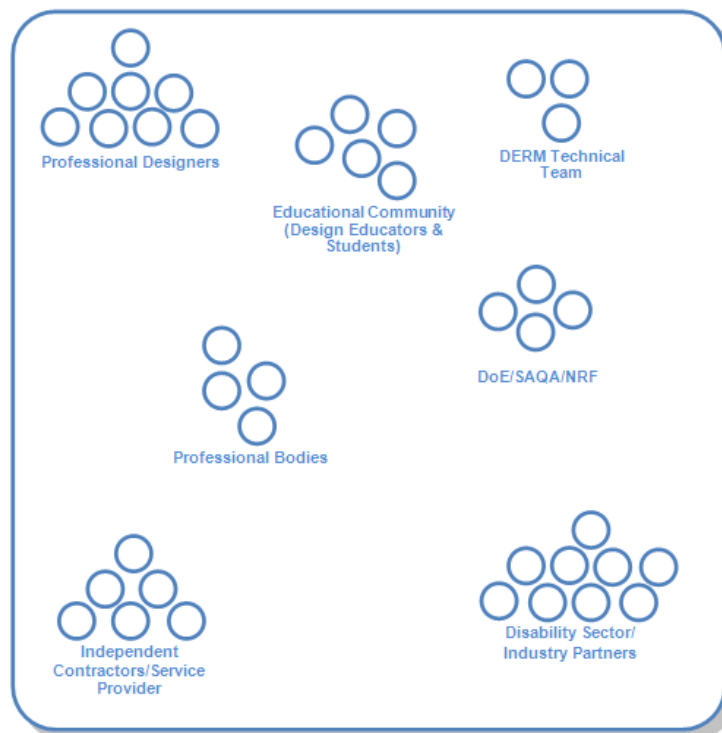


Figure 8.13: Actors within the students' competition domain

The group level activities of the project (depicted in Figure 8.14) also reveal many actions and activities that are similar in nature irrespective of the community-of-practice involved. For example, the DoE, SAQA, and the NRF in the higher education landscape compliment the role of professional bodies. The former accredit academic programmes and finance research activities in HEIs, whilst the latter oversee continuing professional development and regulation of professional practice/standards.

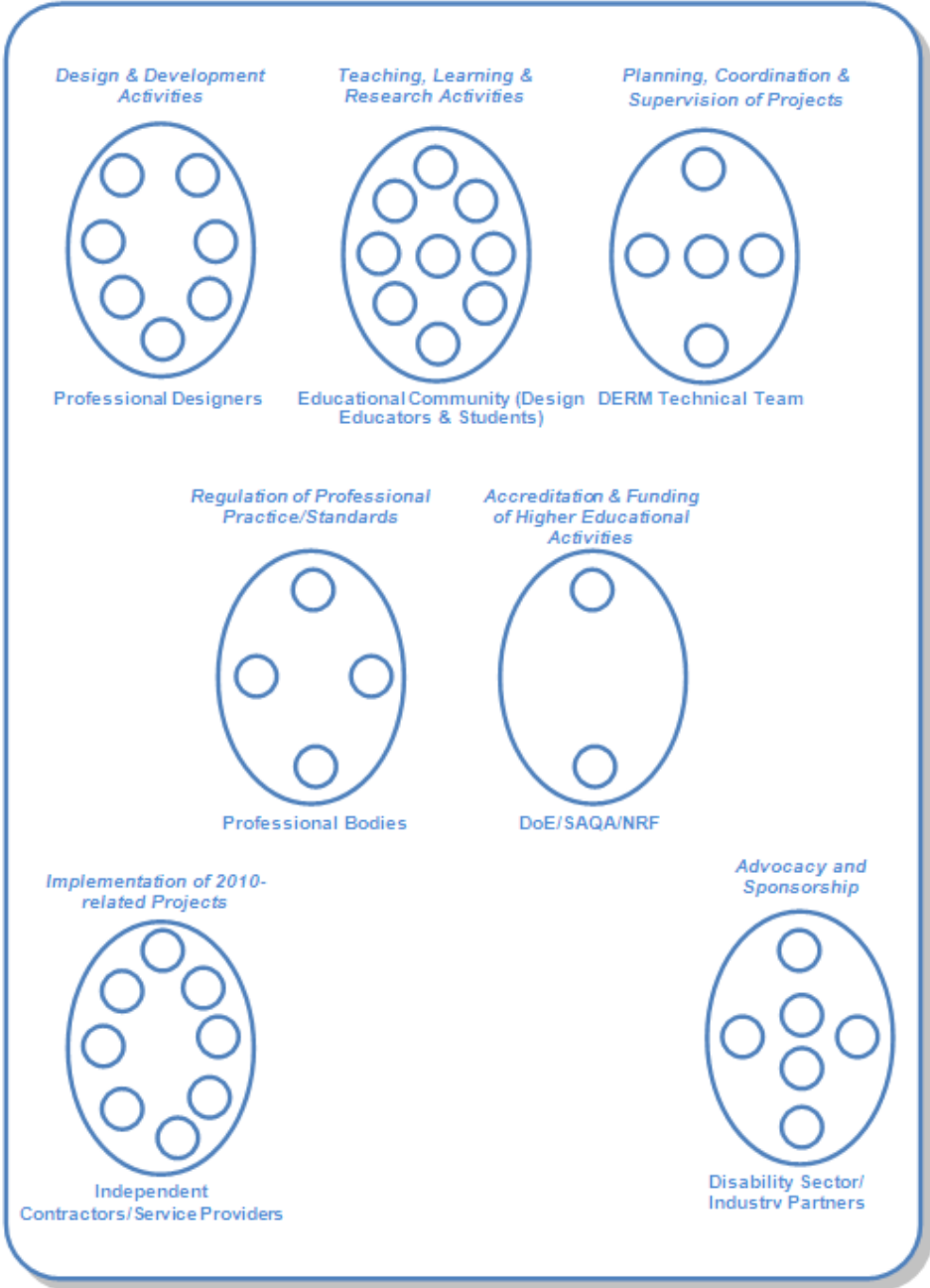


Figure 8.14: Group activities within the students' competition domain

Organisational level activities were set in the City of Cape Town/Western Cape Province as the management of 2010-related projects typically involves different levels of government (local and regional). Figure 8.15 shows a grouping of the three main communities of actors: DERM/City of Cape Town; HEIs (CPUT and UCT); and professional landscape designers. Additionally, the other communities are depicted with respect to the student competition domain.

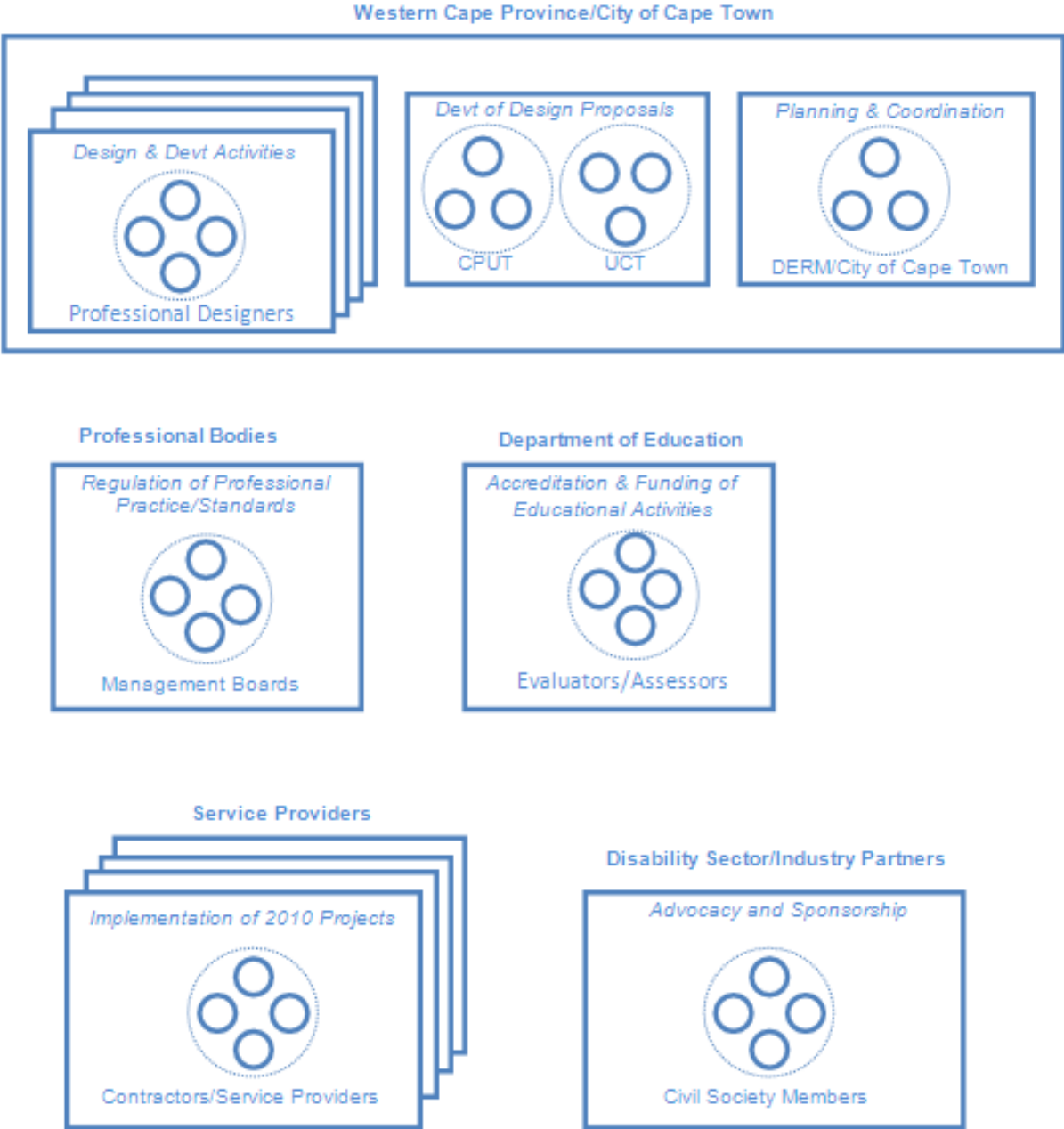


Figure 8.15: Organisational level activities within the students' competition domain

The societal level activities are a further development of the abovementioned in the context of South Africa as illustrated in Figure 8.16.

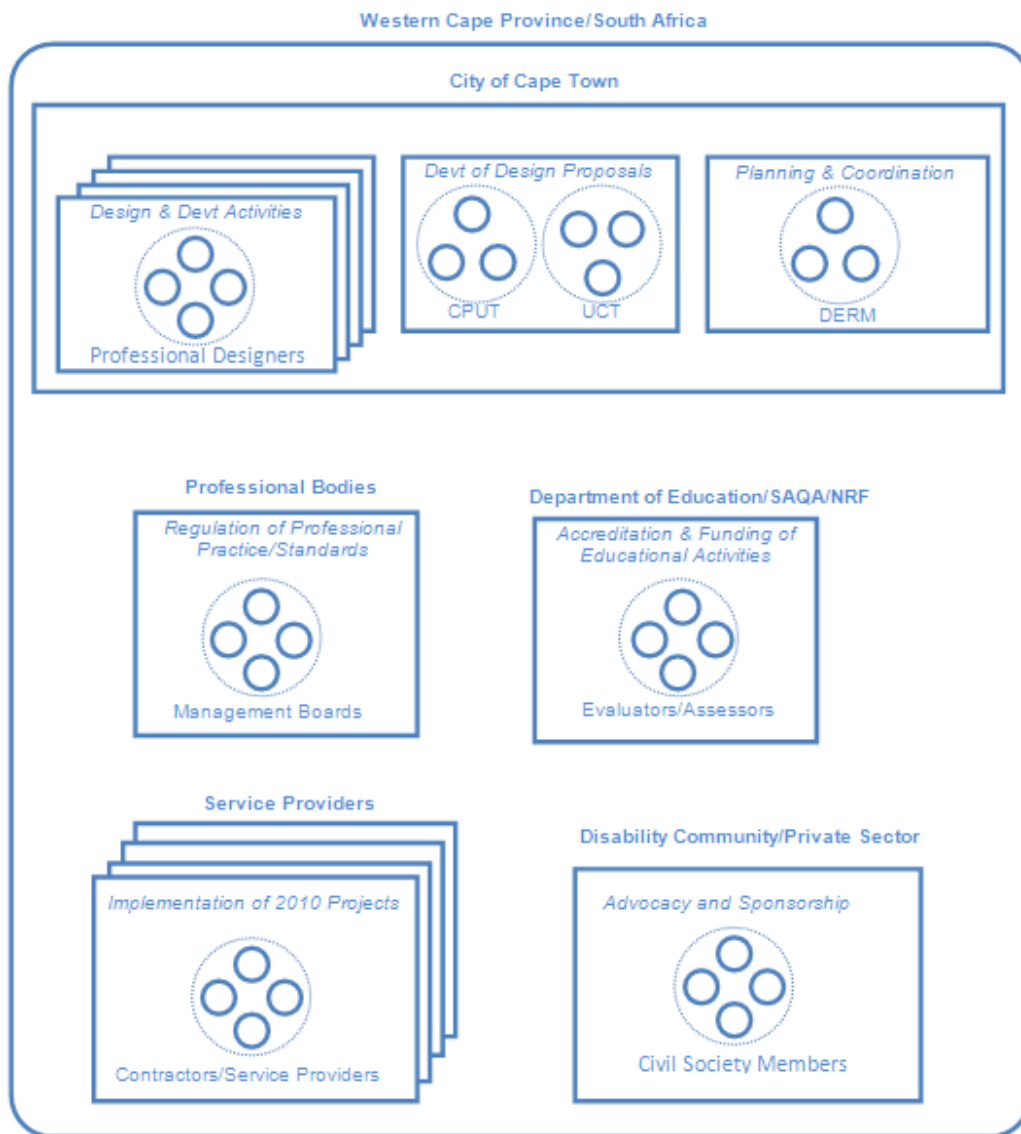


Figure 8.16: Societal level activities within the students' competition domain

The overview details some of the specific actions and activities performed in the planning, coordination and implementation of the students' competition (see Figure 8.17). Whereas the initial planning envisaged the participation of landscaping architecture and architectural students at both CPUT and UCT, the quest for broader involvement met with unforeseen challenges. Timetabling and other logistical issues limited the participants to *third year undergraduate* students of *interior design* at CPUT and *first year postgraduate* students of *landscape architecture* at UCT. The personal commitment and dedicated promotion by the coordinators for

the two HEIs was pivotal in ensuring the participation of the said students. Consequently, the judging criteria had to be revised to reflect this dichotomous complexity to avoid disadvantaging any of the students. (Appendix G).

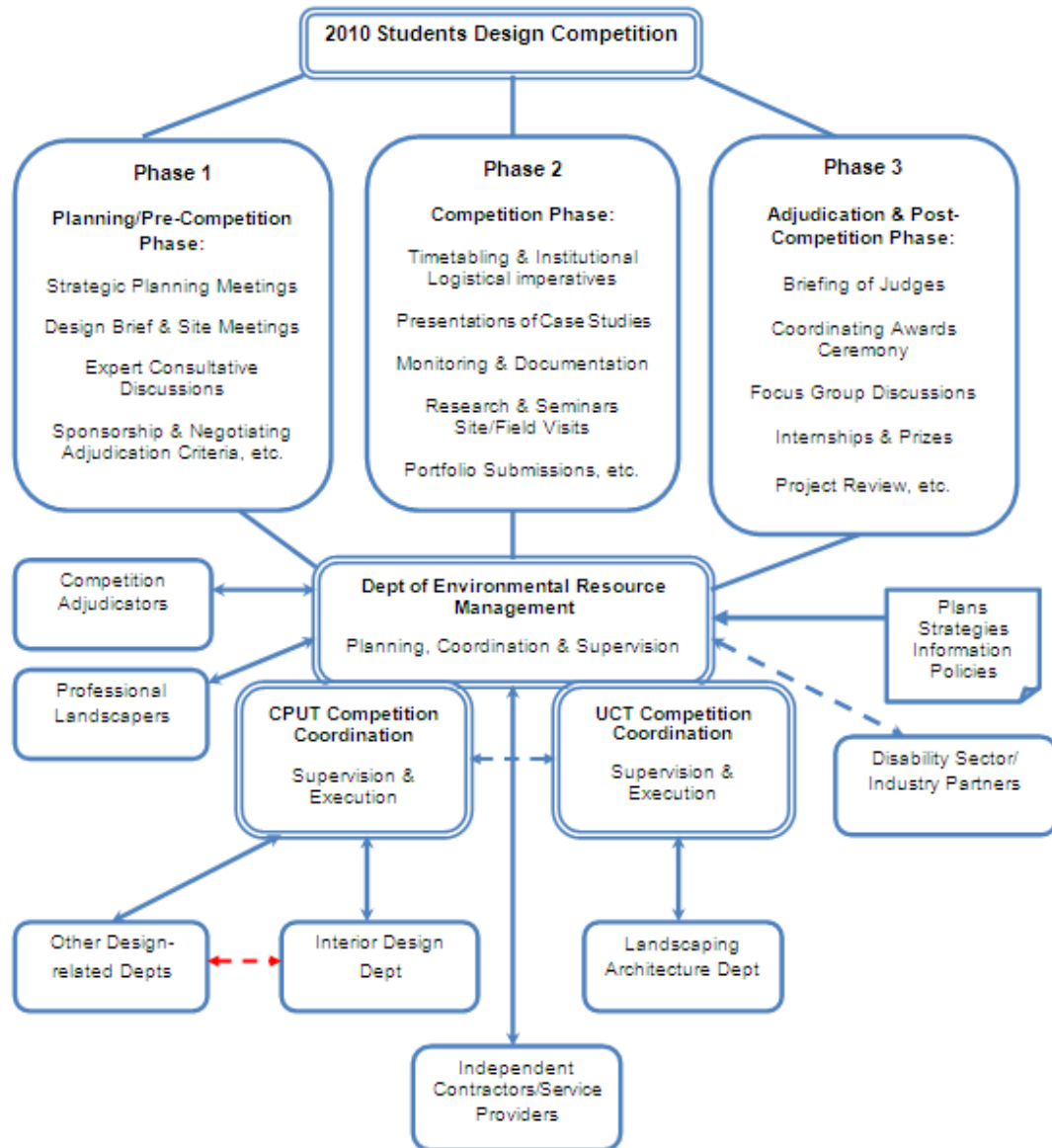


Figure 8.17: The students' competition: an overview

As mentioned earlier, the coordination of such a diverse number of communities and actors required constant flows of communication and information (Figure 8.18). Notwithstanding, several unforeseen challenges necessitated the re-interrogation of the process of the engagement. Further, some contradictions/tensions had to be resolved:

- the lack of commitment from design-related disciplines (other than interior design) necessitated a rethink on the multi/cross-disciplinary expectations in terms of group dynamics, the scaling down of the absolute number of expected student submissions, and the reformulation of judging criteria to reflect the student competency profiles;
- the DERM technical team did not engage the disability sector for specialist input though the interaction with industry partners resulted in additional potential prizes being offered for winning entries; and
- contractors and service provider did not invite the participation of civil society members representing special needs (such as the disabled).

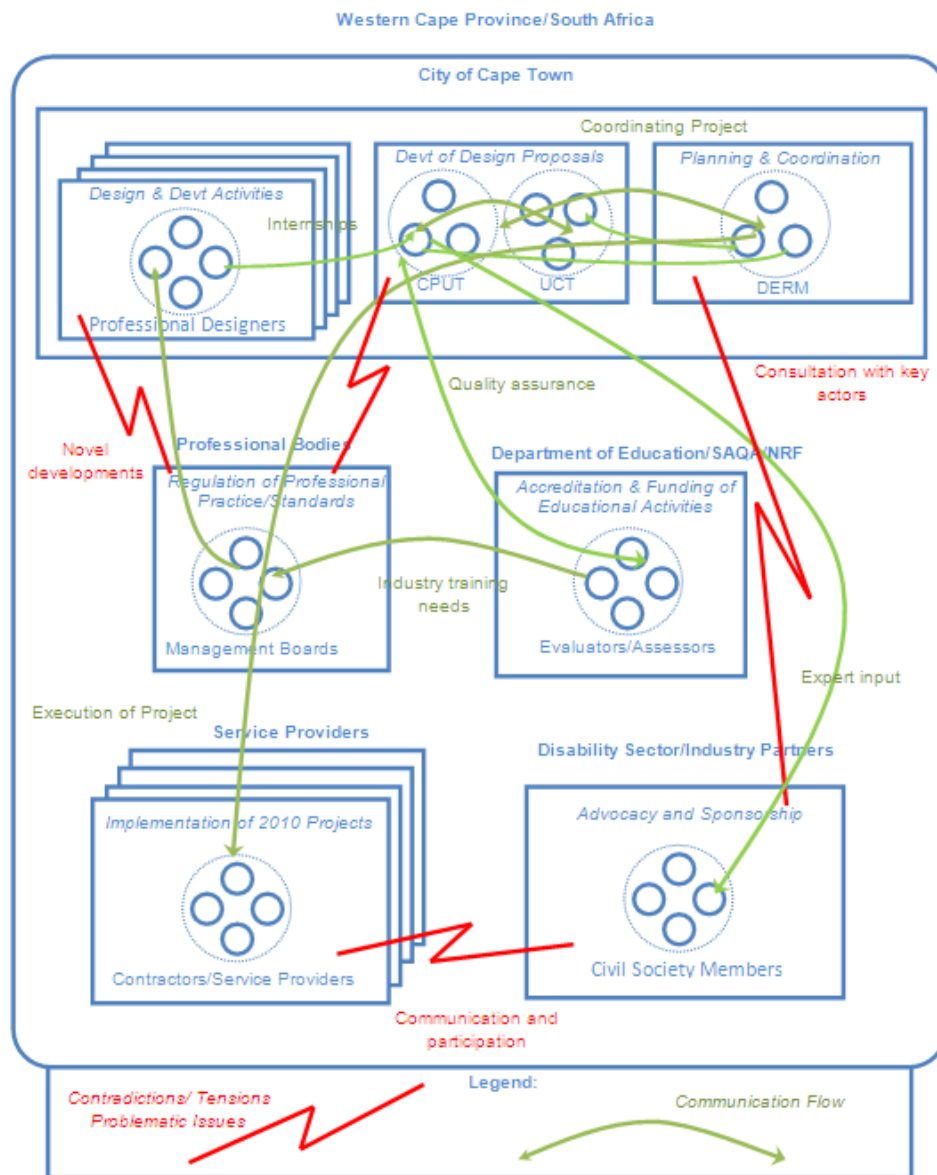


Figure 8.18: Activity analysis: the students' competition

The activity analyses in Sections 8.2.1, 8.2.2 and 8.2.3 provide insight into the group and collective aspects of the activities discussed. Activity Theory (AT) provides a practical analytical lens to view the dynamics of various actors and communities of practice which though very different in composition in each of the three cases discussed, show how the shared objective (of mainstreaming UD) potentially unites such disparate groups. The following section (8.2.4) is more detailed as it addresses operations and actions at the individual level. Further, the section presents results of analyses of responses in graphical form to elaborate emerging trends.

8.2.4 Thematic Analysis: Institutional Architect's Perspective

The five main themes utilised in the coding framework formulated are derived from the thematic analysis process (as elaborated in Table 7.4). The emerging twenty codes are summarised in Table 8.1.

Table 8.1 Summary of emerging themes based on coding framework

Theme	Code	Abbreviation
<i>Identification with Vulnerable Populations</i>	Personal Factors	PER
	Social Factors	SOC
	Political Factors	POL
	Technical Factors	TEC
<i>Familiarity with UD-related concepts</i>	Identification	IDT
	Definition	DFN
	Knowledge	KNW
	Application	APL
<i>Participation/Interest in 2010 Projects</i>	Events	EVT
	Logistics/Planning	LOG
	Policy	PCY
	Projects	PJT
<i>Integration of UD Principles</i>	Individual	IDV
	Professional	PRO
	Group	GRP
	Community	COM
<i>Promotion of UD concept</i>	Self	SLF
	Organisations/Institutions	ORG
	Champions	CHP
	Media	MED

In the analysis of the institutional architect's responses (Figure 8.19), the three main codes identified (in order of frequency) were those relating to *policy* on UD (20%), *logistics/planning* of 2010 projects (15%), and *identification* of UD-related concepts (12%). These are followed by *social factors* (7%), *technical factors* (7%), and *organisational/institutional* imperatives relating to the promotion of UD (7%) – these seemed to be of equal importance in this respect. The critical value of guiding policy cannot be over-emphasised. According to Adriana Hornea (2008):

The executive management of each university should define via its Disability Policy, the range, as well as degrees of disabilities which are to be accommodated by its facilities and means of instruction. There is no tertiary education institution in the world, which could accommodate all disabilities, out of practical/economic considerations (budgets are always limited, never sufficient).

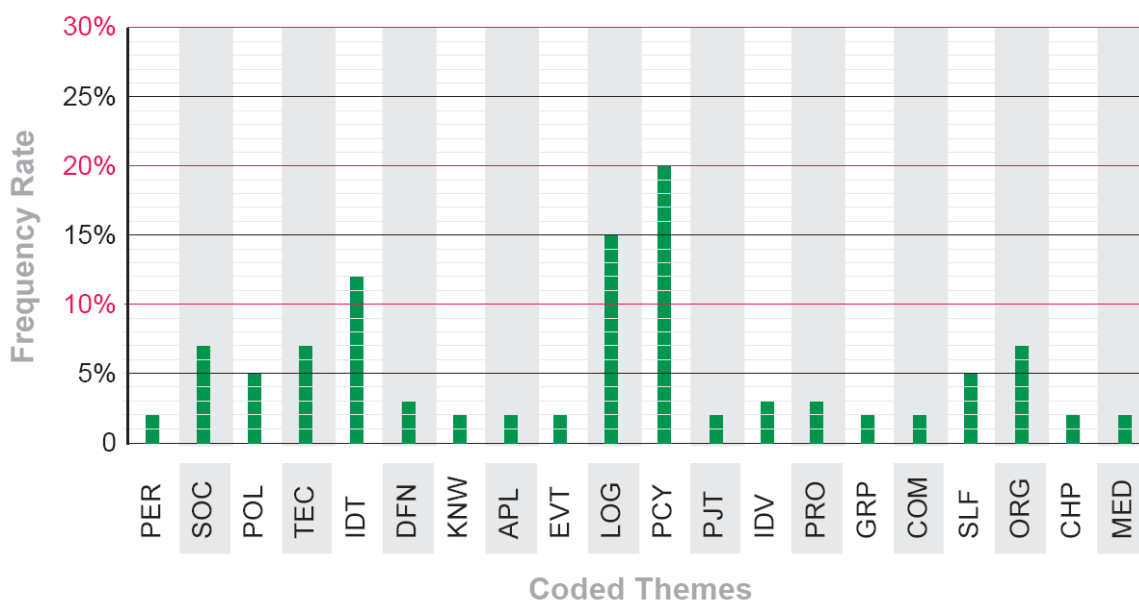


Figure 8.19: Thematic analysis: an architect’s perspective

As Hornea (*ibid*) points out, other institutional priorities tend to dominate the agenda, thus relegating UD-related concerns to the periphery. This challenge is particularly significant for a diversity-embracing institution such as CPUT should it seek to adopt UD as an official policy for addressing issues of inclusion and accessibility – UD must be viewed as a long-term investment and should be phased in gradually. The most effective way to demonstrate the efficacy of UD in an institutional context is in incorporating UD principles in new developments. Retrofitting is more expensive and often offers only superficial or temporary redress. Political commitment is required for “the consistent implementation of the UD principles in all decisions related to the university facilities are *a must*, and *should be a consistent priority* at top management level” (*ibid*).

Hornea (*ibid*) suggests that the Disability Units should be the most vocal and visible champions for UD within the CPUT community. The obstacles identified in the adoption and implementation of UD include: *general human resistance to change; mindset (including older institutional cultures); budgetary constraints; and [lack of] in-depth understanding of the UD principles (ibid)*.

8.2.5 Thematic Analysis: Design Students' Perspective

The thematic analysis of responses by the third year interior design students who participated in the landscaping competition reveals a different emphasis (see Appendix I). In this instance, the issue of *identification* of UD-related concepts (17%) is clearly the most important theme (shown in Figure 8.20). The next significant theme was the expressed desire for *group* participation in projects (9%). The next three themes are the identification of *social factors* (8%), *definition* of UD as a concept (8%), and *logistics/planning* for active participation in 2010-related projects (8%).

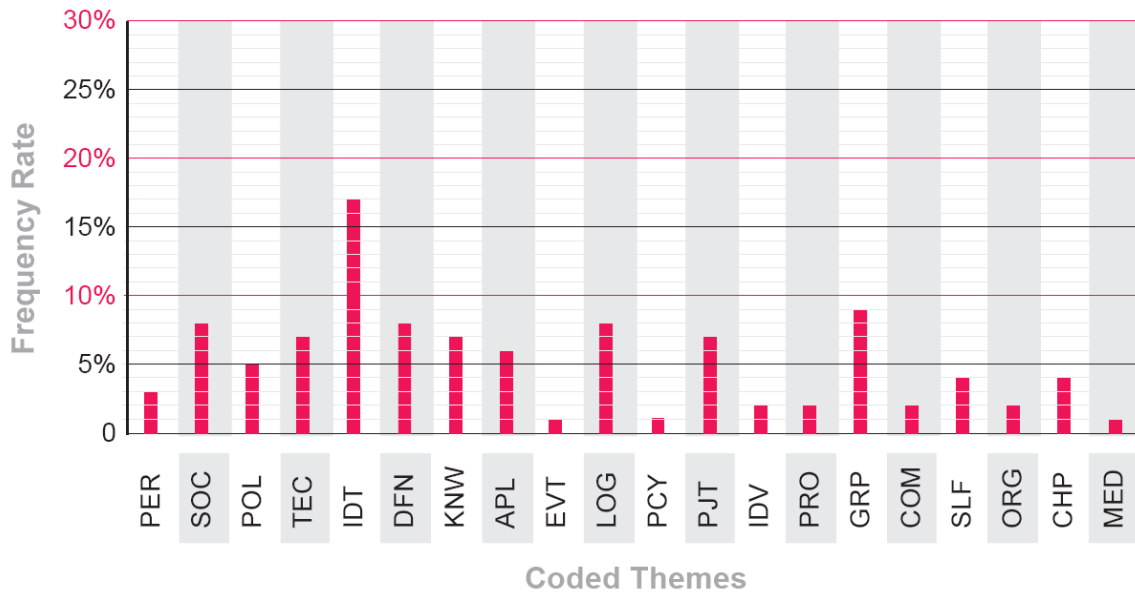


Figure 8.20: Thematic analysis: a design students' perspective

The value of group/team work was emphasised by the students. The following are quotes from informants regarding what they enjoyed most about the 2010 landscaping competition:

- *What was enjoyed about the brief was that it was a group project and we got to interact with each other* (Student 1).
- *What was nice about the project was that we all had to work together with each other's positive and negative, and we had to compromise, even if we didn't agree, but in the end we produced good work through working together. We enjoyed the group dynamics* (Student 2).

The challenges that the students encountered included *time constraints*, *lack of sufficient engagement* with the concept of UD prior to the competition, and *lack of confidence* when they learnt that postgraduate landscape architecture students from UCT would be participating in the

competition as well. Subsequently, the students' courage/confidence increased when the dual criteria (Appendix G) was elaborated and they learnt that they "were not going to be judged at the same level as landscape architect students" (Student 6).

The informants were unanimous in their support for the *involvement of students from other design disciplines* as an integral part of their teams. The various rationales provided include the following:

- *I think the students are aware that in industry they will be working in multi-disciplinary teams, and they understand that each discipline brings something different to the team and are kind of conditioned to this idea. It would be wonderful if we could get the opportunity to work in a multi-disciplinary team* (Lecturer 1).
- *Because where we lack knowledge they can build us up* (Student 5).
- *Didn't we do that already? Last year's [interior design] third years were going to have to work with the surface designers* (Student 7).
- *So we have done it before, it was a very successful project, but was also very strenuous and difficult in the beginning because people have different priorities, and we want to be individuals and we like our differences but we still need to work together* (Lecturer 2).

The disciplines most likely to be co-opted for membership in teamwork included *landscape architecture, urban design, tourism* and *graphic design*. In response to the question of whether they talked to (or consulted with) people outside of their own discipline, students reported that they spoke to *graphic designers, architects, and landscape architects*. One student visited Metrorail to consult technical experts on a train carriage theme that they were exploring.

In response to the question on whether the informants considered competitions to be an effective platform for promoting new design concepts/ideas, the following responses are sampled:

- *I think it is an opportunity for anybody to prove themselves and show what they can do in terms of 'green design', and all these things* (Student 3).
- *I also like to think, and like to promote this, that having competitions geared to young developing designers, you are at the nexus of innovation, because they haven't been tainted by all the other things in the world. So I think competition at this level is probably the best learning curve that students can gain* (Lecturer 2).
- *It gives us feedback and a sense of achievement when you design something and someone else [in industry] likes it and compliments you for it* (Student 4).

- *If I design something at home in my room, nobody's going to know about it, but if it's for a competition, there's a big panel of people who knows where it's actually moving to so they can see potential in your work (Student 6).*
- *Also I think it gives you more freedom to design what you want to design, because at the end of the day you're not going to get a mark for it, whether you win a prize for it or not. Because you can do something you've always wanted to do before but you were too scared because of [the concern over] marks (Student 2).*

The students felt that *effective communication* and *allocation of sufficient time* for participation would make future competitions more effective in promoting novel concepts or ideas. With respect to UD, informants stated that what worked best for them was that:

- *I found it quite a challenge. I had the really exciting topic of doing the paving, which wasn't like the most design-award-winning topic to have, but to try and incorporate everyone; someone with a blind cane, someone with a wheelchair, people running, etc. It is really tough and it is a big challenge to try and think of all the different ways of doing that. I have not had the chance to apply it to another project since that, but I know I found it really tough (Student 8).*
- *Incorporating it without making it obvious, because in the bench that I did, I looked at the seating and realised, that if I took one of them away, wheelchairs could roll up to it so that it provides the facility, without putting up a big sign saying "here it is for you to use", you just make it usable, and I think that made quite a big impact (Student 9).*

Asked what did not work for them vis-à-vis UD, the informants stated:

- *You know what it was? It was: "okay it's an awesome idea, great concept, it includes everyone, then you get down to the practical nature of doing it, and you try incorporating those ideas, but then you have to try get your ideas past the person in charge of the project who has their own ideas, and believes you should have certain barriers. It was an interesting challenge (Student 10).*
- *We had to constantly remind each other about how someone in a wheelchair was going to get there or access that. So we had to keep it in the back of our minds (Student 11).*
- *It's like knocking away at a block to create a statue. It becomes very difficult to accommodate everybody. To find the ways, and when you have the ways, it places limitations on the design, and takes away from the aesthetic. To find a design that doesn't scream "I'm here for disabled people" or "I'm here for people with wheelchairs." Every time I designed something I had to go back because I came to*

the realisation, that vandals could rip this up, or that there was no place for the disabled to sit. So I had to go back to the drawing board and adapt it (Student 12).

Informants found it difficult not to associate UD with disability-specific needs. Some however found that “it was actually easier to say that [we were] thinking of other people because a child could also use it because it is lower, so [we’re] also fulfilling two purposes, kind of. So it wasn’t too much of a bad thing that we had to think of more people” (Student 13).

Regarding the level at which UD should be formally introduced to them, there was general consensus that it should begin in first year. Here are some responses:

- *It would need to be taught in first year, and in ‘Design’ but also in ‘Services’, but definitely in ‘Design’, because its no just about the technicality of it but also how to integrate it (Student 14).*
- *I think that the theory should be done in first year, and the practicality should be done in second year. Because in second year we start dealing with wheelchair [users], but in first year we don’t have to think about that (Student 15).*
- *I think first would be the theoretical component, where we look at functions and human occupants and how we make human occupancy viable and comfortable and I think ultimately, all things considered, UD actually extends design to a totally different platform. The more we include it in our answers the bigger the design becomes [and] the more inclusive and democratic it becomes. We should be conditioned from the beginning. So I do agree [with the students] that we should incorporate it at the theoretical level in first year and at a more practical level in second year (Lecturer 2).*
- *I think for too long we have just been looking at wheelchair people only and the other people get lost along the way (Student 7).*
- *It is impressed on us that we need to incorporate people in wheelchairs, but in this project we had to look at blind people and deaf people, all kinds of people, children and elderly. Usually we would just throw in a wheelchair line, put a button lower, that kind of thing (Student 11).*
- *That runner [Oscar Pistorius] that has no feet, that is also something that we will eventually have to start looking at, because that’s almost like a new technology, so people who have lost their limbs are not even going to sit in a wheelchair, so we need to look at what the faults are with that and what’s going to be (Student 16).*

Informants agreed that the principle of *Low Physical Effort* was the one they would most like to incorporate in future. Regarding the way in which UD could best be mainstreamed in interior

design, the informants suggested that engagement with people of diverse abilities would help them challenge some of the stereotypes they acquired regarding diverse users. There was general agreement that the students certainly felt more confident (with respect to professional competence) after participating in the competition. Additionally, all informants stated their intention to continue using UD principles in their future interior design projects.

The only individual (or organisation, or department) offered for consideration as a possible champion for UD in Cape Town was (former President) Nelson Mandela. There was however concern that in attempting to be politically correct in every respect, the impact of the final message could be compromised and potentially lost altogether. To address this ethical dilemma, informants discussed the possibility of using a “green-coloured” fictitious (animated) character that would be neutral and therefore more acceptable to all parties concerned (Student 17).

The analysis of the focus group’s responses validates the Vygotskian concept of *internalization* (in Activity Theory) as a transformational process which results in measurable changes in the structure of activity. Internalization “involves social processes and semiotic mechanisms – particularly language [...] – this transforming process depends upon cooperative labour and social interactions” (Bedny *et al.*, 2000:171). The mediating cooperative strategies/tools (as advocated by Chmela-Jones, Buys and Gaede, 2007) were the principles of UD (as semiotic mechanisms) through a social process that invited the students’ participation in the landscaping design competition and was simultaneously open to participants from another institution

8.2.6 Thematic Analysis: Indigenous Knowledge Expert’s Perspective

The one theme (based on the questionnaire in Appendix J) that stands out most prominently from the analysis of the indigenous knowledge expert’s responses is that of *identification* of UD-related concepts (26%). The next significant theme was the need for engagement with UD concepts at the *community* level (17%). UD appears to be an alien concept in the discourse on *indigenous knowledge systems* (IKS). A third theme relating to the promotion of UD suggests that emphasis should be on *self*-driven operations and actions as opposed to a group level activities at the collective level (11%). Further, the *social factors* relating to the identification of vulnerable populations (7%), and the lack of a clear identification with UD-related concepts (7%) suggest the need for clarity in the grand narrative of disability (and other “extra-ordinary” human conditions). The other themes (as shown in Figure 8.21) appear to be of minor significance in the context of IKS.

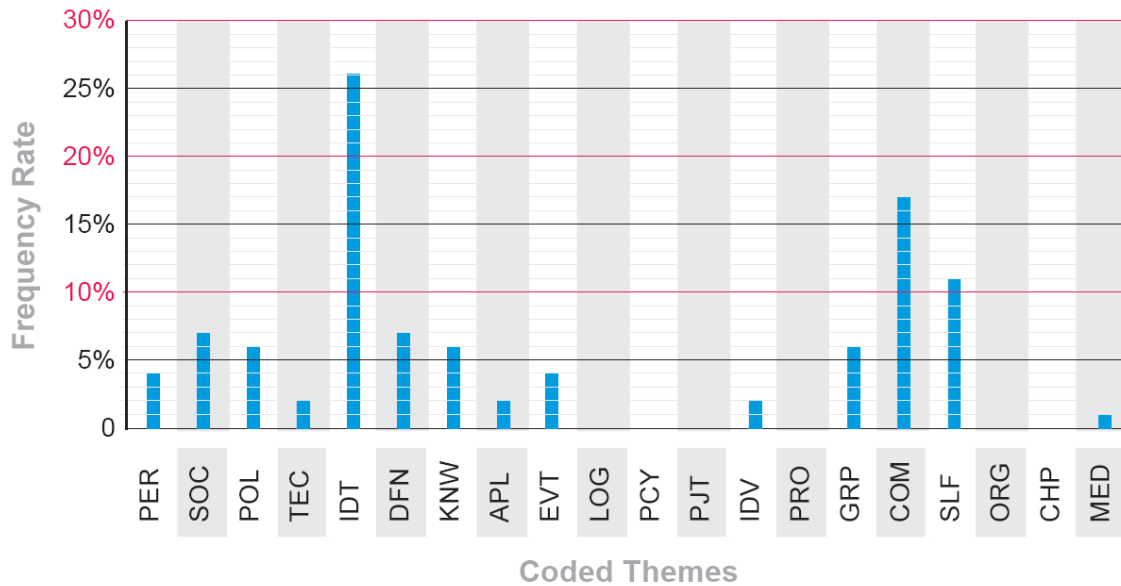


Figure 8.21: Thematic analysis: an IKS expert’s perspective

Nomathamsanga Tisani (2008) links the discussion on UD to ‘universality’ and ‘university’ in arguing that these three ideas should counter the notion of homogeneity and class belongingness, and instead “[are] supposed to denote *openness* and *inclusion*”. As such, UD strategies (that are cognisant of IKS) should adopt a postmodernist stance and guard against being associated with “a homogenous group, a particular group that speaks a particular language; with a particular background; with particular thought-forms; with specific thought-forms” (*ibid*). Further, disability is arguably “a very difficult concept in an African context” if one posits disability within “the strong binary philosophy [or] dichotomous logic” linked to Western thinking (*ibid*).

Tisani (*ibid*) argues that with respect to apparent physical differences, people considered ‘disabled’ in modern parlance were traditionally “seen as being *special* because of the difference and actually as being *selected* – as one *elected* because of being special”. Subsequently, the focus with respect to “extra-ordinary” individuals was on their *ability*. This view was consistent with the principles engendered in *ubuntu* which humanises the condition by acknowledging the humanity of the person with a disability – *ubuntu* intrinsically respects physical and intellectual diversity – “uniqueness is actually celebrated and recognised” (*ibid*).

Additionally, elective socio-cultural practices including various forms of initiation (such as facial markings and related rites-of-passage) were celebrated for reaffirming the body-image, identity

and (inter)connectedness of individuals and their respective communities and were collective/communal bonding experiences. As such, if children were born with unique features, a conscious effort (usually championed by female relatives) was made to link the said appearance with that of another relative (whether living or deceased). In this sense “the notion of *being different* and *being special*” were strongly correlated (*ibid*). Facial markings that were traditionally a source of adoration are often presently referred to as ‘scarring’ (or scarification) – a fact that reveals negatory attitudes towards the practice. Further, individuals exhibiting atypical appearance or behaviour are branded as being ‘scarred’ and elicit strong responses of revulsion or denial outside one’s community, possibly due to social ignorance or cultural chauvinism (*ibid*).

A number of people with disabilities in traditional African societies achieved great success in various spheres of life and were consequently honoured by their communities. Tisani (*ibid*) gives the example of a famous traditional leader known as Sandile who “had a limp”. Sandile was born in the 1820s was the brother of Maqoma, the renowned military leader of the *amaXhosa* who fought against the British in the nineteenth century. Both brothers were equally revered for their legendary courage and military prowess.

Tisani (*ibid*) suggests that negative, stigmatising or discriminatory connotations of atypicality have Biblical associations and illustrates this point as follows:

... because also now you get these strange things in the Biblical teachings – the Bible does not allow difference and this albinism is always associated with curse. The notion of the curse has very strong Biblical roots or steerings and [as such] albinism is very difficult. All I know is that around albinism a lot of myths [are] built – one of the things that is said is that they are described in animal-like language such as ‘inkawu’ (which is a monkey). So they [people with albinism] are referred to as monkeys, and I don’t know whether we were referring to them as monkeys because of the vervet monkey. There is a lot of mystery and ignorance about them, but they are embraced by family and friends. So again there is that linear [dichotomy] – that line of revulsion and complete acceptance. [...] So this rejection of something that is different we carry it along because if those children are born, we actually love them. That actually is a condensed African philosophy where you’ve got what would be seen as antithetical co-existing because they are not exclusive. A day will not be if there is not going to be a night because they are complementary; they are mutually reaffirming. That is our identity. So even that rejection is not finite as [one finds] with a way of thinking that is exclusive...

Ubuntu should not be invoked selectively to buttress responses to people with disabilities as this would perpetuate the stigma associated with observable differences – it should instead engage all members of society regardless of their (dis)abilities in alignment with the UD ideal. *Ubuntu* is informed more by *empathy*, not *sympathy* in response to other people. As Tisani (*ibid*) argues:

Ubuntu is [...] being put into books rather than being a way of life [and is consequently] becoming quite difficult. Because we are not going to begin to have ubuntu when engaging with people who are disabled – that will immediately negate ubuntu – it will be just being either paternalistic or maternalistic. I would prefer a broader definition of ubuntu and even in the ‘first culture’ you will see [reference to] the relationship of ubuntu between the normative institutions and those seen to be different, because once it is given to them, as [a] special dispensation, then it will no longer be ubuntu...

According to Tisani (*ibid*) women “are pace-setters in African communities in their roles and interaction with everybody be it the young or the elderly; be it the sick or well; be it the different – because it is in rare instances where the mother rejects a child, and will struggle even in the present society”. As primary caregivers, women would naturally champion UD-related issues in their own families and communities. With regards to ways in which UD can incorporate IKS for a more sustainable future for all, Tisani (*ibid*) argues:

Sustainability is more important for systems, rather than for concrete examples. People want to give concrete examples and want to give that as an African thought-form. But it is in understanding the underlying systems that hold reality together. And when you think very hard on sustainability it does come out, so we have to understand indigenous systems by sometimes debunking them from the factors that have influenced us. And if you think hard enough you can actually fish out indigenous systems which are sometimes more enriching, more enlightening and [by extension] more sustainable...

8.2.7 Thematic Analysis: Politician’s Perspective

The thematic analysis of codes emerging from the semi-structured interview (in Appendix K) with the politician from the *Democratic Alliance* party indicates that *group* activities (10%) and *organisational/institutional* imperatives (9%) with reference to integration of UD principles are most significant. As a category, *participation/interest* in 2010-related projects are important concerns with *logistics/planning*, *policy* matters, and specific *projects* (all with 8%). *Personal* factors (8%) and *social* factors (6%) in identification with vulnerable populations is also significant (at 8%), whereas *knowledge* and familiarity with UD-related concepts (6%) follows

closely. The remaining codes are not as significant statistically, though a comparison with Figures 8.19, 8.20 and 8.21 shows the politician’s responses to be the most evenly distributed.

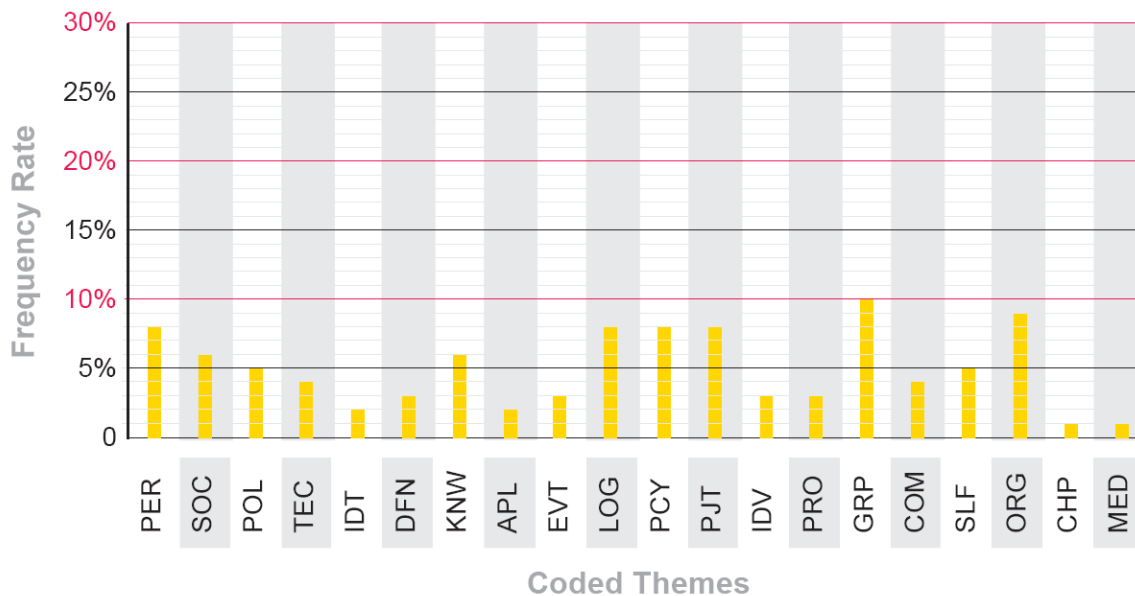


Figure 8.22: Thematic analysis: a politician’s perspective

According to James Vos (2008), those categorised as ‘vulnerable’ include “the youth, senior citizens (or the elderly), and the disabled – those are the three categories which [are] the most vulnerable sectors of our society”. As a councillor and politician in the Democratic Alliance (DA) party (and in keeping with the DA’s vision of *An Equal Opportunity Society for All*), Vos (*ibid*) views politics as “a vehicle to have a much more longer-term benefit and impact” on the social development agenda in the Cape Town UniCity, with the “objective of bringing focus, relief, and giving more emphasis on these three sectors of society”. Whilst acknowledging the usefulness of short-term infrastructural developments, Vos (*ibid*) emphasises the need to adopt an *outcome-based approach* to leverage large-scale projects such as those associated with the hosting of the FIFA 2010 World Cup™ to benefit micro-entrepreneurs.

Vos (*ibid*) sees UD as a useful tool to address the needs of the vulnerable sectors of the society “because their needs though different, at the end will all require the same provisions”. The DA is associated with “*liberal democratic values* which are underpinned by the rights of the individual” (*ibid*). Further, the DA has a special focus on women through the *Democratic Alliance Women’s Network* (DAWN) as well as a number of initiatives of benefit to vulnerable populations (*ibid*):

- holding the regular *Senior Citizens’ Month* in October and November;

- maintaining an active *Disability Desk* in the national parliament;
- supporting activities for the *Tygerberg Service Centre for the Aged* through the *network of care* concept;
- sponsoring the *Extended Family Tax Allowance* in the national parliament so as to offer tax relief to those families opting to stay with their elderly relatives instead of sending the latter to institutional facilities (such as old-age homes);
- sponsoring *The Funding of Homes for the Aged* proposal in collaboration with CommuniCare to develop ageing-in-place *gap/social housing* for the elderly;
- supporting the call for more *subsidised meal schemes* known as *Meals on Wheels* (without promoting unnecessary dependency by recipients);
- promoting better *access to proper health care* through the *City of Cape Town Health Portfolio Committee* (which Vos chairs);
- supporting the roll-out of more *mobile clinics* through *private-public partnerships*;
- the improvement of distribution and collection of *chronic medication* (especially for senior citizens) through the introduction of a *pre-packed system*;
- developing a user-friendly integrated colour-coding as a *wayfinding system* Bothasig Clinic as a pilot project to make the clinic more accessible; and
- hosting *senior citizens* through a regular programme called *Breakfast in Bed with James Vos* which is publicised through the media to raise awareness on the needs of the elderly.

Vos (*ibid*) believes that care for and showing respect for the elderly is a reflection of society's values. He states thus:

I say no community, no country, can really talk about improving the quality of life if it does not show respect for its elderly, if it does not show respect for its youth, and if it does not show respect for the disabled. No country, no city, and no community can talk about improving the quality of life if it does not show respect for the vulnerable. [...] I'm also saying that we have a duty, and a responsibility to take special care of our senior citizens (we are only talking about seniors now, but this can apply to the disabled and the youth). This sector of the community has made an invaluable contribution to society. [...] I say to them; "you know, you must not be put in an old age home, we must keep you here amongst us. We must build communities and build families. We must recognise your valuable contributions because you have the wisdom, you have the persistence, and you have the know-how...

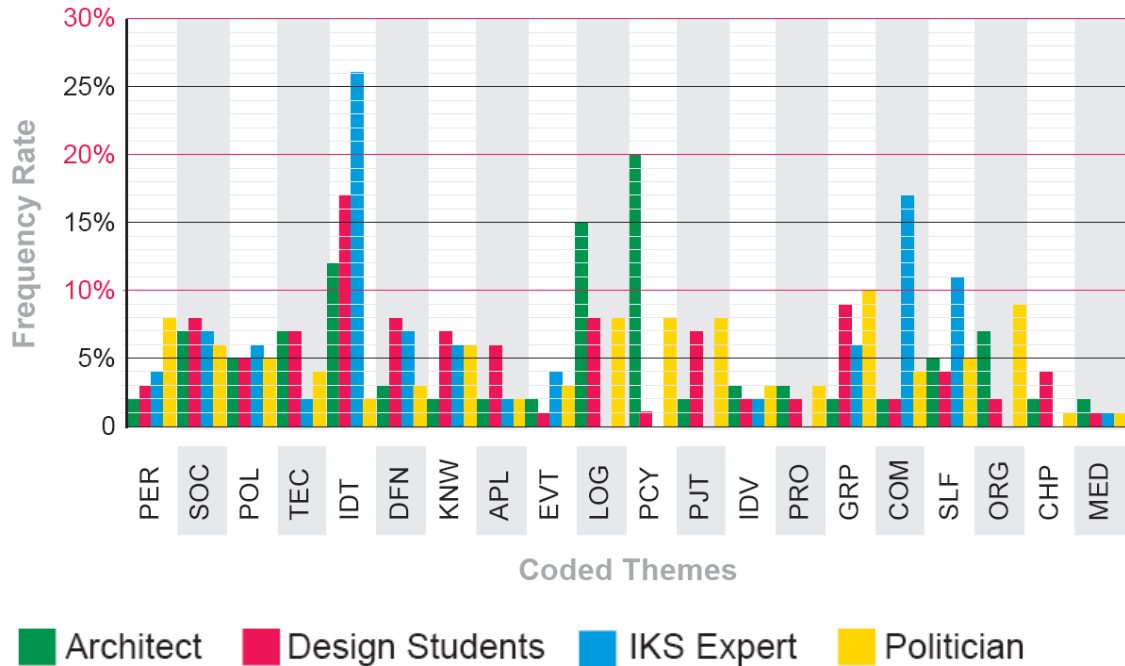
With regards to the possibility of incorporating UD within the DA's overall response to vulnerable populations, Vos (*ibid*) states the following:

UD is an exciting and creative concept which aims to achieve more-or-less what we have set out ourselves to achieve. [...] As a political party the DA can benefit from case-studies [on UD] as the DA believes in taking extra-special care of our vulnerable citizens within society. Where the DA shares your views on how to influence legislation, how to influence policy in our country. To speak in favour and to the benefit of these people (these sectors of society) then the DA can benefit. And if the DA can benefit, people ultimately also benefit. So I think most definitely at the level where I am involved (and) I would also like to propose that we put you into contact with our DA policy advisers and researchers so that one can pick up on that from the national level.

Vos (*ibid*) believes that the individuals and/or institutions that would best champion UD in different spheres of life should be "organisations looking after people with disabilities". In his opinion, he believes a number of "well-structured civil societies of active rate-payers, active sports clubs, churches, Lions International, and a number of other organisations [...] would definitely be able to benefit, and to be sustained by engaging with UD" within the ward he represents (*ibid*). The potential legacy of the FIFA 2010 World Cup™ for residents (and visitors) in Cape Town should be on the small entrepreneurs who ply their trade within the city of Cape Town – the event should be used as a catalyst to ensure a legacy of sustainable economic development (*ibid*).

8.2.8 Thematic Analysis: Consolidated Perspective

The single most significant theme (with a group average of 14.25%) emerging from the consolidated/comparative analysis shown in Figure 8.23 is that of *identification* with respect to familiarity with UD-related concepts. This places importance on the need to create an accessible database of exemplars that clearly identifies UD and its related principles for ease of recognition. Other significant themes include that of *logistics/planning* (7.75%) and *policy* imperatives (7.25%) with regards to participation/interest in 2010-related projects; *social factors* (7.00%) in identification with vulnerable populations; *group* (6.75%) and *community* level dynamics (5.75%) in the integration of UD Principles in various activities; *self-driven* (6.25%) reasons for promoting the concept of UD; and *knowledge* (5.25%) or familiarity with UD-related concepts. The remaining codes and themes are not a significant and there is a more representative spread in coverage by the design students as compared to the architect and politician's responses. Analysis of the IKS expert's responses indicates that a number of codes are under-represented.



PER (Personal Factors): SOC (Social Factors): POL (Political Factors): TEC (Technical Factors): IDT (Identification): DFN (Definition): KNW (Knowledge): APL (Application): EVT (Events): LOG (Logistics / Planning): PCY (Policy): PJT (Projects): IDV (Individual): PRO (Professional): GRP (Group): COM (Community): SLF (Self): ORG (Organisations / Institutions): CHP (Champions): MED (Media):

Figure 8.23: Thematic analysis: a comparative view

Consequently, context-responsive UD strategies would need to allow for prior planning and mapping out of key actors within society to be included in the community-of-practice. Further, the coordinators/drivers of the project should engage (potential) participants individually to establish their levels of expertise and commitment. Champions would then be brought on board once some initial research and groundwork has been done to chart out the planned project.

8.2.9 Findings from Student Survey

A survey (see Appendix L) on the levels of engagement with UD by design students was carried out at the Cape Town Campus, CPUT. Whereas six design sub-disciplines within the *Faculty of Informatics and Design* (FID) were approached at the commencement of the survey, *surface design* students at the time felt that their design process did not align with the problem-based learning model the others followed. *Jewellery Design and Manufacture* students were not approached for the self-same reason. Notwithstanding, a senior lecturer in the *Department of Fashion and Surface Design* participated in the semi-structured interviews administered to design teaching staff. Altogether, 147 students from the Departments of *Architectural*

Technology, Graphic Design, Industrial Design, Interior Design, and Town and Regional Planning participated as shown in Table 7.3.

The top four categories of “extra-ordinary” population groups (in rank order) that the majority of students were most familiar with are: *elderly people*, *young people*, *foreigners*, and *women who were either pregnant or had toddlers* (as depicted in Figure 8.24).

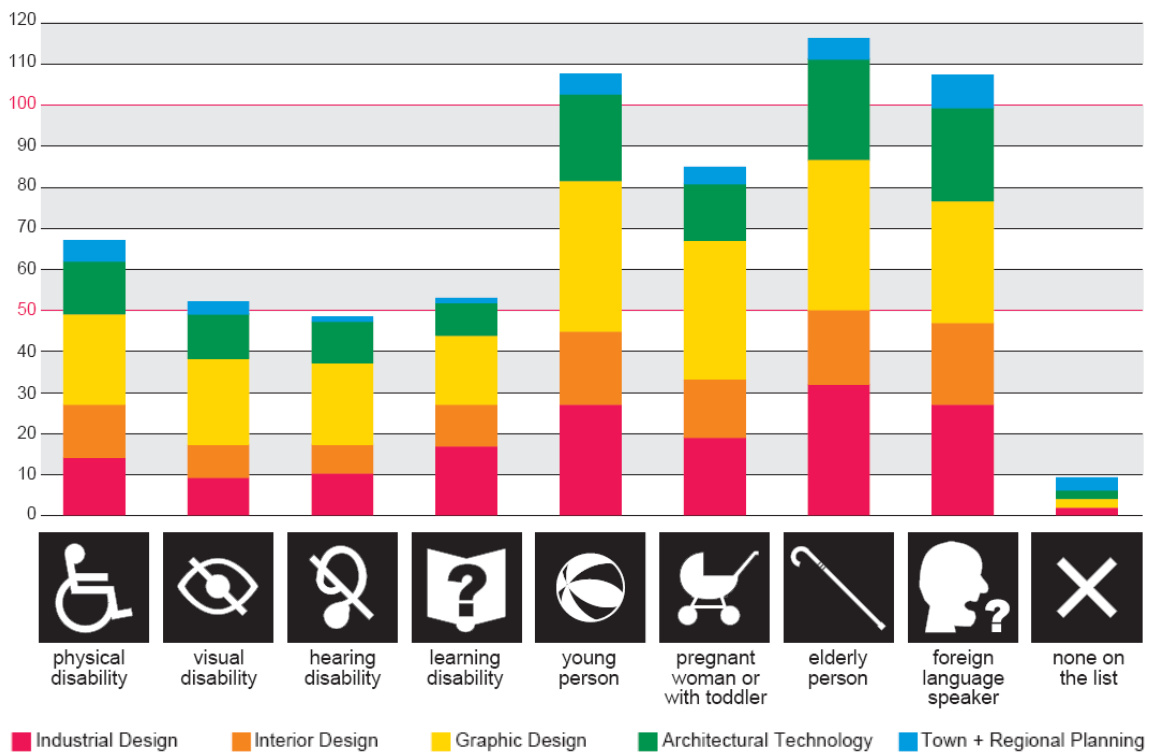


Figure 8.24: Familiarity with “extra-ordinary” population groups
(symbols: © David Christer, 2009)

People with *physical* disabilities (including those using wheelchairs on a regular basis) were the form of disability that most students were familiar with. This point is confirmed in the focus group discussion with interior design wherein the most frequently cited representative typology for disability were wheelchair users (see transcribed verbatim responses in Section 8.2.5). Consequently, strategies for introducing UD at CPUT/FID (particularly in the first year of study) could start with discussions around challenges brought about by ambulatory limitations with regards to products, systems and built environments. The experiential exercises facilitated through the use of a wheelchair (as described in *UD for Product Designers* module in Section 5.2.3.1) could be readily extended to other sub-disciplines (Benktzon, 1993; Moore, 2001). Other forms of disabling limitations in functioning could also be simulated to promote empathic design

responses by the students whilst simultaneously advancing their *zone of proximal development* (Vygotsky, 1981; Bedny *et al.*, 2000; Coleman, 2001).

Interestingly, many informants also stated familiarity with persons with *learning* disabilities (such as dyslexia) – a fact attributable to the mandatory requirement at the time that as a prerequisite to entry into design programmes, students had to undergo a battery of *psychometric tests* organised by the CPUT *Student Counselling Unit*. The majority of informants (74%) reported that they had not received any UD-related training during the previous six months leading up to the survey (Figure 8.25). Of those that had received some UD-related training, Architectural technology students had the highest rates of attendance. A UD module targeting the design disciplines of FID could be formulated and coordinated by the Departments of *Architectural Technology* and *Industrial Design* as lead partners/collaborators.

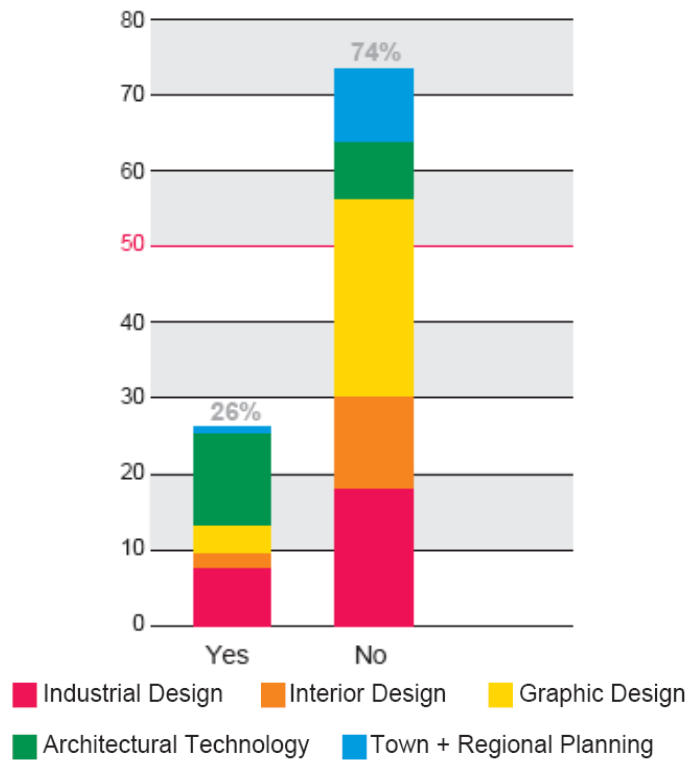


Figure 8.25: Whether the informants had UD-related training during the previous six months

Of the different UD-related concepts, *Design for Disability* and *Design for All* (with 25% each) were the ones that students were most familiar with (see Figure 8.26). A significant number (16%) were unfamiliar with any of the concepts. Indeed, this number was greater than those who were familiar with UD (15%). Further, those who knew of *Barrier-free Design* (10%) were more

than those who were familiar with *Inclusive Design* (9%). *Graphic design* students formed the majority of those who claimed *not to know* any of the concepts. Notwithstanding, the combined total who linked UD to its more inclusive synonyms (that is, *Design for All* and *Inclusive Design*) totalled 49% – which works out to about half of the total number of responses.

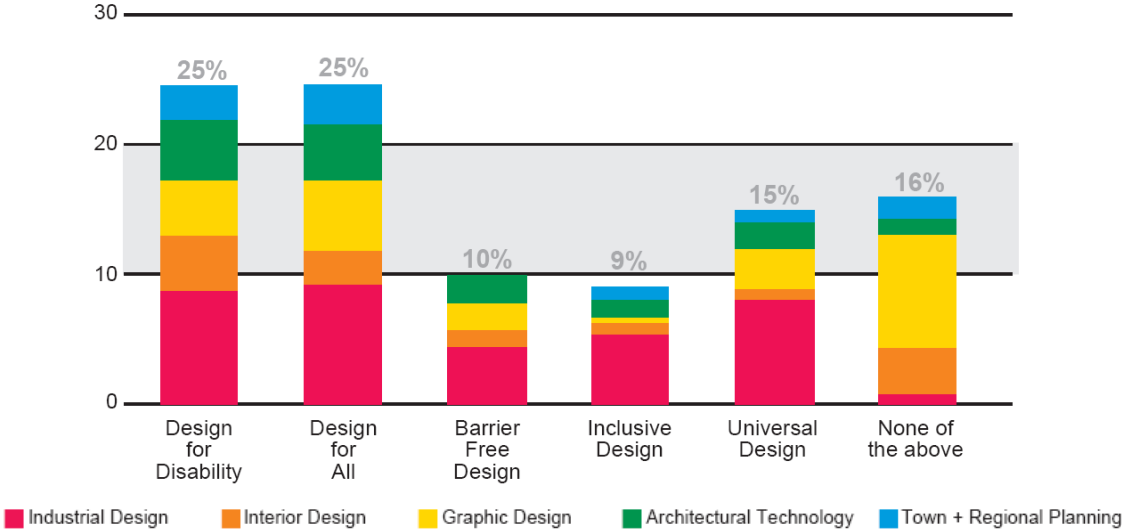


Figure 8.26: UD-related concepts that were most familiar

Of the UD-related concepts discussed above, the ones that were best understood followed more or less the same trend (Figure 8.27). *Design for Disability* (30%) is the best understood concept, whilst *Inclusive Design* (3%) is the least understood. *Industrial design* students form the significant majority of those who claim to understand UD, whilst virtually no *architectural technology* students claimed to understand either *Barrier-free Design* or *Inclusive Design*. As such, a course targeting this community of students should clearly articulate the links between UD and allied concepts to facilitate greater understanding and uptake of the former.

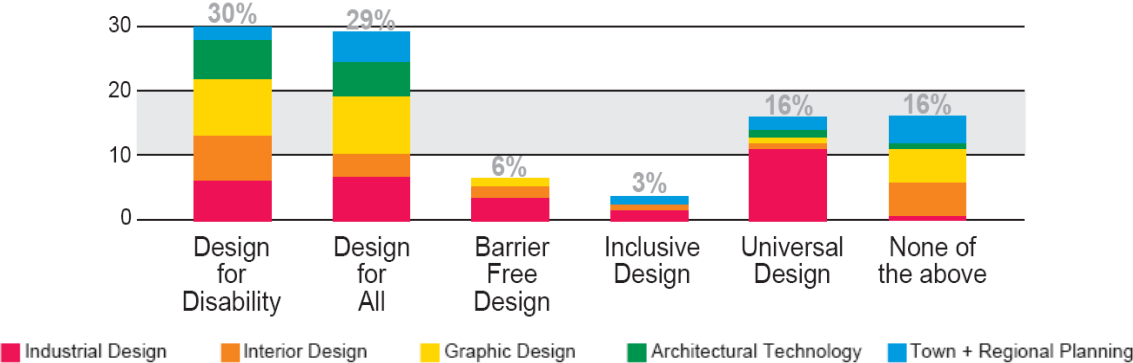


Figure 8.27: UD-related concepts that were best understood

In response to the question requesting informants to provide a *brief definition* (in their own words) of the concept they selected in the previous question, informants submitted a variety of definitions as sampled below:

- *design for people with disabilities, to aid in society;*
- *recognisable design;*
- *keeping in mind all the different shapes, sizes, cultures, etc of people and designing something everyone can use and understand;*
- *designing intelligent solutions for the disabled; user-friendly designs for people with disabilities;*
- *designing for everyone even if they can't design;*
- *design that reaches a large audience, that is easily understood by all;*
- *design where all people are taken into account, but with a bias towards those who have difficulty using some object or facility, catering for them, but in such a way that the largest group of users can still use the facility, usually better than before;*
- *a set of 7 design guidelines which, if applied, helps to make products/surroundings easier to use for all – but mostly those with special needs. If it is easy for individuals with special needs it will make the use by regular individuals much easier;*
- *UD is 'good' well thought out design. UD comes naturally if the designer takes into account all the possible users and designed accordingly to suit their specific needs;*
- *UD is well, proportioned, and flexible design, that speaks to the user including all people from all backgrounds, and all abilities;*
- *design allowing for all variations in human physiology and anthropometry;*
- *design for use of a multitude of people, creating environments which can be used by more than the general public;*
- *designing a product which targets your specific target market to the best of your ability;*
- *UD is when objects go beyond specific areas of 'acceptance' i.e. something that is universal can fit or adapt to any related object. A universal designed object is inclusive;*
- *design that relates to all and includes as many people as possible;*
- *designing for all people, including the elderly and persons with disabilities;*
- *to design for disabled people to allow for comfort and freedom in their environment;*
- *designing in ways that fulfil the human need mentally, physically, etc;*
- *answering all human needs; design for all people, disabled or not;*
- *designing appropriate spaces for the individual and the environment;*
- *making things accessible for people with disability;*
- *taking wheelchairs, etc into account when designing entrances, spaces, etc;*
- *design that provides safety, comfort and practical solutions for disabled people;*

- *innovative design that recognises and meets the needs of those with disabilities and helps make their lives easier especially in those tasks we find easy to do, but is very difficult for them;*
- *Design for Disability would be designing spaces that are comfortable for people with disabilities as well as how they would use the space;*
- *accommodating for disabled people and enhancing their mobility;*
- *design that caters for a diverse group of people, not a specific race or culture;*
- *designing for the disabled using ergonomics, to make their quality of life better; and*
- *allocations and adaptations to improve design, so that it helps the disabled.*

The vast majority of informants correlate UD-related concepts predominantly with designing for people with disability. A number of responses acknowledge the need to accommodate diversity and heterogeneity in the quest for inclusiveness. Arguably, disability is a strong recurring theme in the discourse on UD and would need to be incorporated as one of several key constituencies within the purview of UD. The aforementioned definitions are vital for accurate semantic and semiotic interpretative descriptors for Principles of UD and their corresponding pictograms (Figure 8.28).

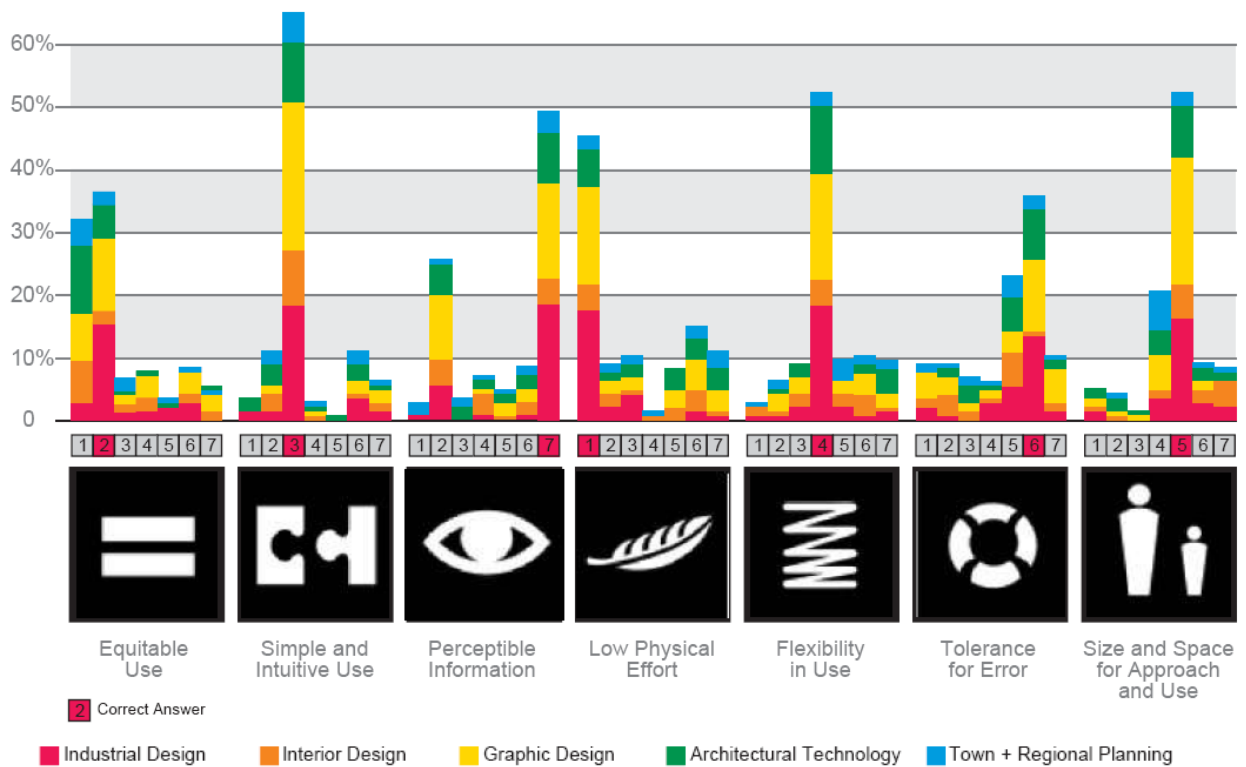


Figure 8.28: Recognition of Principles of UD pictograms

(source: © Beth Tauke, 2001)

The pictograms that have the least ambiguous associations appear to be *Simple and Intuitive Use* and *Flexibility in Use*. The four most ambiguous pictograms appear to be those of *Equitable Use*, *Tolerance for Error*, *Perceptible Information* and *Size and Space for Approach and Use*. Generally speaking, the more explicit pictograms are easier to recognise as opposed to the more abstract ones. Further, one notes that a clearer correlation emerges between responses from *graphic design* students with the intention of the designer of the pictograms. This could be as a result of the affinity towards higher levels of abstraction and visual literacy associated with the discipline. Ultimately such symbols should be accessible to everyone. As Dalcher (2006:254) argues “design should [...] take into account the needs of the entire community of potential users and their varied levels of abilities to ensure that the results are widely available for the entire community”. Consequently, further research needs to be done to evolve a clearer set of culturally-appropriate pictograms for the South African context. A detailed statistical analysis using SPSS™ for comparison within and across disciplines is provided in Appendix P.

When asked whether they used UD extensively in their design process, just over half (51%) answered in the affirmative (Figure 8.29). The significant majority of those informants utilising UD were *industrial design* students (possibly as result of greater exposure from their lecturers). Further analysis reveals that there were more students of *graphic design* and *town and regional planning* who did not use UD than those who did. A special focus on UD-related applications for these two disciplines could potentially increase use of the concept.

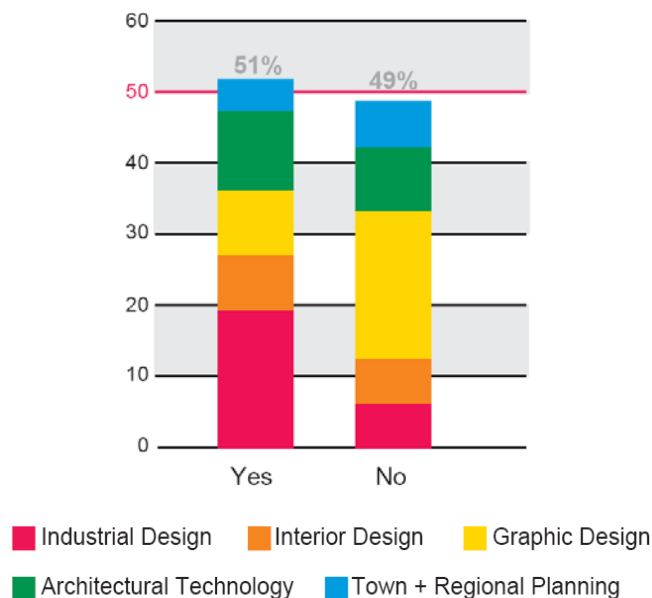


Figure 8.29: Whether UD is used extensively in the informant’s design process

Informants stated that the Principles of UD (elaborated in Appendix B) they most frequently used were: *Simple and Intuitive Use* (23%); *Flexibility in Use* (21%); *Size and Space for Approach and Use* (18%); *Perceptible Information* (13%); *Low Physical Effort* (9%); *Equitable Use* (8%); and *Tolerance for Error* (8%). As shown in Figure 30, *architectural technology, industrial design and interior design* students claimed to use the first three principles (in rank order) most frequently. *Equitable Use* was the principle most often used by *town and regional planning* students used. All seven Principles of UD were used in varying degrees of frequency by all groups of informants, except for *Low Physical Effort* which was not used at all by *town and regional planning* students.

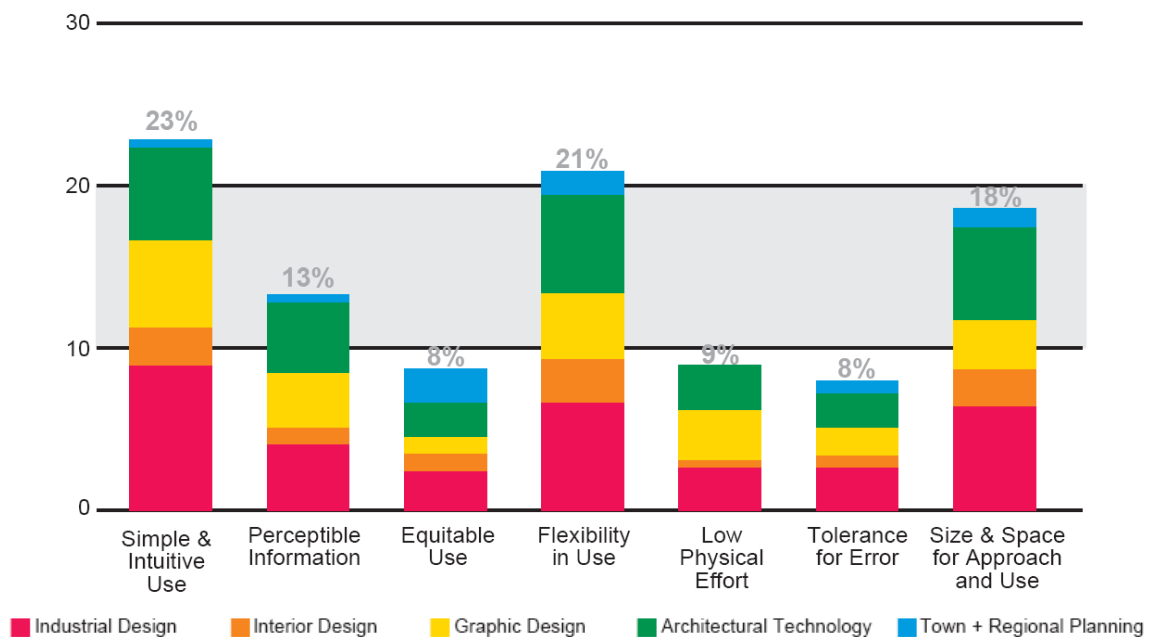


Figure 8.30: Principles of UD that are most often used

When asked why they did not use Principles of UD in their work, the majority of informants (44%) claimed it was because they *had not heard of the Principles of UD before*. Responses from the majority of *graphic design* and *interior design* students fell into this category (see Figure 8.31). Equal numbers of *town and regional planning* students picked this response and that which stated that they *had to choose from a different range of prescribed principles*. 27% of informants stated that they *could use any principles they wanted to*; whilst 22% chose from a *different range of prescribed principles*. 4% responded that they *were not interested in applying such principles in their work*; whilst 3% indicated that *these principles did not apply to their work*. The implications from these responses is that a dedicated UD course should promote awareness of Principles of UD in general, whilst clearly articulating links between UD and similar principles that are

prescribed in discipline-specific domains. Additionally, focus groups as well as joint inter-disciplinary seminars and workshops should engage students who are reluctant to embrace UD – the aim should be on effectively addressing concerns students gave for their initial reservations.

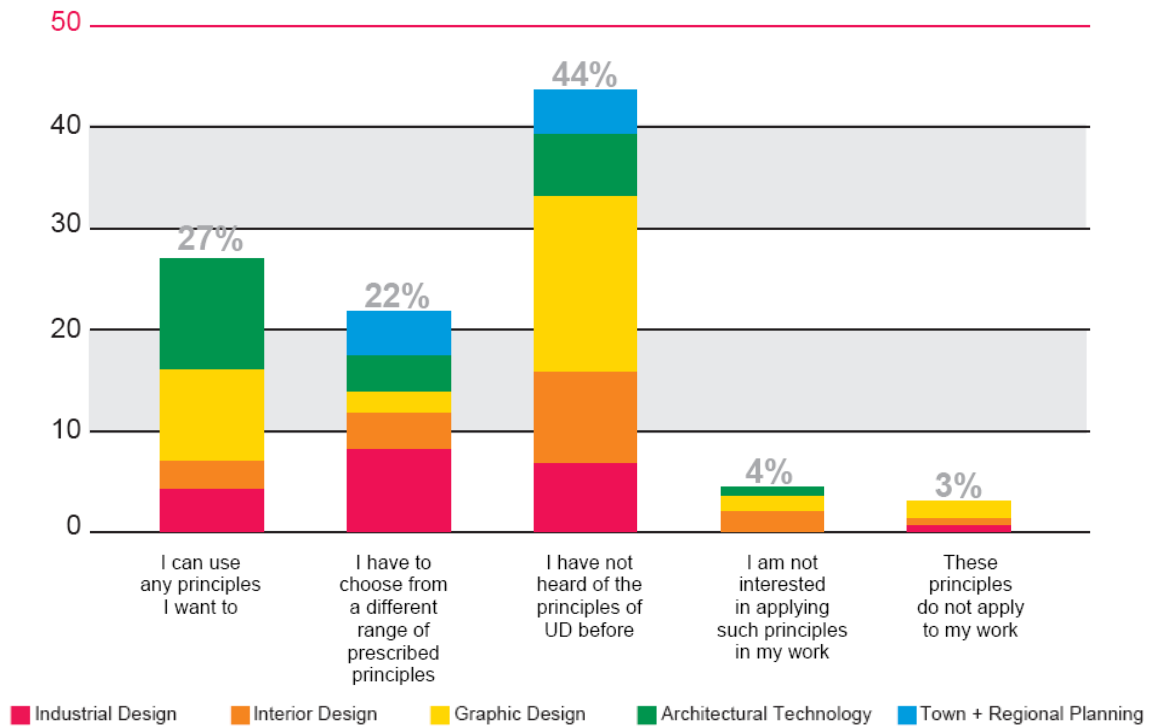


Figure 8.31: Reasons for non-use of Principles of UD

28% of informants stated that they were *very likely to use information on UD* should it be made available, whilst 48% responded that they would be *quite likely* to do so (see Figure 8.32). 15% were non-committal as they were *neither likely nor unlikely* to use information on UD if it were availed. 7% were *quite unlikely* to do so, whilst 2% responded that they were *very unlikely* to use information on UD. Of those that stated that they were *neither likely nor unlikely* to use the information, 52% were *graphic design* students. Consequently, a concerted effort should be made to demonstrate the relevance and efficacy of UD thinking within the practice of *graphic design*. The benefits of such a strategy could potentially include better designed (and more accessible) signage, symbols, pictograms and wayfinding systems, among others. Further, in adopting a cross-domain approach to UD, concilience through associations with *industrial design*, *human-computer interface design* and *interaction design* could potentially reinforce the value of UD in *graphic design* applications (Dalcher, 2006).

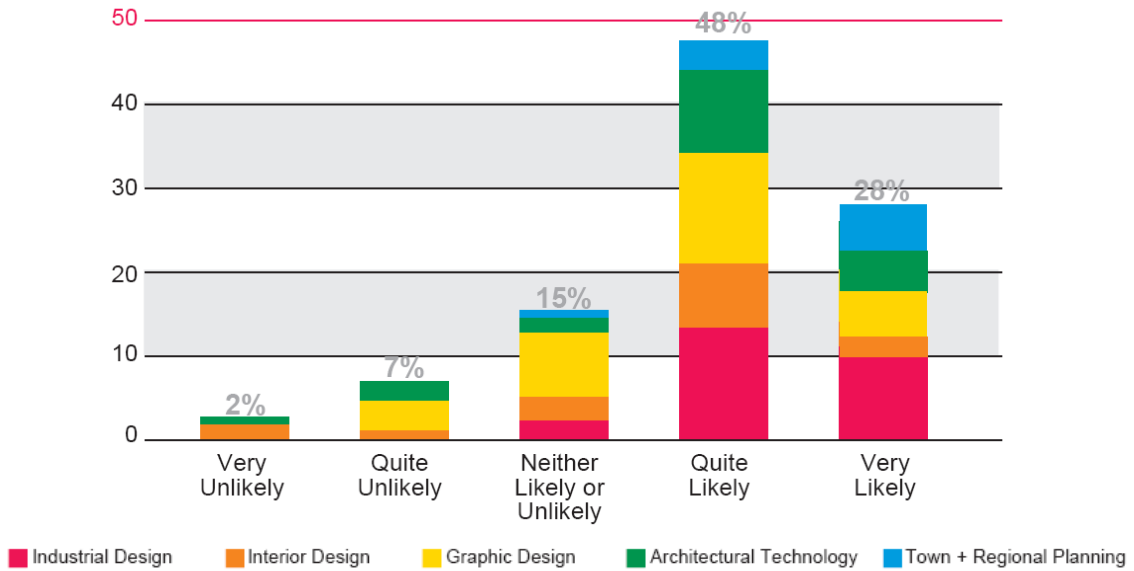


Figure 8.32: Likelihood of using information on UD should the same be availed

With regards to the preferred format for availing information on UD, the most popular modes include: *exemplars/samples*; *useful internet links*; *workshops/seminars*; and *training/short courses* (all with 9% of responses). Other significant options include: *printed reference guidelines*; *posters*; and *projects* (all with 8% of responses). The full range of responses is provided in Figure 8.33 below.

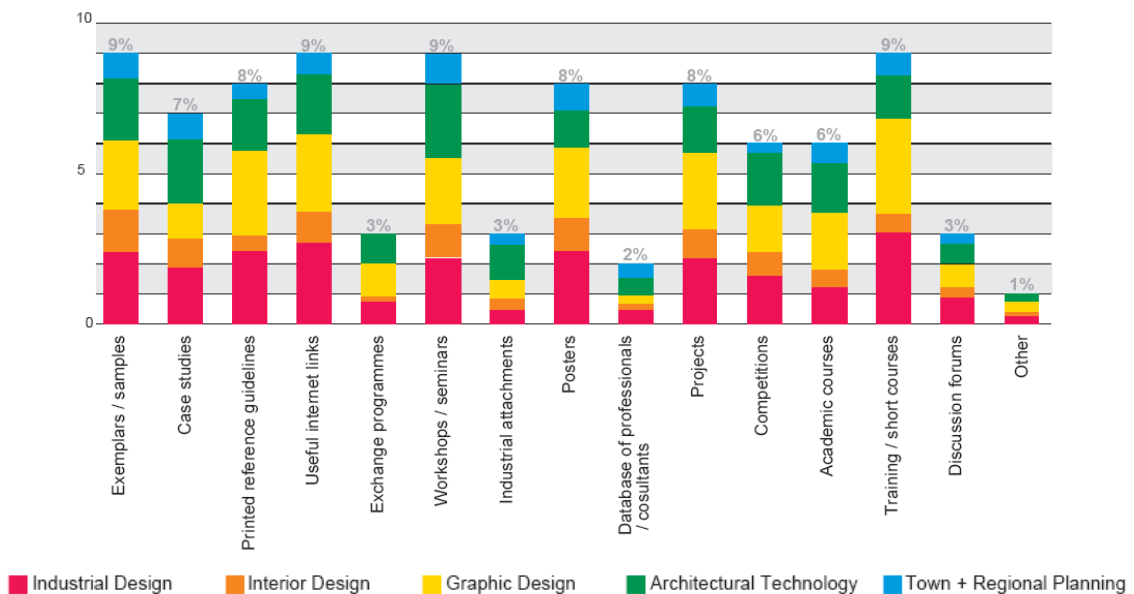


Figure 8.33: Preferred format for availing information on UD

Provision was made for formats not covered in the above question. Other preferred formats for availing information on UD suggested by informants include: *media coverage (radio and*

television) coverage; student magazines and blogs; site/field visits; books; and advertisements in magazines.

Informants identified *design educators* as the actors who would be the most effective champions of UD (43%). This response was consistently the highest for all disciplines except *interior design* (see Figure 8.34). *Individual designers* were proposed as champions by 28% of the informants (who did not include any from *town and regional planning*). 20% of the informants chose *team/project leaders*, whilst 9% proposed *political leaders* – interestingly, no *interior design* students opted for the latter. Section 8.4 discusses this issue further.

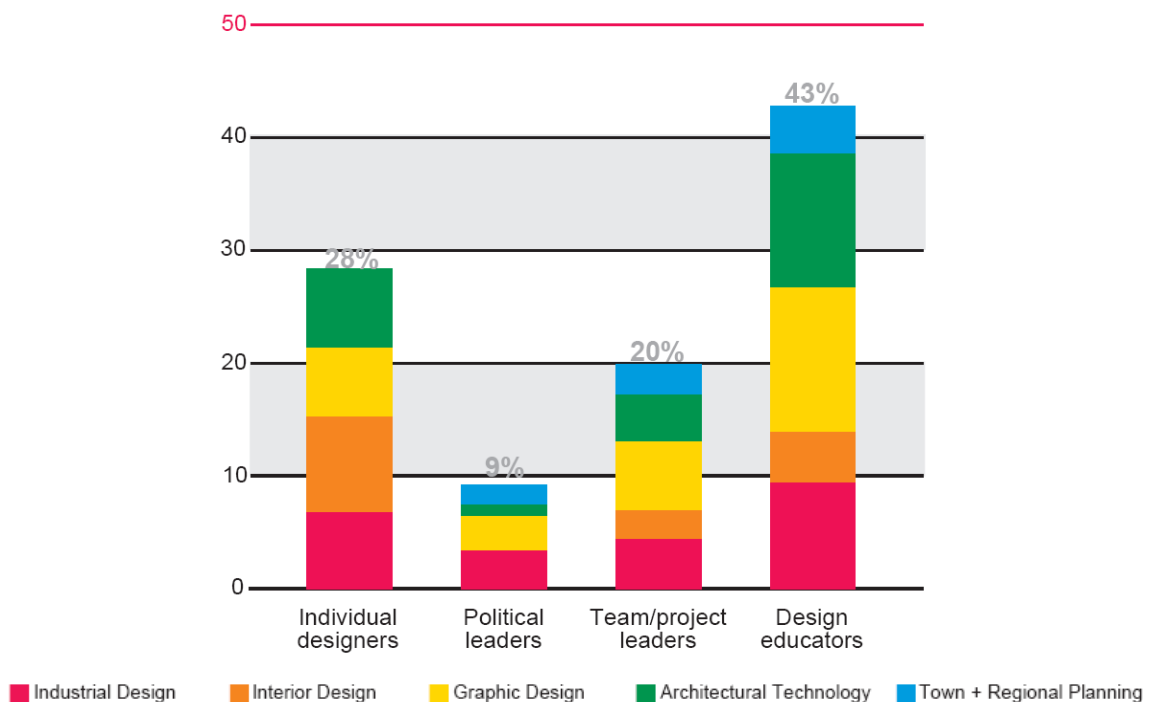


Figure 8.34: Actors perceived to be the most effective champions of UD

In response to the question on their *degree of satisfaction with current levels of accessibility within built environments, products, and/or systems used most often*, the majority of informants (43%) felt that they were *somewhat satisfied*; 28% felt that were *neither satisfied nor dissatisfied*; 21% felt *somewhat dissatisfied*; 5% were *very satisfied*; and 3% felt *very dissatisfied* with current levels of accessibility. No informants from *industrial design* reported any of the extremes (either *very satisfied* or *very dissatisfied*), whilst no *architectural technology* students reported to be *very satisfied* with current accessibility levels. A further breakdown is provided in Figure 8.35.

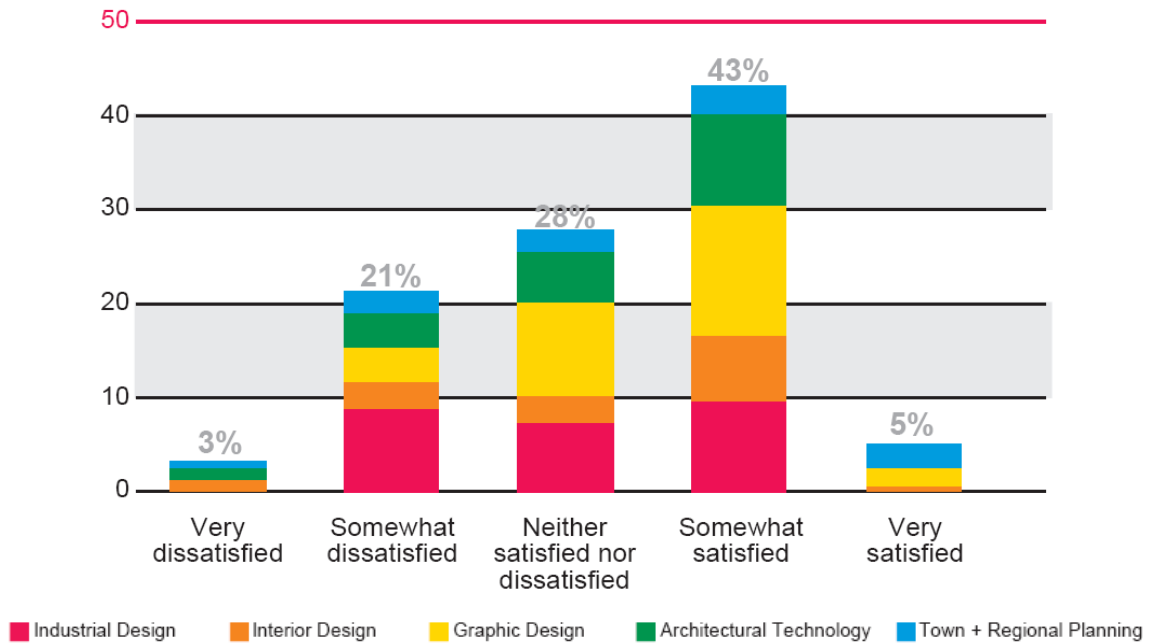


Figure 8.35: Degree of satisfaction with current levels of accessibility within built environments, products, and/or systems used most often

Regarding their *perception of the likelihood of UD as adding to the total cost of a design process/project*; the breakdown of responses in rank order is as follows: *quite likely* (39%); *neither likely nor unlikely* (35%); *quite unlikely* (17%); *very likely* (8%); and *very unlikely* (1%). *Architectural technology* students were the only ones who felt that UD would be *very unlikely* to increase the total cost of projects, whilst almost equal (but not significant) numbers from *all design disciplines* felt that incorporating UD was *very likely* to increase costs (Figure 8.36).

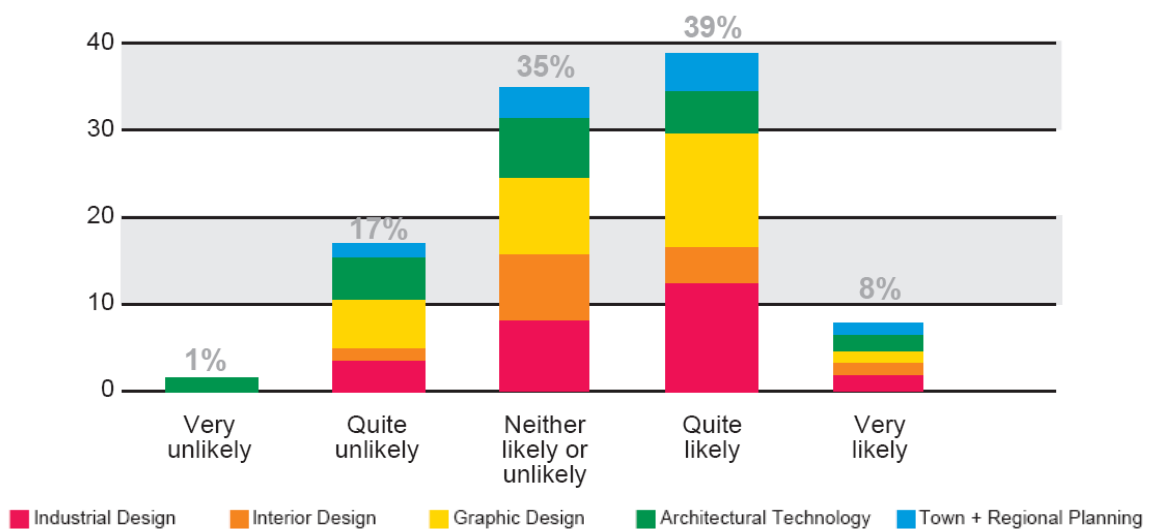


Figure 8.36: Perception of the likelihood of UD as adding to the total cost of a design process/project

A significant majority of informants (41%) reported that they would be *quite likely* to participate in a multi-disciplinary team on a UD project (see Figure 8.37). Equal numbers (25%) stated they would be *very likely*; or *neither likely nor unlikely* to participate. A less significant number (8%) reported that they were *quite unlikely*, whilst only 1% were *very unlikely* to participate. All the design groups were represented in the response categories except for those who responded that they were *very unlikely* to participate in a multi-disciplinary team on a UD project – only students of *town and regional planning* and *industrial design* gave responses in this category.

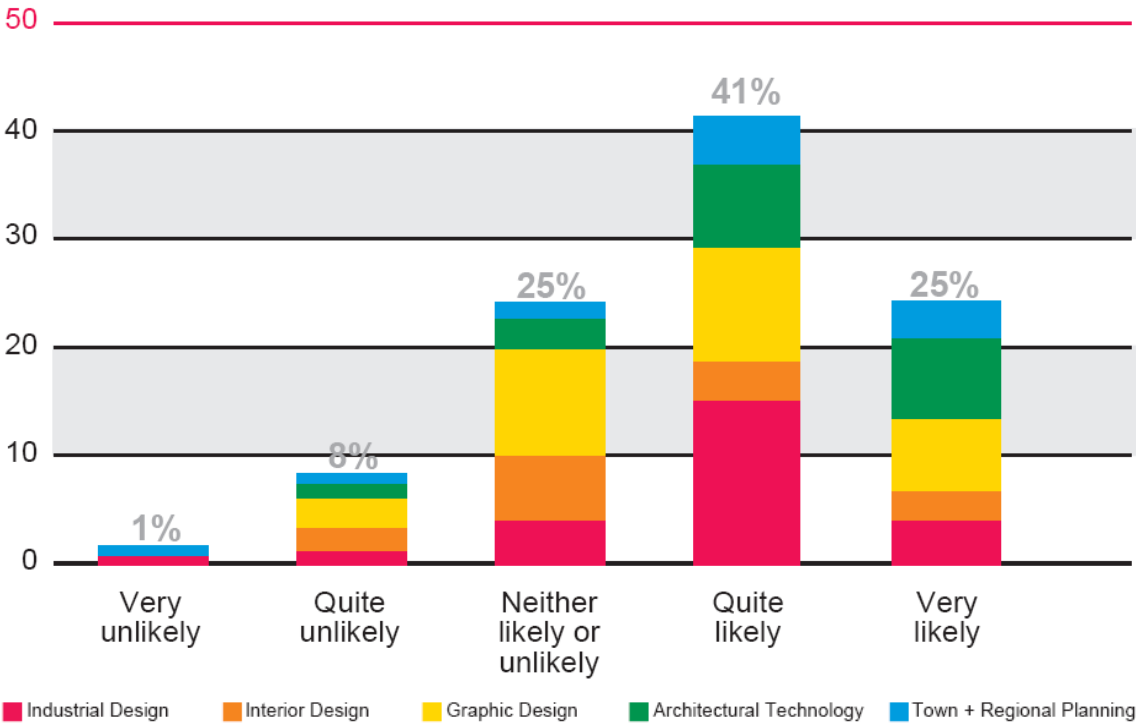


Figure 8.37: Likelihood of participation in a multi-disciplinary team on a UD project

An overwhelming majority of informants (84%) had positive perceptions about the *importance of designers to engage in socially responsible design to counter various forms of discrimination* (such as ageism, disablism, racism and sexism) – 63% felt that it was *very important*, whilst 21% felt that it was *somewhat important* for designers to do so. 10% of the informants were non-committal and felt that it was *neither important nor unimportant* for designers to engage in such responses, 4% felt it was *somewhat unimportant*, and 2% felt that it was *not important at all* for designers to engage in socially responsible design as a means to counter various forms of discrimination. The complete distribution of responses is shown in Figure 8.38.

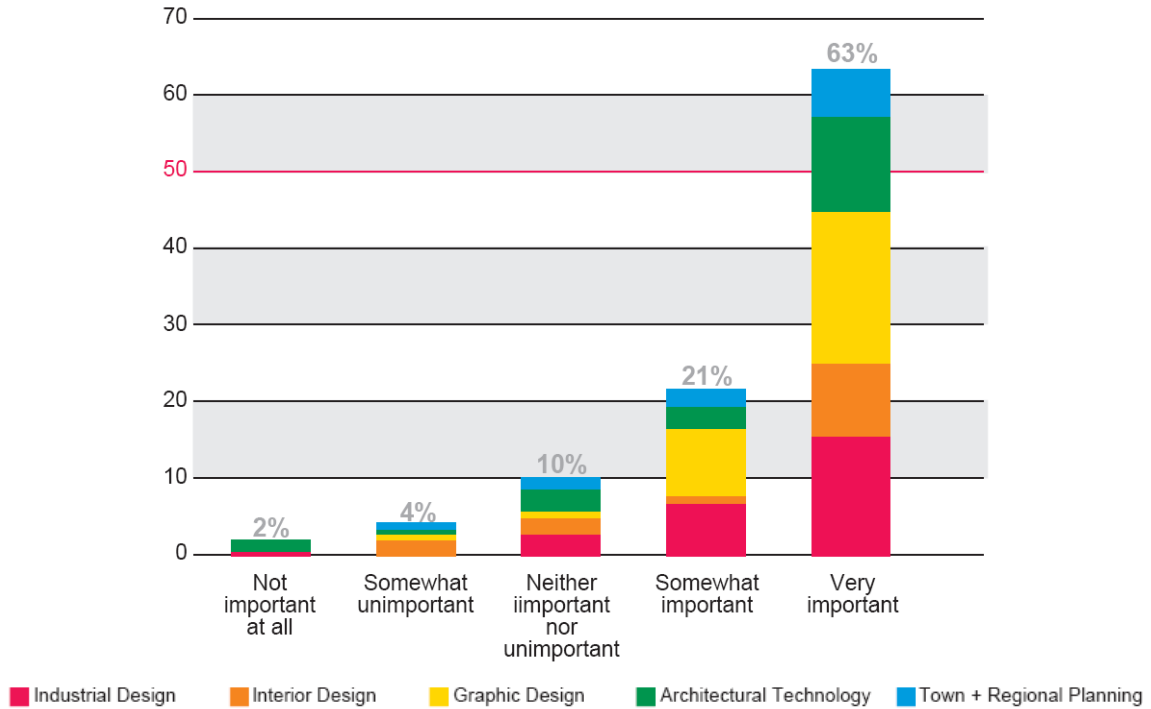


Figure 8.38: Perception on the importance of designers engaging in socially responsible design to counter various forms of discrimination

The majority of informants (63%) *felt confident (or sure)* that they would be practicing design in South Africa beyond the FIFA 2010 World Cup™ – with 33% being *somewhat confident/sure* and 30% being *very confident/sure* (see Figure 8.39). 20% were *neither confident nor sure*; 10% reported being *somewhat unsure*, whilst 7% were *very unsure* of their professional prospects.

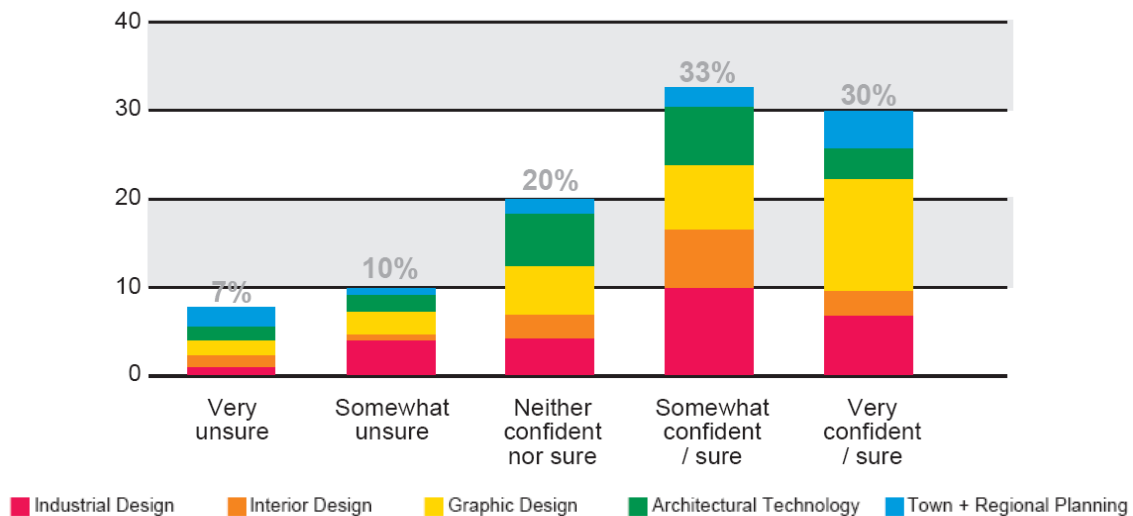


Figure 8.39: Degree of confidence that informant will be practicing design in South Africa beyond the 2010 FIFA World Cup™

The question on the usefulness of *ubuntu* to design practise in South Africa produced interesting results (see Figure 8.40). The majority (52%) were felt that *ubuntu* was useful – with 28% *slightly agreeing* and 24% *strongly agreeing*. A significant number (15%) stated that they *did not know*. 13% *disagreed* on the usefulness of *ubuntu* – with 8% *slightly disagreeing* and 5% *strongly disagreeing*; whilst 20% were non-committal as they *neither agreed nor disagreed*. The strategic implication is that the philosophy of *ubuntu* would need to be clearly and robustly discoursed for greater appreciation of its potential usefulness to various design disciplines.

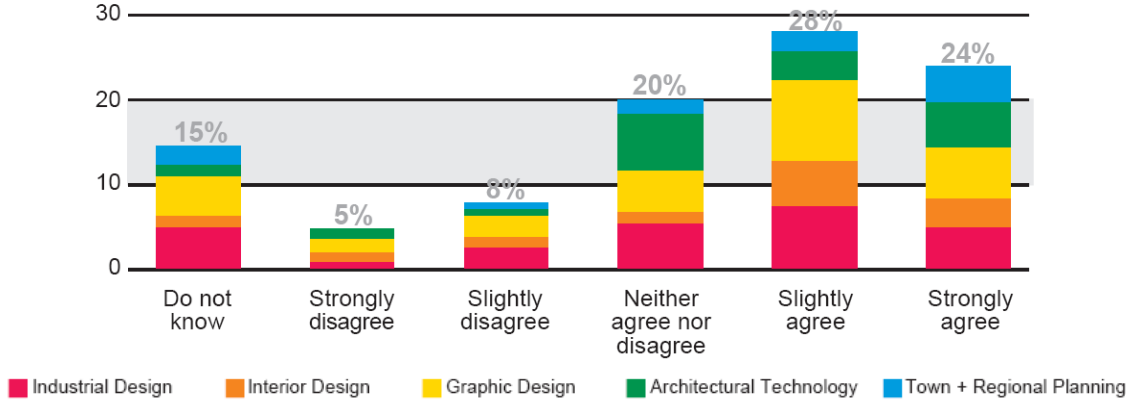


Figure 8.40: Degree of agreement that *ubuntu* is useful to design practice in South Africa

The question on the *likelihood of informants increasing adoption of UD if the value of UD was showcased in 2010 projects* elicited encouraging responses (see Figure 8.41). 69% of the responses were positive – with 48% replying that they were *quite likely*, whilst 21% were *very likely* to adopt UD to a greater degree. Notwithstanding, a significant number (26%) responded that they were undecided – *neither likely nor unlikely*; 5% were *quite unlikely*; and no one reported being *very unlikely* to adopt UD if its value was showcased in 2010-related projects.

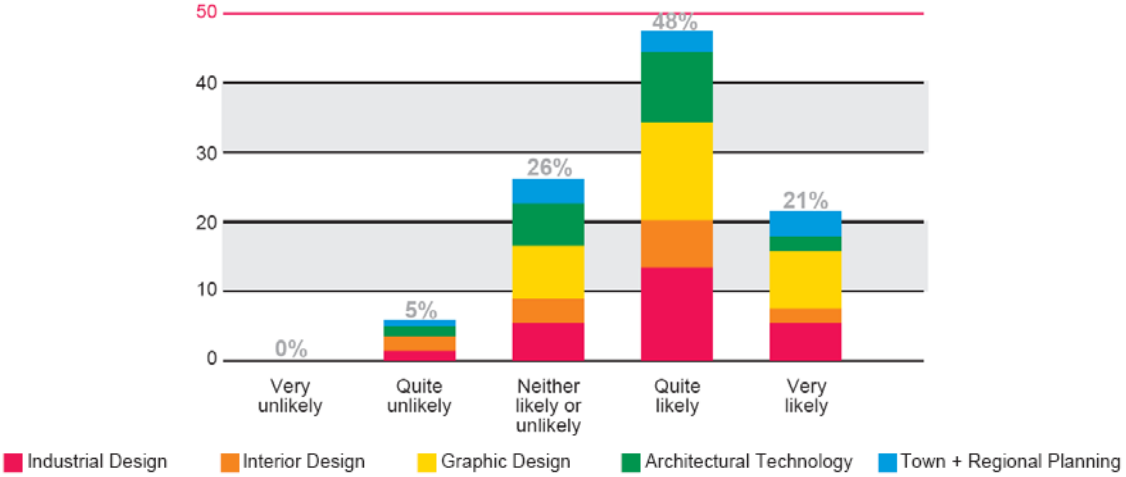


Figure 8.41: Likelihood of greater adoption of UD should its value be showcased in 2010 projects

The majority of responses (63%) indicate a likelihood of compliance in implementing UD in projects should the law mandate the same (see Figure 8.42). 45% of informants stated they would be *quite likely* to comply, whilst an additional 18% would be *very likely* to comply with such mandatory legislation. A significant number (26%) were *neither likely nor unlikely* to comply; 9% would be *quite unlikely*; and 2% were *very unlikely* to comply with such a law. Of these groups, no *graphic design* or *industrial design* students expressed strong objections by indicating that they would be *very unlikely* to comply.

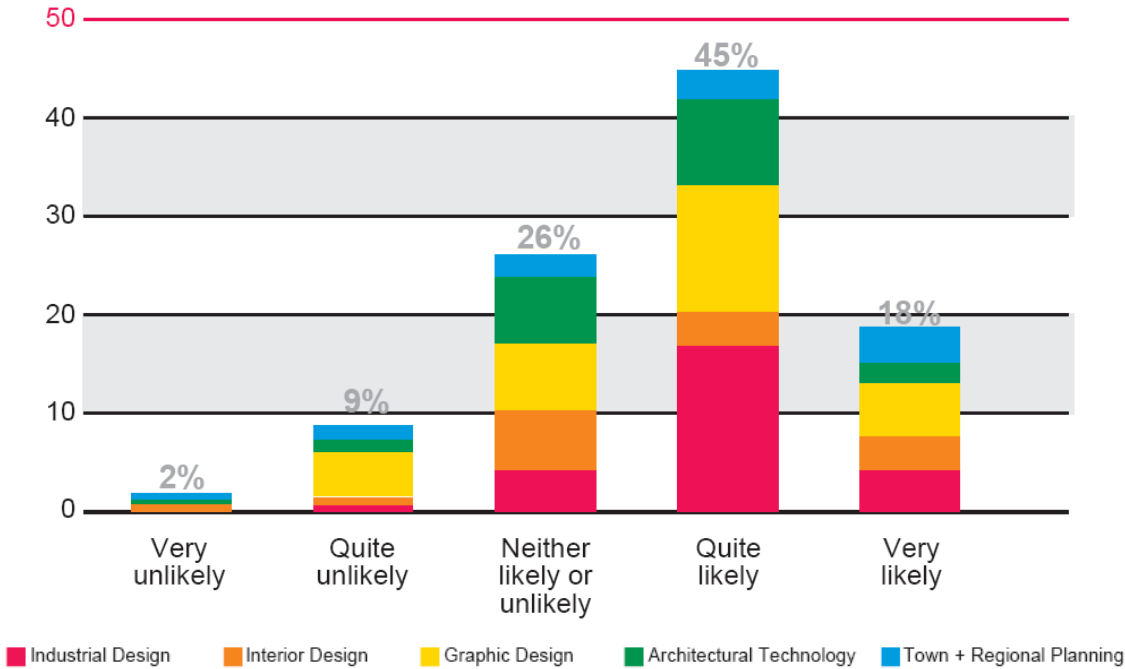


Figure 8.42: Likelihood of compliance should implementation of UD in projects be mandated by law

There was general agreement (70%) that UD courses should be integrated into all design-related disciplines at university level. 36% of informants *slightly agreed*, whilst 34% *strongly agreed* with this suggestion (see Figure 8.43). 14% *neither agreed nor disagreed*; 10% *slightly agreed*; 1% *strongly disagreed* with this proposition. A small number (5%) stated that they *did not know* whether or not UD courses should be integrated into all design-related disciplines at university level. Only *graphic design* students expressed *strong disagreement*; whilst there were no informants from *architectural technology* and *industrial design* who claimed that they *did not know* whether UD courses should be integrated into such disciplines. Subsequently, concilience should inform the development of a multi-disciplinary and cross-domain UD course that is available (at least as an elective) to all design students at university level (Dalcher, 2006).

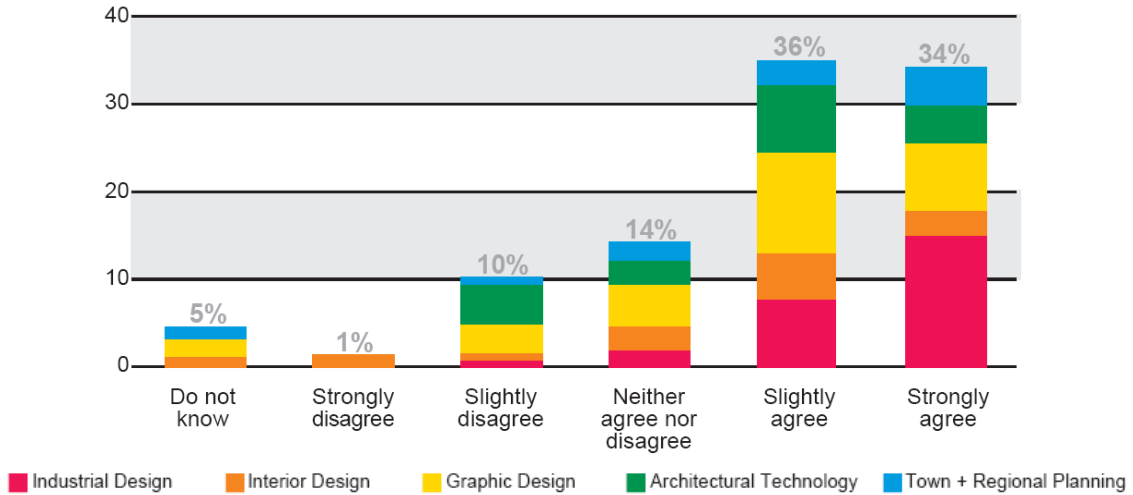


Figure 8.43: Degree of agreement that UD courses should be integrated into *all* design-related disciplines at university level

Responses to the question on the *likelihood of implementing UD in projects if incentives were available to reward designers* (shown in Figure 8.44) are comparable to a similar question on whether mandatory compliance would promote implementation of UD (shown in the previous page in Figure 8.42). A markedly higher number of informants (77%) were favourably disposed towards voluntary implementation – with 44% being *quite likely*, and 33% stating that they would be *very likely* to implement UD in projects. 18% were *neither likely nor unlikely* to implement UD in projects; 3% said they were *quite unlikely*; and 2% reported that they were *very unlikely* to do so. Only *architectural technology* and *town and regional planning* students indicated that they would be *very unlikely* to use UD in projects if incentives were available to reward designers.

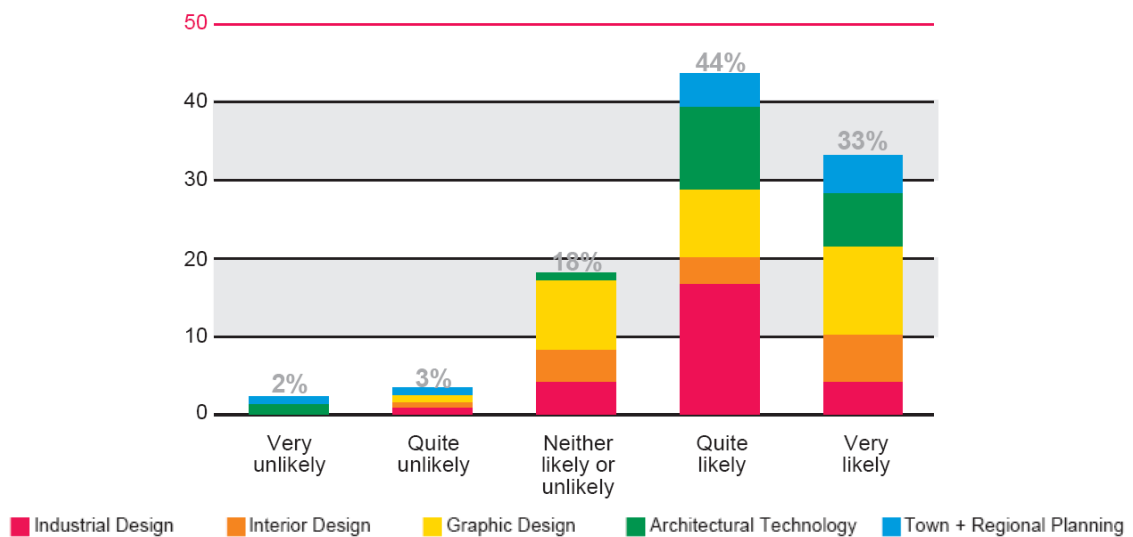


Figure 8.44: Likelihood of implementing UD in projects if incentives were available to reward designers

Informants also made the following (self-explanatory) suggestions of possible incentives for rewarding UD-compliant designers:

- *bursaries and scholarships to study UD locally and abroad;*
- *prizes, internships, mentorship, recognition from industry;*
- *cash prizes, contracts, rewards, vouchers, money, recognition, software;*
- *higher marks; opportunities for jobs; travel opportunities;*
- *media coverage and more public visibility of good design*
- *recognition of UD products in design;*
- *bypassing [Broad-based Black Economic Empowerment] BBBEE requirements, civil projects awarded to UD companies;*
- *tax rebates to UD-compliant firms;*
- *tickets to attend UD-related expos;*
- *certification, endorsements from reputable organisations;*
- *international competitions and awards;*
- *global recognition for designers to showcase their use of UD; and*
- *public humiliation for designer if not compliant with UD.*

Further, informants offered some additional comments when invited to do so on UD-related concerns:

- *UD must become an essential part of Industrial design;*
- *Ergonomics is an extremely interesting subject, as well as important and relevant. It should be a main subject in the 3D design course;*
- *Should be implemented and taught academically;*
- *UD is a great tool, but cannot be used as the only tool;*
- *I would like to know more about UD but I am concerned it might limit the designer creatively;*
- *more discussions, brainstorming and practice sessions on UD for design students;*
- *interesting way of trying to understand the way design influences us;*
- *engaging survey – UD sounds very interesting. Should have been a subject as part of my course;*
- *it is a great initiative done in letting us know about design solutions; and*
- *UD would have enriched my work process.*

The aforementioned suggestions and comments would be factored in when formulating responsive strategies that seek to promote the adoption and mainstreaming of UD within academic and professional design domains. The overall impression is that UD is an effective (and more importantly in this context, desirable) tool that would suitably equip designers to respond to the diverse needs presented by various categories of vulnerable populations.

8.3 Implications for Principal Actors

The following section analyses responses to specific questions posed to various principal actors. The said responses are reproduced verbatim in some instances for clarity and authenticity.

8.3.1 Implications for the City of Cape Town

The interviews with city planners sought to establish their perceptions with regards to 2010-related projects. There was general agreement on *the value of enlisting the participation of student in 2010 projects*. Pezeshki (2008) felt that the greatest benefit accruing from involving students lay in harnessing their creativity – “they contribute their ideas, their visions to the city and the planning team”. Joustra (2008) concurs by adding that:

It is important also for students to be aware of what is happening around them and be open to comment or criticism on the developments around them applying their knowledge and ideas of this developing UD approach. I would advise students to get involved where they can through public participation processes.

Pezeshki (2008) and Joustra (2008) both agree on the need to involve design educators in the planning and execution of projects within the city. Joustra (*ibid*) places the onus on educators to be more proactive in engaging with city planners and puts it thus:

It would be useful for educators to be able to have access to departments in the City and relevant persons that are aware of the processes and progress being made in the City in mainstreaming UD. Therefore educators can inform their students of everyday challenges and opportunities relevant to their studies and their city the most probable their workplace to be in the future.

The design disciplines most likely to be co-opted to work with city planners include “urban planners, architects, transport planners, landscape architects, and fire consultants” (Griffith, 2008). There was also consensus on the perceived *value of competitions as effective platforms for promoting new design concepts or ideas*. Key elements identified for making competitions more effective in promoting novel concepts include: “multi-disciplinarity” (Griffith, 2008); “broad-based appeal and cross-disciplinarity” (Pezeshki, 2008); and “multi-lateral, awareness raising [potential]” (Joustra, 2008). All informants agreed that the 2010-related projects would leave a lasting legacy to the residents of Cape Town. According to Clive Griffith (2008) the principal infrastructural legacy would be “a world class multi-purpose stadium with an urban park, sporting facilities, eco-centre and golf course for relaxation and entertainment”.

Some of the informants stated that they were not familiar with the concept of UD, whilst Griffith (2008), the City's *project architect* responsible for the design and construction of the new Greenpoint stadium, stated that he was familiar with the concept "but not named as such". Griffith (*ibid*) came to know of the UD-related concept through his association with "a deaf and dumb *architect* in Zimbabwe who had his own practice and was obviously sensitive to this subject". Griffith (*ibid*) felt that 2010 project architects had been sensitive to UD in their work though he felt that UD was "not at present" relevant to any of the projects or functions he was personally involved in.

With respect to Principles of UD (elaborated in Appendix B), *Flexibility of Use* and *Low Physical Effort* were the two that were most relevant to the 2010-related projects (*ibid*). The self-same UD principles were the two that Griffith (*ibid*) felt were most neglected in terms of implementation in projects at present. Griffith (*ibid*) affirmed his personal commitment to continue utilising UD, and further suggests that the best way to mainstream UD within his specific department (as well as to the general public) was by making people "aware of such issues through *education*".

According to Griffith (*ibid*) the *Council of Architects* was proposed as a suitable champion, and as an effective means for promoting UD as the media had not been effective thus far in promoting UD nationally. Within the context of Cape Town, the *Institute of Architects* was identified as an ideal champion for UD (*ibid*). The main actors with regards to UD should include "designers such as industrial, architects – urban and landscape, engineers, [and related] disciplines" (*ibid*). The government policies that would best align with (and accommodate) UD would be the *National Building Regulations* and *environmental policies* (*ibid*). Others include the *Batho Pele* principles; the new *Consumer Protection Act*; the *Information Act*; and the *Promotion of Equality and Prevention of Unfair Discrimination Act*. The role of official policy formulation and implementation within the city of Cape Town is critical to effective mainstreaming of UD in the city.

In summary, the following strategic implications apply to city planners and policy formulators in the context of the city of Cape Town:

- formulate comprehensive integrated UD/Universal Access (UA)-specific policies that articulate across various operational departments and other administrative units;
- create a community-of-practice with other key actors as well as strengthen collaborations with other *Triple Helix* partners in academia and industry/civil society to build capacity around applied research and project development;

- support (and possibly co-sponsor) multi-disciplinary, cross-domain competitions that are problem-based and responsive to real-life challenges through *public-private* initiatives that showcase the value of integrated UD strategies to all residents;
- engage residents and other key actors through a *consensus participatory process* on UD-related issues potentially affecting their welfare or livelihood within Cape Town;
- highlight and recognise UD-compliance through popular media and official publications;
- invite the involvement of professional bodies that represent designers, architects, town planners, and engineers as key co-actors in project oversight and implementation;
- identify and support internal champions to fast-track the adoption and diffusion of UD; and
- link proposed UD strategies to local, regional and national policies, acts, and other legislative imperatives.

8.3.2 Implications for Professional Designers

The responses from professional designers who were interviewed are based on questions provided in Appendix M. A number of informants reported that they were specifically involved in 2010-related projects. Therina Wetzel (2008), the Manager for Resource Mobilization with the South African *National Council for Persons with Physical Disabilities* (NCPPD) reported that her organisation was an *accessibility consultant* in a number of 2010-related projects including *stadia*, the *Gautrain heavy rail system* in Gauteng Province, as well as a number of *bus transit systems* nationally. Bernard Smith (2008) of the *Industrial Designers Association South Africa* (*IdeaSA*) stated that he participated in meetings with the *Department of Science and Technology* to explore the potential contribution of *industrial design* to 2010-related projects, whilst Mel Hagen (2008), a *design activist, educator and researcher*, reported that she had “conduct[ed] *consumer research* for the provincial government of the Western Cape with a view to developing a craft development strategy, using 2010 as a catalyst for development beyond 2010”. The importance of anticipating the impact of such activities from 2011 onwards is supported by other commentators (du Plessis & Maennig, 2009; Swart *et al.*, 2009; Tomlinson, 2009; Tomlinson *et al.*, 2009). Craig Thompson (2008) of the *IDC Consultants* reported that their firm had “approached the LOC and had some discussions on mainstreaming *universal access* and *UD* in a number of projects as opposed to [merely] incorporating industrial design or signage design”.

All the informants said they would welcome the involvement of design students and independent professional designers in such projects. The professional designers felt that they would most likely co-opt the following disciplines/professionals in 2010-related projects: *accessibility auditors*,

engineers, architects, and designers (Wetzel, 2008); *industrial designers; engineers and graphic designers* (Smith, 2008); *product/industrial designers, graphic designers, and surface designers* (Hagen, 2008); *industrial designers, IT [information technology] professionals, public policy makers, and educators* (C.Thompson, 2008). *Product/industrial design* appears to be a key discipline as it is the one most frequently cited by the informants – the reason given for selecting industrial design lies in its capacity the *cross-disciplinary collaboration* with a diverse number of other profession(al)s.

When asked whether they considered competitions as effective platforms for promoting new design concepts, the general consensus amongst informants was that competitions were indeed a useful and effective tool. C.Thompson (2008) felt that UD-specific competitions should focus on real-life challenges as is the case in Denmark, and the USA. Hagen (2008) concurred but cautioned against the potential of competitions to sometimes be narrowly-defined and rather prescriptive. These sentiments echo those of Biggs (2002) who emphasises *problem-based* (as opposed to *solution-based*) *learning*, as well as Kruger and Cross (2006) who support *problem-driven* (and not *solution-driven*) strategies. Hagen (2008) argues thus:

Frequently competitions are launched by organisations that have their own agendas that might work against the development of totally new design concepts. However, they may provide an opportunity for engaging with real-life, implementable problems which are aspects that is often lacking in the academic environment. I personally believe that students need to be much more exposed to the real world, and engaging with major problems that beset our society, rather than producing the nth generation of an existing project. Development of new concepts is much more likely when the problem is framed in a way which precludes approaching it as a redesign of an existing product. I like [the Integral Design] method of framing problems in a way that does not predetermine the product, e.g. students being asked to provide a body support system rather than a chair – this immediately opens the way for looking at all sorts of different solutions. Or providing students with a specific problem, e.g. the reality of most shack dwellers is that they are situated on the Cape Flats where the water table is just beneath the surface. [...] What can be done to ameliorate this particular problem – where can design play a role? [...] What I am trying to say is that most competitions are not framed in this open way, and thus do not necessarily invite new concepts/solutions. What they tend to do is expand on existing products and often this merely involves restyling. I also believe that most competitions are framed around a narrow design area which does not necessarily encourage students to engage in methodologies that exist in the real world, i.e. multi-disciplinary teams, etc.

The key elements identified for making competitions more effective in promoting novel concepts include: *presentations on real projects and not just ideas* (Wetzel, 2008); *well-defined briefs, good organisation and good incentive prizes* (Smith, 2008); *competitions that specifically explore the usage of IT with regard to interior environments* (C.Thompson, 2008); *a UD-specific focus* (Mulder, 2008); and an emphasis on *real-life, implementable problems* (Hagen, 2008).

The legacy that informants felt the FIFA 2010 World Cup™ would leave for residents (and visitors) in Cape Town once the mega-event was over include the following:

- *Transport and some other facilities will be accessible to all* (Wetzel, 2008);
- *The 2010 WC should leave a legacy that South Africa and Africa have a strong identity of who we are as a nation and continent, a legacy that should convey confidence and a sense of determination for hope and prosperity for all the people of Africa* (Smith, 2008);
- *The event certainly provides a strong focus and catalyst. [...] A major impact has been that the World Cup provides a focus which pushes us into developing vital infrastructure which would normally take its course depending on availability of funds. In particular, in Cape Town, the development of the urban park around the stadium complex, improvements in road systems, and the phasing in of a public rapid transport system, the development of public open spaces (the Grand Parade and the station deck). And if Universal Design principles can be employed in all infrastructure for the World Cup, then we could have a major showcase for how design can provide accessibility and inclusivity to all – useful for advocacy. The other plus of the World Cup is the opportunity to present South Africa to the world. This could have major impacts on not only tourism (which is the immediate beneficiary) but on the world developing a positive outlook about South Africa's infrastructure, economy, etc* (Hagen, 2008); and
- *My impression of the 2010 World Cup is that ideally that it be used a platform for the civil society to engage in. To engage with government and with stake-holders. To try and raise a lot of awareness and do advocacy work. To use the larger-scale products like the stadiums and to integrate the World Cup with the tourism grading process that's being run. To try and use this as a catalyst to try and engage with hotels and tourism venues and with DEAT [Department of Environmental Affairs and Tourism] as well. To try and make their facilities, their services and their tourist products as successful as possible* (C.Thompson, 2008).

When asked if they were familiar with UD, all the informants responded in the affirmative. C. Thompson (2008) elaborates thus:

Yes [we] have also been involved in the Saudi [Arabian] government, specifically the Prince Salman Center in Riyadh. What they are busy doing at the moment is they are actually busy framing legislation policies to implement UD across the board. In tourism,

transportation, communication, the built environment, and that is a program they are running over the next 5 or 6 years. The aim of which is to make Saudi Arabia completely accessible.

In response to the question on how they first came to be involved with UD, informants made the following statements:

- *Working in the disability sector for a long time [as a disability activist for over 20 years]. This is what we lobby for. [Learnt about UD from people like Philip Thompson (architect), Joan Seirlis (architect), and David Boonzaier (medical doctor) some ten years ago] (Wetzel, 2008);*
- *As an industrial designer having worked on hundreds of commercial design projects, I have become of UD when considering the use and the 'user' of the product to be designed – this may be as simple as 'left or right-hand use' to more complex issues around disabilities. The work of Henry Dreyfuss on ergonomics and Leonardo da Vinci's "Vitruvian Man' have influenced my perception towards UD, specifically concerning the relation between the human form (abled and disabled) and the environments/products we create to live in. Technology has also influenced my thinking towards UD. During my employment at CSIR in 2005 I was involved in a collaborative research project concerning UD with the Meraka Institute and Built Environment (Smith, 2008);*
- *I have been a strong champion of design in all its forms over a number of years. And while I was aware of design for those who are challenged in some way, the concept of Universal Design, which is an inclusive concept, was strongly brought to my attention a number of years ago by Dr David Boonzaier, who is a strong proponent. So I have read some of the literature on this subject and have been interested in particular design projects, e.g. the Royal College of Art's programme for 'Designing for the Third Age' (Hagen, 2008);*
- *Through projects and research on the topic (C. Thompson, 2008); and*
- *It goes back to... it would have been about 1985 or 1986. That was the first time I started reading up on it. Interestingly enough as I was associated with some work we were doing on education; what we then called 'special skills' in the Transkei region of the Eastern Cape. The interesting part of that was that it was before I had a developed a spinal injury. So that was my first contact with UD (Philip Thompson, 2008).*

As for the reasons why UD had not found wider acceptance within their spheres of influence, informants offered the following reasons:

- *Ignorance and politics (Wetzel, 2008);*
- *For the reason that the world was developed mainly 'by abled persons for abled persons' (Smith, 2008);*

- *I do not believe that there has been sufficient advocacy out there. Most people understand the notion of designing for the disabled, but the concept of providing design solutions that would meet most if not all physical/kinetic constraints is not something they have ever thought of. Currently certain aspects of designing for the disabled are being dealt with in the architectural profession, but the way they are being implemented shows a clear misunderstanding of the importance to all.* (Hagen, 2008); and
- *My personal impression on the matter is that there is just a lack of political will. You know there just doesn't seem to be enough buy-in at the highest level. There also seems to be a lack of understanding. Most people's interpretation of UD is that it is "designing for paraplegics", which is quite incorrect. I think that tends to be a big problem, that there isn't any understanding that it relates to a whole series of user groups and user requirements* (C.Thompson, 2008).

Informants reported that UD was relevant to some of the projects or functions they were currently involved in. The Principles of UD (in rank order) found to be most relevant to the projects the informants were involved in include:

- *Low Physical Effort, and Size and Space for Approach and Use* (Wetzel, 2008);
- *Size and Space and Approach and Use; Perceptible Information; and Flexibility in Use* (Smith, 2008);
- *Flexibility of Use, Size and Space for Approach and Use, Low Physical Effort, and Perceptible Information* (Hagen, 2008); and
- *Size and Space for Approach and Use, Perceptible Information, and Low Physical Effort* (P. Thompson, 2008).

The most relevant Principles of UD (elaborated in Appendix B) from the above responses are: *Size and Space and Approach and Use, Low Physical Effort, Perceptible Information, and Flexibility in Use*. The aspects of UD considered most neglected include the fact that UD is treated as an *add-on* (as opposed to being an *integral part*) of the design process; lack of incorporation into mobility provisions as well as *Information and Communication Technology* (ICT); lack of sensitivity towards the needs of people with visual disabilities; and the ill-consideration of certain Principles of UD (such as *Perceptible Information, and Tolerance for Error*). *Education and awareness promotion* were the main strategies suggested for the mainstreaming of UD in the informants work(places) – all the informants acknowledged the fact that very little promotion of UD was evident presently.

Informants proposed the following as the main actors with respect to UD: designers, developers, architects, engineers, human, social, physical sciences, and government officials (at local,

regional and national levels). The local, regional, and national government departments that were proposed as being best placed to accommodate UD include: Departments of *Science and Technology, Transport, Public Works, Labour, Tourism and Economic Development*; whereas the *Council of Architects, Council of Engineers, and professional associations for designers*, were the professional bodies (in the private or public sectors) considered to be the ideal champions for UD. Wetzel (2008) proposed *Jim Stanburry* (a civil engineer) as a possible champion for UD in Cape Town. Smith (2008) on the other hand advanced the names of two popular Paralympics athletes (*Natalie du Toit* and/or *Oscar Pistorius*) and justified his choice by arguing that “UD is about equality both in theory and practice and would require a champion that has displayed exceptional perseverance living in a ‘disabled’ world” – the suitability of these two candidates/nominees is interrogated in greater detail in Section 8.4.

When asked what strategies they felt would mainstream UD at local, regional and national levels in an effective and sustainable manner, informants suggested engaging *Triple Helix* partners in joint efforts and initiatives; linking national strategies to measurable outcomes; and creating clear, comprehensive strategic plans involving all key actors at various levels (local, regional and national). In response to the question on whether they intended to promote the use of UD principles in future, informants were unanimous in stating that they would do so. Further, when asked how they would do so specifically, informants proposed the use of exhibitions, workshops, seminars, conferences, applied research and consultancy as effective tools. Two further comments were offered by informants:

- *Good to see that somebody is taking us seriously (Wetzel, 2008); and*
- *UD is an extremely relevant subject to pursue, particularly in Africa where there is a great need for UD but due to a ‘third-world’ mentality, the subject remains largely unknown, left for more developed nations to research due to Africa having more serious developmental problems. This scenario should be reversed where UD could be a means for development. [That is] if Africa could use the unique challenges to research and develop UD, then this could not only benefit the continent but be exported to other developing countries where similar development and social challenges occur such as poverty – in countries such as India, China and Brazil (Smith, 2008).*

In summary, responses from professional designers inform the following strategic imperatives:

- ensure the inclusion and participation of professional bodies representing *designers, architects* and *engineers* in any strategic planning around UD-related strategies;

- support the development of SAQA-aligned credit-bearing *continuing professional development* training programmes on UD-related topics for practicing professionals;
- encourage collaborative work through multi-disciplinary, cross-domain teamwork in UD-related project planning and implementation;
- convene regular symposia and related public *consultative fora* (such as exhibitions/expos, workshops, seminars and conferences) to sustain robust debate and dialogue on UD;
- identify support mechanisms (such as *tax incentives*, as well as peer-recognised *awards* and *prizes*) to promote the adoption of UD – the *Design Excellence Awards* programme run by the SABS Design Institute serves as a good reference for a possible model;
- identify and support suitable *champions* (particularly those who enjoy broad public appeal);
- maintain accessible and expandable databases of UD-compliant professionals and projects – this could be done in collaboration with other *Triple Helix* partners to ensure greater inclusiveness and reach;
- engage in *socially responsible design* projects that are *participatory* in approach to demonstrate the value of UD to civil society/the general public;
- participate in and support competitions that promote the *sustainable* diffusion of novel concepts such as UD in *majority world/industrially developing* contexts;
- proactively incorporate and promote the adoption of Principles of UD within their own communities-of-practice by benchmarking international best practices; and
- provide the popular media and press with UD-compliant exemplars for dissemination to the general public.

8.3.3 Implications for Design Educators

Design educators from the Departments of *Architectural Technology, Design History and Theory, Fashion and Surface Design; Graphic Design, Interior Design, and Town and Regional Planning* (all based at the Cape Town Campus, CPUT) answered semi-structured questions listed in Appendix N. *Industrial Design* educators were not interviewed – they were already cognisant of, and committed to research, teaching and learning support with regards to UD.

In response to the question of who (students and/or staff) were carrying out 2010-related projects, Andrea Broom (2008) and Bruce Snaddon (2008) both *graphic design* educators reported that students were involved. Roelof Oelofsen (2008), the Head of the Department of *Interior Design* also reported that two lecturers and the entire class of third year students were

involved in the students' landscaping competition (discussed in Section 5.2.3.3). Aletia Chisin (2008) of the *Department of Fashion and Surface Design* also identified one of their students involved in a project to design furnishing and lighting for the VIP lounge at the Greenpoint Stadium. Chisin (*ibid*) however clarified that the said project was "not an official collaboration with FIFA". When asked to describe the projects that were carried out in their departments, informants stated the following:

- *With Cape Town Tourism, I've got a 4th year (BTech Graphic Design) who was very interested in looking at tourism after 2010, and how he could capitalise on the 2010 World Cup to communicate to that particular target audience. He has done interviews with Cape Town Tourism and they were very interested to see his project. He conducted readability research and wrote a report in collaboration with [the Department of] Sport Management. So far he has come up with a loyalty card concept, which has been well accepted. We had it moderated by industry. [...] So he is now working on how to activate that card, which is a huge incentive for overseas visitors to return, and it looks like Cape Town Tourism is quite interested in the concept. Even though they already have a loyalty card, apparently, we did discover, but it is not along the same principles. It is not 2010-related, I think that's the point of difference, it's actually for soccer fanatics and introducing them to the city and the region (Broom, 2008);*
- *The project took the form of a competition which involved the upgrading of the Mouille Point beach promenade area as part of the new 2010 sport stadium development in Greenpoint. Students submitted design proposals for elements such as bus shelters, seating, paving, site maintenance sheds, balustrading along the seafront, etc (Oelofsen, 2008); and*
- *[The student] focused on the essence of Swedish and African (particularly Zambian) design, to originate a visual design language which will find expression in surface designs for upholstery, furnishing and lighting. It is envisaged that this design language will render the particular surface applications accessible to the international and local soccer supporters making use of the VIP lounges (Chisin, 2008).*

When asked if they would support the participation of their students in 2010 projects, design educators replied as follows:

- *In principle, yes, depending on the interior design content of the specific project (Oelofsen, 2008);*
- *Absolutely. Obviously 2010 can be seen as a huge opportunity to use design, and communication design, to do something good for the city. Not just a commercial venture. I would try to keep it out of the commercial world and make it more for social projects (Broom, 2008); and*
- *Yes. The type of exposure that they will gain in designing/participating for and in such a high-profile event is invaluable. The participation must be properly structured to ensure maximum student and CPUT benefit (Chisin, 2008).*

Informants were unanimous that they would support the involvement of students from other departments in such projects. Broom (2008) felt that “collaboration with other disciplines is probably the best way [to go] about projects of this nature”. Jake de Villiers (2008), Head of the Department of *Architectural Technology* included “other departments of the *Faculty of Informatics and Design*”, CPUT. Johann J. van der Merwe (2008), Head of Department, *Design History and Theory* selected “graphic design and informatics”; whilst Nigel Tapela (2008), Head of Department, *Town and Regional Planning* identified “graphic, industrial design, photography, civil engineering, architecture, and art”. Oelofsen (2008) picked “Industrial Design and Architecture”; while Broom (2008) responded that “the first one is usually *Industrial Design*. Then also *Interior*, definitely *Fashion*, we often work with *Surface Design* – even *Jewellery*. I think *Communication Design* actually works with all of them”.

Informants offered the following elaborations for selecting the aforementioned disciplines:

- *The fits between Industrial and Graphic [design] are the most obvious, whereas graphic, or communication design, works for some of the other disciplines in more of a communication of selling their design, it complements. With industrial [design] there is a definite crossover* (Broom, 2008);
- *Whereas Graphic Designers might very well produce things, like packaging, as part of the communication needs. But that is only one aspect of what it is that we do. So we interface with Industrial Design, Interior, Surface, Fashion, if and when the need arises driven by the communication needs* (Snaddon, 2008);
- *A certain synergy exists between Interior Design and the above mentioned disciplines, inasmuch as Interior Design can be seen as the interface between buildings and occupants, and furniture design is a shared activity between the three* (Oelofsen, 2008);
- *The current proposal to initiate a project around Cape Town as a legible city could be an example. This would entail the involvement of a range of design disciplines* (de Villiers, 2008);
- *We have had successful collaborations in the past. We have built up a good understanding with Graphic Design and Industrial Design with the inter-departmental crits, and I believe that Interior Design and Surface Design are well-positioned to complement each other in projects* (Chisin, 2008);
- *Internationally these three departments (industrial, graphic and informatics) are being seen as forming a “natural” combination that can provide solutions to what are hybrid problem situations* (J.J. van der Merwe, 2008); and
- *Collaboration in project conception, design, development and packaging would benefit from interdisciplinary team for impact* (Tapela, 2008).

When asked whether they considered competitions to be effective platforms for promoting new design concepts/ideas, the responses were varied. Broom (2008), Snaddon (2008), de Villiers (2008), and Tapela (2008) all felt that competitions were an effective platform for such purposes. Oelofsen (2008) and Chisin (2008) were more cautious in observing that the value of competitions could not be generalised as they were outcome-dependent. J.J. van der Merwe (2008) was not convinced of their value and replied that “competitions have their place, but *problem-based learning* (learning about and with the real world) is much wider than any competition” – this need to link learning activities to real-life problems is an approach endorsed by other educational commentators (Biggs, 2002; Kruger *et al.*, 2006; Hagen, 2008).

In response to the question on how competitions could be made more effective in promoting novel concepts or ideas, informants said the following:

- *I must say that we've found with anything that has a sustainable focus, our students are getting to be very aware of sustainability issues and it's getting more and more intense every year, but naturally I find that Graphic Design students are very aware of their role. So anything that will motivate them will be the fact that they are making a difference. I find it so interesting, it used to be money and prestige, but now (also with the community-based projects that we have) we see that the internal motivation is very much about making a difference (Broom, 2008);*
- *I think when it comes to a competition brief you've got to be absolutely up-front with what the agenda is, and if it is UD then that's fine. The way we operate as communication designers is we use the brief as the starting point, the framework; it's the well from which we draw everything. [...] ... because when you work for a client, your client is going to give you the parameters and our job as the designer is to actually further develop those liberating constraints. The concept of 'liberating constraints' is a nice one, even though it sounds contradictory, I think in terms of how competitions can be more effective in promoting new concepts and ideas – inherent in the nature of the work that we do is the necessity for a brief to be accurate and to be inclusive of every aspect of what it is that you are trying to achieve. [...] Another thing is the recognition of the power that a designer wields, especially in the world of communication design, and that people need to be responsible with that power (Snaddon, 2008);*
- *Promotion and publicity in a range of both technical and popular media will be a start (Oelofsen, 2008);*
- *Wide publicity, “tightly” written briefs, effective workshops for competitors in which the organisers/instigators disseminate relative guidelines information and advice and attractive prizes (de Villiers, 2008);*
- *The media coverage that the competition generates is important. Consistency of the competition and a national format helps, such as the Mr Price and “No Kak Environmental” competitions.*

However, comparing those with the “New Signatures Art competition” is problematic since the latter has status in the academic/cultural sphere while the former, as a competitions focusing on consumer products, lack that status. This is changing though...The value of design as a catalyst for change and a facilitator for system and social design should be promoted more aggressively in competitions (Chisin, 2008);

- Use [competitions] as mere platforms/springboards for design learning, by allowing students to break out of the rules and guidelines of the sponsor of the competition. A straightforward competition is just another way of making students follow his master’s voice (J.J. van der Merwe, 2008); and
- Competitions tend to release energies that invoke innovation (Tapela, 2008).

Based on the above responses, the design educators should be involved in the conceptualisation, implementation and adjudication of competitions to enhance the effectiveness of competitions in the promotion of new concepts and ideas such as UD. With specific reference to UD, the majority of informants stated that they were familiar with the concept of UD and wished to interrogate the subject further. About half of the total number of informants had taught UD to some of their students – representing the Departments of *Architectural Technology, Design Theory and History, Interior Design, and Town and Regional Planning*. J.J. van der Merwe (2008) stated that “UD has formed a part of [the Department of Design History and Theory’s] first module for years”. Of those who offered UD to students, the majority offered the concept in an unstructured way – that is, not as a dedicated module or course, but as an integral part of other design, technology and theory-related course offerings. Those who had not yet begun teaching their students about UD (as understood and elaborated in this thesis) were from the Departments of *Graphic Design, and Fashion and Surface Design*. Informants from the Department of Graphic Design said the following:

- *Not formally – no. Not as a genre or area...* (Broom, 2008); and
- *No, though I feel that one maybe needs to qualify this and say that UD in that terminology structure has not been taught. I do believe that we do teach UD, it just has not necessarily been called UD* (Snaddon, 2008).

When asked whether UD was relevant to any of the courses or modules they currently offered in their programmes of study, all informants replied in the affirmative. Some of their responses are sampled below:

- *In short, yes – Communication Design, History and Contemporary Design studies offered from levels 1-4* (Snaddon, 2008);

- Yes – relates to the Design component (Oelofsen, 2008);
- Yes, particularly the module “Language, Culture and Difference” that I do with the BTechs, since UD speaks to aspects of difference, culture and language (Chisin, 2008);
- Yes – the relevance to [Design] Theory is to make students aware of the wider focus they need to take when dealing with potential users of theory designs (J.J. van der Merwe, 2008); and
- Yes – most of our planning design courses involve UD principles both in terms as understanding human behaviour and use of space (Tapela, 2008).

The Principles of UD (elaborated in Appendix B) that informants found most relevant to their disciplines included the following:

- *Mostly Simple and Intuitive Use, and Perceptible Information* (Broom, 2008; Snaddon, 2008);
- *Mostly Equitable Use, Simple and Intuitive Use, and Perceptible Information – in public spaces; Low Physical Effort – especially [with reference to] children and the aged; and most importantly Size and Space for Approach and Use* (Oelofsen, 2008);
- *All the seven Principles of UD* (de Villiers, 2008);
- *Flexibility in Use, Size and Space for Approach and Use, and Tolerance for Error, but very much dependant on the curriculum and the students* (Chisin, 2008);
- *All these Principles are necessary – for theory (as a way of seeing the world) the combined aspects of UD serve as a type of design thinking constraint – which fits in very well with Donald Norman’s rules of [1] designing with constraints and [2] make use of both knowledge in the head and knowledge in the world* (J.J. van der Merwe, 2008); and
- *All 7 Principles are important in human perception and use of space, oversight on one Principle impacts on overall design functionality, usability and aesthetic* (Tapela, 2008).

The comments on what aspects of UD that informants wished to incorporate in future are sampled below:

- *I think we’ll appropriate all. We don’t go to a category of user, we go to a niche within the category* (Broom, 2008);
- *Now see, ‘Equitable Use’ is the major problem, because a lot of the time we’re actually having to niche-market. I think it really acknowledges difference. You know, our approach, the old analogy is the shotgun shot versus the marksman shot. The shotgun blast is more ‘universal’ and whatever you’re going to do is going to work for everybody, but in marketing terms, in advertising terms, in budgetary terms you can’t do this. You know the flyer that you get through your mailbox is the shotgun blast and how often does that end up missing the mark. Whereas something that is more marksmanship, aimed at you, you might even get something with your name on it. Now they’ve managed to get that information from somewhere, from some database. Then you are more likely*

to read that, and they know, so that is a critical factor. [...] When you think of Coca Cola – if you were to hand a blind person a Coke bottle they would know exactly what it is if they hold it, even though they can't see the logo. That logo would never transform into Braille. I think that maybe cuts quite nicely to the issue. When we teach 'Corporate Identity', 'Logo Design' is a facet of 'Corporate Identity' [which in turn] is a facet of 'Branding'. So corporate identity (the way we teach it) is very holistically [done] – beyond just a logo. Branding is the most universal of those three categories. In simple terms a logo is a trigger. I like to use words that are more universal, a trigger, because graphic design also has to be a visual trigger. It can most certainly be a trigger in many other ways. There's smell, there's tactile, sound, there's tone of voice. These are all triggers that can relate a brand to a person who might be sight-impaired or hearing-impaired or whatever. Or just of a culturally different calling (Snaddon, 2008);

- *It is important for design students to be familiar with all aspects of UD (Chisin, 2008); and*
- *ALL, but would like to develop a more nuanced analytical/interpretative model that explores intersections between these (Tapela, 2008).*

The responses from Broom (2008) and Snaddon (2008) inspire a potentially new area of multi-disciplinary and cross-domain exploration for UD with respect to two- and three-dimensional interfaces. The possibility of developing *tactile branding* would increase the accessibility and usability of such branded products to categories of end-users/consumers who are typically unable to interact with brands in their present forms.

Informants offered some suggestions on how UD could be mainstreamed into their respective/specific disciplines:

- *UD should be integrated into every single brief. I don't think it should be separated. Communication design has to communicate on so many different levels that you couldn't segregate it to study it separately as a specialisation. I think they do deal with psychographics and demographics. Sometimes discoveries that you make when you're aiming at a general or normal target audience are wonderful and they actually are duplicated universally – this can specifically apply to UD (Broom, 2008);*
- *If you think about it fits really well in the research phase. As far as the design process is concerned it is in the research phase. Increasingly what we are trying to do is trying to think holistically. Were trying to start with the macro and then we come down to the micro. And when it comes to UD, and I love all the Principles of UD, because what it is effectively doing, is talking to the concept of the web of life – the connectivity of everything (Snaddon, 2008);*
- *UD can be mainstreamed as an integrated module within the subject 'Design' (Oelofsen, 2008);*

- *Through pre-qualification education and through post-qualification education, in cooperation with our profession, making use of the compulsory Continuing Professional Development (CPD) programme of South African Council for the Architectural Profession (SACAP) (de Villiers, 2008);*
- *It can be brought into the BTech curriculum, as part of the above mentioned module, in order for students to start incorporating the principles into their 'design thinking' (Chisin, 2008);*
- *I can imagine UD being introduced to first year students in [Design] History and Theory, to "take them out of themselves" in terms of thinking about the 'whys' and 'hows' of designed artifacts through the ages (J.J. van der Merwe); and*
- *Develop curriculum where theoretical exposition of these principles and the scientific, aesthetic/cultural and economic rationale underpinning them; at the same time using planning studio work and projects to demonstrate relevance of these [same principles] (Tapela, 2008).*

When asked whether they would be interested in having UD offered to their students in a formal model, all the informants answered in the affirmative. Snaddon (2008) puts it thus:

We would be very interested in teaching UD, but we would have to customise the current wording and terminology to make it relevant to the discipline. 'To find the correct fit' – as we say – it is almost like a blueprint that one uses to evaluate best practice and the right way to move forward. I think we can definitely factor it in. It is about making something that is so tacit a lot more explicit with regard to the way that we test our students.

The subjects that informants considered to be best aligned with UD include the following:

- *Communication Design, History and Contemporary Design studies (Broom, 2008);*
- *As a integrated module within the subject Design (Oelofsen, 2008);*
- *Principles of Architectural Design, Applied Design and Studio Work 1 to 4 (de Villiers, 2008);*
- *In the first 3 years with Contemporary Studies, and in BTech with the [Design] Theory module (Chisin, 2008); and*
- *Planning Graphics 1; Planning Design 2, 3 & 4, Environmental Planning & Computer Applications (Tapela, 2008).*

Informants were also unanimous in their choice of the *first year* of study as the best time to first introduce UD to their students. Broom (2008) believes that the first year is ideal as this is the stage at which "students are actually being made aware of communicating to a target audience [and exploring] notions of how to talk to a specific niche". Tapela (2008) proposes that students could engage with UD "right from the beginning in Year 1, if not earlier". Subsequently, an investigation of the feasibility and practicality of introducing design students of the Faculty to UD at the multidisciplinary *Foundation Course* or *Extended Curriculum Programme* phase is merited.

The informants also confirmed their commitment in continuing the use of UD principles in their future discipline-specific projects.

When asked who they felt would be the best champion for UD in the context of Cape Town, informants there was a diverse range of possibilities put forward as sampled below:

- *When you're working with a commercial sponsor there needs to be quantifiable returns that can be shown. So you need to find a brand that has Universal Design promise. You need to align it with a brand promise with what it is you would like to promote. So I'm thinking and here it is again "Coke", their whole attitude is diversity, when you look at their advertising, usability, inclusivity, when you look at the way the product is viewed – it is viewed as a universal product (Broom, 2008);*
- *The Cape Town Metropolitan Council in respect of the town planning scheme and building regulations, as well as professional bodies (Oelofsen, 2008);*
- *In our profession, it would probably be the Cape Institute for Architecture and the local branch of the South African Institute of Architectural Technologists (de Villiers, 2008);*
- *Users and design specialists (Chisin, 2008);*
- *Natalie du Toit (J.J. van der Merwe, 2008);*
- *I think where collaboration between disciplines and professions either in project conception and/or implementation is often the cutting-edge of innovation and therefore the site of any champion of UD design (Tapela, 2008).*

The subject of champions is discussed further in the Section 8.4. Informants offered the following additional comments with regards to the object of the study:

- *I think that any brand that doesn't include UD into their corporate responsibility program now, as well as just into their general brand values is going to be missing out. Yes, because with this view on inclusivity and non-discrimination worldwide being topical at this particular time, any brand that discriminates in any way will be missing out (Broom, 2008);*
- *It is becoming increasingly important to integrate UD into the Interior Design (and other) programmes. However, success will depend, to a great degree, on the availability of qualified staff to present the modules in an integrated and meaningful manner (Oelofsen, 2008);*
- *We have been left behind with even basic UD Principles and implementation at CPUT. Wheelchair toilets have been malfunctioning, wheelchair access is non-existent or malfunctioning on campus, to name but a few. Working with hearing-impaired students is problematic, and so the list goes on. This points to the fact that a sensibility of inclusion is still lacking, and by introducing UD from 1st year on, this situation will be helped (Chisin, 2008); and*
- *I would like to see more discussion between staff and students regarding the connections between UD and systems thinking, and the benefits to both (J.J. van der Merwe, 2008).*

The above comments point towards a need to engage both students and staff in a robust discourse and discussion prior to the implementation of UD at CPUT. Chisin (2008) and J.J. van der Merwe (2008) propose that linking the concept of UD to ‘design thinking’ and ‘systems thinking’ would foreground the teaching, learning and research imperatives more concretely. The potential for the creation of *transdisciplinary* or *Mode 2* knowledge can further be enhanced through exploring the overlapping fields that UD facilitates (Winberg, 2006; Garraway, 2008).

In summary, the responses from the design educators have the following implications with regards to the formulation of strategies for UD-related activities at CPUT:

- explore the possibilities of introducing students to UD concepts when students are in their *First Year* of study (or even earlier at *foundation* level if practicable);
- provide students with *theoretical foregrounding* in UD through the cross-disciplinary course offerings of the *Department of Design History and Theory*, and integrate the *practical components* of UD into discipline-specific *studio-based* projects;
- develop *unit standards* for UD to be offered as *core* and *elective* courses through restructured undergraduate programmes – this could eventually evolve into *major* and *minor* subject offerings available via appropriate *web-based learning* platforms;
- facilitate the development of SAQA-aligned credit-bearing (multi-disciplinary and cross-domain teamwork) *continuing professional development* training programmes on UD-related topics for practicing professionals;
- promote *contract research* (and other *third-stream* income) outputs to industry and other *Triple Helix* partners – this can be done in collaboration with other HEIs ;
- collaborate with professional designers, architects and engineers in co-facilitating cooperative learning opportunities for students around UD-related projects;
- promote UD-related collaborative teaching, learning and research activities at CPUT;
- participate in institutional projects to make CPUT a UD-compliant model through the development of effective wayfinding, accessible environments and inclusive educational teaching and learning resources;
- convene regular inter-departmental discussion fora involving teaching staff and students to sustain robust debate and dialogue on UD;
- identify support mechanisms (such as teaching and learning materials, equipment and other resources) to aid in the promotion of UD adoption in various academic projects;
- identify and support suitable internal UD champions with a transdisciplinary appeal;

- maintain an accessible and expandable (electronic) database of UD-related academic publications and research outputs (with particular reference to activities in CPUT);
- identify and secure sustainable sources of funding for research activities (possibly through an NRF niche research focus area) to build institutional capacity in UD. This could also be done by linking such strategies with *Centres of Excellence* and other institutions already working in UD-related activities – such as the *Intelligent Environments for Independent Living (IE4IL)* research project being carried out at the *Meraka Institute: African Advanced Institute for Information and Communication Technology* (Coetzee, 2008);
- participate in and support competitions that align with a problem-based learning ethos in promoting novel concepts such as UD in *majority world/industrially developing* contexts;
- encourage staff and students to engage in *participatory* and *socially responsible design* activities to demonstrate the value of UD to local communities;
- proactively incorporate and promote the adoption of Principles of UD within their own communities-of-practice by constantly exchanging best practices; and
- provide the popular media and press with UD-specific exemplars for dissemination to the general public.

8.4 Possible Champions for Universal Design

Based on findings from this research, a number of individuals were proposed as possible champions for UD in Cape Town. The interior design students also included a ‘neutral’ cartoon character as a potential candidate. The following is the shortlist of public figures (with a brief qualifier) – two sports figures, and two politicians as suggested by informants in rank order – the athletes proved to be the most popular choice:

- *Natalie du Toit* – world record-holding Paralympian swimmer (Bo, 2008);
- *Oscar Pistorius* – world record-holding Paralympian sprinter (du Swardt, 2008);
- *Nelson Mandela* – internationally renowned statesman and former President of South Africa; and
- *Helen Zille* – Premier of the Western Cape Province and former Executive Mayor of Cape Town.

Additionally, a number of professional bodies, corporate organisations and public service agencies were proposed though none emerged as a clear favourite. These include: the *Council of Architects*; the *Institute of Architects*; *Cape Institute for Architecture*; *Coca-Cola*; and the *Cape*

Town Metropolitan Council. The professionals identified as key champions for UD in rank order are: *architects; designers; engineers; planners; and consumer advocates*. A collaborative approach “between disciplines and professions either in project conception and/or implementation” was also proposed as an effective strategy for championing UD (Tapela, 2008).

The choice of *Natalie du Toit* and *Oscar Pistorius* who are both members of the *South African Sports Association for the Physically Disabled (SASAPD)*, and the fact that they enjoyed such popular support is instructive. As disabled athletes, they captured the public imagination by transcending their own physical limitations to achieve world acclaim (Bernard, 2008). Bo (2008) reports of Natalie du Toit’s popularity in the recent *Beijing 2008 Summer Olympics* (also known as the *Games of the XXIX Olympiad* with ‘*One World, One Dream*’ as its motto) in part due to the fact that despite her disability, Natalie managed to qualify for the ‘non-disabled’ swimming heats without the use of a prosthetic device – she made history by being the first disabled athlete to qualify for the Olympics. Natalie (shown in Figure 8.45) finished 16th overall but won tremendous respect for challenging the status quo (McCallum, 2008; Schroeder, 2009).



Figure 8.45 Paralympian swimmer Natalie du Toit
(source: © <http://legendsrevealed.com>, 2009)

Oscar Pistorius nicknamed '*The Blade Runner*' (as he requires prosthesis for running) made similar headlines when he challenged the South African national Olympics committee's rules that bar disabled athletes from participating in the non-disabled version of the games (McCallum, 2008). The case sparked off an ethical debate on the role that technology (potentially) plays in an athlete's performance (du Swardt, 2008). Oscar (shown in Figure 8.46) was eventually allowed to participate in the qualifying heats. Oscar missed the Olympics qualifying time narrowly and as such could not secure a place on the country's national team of non-disabled sprinters – he did however participate in the *Beijing 2008 Paralympics Games* where he lived up to his reputation as '*the world's fastest man without legs*' (*ibid*).



Figure 8.46 Paralympian sprinter Oscar Pistorius
(source: © <http://rawartint.files.wordpress.com>, 2008)

The feat of the South African Paralympics athletes is made all the more impressive when compared to the dismal performance of the Olympics team. The 136 (non-disabled) athletes only managed a single medal overall – a silver medal by *Godfrey Khotso Mokoena* in the long jump event and were ranked out 70th out of the 204 nations that participated in Beijing – a low ranking that echoed that of *Bafana Bafana* in the soccer milieu. The Paralympics team on the other hand, finished in a respectable *sixth overall* position with an impressive tally of *30 medals*, 21 of which were gold – including Natalie's (five), Oscar's (three) and Hilton Langenhoven's (three) personal gold medal tallies (Morgan, 2008). Further, Natalie was "named the female winner of the *Whang Youn Dai Achievement Award* for the 2008 Games" (*ibid*).

An additional factor that lends support to the choice of these two sports figures as possible champions for UD is the significant influence and coverage that sports endorsements attract through sponsorship by the corporate/private sector. This would provide sponsoring agencies opportunities to position themselves strategically with respect to corporate social investment provided that ethical concerns are duly addressed (Manzini, 2006). Internationally, South Africa enjoys a good reputation in certain sports (as discussed in Chapter 2) – sports in this context allows otherwise disparate communities to transcend the potentially divisive nature of politics and instead form a more collective response to issues affecting all citizens and residents alike.

8.5 Mainstreaming of Universal Design in Cape Town

For UD to be effectively mainstreamed in Cape Town, the coordination local, regional and national arms of government would need a collaborative process of logistical and operational articulation across the various departments. The absence of such coordinated action would result in duplication of scarce resources or worse still, confusion regarding the individual level operations and group level actions of key actors on the one hand, and the collective or societal level activities of the emerging community.

Further, some level of inter-departmental coordination would be required in a democratic, transparent, and yet flexible manner. The recently promulgated *Department of Women, Youth, Children and People with Disabilities* is uniquely placed to act as in such a capacity, provided that such a role is legitimised through a popular mandate by all participating actors. Once such a structure is established, a suitable champion should be elected to drive the process that is integrated at all levels of policy and planning. Other departments that could play such a coordinating role include the *Department of Economic Development and Tourism*, *Department of Social Development*, and the *Department of Public Service and Administration*.

Other important actors based on the *Triple Helix* partnership model (of government, industry and academia) would include the *Tourism Grading Council*; the *Cape Town Partnership*; *Higher Education Institutions* (including all the major universities within the greater Cape Town region); professional councils/institutes representing various architectural, design and engineering disciplines; consumer advocacy groups; members of civil society representing the disability sector; as well as representatives from media and the arts, among others. For CPUT, engagement with other key actors around UD-related activities would present an opportunity to realise the institutional mission: “to develop and sustain an empowering environment where,

through teaching, learning, research and scholarship our students and staff, in partnership with the community and industry, are able to create and apply knowledge that contributes to development". Further, UD should become a core strategic component in future efforts to position Cape Town internationally, for example in the city's bid to become the *World Design Capital* (WDC) in 2014 – an influential programme managed by ICSID.

8.6 Summary

This chapter focussed on the analysis of data generated from multiple sites and at various phases of this study. Activity analysis of various operations, actions, and activities shed light on the complex and multi-sectoral imperatives in promoting a novel concept like UD in an industrially developing context. With reference to education, linking *inclusive education* policies and strategies to education-specific applications of UD (such *Universal Design for Learning*) could offer immediate practical benefits to the two related fields. Aligning UD with institutions that are already involved in the provision of more accessible and usable products, services, systems and built environments would potentially eliminate wasteful duplication of effort and instead channel the collective social capital towards ensuring greater sustainability of such activities within Cape Town. Further, as has been argued in this thesis, the interpretivist stance facilitated the voice of various actors in addressing UD-related concerns from their own unique perspectives.

Additionally, the ethos of *ubuntu* cannot (and should not) be applied selectively to inform responses to issues such as discrimination, systemic exclusion or discrimination. By its very nature, *ubuntu* is a unifying philosophy that applies to *all* human beings without exception. Thus *ubuntu* can be invoked in alignment with the ideals of UD, but not narrowly in the context of specific constituencies (such as in response to the needs of people with disabilities or the elderly) whose members exhibit observable or demonstrable differences in appearance and functioning – such actions would only perpetuate the stigma associated with atypicality. Instead *ubuntu* and UD should be viewed as being complementary in their celebration of human diversity in its entirety. Finally, the role of credible champions to promote adoption and mainstreaming of novel concepts is critical to the success of such an enterprise. Informants indicated a general preference for apolitical public figures to play this key role. Notwithstanding, the selection of such champions should be done in an open and participatory manner – short-listed candidates/nominees should enjoy broad-based cross-sectoral appeal so as to ensure acceptance within the communities that require UD promotion and adoption.

CHAPTER NINE

CONCLUSIONS AND RECOMMENDATIONS

9.0 Introduction

This final chapter reviews the research objectives and presents pertinent conclusions from this exploratory study. Further, the chapter attempts a justification of the study in terms of its contribution to knowledge in a number of inter-related fields. Though every effort has been made to address as many issues pertaining to UD in a developing/majority world context, no single study can claim to adequately address all questions arising from the research process – consequently, limitations of the study and implications for further research are presented for due consideration.

9.1 Revisiting the Research Objectives

The stated overall objective of this study was to propose *strategies for effectively mainstreaming UD considerations amongst design practitioners in an emerging economy context*. To achieve this purpose, the specific objectives have been addressed by doing the following:

- Evaluating the current level of UD awareness among selected designers and planners in Cape Town, especially in the light of FIFA 2010 World Cup™-related activities within the city;
- Assessing the applicability of UD strategies that have evolved outside the context of this study;
- Proposing appropriate sustainable and adjustable strategies for mainstreaming UD applications in Cape Town beyond the 2010 sporting mega-event; and
- Contributing to the strategic goals of the African Decade for Persons with Disabilities (1999-2009).

The specific conclusions linked to the abovementioned research objectives are elaborated in the following section.

9.2 Conclusions Drawn

With reference to evaluating the current levels of UD awareness in the context of Cape Town, this study found mixed responses. Planners and professional designers appear to have heard of UD but linked it predominantly to disability-specific applications. Further, *Universal Access* is supported by agencies such as the United Nations and thus more widely known than UD (P.

Thompson, 2008). With the exception of the *Mouille Point Promenade and Beachfront Student Landscape Design Competition*, UD had not been explicitly engaged with nor addressed in policy, planning and projects within the city of Cape Town. Notwithstanding, *IDC Consultants*, a leading architectural design consultancy has been using UD in its professional practice for more than a decade (*ibid*). Further, the *Disability Workshops Development Enterprise* (DWDE), *National Council for Persons with Physical Disabilities*, and *Quadriplegic Association of South Africa* (QASA), all actively promote UD in their work (Deglon, 2008; Wetzel, 2008). The student survey also revealed that a negligible number of students outside the *Department of Industrial Design* (where the researcher is based) were exposed to UD concepts. The students and their lecturers however expressed interest in further engagement with UD in a more formalised and structured manner in future.

In assessing the applicability of UD strategies outside of Europe, Japan and North America, this study found that UD is indeed relevant and adaptable to local contexts. However, the study noted the need to address the central issue of participation (and by extension, ownership) by potential end-users of products, services, systems and built environments. The UD model as practiced elsewhere appears to follow the traditional approach wherein the designers are viewed as professional experts who only engage potential end-users in an *ad hoc* and *post hoc* manner in the design process. The proposed UD strategies should be flexible and allow for a *distributed network* of exchange (Johansson, Kisch & Mirata, 2005). They should also accommodate *diversity* as a means to ensure *resilience* and *sustainability* of resultant strategies (Stirling, n.d).

This thesis proposes sustainable and adjustable strategies for mainstreaming UD applications in Cape Town beyond the 2010 imperative that would enhance participation and ownership by all key actors. Such strategies can only be deemed appropriate if they align with emerging fields as *Participatory Design* (as a methodology for engaging participants), *Design for Sustainability* and *Service Design* (with their allied didactic tools for promoting social equity and cohesion) (Ehn *et al.*, 2002; Manzini, 2006; Vezzoli, 2007; Cipolla, 2009). The said strategies should also engender *consensus* participation – as opposed to *consultative*; and *representative* modes of participation (Sjöberg, 1996). Additionally, the strategies should embrace elements of local inspiration that are easily recognised for their authentic design language (Algotsson & Davies, 1996).

During the compilation of this thesis, the mandate of the Secretariat on the *African Decade for Persons with Disabilities* (ADPD) was extended by another decade. The ADPD was initially set to

run from 1999 to 2009, and will now run all the way to 2019 (Dube, 2008). As noted elsewhere in this thesis, this study addresses certain strategic goals of the ADPD by paying “particular attention to [the needs of] persons with disabilities in the fields of health and education” (DPOD, 2008). The issue of education is the specific purview of the concept of *UD for Learning* – a field allied to *Inclusive Education* (see Section 5.2.2).

9.3 General Conclusions and Proposed Strategies

The UD-related activities discussed in Sections 8.2.1, 8.2.2 and 8.2.3 revealed a number of contradictions and tensions from an Activity Theoretical perspective. Whereas the *object* (or target of the activities) was consistently that of mainstreaming UD adoption within the city of Cape Town, the *units of analysis*, *directing factors* and *subject* changed according to the specific *communities* involved (Engeström *et al.*, 1990). Further, the *instruments* (Principles of UD and related tools used internally and externally) remained more or less constant throughout the diverse contexts. The *rules* and the *division of labour* on the other hand were content- and context-responsive – these elements are elaborated in Section 6.1. The general conclusions and proposed adjustable strategies for mainstreaming UD in various contexts within the city of Cape Town are summarised using the different activity systems of the three cases covered in this thesis and depicted in Figures 9.1-9.3 for reference.

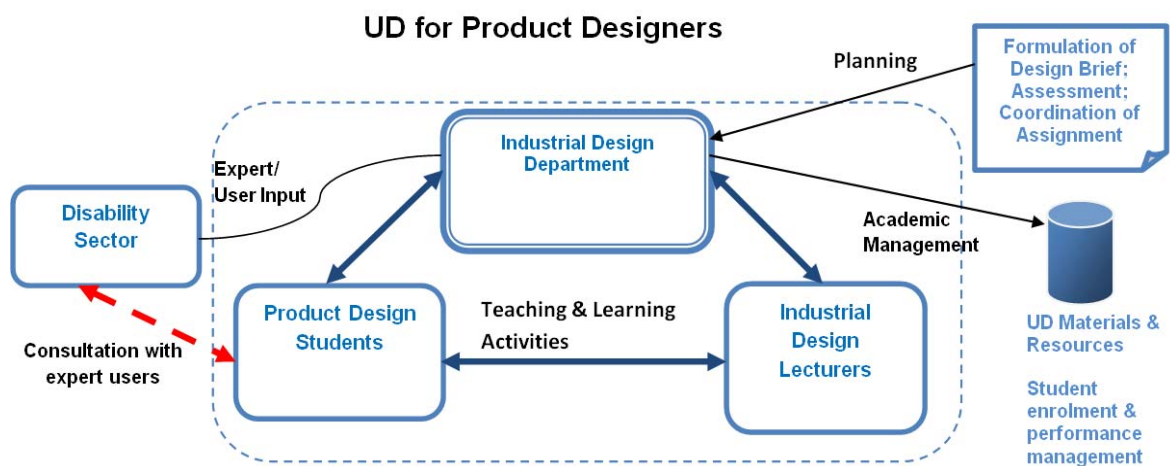


Figure 9.1: Summary of activities: the educational environment

Figure 9.1 presents an overview of the educational environment in which the *UD for Product Designers* module was presented. The following adjustable strategies can be employed:

- CPUT needs to facilitate stronger links with the disability sector. Ensuing benefits could include:

- giving students opportunities to engage experts on disability-related issues;
- supporting collaborative projects with a focus on such topics as reasonable accommodation in the workplace, inclusive education, and the design and development of assistive technology and devices;
- engaging members of the disability sector as guest lecturers;
- facilitating *experiential learning* opportunities for students; and
- advancing UD-specific teaching, learning and research activities.

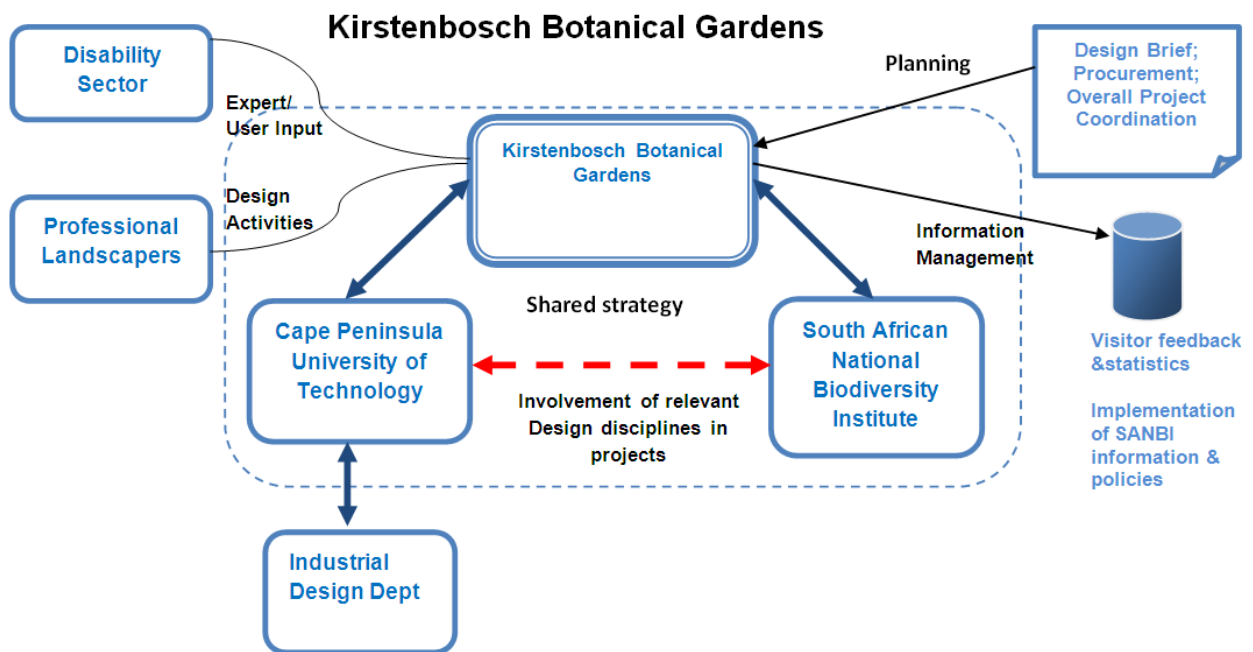


Figure 9.2: Summary of activities: the botanical gardens environment

Figure 9.2 presents a summary of the activities relating to the UD audit at the *Kirstenbosch National Botanical Gardens*. The following adjustable strategies can be employed:

- CPUT should negotiate involvement in public projects in its capacity as a leading HEI in the Western Cape Province. Ensuing benefits would include:
 - engaging staff and students in real-life *problem-based* projects;
 - co-developing relevant policies and strategies within *research niche* areas;
 - generating third-stream income through *contract research* outputs;
 - strengthening of *Triple Helix* partnerships; and
 - providing expert input on disability-related issues.
- CPUT should strengthen its links with design professionals (particularly its own alumni). Such a strategy would hopefully result in:

- o providing opportunities for *internships* and *cooperative learning* for students;
- o engaging alumni as external examiners, guest lecturers, and as industry advisory panel members for quality assurance purposes; and
- o co-developing course content for upgrading skills of in-service designers through *continuing professional development*.

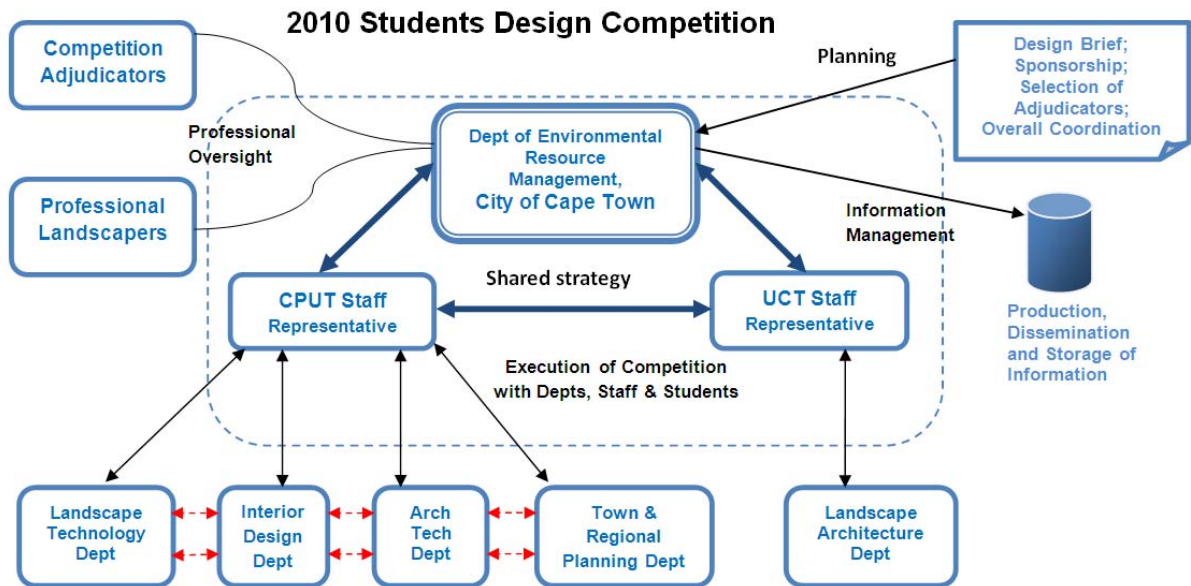


Figure 9.3: Summary of activities: the students' competition

Figure 9.3 presents a summary of the activities relating to the 2010 *Mouille Point Promenade and Beachfront Student Landscape Design Competition*. The following adjustable strategies can be employed:

- Staff within CPUT in general, and the *Faculty of Informatics and Design* in particular, should identify areas of potential collaboration around UD and strengthen inter-departmental and cross-disciplinary links therein. Ensuing benefits would include:
 - o building capacity around UD-related clusters and leverage the same in advancing CPUT's vision: "to be at the heart of technology education and innovation in Africa";
 - o developing multi-disciplinary and cross-domain research projects that invite the broad participation of staff and students within the Faculty;
 - o developing links with other disciplines and departments within the CPUT community that could potentially enrich teaching, learning and research capabilities; and
 - o participating in UD-related activities within operational units where the efficacy of UD-thinking could be demonstrated these should include institutional *Disability Units* and the *Fundani Teaching and Learning Centre*, among others.

9.4 Contributions to Knowledge

The main objective of this research was to evolve and propose strategies for mainstreaming UD applications in design projects in the context of an emerging economy. The proposed strategies are sufficiently adjustable and context-responsive to allow for application in similar industrially developing or majority world settings. It is anticipated that the process of *social change* would be “informed by the potent principles of *ubuntu* [...] as the primary organising principle of African morality” (Siyabulela & Duncan, 2006:306).

The research makes a specific contribution towards the call of the *African Decade of People with Disabilities* for the “*formulation and implementation of technical guidelines and legislation to promote access by disabled persons to buildings, public facilities, transport and communications systems, information, education training, and technical aids as well as empowerment of persons with disabilities*” (ADPD, 2006; Chalken *et al.*, 2006:93). As argued throughout this thesis, these concerns would be adequately addressed by a UD approach.

The study contributes to the development of multi-disciplinary and cross-domain UD modules for teaching and learning at interested *higher education institutions* in the Western Cape Province in particular, and South Africa in general (Lorenzo, ka Toni & Priestly, 2006:189). This follows the lines of the *Universal Design Education Project (UDEP)* as described by Ostroff (2003:348; Universal Design Education Online, 2006), the global examples for teaching UD/*Design for All* presented by Kennig and Rhyl (2002), and UD applications in educational environments (McGuire *et al.*, 2006). This is in alignment with the recommendations of the *Special Needs Education White Paper* (South Africa, 2001) and *Higher Education Act* (South Africa, 1997b) for synergetic collaboration on matters of common interest (such as inclusive education policies and strategies) among higher education institutions (Howell, 2006).

The research offers a database of best practice exemplars for reference and benchmarking purposes by design practitioners. These UD exemplars from Cape Town are found in the supplementary CD-ROM appended to this thesis. This expandable database could be regularly updated and uploaded onto the Internet and offered as a web-based learning resource for greater accessibility, as well as hyperlinked to related hosts (such as national and continental organisations for ageing and disability). Cronjé, Bligaut and Bothma (2002) support the use of *web-based resources* for information, communication and educational applications of this nature.

It is believed that issues raised in this study will help facilitate a vibrant and robust collaborative UD forum/network for all interested parties to sustain debate around pressing social issues; coordinate research by making UD an NRF-recognised *research niche area* at CPUT (South Africa, 2002); facilitate capacity-building of locally available UD-related expertise; provide strategic direction; and act as a one-stop resource base for UD-related queries where as Thomas (2006:65) proposes, “value-driven designers [...] can share their ideas and work more effectively in support of the ideals in which they believe”. Keating (2008) reports of the potential commercial value of innovative research to CPUT – this is the kind of value that UD embodies. Further, *ubuntu* is one of eight core institutional values of CPUT as articulated in its vision and mission statements (CPUT, 2006). This thesis argues that the principles engendered in both the UD ideal and the *ubuntu* ethos are not only perceived to be progressive, but that they are vital to the formulation of context-sensitive and sustainable responses to counter social exclusion.

9.5 Limitations of Research

From a purely quantitative point of view, the limited number of informants (averaging just over 17% of the total student population) could impact upon the generalisability of the findings from the survey of design students. However, with regard to the research intent and focus, the findings reveal rich multi-dimensional aspects that offer a reasonable degree of transferability in related concerns (Dolan & Hall, 2001). The study also provides a firm basis for introducing UD across the different design disciplines, particularly earlier on in course programmes – this would promote enhanced uptake of UD-thinking in latter years of study.

Further, though the initial sample population included all students within the design disciplines, *Fashion and Surface Design* as well as *Jewellery Design and Manufacture* students did not participate in the survey due to the perception by their lecturers that their typical approach to the design process is one of situated learning (as opposed to problem-based learning in the other sub-disciplines). A reasonable degree of representativeness in the survey was ensured by the somewhat higher than anticipated response rates in the departments of *Architectural Technology* (29.3%) and *Industrial Design* (24.2%) – two key disciplines in the community-of-practice of UD.

Finally, whereas the initial intent for the 2010 students’ design competition was to promote multi-disciplinarity through the voluntary participation of all design students (including those of the *Department of Landscape Technology*); only students from the *Department of Interior Design* participated. Those departments that did not do so cited reasons such as inflexibility in

timetabling, lack of content knowledge, and perceived irrelevance of the competition's theme to the core focus of their study discipline. This somewhat disappointing outcome consequently limited the possibility of exploring the cross-disciplinary dynamics of collaborative design tasks.

9.6 Implications for Further Research

The findings provide interesting and useful information on various attitudes towards UD. Further, the study revealed the inherent confusion between UD and *Universal Access* (UA) by many professional designers. The majority of informants from professional design backgrounds suggested that UD should be offered as a [SAQA-aligned] credit-earning (unit standard) course for *Continuing Professional Development* via their respective professional bodies. Though etymologically linked, a useful introduction to UD would need to interrogate the link with UA, as well as a discussion on the unique methodology of the UD paradigm. There is thus scope for research into multi-disciplinary and cross-domain collaborative design work involving mixed architectural and design teams.

There is also a need to document newly-completed and ongoing infrastructural developments that incorporate UD. Emerging exemplars of UD could subsequently be disseminated and diffused through accessible physical and virtual platforms so as to facilitate best practice benchmarking. The said exemplars would form a valuable basis for service learning opportunities for design students. From a pedagogical point of view, a study on the potential synergies between national ministerial policies on *Inclusive Education* with UD (such as *Universal Design for Learning*) should be initiated to consolidate the benefits of UD to the Department of Education and other relevant or related ministries. Subsequently, the newly established *Department of Women, Youth, Children and People with Disabilities* should explore the possibility of coordinating trans-sectoral strategies/activities through an *inter-ministerial committee* that enables government departments/ministries to leverage potential benefits of UD concepts as a means to address such diverse imperatives as the promotion of social equity and cohesion, inclusion, access and participation for all South Africans.

The findings from the analysis on UD pictograms reveals the fact that the more explicit/transparent pictograms lent themselves better to interpretation than the more abstract/opaque ones. This is corroborated by a number of other studies on semiotics and semantics (Singer & Ritz, 1996; Harrell *et al.*, 2000; Murungi, 2003; Yielding, 2003). A dedicated research and design study should be conducted to establish a context-responsive set of

pictograms in the vein of the *Adinkra Symbols* (2007) from West Africa for utilisation as wayfinding signage and related symbols specifically for use in South Africa. As argued elsewhere in this thesis, South Africa's large number of official languages presents certain practical, logistical and economic challenges that could be ameliorated by the development and adoption of an accessible and inclusive visual language employing culturally pertinent signs and symbols. This can be done through a national collaborative research effort involving tertiary/higher education institutions offering Information, Interaction, Visual and/or Graphic Design employing a participatory design methodology across the various unique cultural/linguistic groups.

This study addresses the issue of mainstreaming UD in products, services, systems and built environments. Admittedly, the focus was on an urban setting with world-class infrastructure. Further research would need to interrogate the potential applications of UD to rural and peri-urban, resource-poor settings. The rural areas in this country for example account for a significant population of people categorised as “extra-ordinary” or ‘vulnerable’ – these include people living with HIV/Aids (of all generations), women (usually related to migrant workers in urban areas), children (including large numbers of orphans), seniors citizens, people with disabilities, and certain categories of foreign nationals (such as refugees). Further, the role of *ubuntu* in developing participatory, culturally sensitive, and sustainable models for promoting social inclusion should be interrogated further. Indeed, *ubuntu* would buttress any community-based care model to potentially ameliorate the plight of people living with HIV/Aids in particular, and also inform a robust and comprehensive response to the stigmatising and discriminatory practices experienced by other vulnerable groups. This issue is of particular urgency in the South African context and should be the focus of a dedicated study (Barnett & Whiteside, 2002).

9.7 Summary

Universal Design is a relatively new concept in industrially developing or majority world contexts. The hosting of the FIFA 2010 World Cup™ in South Africa in general, and in Cape Town in particular, presented an historic opportunity for action research into means by which UD could be mainstreamed in the said milieu. The study revealed certain challenges that would need to be addressed in the adoption of UD by a number of actors and communities-of-practice. Notwithstanding, the general impression is that UD is considered worthy of further engagement and application, and that with minor tuning, similar strategies could be employed in related contexts elsewhere in South Africa, the African continent, and beyond. The findings also inform the context-responsive strategies that will be disseminated to a wider audience via an interactive,

collaborative, inclusive and participatory ethos. The emphasis is on maintaining diversity through a battery of strategies, as opposed to amalgamating the diverse proposals into a unified or standardised approach that ignores or negates *in situ* realities. It is critical that for any proposed strategies to ultimately find acceptance within the intended constituencies, as many potential beneficiaries as possible should engage freely and continually with the change process.

Subsequently, the findings in this study suggest that UD should be presented in a distributed and non-prescriptive manner that respects and embraces cultural and philosophical diversity. These trans-cultural and transgenerational imperatives will become more pressing as the double impact of accelerated *international migration*, and the global phenomenon of *population ageing* become increasingly apparent in developing or emerging economies. Additionally, the study challenges prevailing welfarist models that are patently unsustainable and typically serve to perpetuate stigmatisation and discrimination, as well as reinforcing dependency (and in many instances a retroactive entitlement syndrome) in people with special needs.

Finally, the popular notion that the responsibility for UD implementation be left solely in the hands of 'experts' or professionals such as planners, architects and designers is deemed untenable in that every citizen has an inalienable (and constitutionally enshrined) right to social inclusion and participation in all matters that touch on their wellbeing (and quality of life). The notion of 'ownership through participation' is a theme that resonates throughout this thesis. Consequently, any future UD strategies must be informed by a potentially *emancipatory* social change process wherein the end-users are co-opted as co-designers through a *consensus participatory process* – all residents should be *invited and expected* to take part in *all* stages of the design process as far as is practically (and logistically) possible. Such a participatory approach fundamentally fosters democracy and good governance, as well as contributing positively to the development of appropriate and desirable social capital. In so doing, the inclusive character of UD-thinking would facilitate the quest for enhanced accessibility, usability and sustainability in products, systems, services and built environments *for everyone*.

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- Natalie du Toit: <http://legendsrevealed.com/sports/wp-content/uploads/2009/07/natalie2.jpg>
- Oscar Pistorius: <http://rawartint.files.wordpress.com/2008/05/pistorius.jpg>

APPENDICES

APPENDIX A: Disability Definitions, Models and Terminology (source: DPSA, 2004)

SUMMARY

These guidelines on disability terminology and definitions are taken from "A Pocket Guide on Disability Equity" prepared by Disabled People South Africa (DPSA).

- What is Disability?
- Definitions
- Models
- Terminology

WHAT IS DISABILITY?

"Disability is the disadvantage or restriction of activity caused by a society that takes little or no account of people who have impairments and thus excludes them from mainstream activity" (*British Council of Organisations of Disabled People*).

DIFFERENT APPROACHES TO DEFINING DISABILITY

The definition and classification of disabled persons have gone through a number of changes over the centuries.

Biomedical Definition

Disability is identified with illness or impairment in the biomedical approach, with most emphasis falling on curing the disabled individual. If this fails, the person is removed from society.

Philanthropic Definition

Disability is regarded as a tragedy or object of sympathy and charity. People with disabilities are therefore pitied, given handouts and cared for in separate institutions.

Sociological Definition

This approach defines disability as a form of human difference or deviation from the social norms of the acceptable levels of activity performance.

Economic Definition

Disability is defined as a social cost caused both by extra resources that children and adults with disabilities require and by their limited productivity at work, relative to able-bodied people.

Socio-Political Definition as Adopted by the Integrated National Disability Framework

Disability needs to be defined within context, rather than focussing on the inability of people that inadvertently leads to stigmatisation and categorisation. The Integrated National Disability Framework has therefore adopted a socio-political approach to disability, whereby disability is located in the social environment. This takes cognisance of disabled people's viewpoint that disability is a social construct and most of its effects are inflicted upon people with disabilities by their social environment e.g. it is not the disability, nor the wheelchair that disables a person but it is the stairs leading to a building.

MEDICAL APPROACH VERSUS SOCIAL MODEL

Disabled people during the 1970s used their personal experience of disability and institutional life to show that it wasn't their impairments that caused the problem but the way in which society failed to make any allowances for their differences and instead locked them away.

Medical Model Approach

Traditional approaches say that the inability to carry out activities is caused by impairment or impairments; for example, you are not mobile because you have a spinal injury. This understanding of disability is said to be a medical model of disability because the causes of disability are attributed only to medical conditions.

Social Model Approach

This social model is not limited by such a narrow description of activities. It takes the wider view that the ability to take such activities is dependant upon social intervention. It can show that the limitation of activity is not caused by impairments but is a consequence of social organisation- hence the phrase 'social model'. In short, the social model says that a person is disabled if the world at large will not take into account their physical or mental differences.

PREFERRED TERMINOLOGY

Language reflects the social context in which it is developed and used. It therefore reflects the values and attitudes of that context, and plays an important role in reinforcing values and attitudes that lead to discrimination and segregation of particular groups in society. Language can therefore be used as a powerful tool to facilitate change and bring about new values, attitudes and social integration

Here are a few examples of the preferred terminology for English¹.

- Although some disabled people prefer the terms "physically challenged" or "differently abled", these should not generally be used. The disability rights movement of South Africa accepts both the terms "disabled person" and "people with disabilities".
- Avoid "suffers from," "afflicted with" or "victim of", all of which cast disabilities as a negative. "Suffers from" indicates ongoing pain and torment, which is no more the case for most people with disabilities as it is for most people without disabilities. "Afflicted with" denotes a disease, which most disabilities are not. "Victim of" implies that a crime is being committed on the person who has a disability.
- Do not use "wheelchair-bound" or "confined to a wheelchair". People see their wheelchairs as a convenient mode of transportation, not prisons, and the "bound/confined" phrase belies the fact that many people with motor disabilities engage in activities without their wheelchairs, including driving and sleeping. The proper phrase is "uses a wheelchair".
- Use "disability" not "handicap." The word "handicap" derives from the phrase "cap in hand", referring to a beggar, and is despised by most people with disabilities. Other terms to avoid are "physically/mentally challenged" (who isn't?) "cripple" or "crippled."
- Use "able-bodied" or "people without disabilities." The terms "normal" and "whole" are inappropriate and inaccurate.
- Most disabilities are not a disease. Do not call person with a disability a "patient" unless referring to a hospital setting. In an occupational and physical therapy context, "client" or "customer" is preferred.
- Some diseases by legal definition are considered disabilities. Victimization imagery ("AIDS victims") or defining the person by the disease ("she is a diabetic") is inappropriate. Use "person with diabetes" or "people living with AIDS".
- People who consider themselves as part of Deaf culture refer to themselves as "Deaf" with a capital "D". Because their culture derives from their language, they may be identified in the same way as other cultural groups, for example "Shangaan". Never use the terms "Deaf-mute" or "Deaf-and-Dumb".
- Avoid "deformed," "deformity" and "birth defect". A person may be "born without arms" or "has a congenital disability," but is probably not defective.
- Use "person with Down syndrome." Avoid "Mongol" or "mongoloid."
- Avoid "mentally retarded", "insane", "slow learner", "learning disabled" and "brain damaged". Use "person with an intellectual disability", or "person with a psychiatric disability".
- Avoid "cerebral palsied" and "spastic". Use "person with cerebral palsy".
- Use "person with epilepsy" or "child with a seizure disorder". Avoid "epileptic", either as noun or adjective.
- Avoid "dwarf" or "midget". Some groups prefer "little/short", but its best to use "person of short stature".
- Use "man with paraplegia" or "she has quadriplegia". Avoid "paraplegic" or "quadriplegic" as either a noun or adjective.

Negative and patronizing language produces negative and patronizing images. Words are important, so make sure your words do not offend or reinforce negative stereotypes.

¹ With acknowledgement to Patricia Digh of Real Work Group cited in the DPSA (Disabled People South Africa) - "A Pocket Guide on Disability Equity".

THE PRINCIPLES OF UNIVERSAL DESIGN

Version 2.0 (4/1/97)

1 EQUITABLE USE



The design is useful and marketable to people with diverse abilities.

- GUIDELINES**
- 1a. Provide the same means of use for all users: identical whenever possible, equivalent when not.
 - 1b. Avoid segregating or stigmatizing any users.
 - 1c. Make provisions for privacy, security, and safety equally available to all users.
 - 1d. Make the design appealing to all users.

- EXAMPLES**
- Power doors with sensors at entrances that are convenient for all users
 - Integrated, dispersed, and adaptable seating in assembly areas such as sports arenas and theaters

5 TOLERANCE FOR ERROR



The design minimizes hazards and the adverse consequences of accidental or unintended actions.

- GUIDELINES**
- 5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
 - 5b. Provide warnings of hazards and errors.
 - 5c. Provide fail safe features.
 - 5d. Discourage unconscious action in tasks that require vigilance.

- EXAMPLES**
- A double-cut car key easily inserted into a recessed keyhole in either of two ways
 - An "undo" feature in computer software that allows the user to correct mistakes without penalty

2 FLEXIBILITY IN USE



The design accommodates a wide range of individual preferences and abilities.

- GUIDELINES**
- 2a. Provide choice in methods of use.
 - 2b. Accommodate right- or left-handed access and use.
 - 2c. Facilitate the user's accuracy and precision.
 - 2d. Provide adaptability to the user's pace.

- EXAMPLES**
- Scissors designed for right- or left-handed users
 - An automated teller machine (ATM) that has visual, tactile, and audible feedback, a tapered card opening, and a pain test

6 LOW PHYSICAL EFFORT



The design can be used efficiently and comfortably and with a minimum of fatigue.

- GUIDELINES**
- 6a. Allow user to maintain a neutral body position.
 - 6b. Use reasonable operating forces.
 - 6c. Minimize repetitive actions.
 - 6d. Minimize sustained physical effort.

- EXAMPLES**
- Lever or loop handles on doors and faucets
 - Touch lamps operated without a switch

3 SIMPLE AND INTUITIVE USE



Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

- GUIDELINES**
- 3a. Eliminate unnecessary complexity.
 - 3b. Be consistent with user expectations and intuition.
 - 3c. Accommodate a wide range of literacy and language skills.
 - 3d. Arrange information consistent with its importance.

- EXAMPLES**
- An automated teller machine (ATM) that has visual, tactile, and audible feedback, a tapered card opening, and a pain test
 - A moving sidewalk or escalator in a public space
 - An instruction manual with drawings and no text

7 SIZE AND SPACE FOR APPROACH AND USE



Appropriate size and space is provided for approach, reach, manipulation, and use regardless of users' body size, posture, or mobility.

- GUIDELINES**
- 7a. Provide a clear line of sight to important elements for any seated or standing user.
 - 7b. Make reach to all components comfortable for any seated or standing user.
 - 7c. Accommodate variations in hand and grip size.
 - 7d. Provide adequate spaces for the use of assistive devices or personal assistance.

- EXAMPLES**
- Controls on the front and clear floor space around appliances, mailboxes, dumpsters, and other elements
 - Wide gates at subway stations that accommodate all users

4 PERCEPTIBLE INFORMATION

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.



- GUIDELINES**
- 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
 - 4b. Maximize "legibility" of essential information.
 - 4c. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
 - 4d. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

- EXAMPLES**
- Tactile, visual, and audible cues and instructions on a thermostat
 - Redundant cueing (e.g., voice communications and signage) in airports, train stations, and subway cars

THE PRINCIPLES WERE COMPILED BY ADVOCATES OF UNIVERSAL DESIGN, IN ALPHABETICAL ORDER:

- Betty Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mulkick, Elaine Ostroff, Jon Sanford, Ed Steinfield, Molly Story, and Gregg Vanderheiden.

NOTE: The Principles of Universal Design are not intended to constitute all criteria for good design; only universally usable design. Certainly, other factors are important, such as aesthetics, cost, safety, gender and cultural appropriateness, and these aspects must also be taken into consideration when designing.

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APPENDIX C: International Universal Design Declaration

"We, the participants of the UD2002 Conference, gathered here in Yokohama, and discussed focusing on the topic with the main theme "For All, For Everybody."

As our society has developed and become more complicated, we have tended to presume a uniform whole rather than recognizing the diversity of individuals. We propose to redefine the relationships between the designers/producers and users, thus giving priority to the diversity of individuals and cultures.

Design should create the social environments that respect and support the dignity of humans, which we propose to call Universal Design.

To realize this, it is urgent to establish user-centered system to be applicable to all aspects of society including infrastructures and legal systems.

We do not assume Universal Design to be a panacea. However, we think it possible going step by step toward the goal. In doing this, it is vital for the users to be part of the process, and the society to earnestly respond to them.

We would like to seek true globalization that respects difference in cultures.

The philosophy of Universal Design should be a foundation to respect limited natural resources and sustainable society.

We go forward.

We would like to continue our efforts toward building a society that will respect the natural variations among individuals, and the changes that we experience as we grow older, and give the highest priority to inclusion, participation, and independence for all.

We the participants from all over the world to the UD2002 Conference share this ideal as a result of this conference and declare that we devote ourselves to progress forward to this goal".

Yokohama, Japan

December 4, 2002

APPENDIX D: Universal Design Audit Checklist (source: Levine, 2003:211-225)

UD Audit Checklist

How to Use this Checklist

To use the Checklist:

- Step 1** **Check** all the sections to be included in your evaluation.
- Step 2** **Rate** the level of usability for each element by checking the appropriate box in each section included. (either 1 point, 2 points, or 3 points.)
- Step 3** **Calculate** the project score as described below. Remember, to rate 3 points, the element listed must have all the features listed.

How to Score this Checklist

Scores are computed as the percentage of the maximum score possible.

Calculation Steps:

Step 1 Count the number of sections you have rated, enter that number here:	_____
Step 2 Total the scores of all the sections rated.	_____
Step 3 The maximum possible score is the total in Step 1 multiplied by 3	_____
Step 4 UD Audit Score for the Project simply divide total in Step 2 by total for Step 3.	_____

Additional copies of this checklist are available online at www.ap.buffalo.edu/idea

APPENDIX E: Sample of Informed Consent Form (author's construct)

Study Title: *Mainstreaming Universal Design in Cape Town: FIFA 2010 World Cup™-related Activities as Catalysts for Social Change*

Investigator: *Mugendi K. M'Rithaa, Doctoral Candidate*

Mr. M'Rithaa is a doctoral candidate studying the factors that influence the adoption and potential mainstreaming of Universal Design (UD) strategies in industrially developing contexts with special reference to FIFA 2010 World Cup™-related activities in Cape Town, South Africa. Although the study will not benefit you directly, it will provide information that might enable designers, educators, and policy planners to incorporate Universal Design features beneficial to the widest possible range of potential users of products, services, systems and built environments.

The study supervisors and other appropriate authorities at the Cape Peninsula University of Technology (CPUT), in the Western Cape Province, have approved the study and its procedures. The study procedures involve no foreseeable risk or harm to you. The procedures include:

- [1] *responding to a questionnaire about your response to design for all categories of people; and*
- [2] *completing a supplementary demographic data sheet.*

Participation in this study will take approximately 20 (twenty) minutes of your time.

Please feel free to ask any questions about the study or about being a participant/informant and you may call Mr. M'Rithaa at 021-460 3670 (work) or 072-655 8727 (mobile) during office hours if you have further questions. Additionally, you can contact him via facsimile: 021-460 3704, or email: <MugendiM@cput.ac.za>.

Your participation in this study is voluntary; you are under no obligation to participate and you have the right to withdraw at any time should you choose to do so.

The study data will be coded so they will not be linked to your name. Your identity will not be revealed while the study is being conducted or when the study is reported or published unless you give explicit consent for the same. To ensure anonymity and confidentiality, all study data will be collected by Mr. M'Rithaa, stored in a secure place, and not shared with any other person without your permission.

I have read this consent form and voluntarily consent to participate in the study:

Signature of Participant/Informant

Date

Signature of Witness

Date

I have explained this study to the above subject and have sought his/her understanding for informed consent:

Signature of Investigator

Date

APPENDIX F: Enrolments for Faculty of Informatics & Design (Cape Town Campus), 2007 (source: Institutional Planning Office, CPUT)

DISCIPLINE	1 st Year	2 nd Year	3 rd Year	4 th Year	TOTAL
ARCHITECTURAL TECHNOLOGY	37	28	28	6	99
GRAPHIC DESIGN	77	70	70	22	239
INDUSTRIAL DESIGN	52	43	40	22	157
INTERIOR DESIGN	37	28	28	13	106
SURFACE DESIGN	33	17	22	8	80
TOWN & REGIONAL PLANNING	61	35	40	31	167
	297	221	228	102	848

APPENDIX G: Judging Criteria and Weighting for the 2010 Green Goal Mouille Point Promenade & Beachfront Student Landscape Design Competition

UCT: focus on landscape design factors

	Weighting	Description	Marking
<i>1. Understanding the brief</i>	15%	<ul style="list-style-type: none"> Has the student followed the brief, and shown understanding 	<ul style="list-style-type: none"> Each entry will be scored on a scale from 1 to 10 That rating will then be multiplied by the rating allocated to each category
<i>2. Concept plan and contextualisation</i>	15%	<ul style="list-style-type: none"> Has the student provided and interesting, concept plan and put it into context of the bigger picture e.g. the "Green Corridor" Valuation of the concept plan 	
<i>3. Green Goal principles incorporated</i>	15%	<ul style="list-style-type: none"> Has the student considered "Green Goal" aspects; water, waste and energy minimisation/efficiency 	
<i>4. Visual quality of material</i>	15%	<ul style="list-style-type: none"> Valuation of the quality of the material and presentation of the poster/s 	
<i>5. Design proposals</i>	40%	<ul style="list-style-type: none"> Valuation of the furnishing; feasibility, quality and creativity 	

CPUT: focus on furniture design factors

	Weighting	Description	Marking
<i>1. Understanding the brief</i>	5%	<ul style="list-style-type: none"> Has the student followed the brief, and shown understanding 	<ul style="list-style-type: none"> Each entry will be scored on a scale from 1 to 10 That rating will then be multiplied by the rating allocated to each category
<i>2. Concept plan and contextualisation</i>	5%	<ul style="list-style-type: none"> Has the student provided and interesting, concept plan and put it into context of the bigger picture e.g. the "Green Corridor" Valuation of the concept plan 	
<i>3. Green Goal principles incorporated</i>	20%	<ul style="list-style-type: none"> Has the student considered "Green Goal" aspects; water, waste and energy minimisation/efficiency 	
<i>4. Visual quality of material</i>	10%	<ul style="list-style-type: none"> Valuation of the quality of the material and presentation of the poster/s 	
<i>5. Design proposals</i>	60%	<ul style="list-style-type: none"> Valuation of the furnishing; feasibility, quality and creativity 	

APPENDIX H: Questionnaire for Institutional Architect

The Cape Peninsula University of Technology and Universal Design (UD)

Name:											Department:											
Phone No.				-								Mobile				-						
Facsimile No.				-								Email										

Semi-Structured Interview Questions:

1. How does your Department/Section specifically cater for “extra-ordinary” individuals such as;
 - The Elderly; Women and Children; People with Disabilities; and Visitors (who do not speak any of the official languages)?
2. Do you have a specific policy that informs Design for Special Human Needs?
3. Kindly elaborate on Q.2.
4. In what ways can the Facility Management Department (of CPUT) incorporate UD for a more accessible and usable environment for all?
5. Who (individuals and/or departments/units) would best champion UD in the life of our esteemed institution (CPUT)?
6. With regards to Universal Design;
 - a. In your opinion, would your Department/Section be amenable in engaging UD?
 - b. Would you explicitly champion the concept of UD via the projects you are personally responsible for?
7. What obstacles do you anticipate in adopting UD as a strategy for enhancing accessibility at CPUT?
8. What is the best way to mainstream UD in CPUT?
9. What legacy will the FIFA 2010 World Cup™ hopefully leave for accessibility in Cape Town once the mega-event is over?
10. Any other comments you might have...

Thank you for your time and valuable input. I would like to have your permission to cite you in my research.

Official use only	Interviewer's Name: Mugendi K. M'Rithaa					Signature			
Date	22 nd July 2008		Start Time			End Time			
Scrutinised	Yes		No		2	by (name)			
Questionnaire Serial Number									

APPENDIX I: Questionnaire for Focus Group with Interior Design Students

Questions for Focus Group on 2010 Students' Design Competition

3rd Year Interior Design Students, CPUT:

I am carrying out some follow-up research on mainstreaming Universal Design (UD) in Cape Town and would greatly appreciate your honest responses to some questions relating to the 2010 Mouille Point Promenade & Beachfront Student Landscape Design Competition that was concluded on 8th May 2008:

A. Comments on 2010 Competition:

1. What worked best for you?
2. What did not work for you?
3. Would you have supported the involvement of students from other design disciplines in your team(s)?
4. Which disciplines would you have co-opted to work with?
5. Did you talk to people outside your own discipline during this project?
6. Do you consider competitions as effective platforms for promoting new design concepts/ideas?
7. How can future competitions be made more effective in promoting such concepts/ideas?

B. Comments on Universal Design (UD):

8. What worked best for you?
9. What did not work for you?
10. What aspects of UD would you wish to incorporate for future reference?
11. How can UD be mainstreamed in Interior Design?

C. Additional Comments:

12. Are you more confident about your professional competence after participating in the competition?
13. Do you intend to continue using UD Principles in future Interior Design projects?
14. Who would be the best champion for UD in the context of Cape Town?

Feel free to make any further comments...

Thanks for your valued time and input.

Mugendi K. M'Rithaa

22/05/2008
10.00-11.30 AM

APPENDIX J: Questionnaire for Indigenous Knowledge Expert

Indigenous Knowledge Systems: Disability, Ubuntu, and Universal Design

Semi-Structured Interview Questions:

(20th March 2008; 09.00- 09.30; 2nd Floor, Admin Building, Bellville Campus, CPUT)

Q1: How did our people respond to the issue of Disability; for example, how was it defined, and what was the response to People with Disabilities?

Q2: How can the anthropocentric philosophy of *UBUNTU* inform current and future strategies to promote inclusion of disabled persons thereby countering exclusion (via stigma and discrimination)?

Q3: Who (individuals and/or institutions) would best champion UD in our different spheres of life?

Q4: In what ways can UD incorporate IKS for a more sustainable future for all?

Q5: Any other comments you might have...

Thank you for your valued time and input. I would like to cite you in my research.

APPENDIX K: Questionnaire for Politician

The DA, the City of Cape Town and Universal Design (UD)

Semi-Structured Interview Questions for DA Councillor:

1. How does the DA specifically engage with “extra-ordinary” individuals;
 - a. The Elderly;
 - b. Women and Children;
 - c. People with Disability; and
 - d. Foreigners (who do not speak any of the local languages)?
2. How can the anthropocentric philosophy of *UBUNTU* inform current and future strategies to promote inclusion of all residents and visitors and thereby countering exclusion (via stigma and discrimination)?
3. In what ways can the DA incorporate UD for a more sustainable future for all?
4. Who (individuals and/or institutions) would best champion UD in our different spheres of life?
5. With regards to Universal Design;
 - a. In your opinion, would the Ward you represent be amenable to engaging UD?
 - b. Would the Executive Mayor of Cape Town be interested in exploring the efficacy of UD?
 - c. Could you kindly facilitate a meeting whereby we can discuss/present the concept of UD to the Mayor?
6. What is the best way to mainstream UD in Cape Town?
7. What legacy will the FIFA 2010 World Cup™ hopefully leave for residents (and visitors) in Cape Town once the mega-event is over?
8. Any other comments you might have...

Thank you for your time and valuable input. I would like to have your permission to cite you in my research.

Mugendi K. M'Rithaa <MugendiM@cput.ac.za>
Dept of Industrial Design; Cape Peninsula University of Technology
Tel: 021-460 3670; Fax: 021-460 3704; Cell: 072-655 8727

22nd April 2008: 10.00- 11.00 am; Goodwood, Cape Town

APPENDIX L: Questionnaire for Survey of Design Students



PROJECT UNIVERSAL DESIGN 2010+

Greetings. My name is Mugendi K. M'Rithaa. I am a doctoral student at the Department of Industrial Design, Cape Peninsula University of Technology in Cape Town. I am presently conducting a survey to gather opinions and ideas from designers on the subject of Universal Design (UD). Today I am conducting a survey on knowledge and usage of UD. I would be grateful if you could answer the following questions for me. Your responses will be kept confidential. If you would like me to contact you for further information, please indicate at the end of this questionnaire on Q.27.

Questionnaire Serial Number										A								
Country	South Africa				City/ Town				Cape Town									
Informant's Name									Male	1	Female	2						
Organisation's Name	CPUT				Specialisation*				Year of Study									
Phone No. (Landline)				-						Mobile			-					
Facsimile No.				-						Email								

SPECIALISATION* CODES

Specialisation	Code	Specialisation	Code	Specialisation	Code
Industrial Design	1	Interior Design	2	Town & Regional Planning	3
Surface Design	4	Graphic Design	5	Architectural Technology	6

SECTION I: KNOWLEDGE

Q.1 Please indicate if you know anyone in any of the following groupings:		
"Extra-ordinary" population groups	Code	Go to
Person with physical disability	1	Q.2
Person with visual disability	2	
Person with hearing disability	3	
Person with learning disability	4	
Young person (14 years of age or younger)	5	
Pregnant Woman/Mother with toddler (child aged 3 or younger)	6	
Elderly person (65 years of age or older)	7	
Foreign language speaker	8	
None of the above	9	


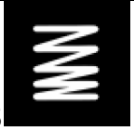





Q.2 Have you had any Universal Design-related training in the past six months?		
Previous UD training	Code	Go to
Yes	1	Q.6
No	2	Q.3

Q.3 Which of the following concepts are you familiar with? You may select as many as you wish.		
Familiarity of concepts	Code	Go to
Design for Disability	1	Q.4
Design-for-All	2	
Barrier-Free Design	3	
Inclusive Design	4	
Universal Design	5	
None of the above	6	Q.6

Q.4 Of the ones you have mentioned which one concept do you understand the best?		
Understanding of concepts	Code	Go to
Design for Disability	1	Q.5
Design-for-All	2	
Barrier-Free Design	3	
Inclusive Design	4	
Universal Design	5	
None of the above	6	Q.6

Q.5 Please provide a brief definition (in your own words) of the concept you selected in Q.4
Definition of concept

Q.6 Please examine each pictogram carefully. Of the pictograms shown below, please indicate the number of the one that you feel is most suited to the principle described.

Pictograms of Universal Design principles	No.		
<i>Simple and Intuitive Use</i>		1 	5 
<i>Perceptible Information</i>		2 	6 
<i>Size and Space for Approach and Use</i>		3 	7 
<i>Equitable Use</i>			
<i>Low Physical Effort</i>			
<i>Tolerance for Error</i>		4 	Go to
<i>Flexibility in Use</i>			Q.7

SECTION 2: USAGE

Q.7 (Refer to Q.4). Is Universal Design used extensively in your design process?

Extent of UD usage	Code	Go to
Yes	1	Q.8
No	2	Q.9

Q.8 Which of the following principles of Universal Design do you use most often? You may select as many as you wish. Please refer to the reference poster on principles of Universal Design if you so wish.

Usage of Universal Design principles	Code		Code	Go to
Simple and Intuitive Use	1	Low Physical Effort	5	Q.9
Perceptible Information	2	Tolerance for Error	6	
Equitable Use	3	Size and Space for Approach and Use	7	
Flexibility in Use	4			

Q.9 Which of the following statements best describes why you do not use any principles of Universal Design?

Non-usage of Universal Design principles	Code	Go to
I can use any principles I want to	1	Q.10
I have to choose from a different range of prescribed principles	2	
I have not heard of the principles of Universal Design before	3	
I am not interested in applying such principles in my work	4	
These principles do not apply to my work	5	

Q.10 If more information on Universal Design was available to you, how likely or unlikely would you be to use this information?

Very likely	Quite likely	Neither likely or unlikely	Quite unlikely	Very unlikely
5	4	3	2	1

Q.11 In what form do you feel should information on Universal Design be offered? You may select as many as you wish.

Preferred information	Code	Go to		Code	Go to
Exemplars/samples	1	Q.13	Database of professionals/consultants	9	Q.13
Case studies	2		Projects	10	
Printed reference guidelines	3		Competitions	11	
Useful internet links	4		Academic courses	12	
Exchange programmes	5		Training/short courses	13	
Workshops/seminars	6		Discussion forums	14	
Industrial attachments	7		Other	15	
Posters	8				

Q.12 Please provide other examples that you feel are not covered in Q.11

Other information

Q.13 Who do you feel would be most effective in championing implementation of Universal Design?

Universal design champions	Code		Code
Individual designers	1	Team/project leaders	3
Political leaders	2	Design educators	4

Please consider the following statements carefully. Based on your experience or perceptions of the following issues relating to Universal Design, please indicate how you rate your feeling for each statement.

SECTION 3: UNIVERSAL DESIGN IN CONTEXT

Q.14 How satisfied are you with the levels of accessibility within built environments/products/systems that you use most often?

Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
1	2	3	4	5

Q.15 If Universal Design considerations are used in the design process, how likely or unlikely would these considerations increase the total cost?

Very likely	Quite likely	Neither likely or unlikely	Quite unlikely	Very unlikely
5	4	3	2	1

Q.16 If you were given an opportunity to work on a multi-disciplinary team on a Universal Design project, how likely or unlikely would you be to do so?

Very likely	Quite likely	Neither likely nor unlikely	Quite unlikely	Very unlikely
5	4	3	2	1

Q.17 How important do you feel it is for designers working in South Africa to engage in socially responsible design to counter discrimination in the form of ageism, disablism and sexism?

Very important	Somewhat important	Neither important nor unimportant	Somewhat unimportant	Not important at all
5	4	3	2	1

Q.18 How sure are you that you will be practicing design in South Africa beyond the 2010 FIFA World Cup™?

Very confident/sure	Somewhat confident/sure	Neither confident nor sure	Somewhat unsure	Very unsure
5	4	3	2	1

Q.19 To what extent do you agree that the philosophy of *ubuntu* is useful to design practice in South Africa?

Strongly agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Strongly disagree	Do not know
5	4	3	2	1	0

Q.20 If the 2010 FIFA World Cup™ projects showcase the value of Universal Design, how likely or unlikely do you feel this would have on greater adoption of Universal Design?

Very likely	Quite likely	Neither likely or unlikely	Quite unlikely	Very unlikely
5	4	3	2	1

Q.21 If legislation was used to compel designers to implement Universal Design in their projects, how likely or unlikely would you be to comply with the law?

Very likely	Quite likely	Neither likely or unlikely	Quite unlikely	Very unlikely
5	4	3	2	1

Q.22 To what degree do you agree that Universal Design courses be integrated into all design-related disciplines offered at university level?

Strongly agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Strongly disagree	Do not know
5	4	3	2	1	0

Q.23 If incentives were available to reward designers who implement Universal Design in their projects, how likely or unlikely would you be to comply?				
Very likely	Quite likely	Neither likely or unlikely	Quite unlikely	Very unlikely
5	4	3	2	1

Q.24 Please suggest some incentives that would appeal to you with reference to Q.23:
Possible incentives

SECTION 4: DEMOGRAPHIC DETAILS

Q.25 Please indicate the age group you fall into:				
Age	Code		Code	Go to
Up to 18 years	1	45 – 54 years	5	Q.26
19 – 24 years	2	55 – 64 years	6	
25 – 34 years	3	65 years and above	7	
35 – 44 years	4			

Q.26 Please indicate the highest level of education you have attained:			
Education level attained	Code		Code
Completed High School (Matric)	1	Completed Higher Diploma	6
Part Certificate	2	Part university degree (Bachelor's or equivalent)	7
Completed Certificate	3	Completed university degree (Bachelor's or equivalent)	8
Part Ordinary Diploma	4	Post-graduate university degree (Master's equivalent or higher)	9
Completed Ordinary Diploma	5		

SECTION 5: FEEDBACK COMMENTS

Q.27 Kindly provide feedback on any additional questions or comments for consideration:
Informant's feedback

THANK YOU FOR YOUR TIME AND INPUT.

Official use only	Interviewer's Name				Signature	
Date	Start Time		End Time			
Scrutinised	Yes	1	No	2	by (name)	Signature

APPENDIX M: Questionnaire for Professional Designers

Questions for 'Mainstreaming UD in Cape Town' research

Greetings. My name is Mugendi K. M'Rithaa. I am a doctoral student at the Department of Industrial Design, CPUT, presently conducting a survey on the subject of Universal Design (UD). Subsequently, I wish to gain an insight into your views on UD in your personal and professional capacity. Kindly answer the following questions as candidly as possible. Your responses will be cited in my dissertation unless you explicitly object (refer to Section E).

Contact Details:

Name:																										
Organisation & Position:																										
Phone No.																Mobile										
Facsimile No.																Email										

A. FIFA 2010 World Cup™-related projects:

1. What is your specific role in the 2010-related projects?
2. Briefly describe the projects being carried out.
3. Would you enlist the participation of university students in your 2010 projects?
4. Would you support the involvement of independent professional designers in these projects?
5. Which design disciplines would you most likely co-opt to work with?
6. Kindly elaborate on your answer to Q. 5.
7. Do you consider competitions as effective platforms for promoting new design concepts/ideas?
8. What do you consider to be the key elements in a competition to make them more effective in promoting new concepts/ideas?
9. What legacy will the FIFA 2010 World Cup™ hopefully leave for residents (and visitors) in Cape Town once the mega-event is over?

B. Familiarity with Universal Design (UD):

10. Are you familiar with the concept of Universal Design (UD)?
11. Kindly comment on how you first came to be involved with UD. Feel free to provide names, facts, figures and dates where appropriate.
12. Briefly comment on the reason(s) why UD has not found wider acceptance within your sphere of influence.
13. Is UD relevant to any of the projects/functions you are currently involved in?
14. With reference to the Principles of UD (refer to attached document) what principle(s) do you find most relevant to the projects you are involved in?
15. What aspects of UD do you consider to be most neglected presently?
16. How can UD be mainstreamed in your specific department?

C. Promotion of UD:

- 17. Briefly comment on your personal experiences with regards to UD promotion.
- 18. What media has been used to promote UD, and how would you rate the same in terms of effectiveness?
- 19. Who should be the main actors with regards to UD?
- 20. Which official/government policies would UD best align with?
- 21. Which local, regional, and national government departments would best accommodate UD?
- 22. Which individual/profession (in the private or public sectors) would be the ideal champion for UD? Kindly elaborate on your choice(s).
- 23. Who would be the best champion for UD in the context of the city of Cape Town?
- 24. What strategies would mainstream UD at local, regional, and national levels in an effective and sustainable manner?
- 25. Do you intend promoting the use of UD Principles in future?
- 26. Kindly elaborate on your answer to Q. 25.

D. Additional Comments:

- 27. Feel free to make any further comments...

E. Authorisation to publish responses:

I hereby request your authorisation to publish your responses in my dissertation, subject to the conditions mentioned above:

Signed:

Date:

Please send this authorisation to MugendiM@cput.ac.za by the 19th September 2008.

Thank you for your valued time and input.

Official use only	Interviewer's Name: Mugendi K. M'Rithaa				Signature	
Date			Start Time		End Time	
Scrutinised	Yes	1	No	2	by (name)	Signature
Questionnaire Serial Number						

APPENDIX N: Questionnaire for Design Educators

Questions for 'Mainstreaming UD in Cape Town' project

Dear Colleague,

Greetings. My name is Mugendi K. M'Rithaa. I am a doctoral student at the Department of Industrial Design, CPU, presently conducting a survey on the subject of Universal Design (UD). Subsequently, I wish to conduct a needs analysis on UD with respect to your Department. Kindly answer the following questions as candidly as possible. Your responses will be cited in my dissertation unless you explicitly object. Kindly confirm whether (or not) you wish to have your responses published and communicate the same as described in Section E.

Contact Details:

Name:																																						
Position:																																						
Phone No.				-																Mobile				-														
Facsimile No.				-																Email																		

SPECIALISATION* CODES

Specialisation	Code		Code		Code
Industrial Design	1	Interior Design	2	Town & Regional Planning	3
Surface/Fashion Design	4	Graphic Design	5	Architecture	6

A. FIFA 2010 World Cup™-related projects:

1. Are there any 2010-related projects being done in your Department?
2. Who (students and/or staff) is carrying out such projects?
3. Briefly describe the projects being carried out.
4. Would you support the participation of your students in 2010 projects?
5. Would you support the involvement of students from other design disciplines in such projects?
6. Which disciplines/departments would you most likely co-opt to work with?
7. Kindly elaborate on your answer to Q. 6.
8. Do you consider competitions as effective platforms for promoting new design concepts/ideas?
9. How can competitions be made more effective in promoting new concepts/ideas?

B. Familiarity with Universal Design (UD):

10. Are you familiar with the concept of Universal Design (UD)?
11. Has UD been taught to any of your students to date?
12. Is UD relevant to any of the courses/modules you currently offer in your programme of study?
13. With reference to the Principles of UD (refer to attached document) what principle(s) do you find most relevant to your discipline?

14. What aspects of UD would you wish to incorporate in future?
15. How can UD be mainstreamed in your specific discipline?

C. Interest in Teaching of UD:

16. Would you be interested in having UD offered to your students in a formal module?
17. Which subject(s) would UD best align with?
18. In which year of study should UD first be introduced to your students?
19. Do you intend to continue using UD Principles in future discipline-specific projects?
20. Who would be the best champion for UD in the context of the city of Cape Town?

D. Additional Comments:

21. Feel free to make any further comments...

E. Authorisation to publish responses:

I hereby request your authorisation to publish your responses in my dissertation, subject to the conditions mentioned above.

Please send this authorisation to MugendiM@cput.ac.za by the 8th August 2008.

Thanks for your valued time and input.

Official use only	Interviewer's Name: Mugendi K. M'Rithaa				Signature	
Date				Start Time		End Time
Scrutinised	Yes	1	No	2	by (name)	Signature
Questionnaire Serial Number						

**APPENDIX O: Summary of Findings from UD Workshop at DEFSA 2007
Conference, CPUT, Cape Town (Boonzaier & M'Rithaa, 2007)**

Workshop held from 11.30 -13.00 hrs, on Thursday, 4th October 2007 at CPUT Lecture Theatre Venue 2.

Question 1

Have you ever had a personal problem with any consumer Product(s)?

Yes: 19 No: 1 No Answer: 0

List of products with related problems:

- **VEHICLE**
 - Car – one **headlight** not working
 - Cars – too big, **seats** too high, uncomfortable
- **KITCHEN**
 - Automated Coffee-machines – poor **interaction**
 - Clover Milk Cartons – New **lid** always breaks
 - Blender – **ice-crushing** feature not effective
 - Milk jug x2 – **spout** spills milk
 - Vegetable peeler – **difficult to use**
 - Kitchen appliances – **difficult to keep clean**
 - Can opener – designed for the **right handed**
- **FURNITURE**
 - Chairs- not designed for short people, very **uncomfortable**
- **ELECTRONICS**
 - TV's Decoder – **complex** programming, need manual even for simple functions
 - Digital camera – **bad quality** photos*
 - Media equipment – **difficult to set up/ carry**
 - Electronic Goods – need **manual** to use
 - Mac, Apple Computer – crashed, **lost data**
 - Microsoft Windows and Excel – Not enough **functionality**
- **PERSONAL EFFECTS**
 - Reading glasses – falls off, **lens falls out**
 - Pepper spray – takes **too long to use**
- **PACKAGING**
 - Packaging x3 – **difficult to open**
 - Containers x2 – **difficult to open**

Question 2

Have you ever had a personal problem with any built environments?

Yes: 19 No: 1 No Answer: 0

Built Environments and related problems:

- **CPUT**
 - CPUT – Wheelchair friendly **toilets** available, but wheelchair can't enter **door** of restroom
 - Lifts available to solve **stairs**-problem, but person in wheelchair cannot operate **lift controls**.
 - CPUT – **stairs** are highly polished and **slippery**
 - CPUT, Commerce Building – **finding Exit**

- **PUBLIC PLACES**
 - Airports – Long **passages** and problems with baggage handling
 - Cape Town Airport – No proper **signage**
 - Buildings, buses, subways etc. – Difficulty **manoeuvring** child in stroller
 - Public Buildings – **doors**, “push” or “pull”?
 - Shopping centre x2 – steep **staircases**, very **loud/noisy**
 - Entrances to buildings x2 – glass **doors**, difficult to see. **Door handles** difficult to open
 - Restaurants – very **loud/noisy**

- **RESIDENTIAL**
 - House of participant – direction **doors** open does not work with space in rooms
 - Home – bad flow **design** though **rooms**
 - Bathrooms x4 - unmarked **faucets**, **wash basin** is badly designed, **bathroom** too small **cupboard doors** that don't fit.
 - Kitchen – **cupboard doors** that don't fit

- **PUBLIC SPACES**
 - Pavement – lack of **pedestrian space**
 - Unfamiliar places – bad **signage**, difficult to navigate

Question 3

Have you ever had a personal problem with any design-related services?

Yes: 14

No: 5

No Answer: 1

Design-related services and related problems:

- Graphic Products, exhibitions – **lack of lateral thinking**; creative search for solutions
- Business Cards – **font** too small, **not readable**
- Multimedia software – **difficult to use**, help instruction bad
- Design software - **difficult to use**/ translate ideas to designs
- Websites, ATM, signage - bad **fonts** used, **contrasting colours** making it difficult to read

- Architecture design – bad **acoustics**/ sound proofing between rooms*
- ATM – bad **user interface** design
- Taxi metering – system, **can be abused** by operator

Question 4

Do you now have a greater insight into how consumer products can be improved?

Yes: 18 No: 1 No Answer: 1

Suggestions on what aspects of this improvement can be improved:

- Incorporating universal design principals, so that product can be used by a wider range of “disability” groups.
- Products designed for all people to use, across racial and cultural barriers.
- Simpler and more intuitive to use.
- Products must relate to all users
- Implementation and enforcement of design regulations, and a better attitude from designers
- Simplified design that can be used by the handicapped, young, old.
- Feasible products that take the user into consideration.
- Designing better ergonomic products.
- People willing to change the products they use, so that they can include more people.
- Talking more to users
- Having a greater awareness of possibilities and problems when a project is started.
- Consciousness of designers and users can be raised.
- More people need to be aware of the solutions
- Products to be tested before they are sold
- Know what issues need to be considered
- More inclusiveness of use on a universal scale

Question 5

Do you now have a greater insight into how built environments can be improved?

Yes: 15 No: 4 No Answer: 1

Suggestions on what aspects of this improvement can be improved:

- Improved communication design, thru signage and the environment
- Accessible buildings for all people.
- Incorporate cultural needs when designing
- User-centred design with pleasant easy to use spaces
- Research the public’s needs before designing infrastructure
- Accessible design

Question 6

Do you now have a greater insight into how services can be improved?

Yes: 11

No: 7

No Answer: 2

Suggestions on what aspects of this improvement can be improved:

- Services offered by people, attitudes and perceptions*
- Innovative well researched products that benefit the service provider and the user
- Better systems design to make services easy to understand
- More research about the user
- Implementation of regulations in design

Question 7

Are we as South African designers currently taking Universal Design concepts seriously?

Yes: 3

No: 13

No Answer: 4

Elaborations on answers:

Yes:

- At an academic level, consciousness about Universal Design is increasing.
- Awareness is growing, but still needs to be applied practically
- Those who are aware do.

No:

- At some levels there is room for improvement
- Designers are not yet focusing on incorporating UD into design
- UD needs to be incorporated into the design process.
- Designers are closed minded and designing only for themselves
- Aesthetics/consumer-goods dominate consciousness/motivation
- Evidence on the ground – lost opportunities
- No enough user involvement
- Client driven briefs
- Built environments not accessible by all

Number of participants interested in joining a user group: 10

Number of participants interested in joining a blog spot: 14

APPENDIX P: Sample SPSS Outputs

CROSSTABS

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Crosstabs

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Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics for each table are based on all the cases with valid data in the specified range(s) for all variables in each table.
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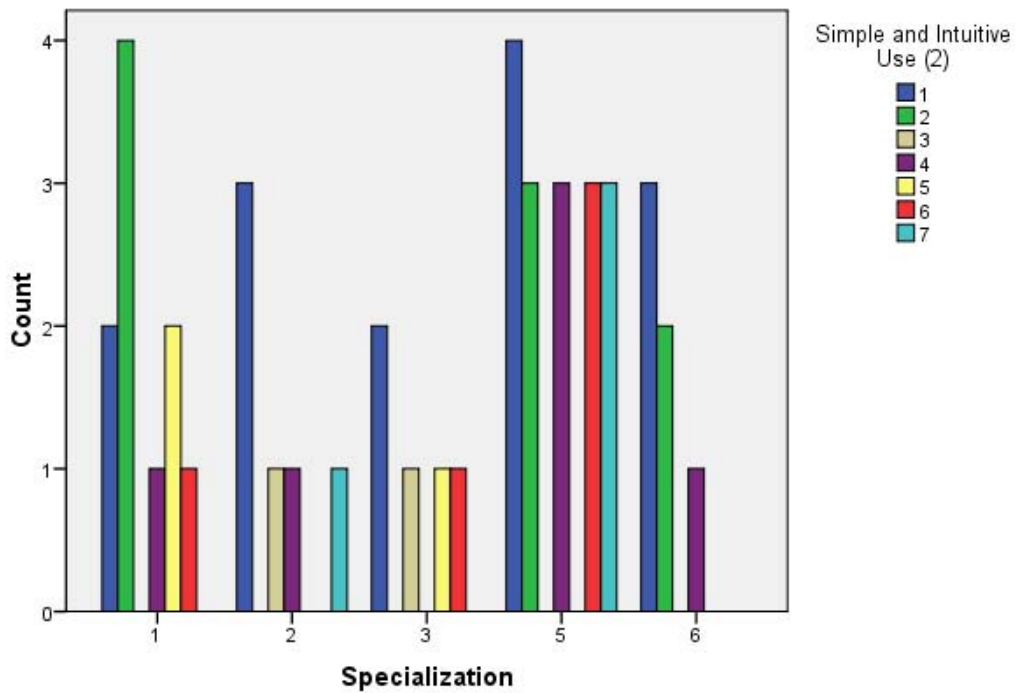
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Specialization * Perceptible Information (3) * Year of Study	147	100.0%	0	.0%	147	100.0%
Specialization * Size and Space for Approach and Use (7) * Year of Study	147	100.0%	0	.0%	147	100.0%
Specialization * Equitable Use (1) * Year of Study	147	100.0%	0	.0%	147	100.0%
Specialization * Low Physical Effort (4) * Year of Study	147	100.0%	0	.0%	147	100.0%
Specialization * Tolerance for Error (6) * Year of Study	147	100.0%	0	.0%	147	100.0%
Specialization * Flexibility in Use (5) * Year of Study	147	100.0%	0	.0%	147	100.0%

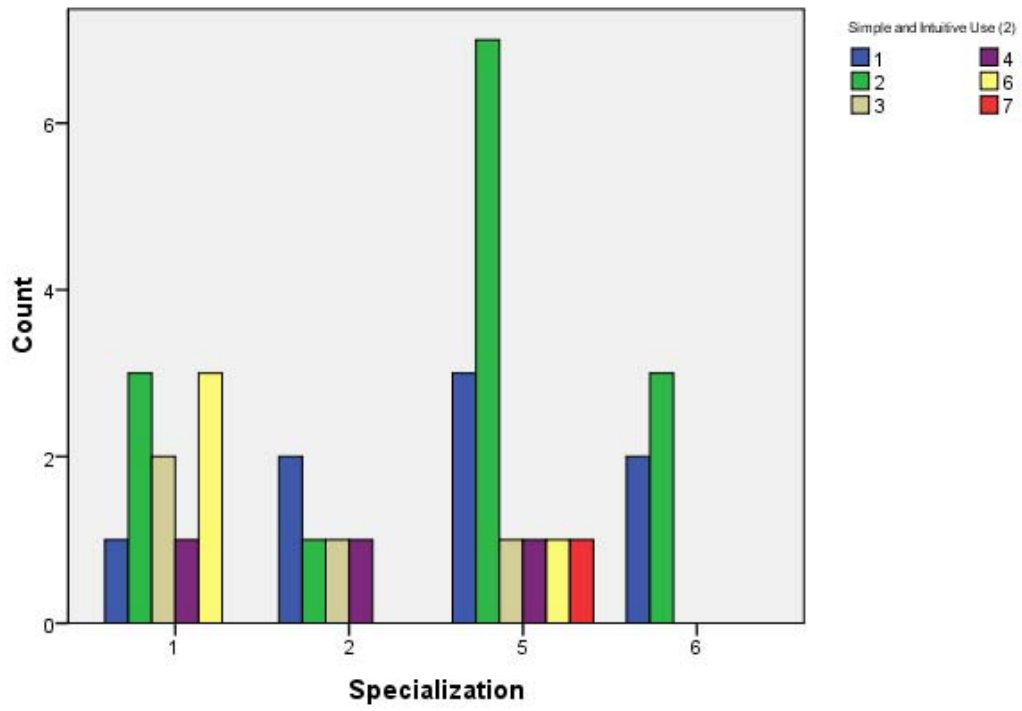
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		5	4	3	0	3	0	3	3	16
		6	3	2	0	1	0	0	0	6
		To tal	14	9	2	6	3	5	4	43
2	Specialization	1	1	3	2	1	3	0	10	
		2	2	1	1	1	0	0	5	
		5	3	7	1	1	1	1	14	
		6	2	3	0	0	0	0	5	
		To tal	8	14	4	3	4	1	34	
		3	Specialization	1	1	7	0	0	1	0
2	2			1	0	0	0	1	5	
3	2			2	1	0	0	0	5	
5	3			3	0	1	0	0	7	
6	7			2	0	0	0	0	10	
To tal	15			15	1	1	1	1	2	36
4	Specialization	1	0	9	0	0	0	0	9	
		2	3	0	0	1	0	1	5	
		3	2	1	1	0	0	0	5	
		5	1	4	1	0	0	1	7	
		6	3	1	1	0	2	0	8	
		To tal	9	15	3	1	2	2	2	34

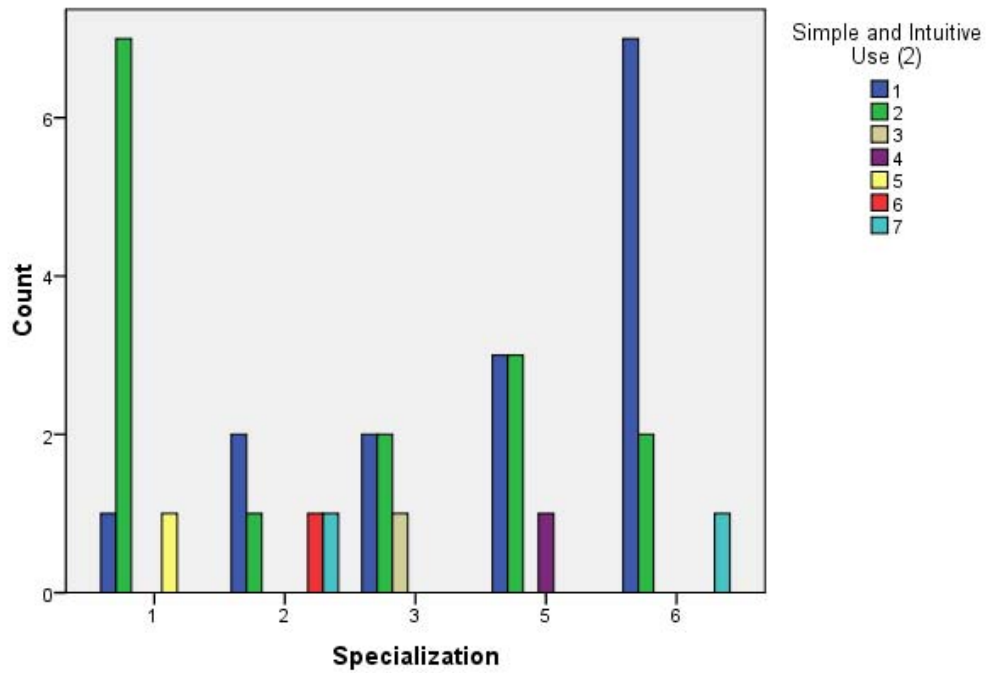
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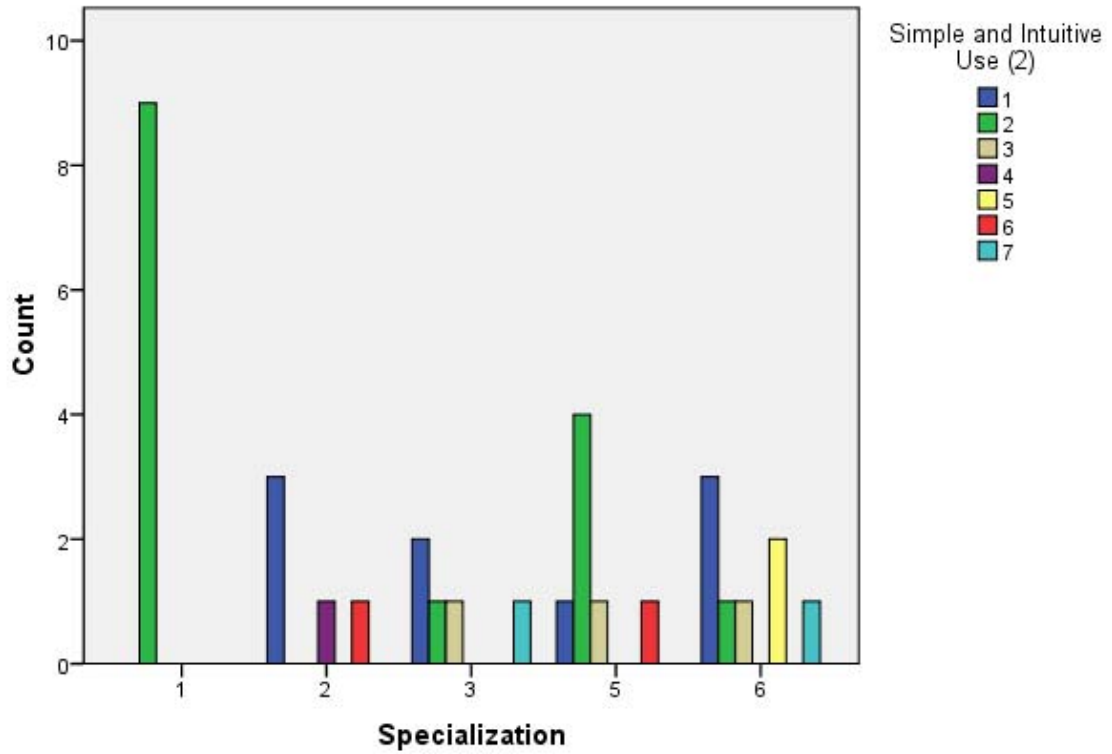
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Year of Study=3



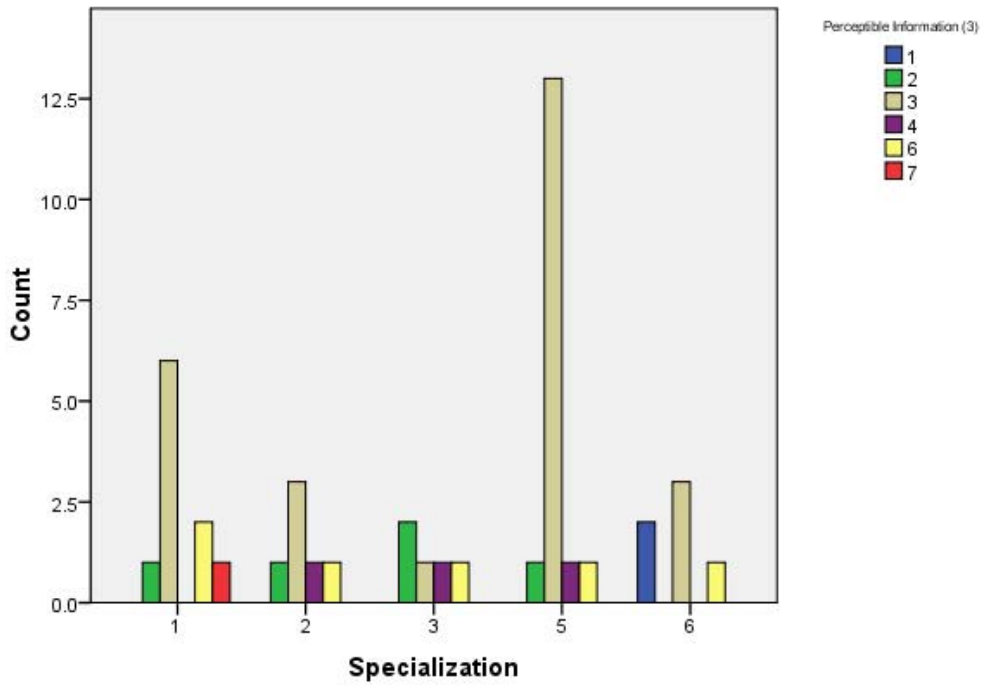
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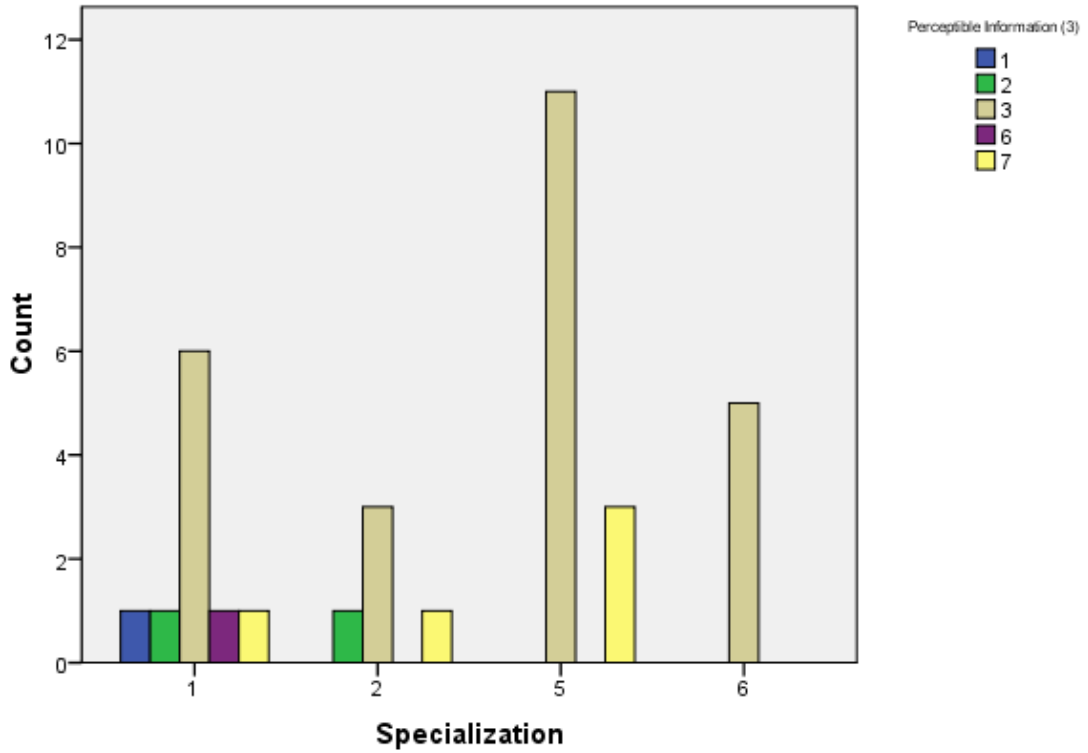
Specialization * Perceptible Information (3) * Year of Study Crosstabulation

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		5	0	0	11			0	3	14
		6	0	0	5			0	0	5
		Total		1	2	25			1	5
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		3	0	1	2	0		1	1	5
		5	0	1	6	0		0	0	7
		6	1	3	3	1		2	0	10
		Total		2	6	20	1		5	2
4	Specialization	1		0	9		0	0	0	9
		2		1	4		0	0	0	5
		3		0	4		0	1	0	5
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		6		2	3		1	1	1	8
		Total			3	25		1	4	1

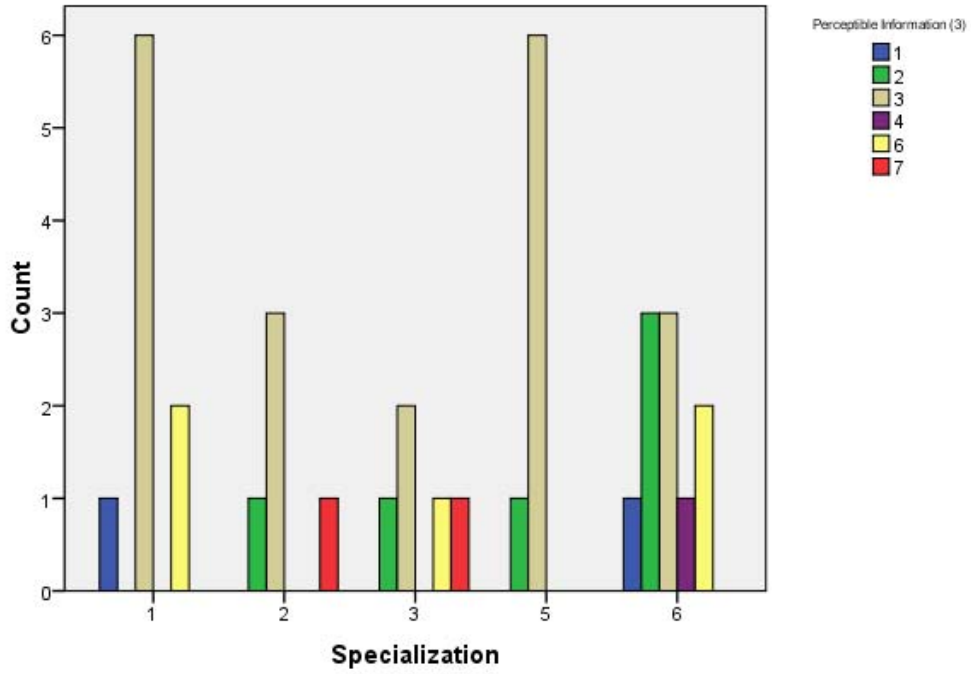
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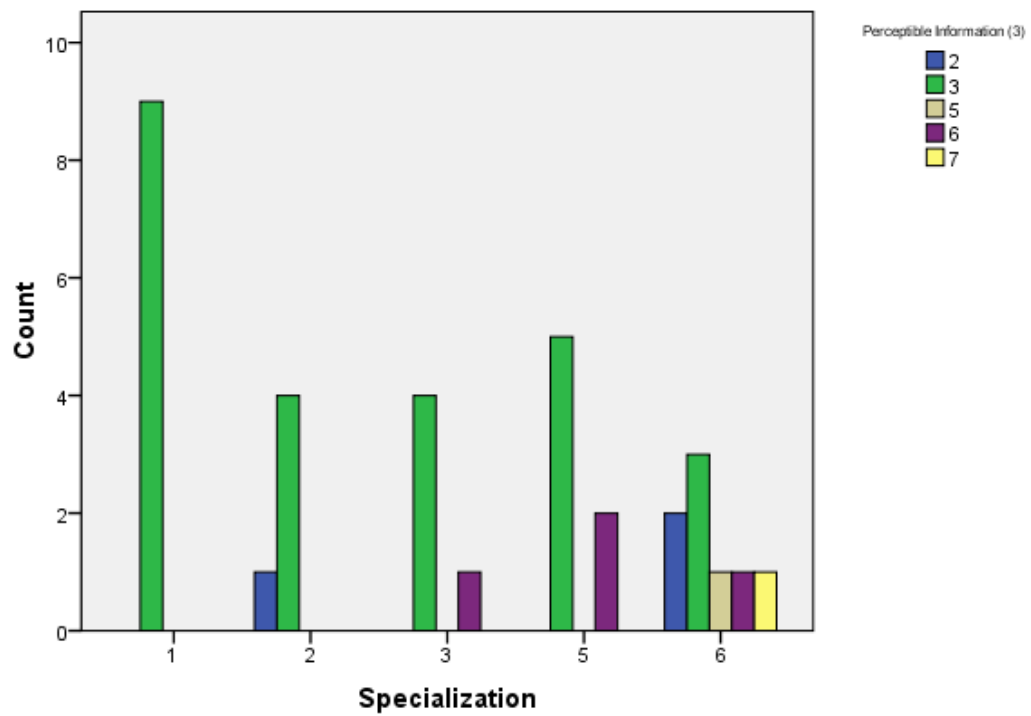
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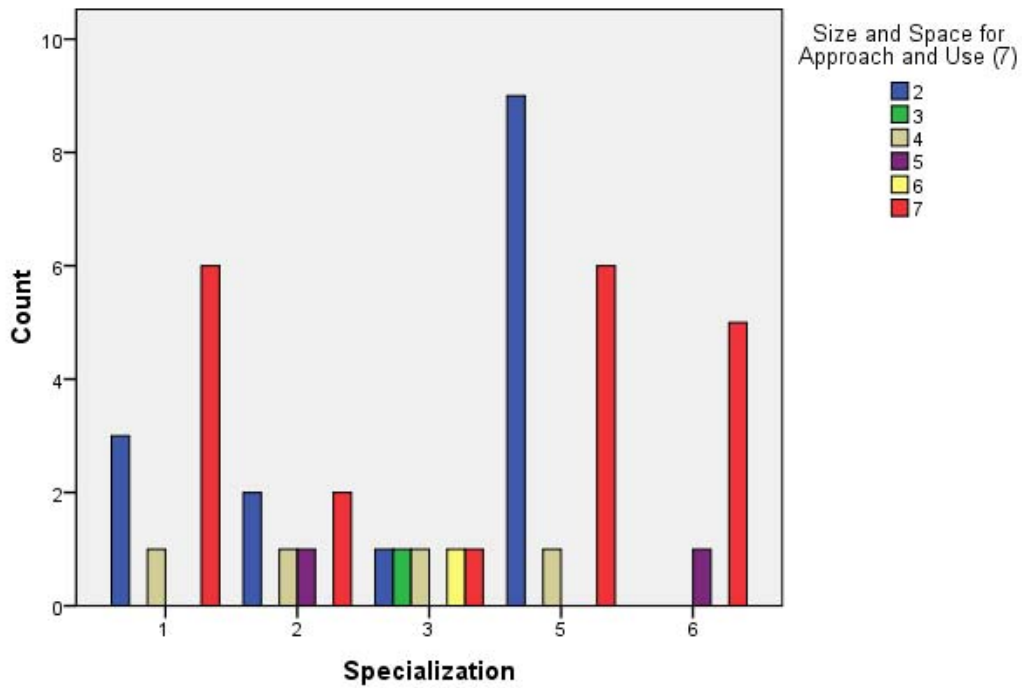


Specialization * Size and Space for Approach and Use (7) * Year of Study Crosstabulation

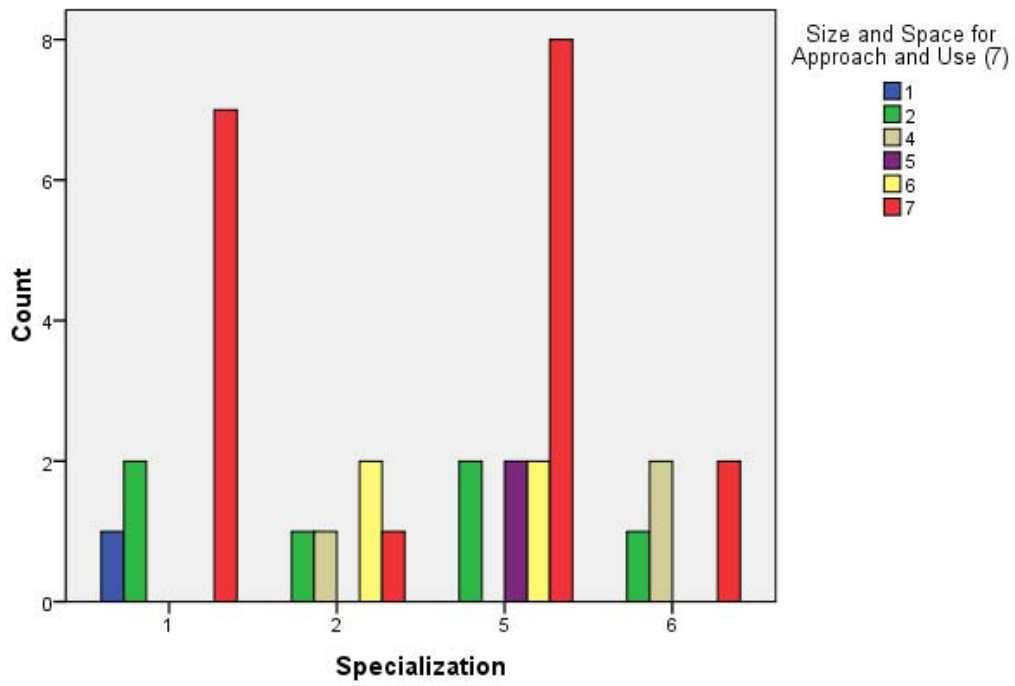
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		3		1	1	1	0	1	1	5
		5		9	0	1	0	0	6	16
		6		0	0	0	1	0	5	6
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		6	0	1		2	0	0	2	5
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		3	1	0	1	0	0	0	3	5
		5	0	0	0	0	1	1	5	7
		6	0	5	1	0	0	1	3	10
		Total	1	10	2	1	1	3	18	36
4	Specialization	1	0	0	0	0	0	0	9	9
		2	0	1	0	2	0	1	1	5
		3	2	0	0	0	1	1	1	5
		5	0	4	0	0	0	0	3	7
		6	0	1	2	0	1	2	2	8
		Total	2	6	2	2	2	4	16	34

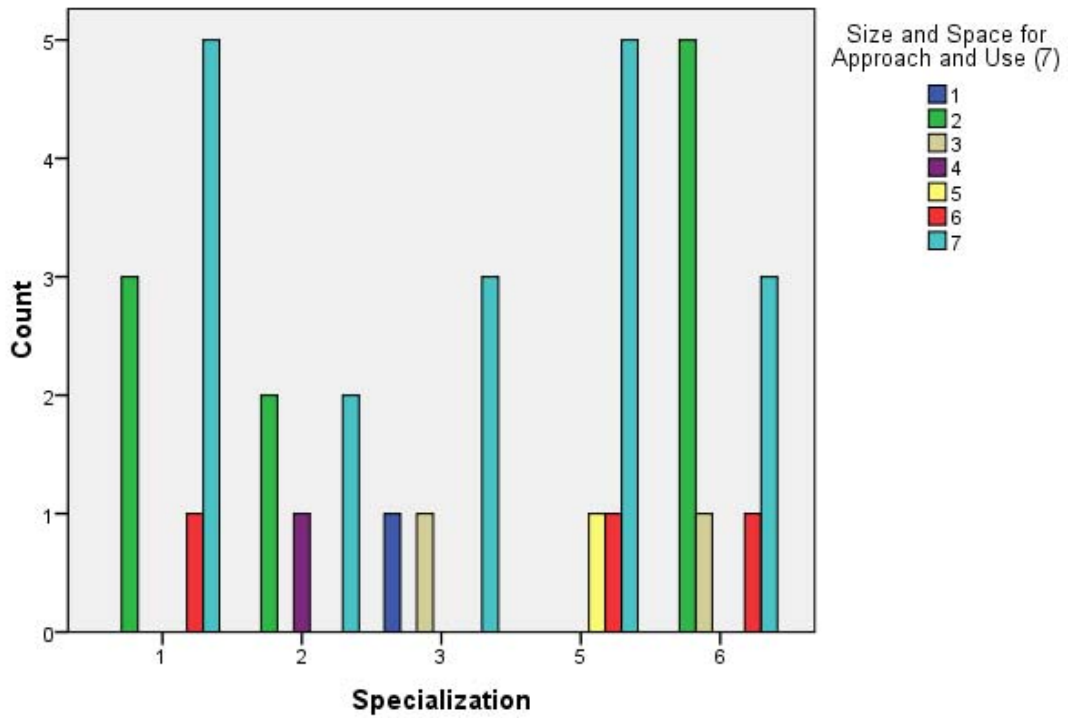
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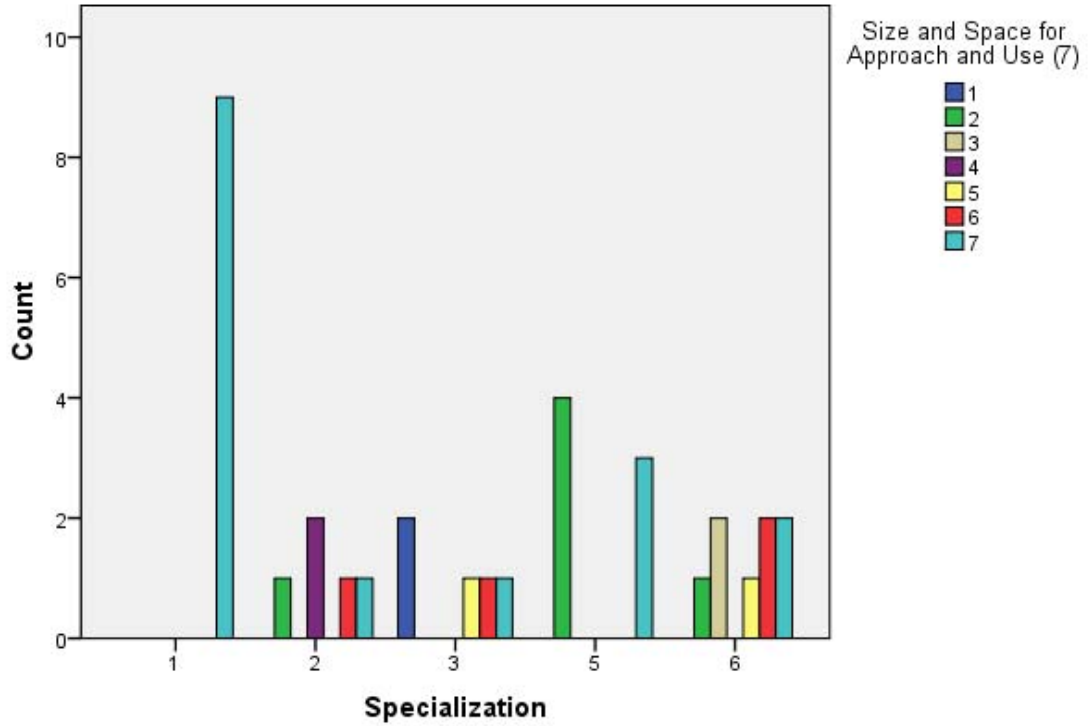
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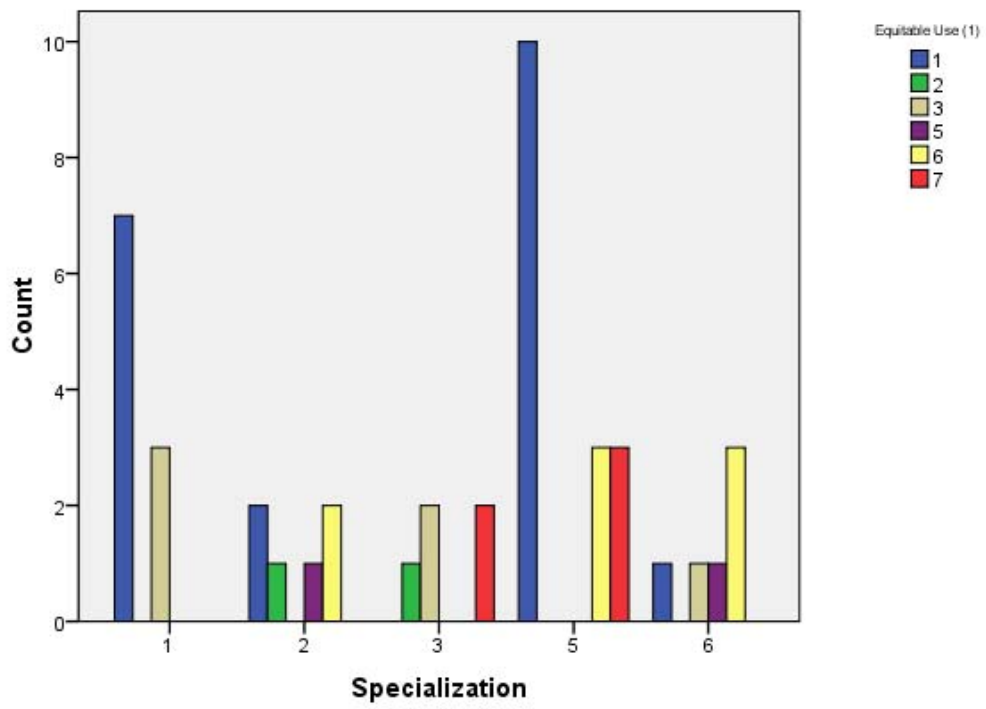
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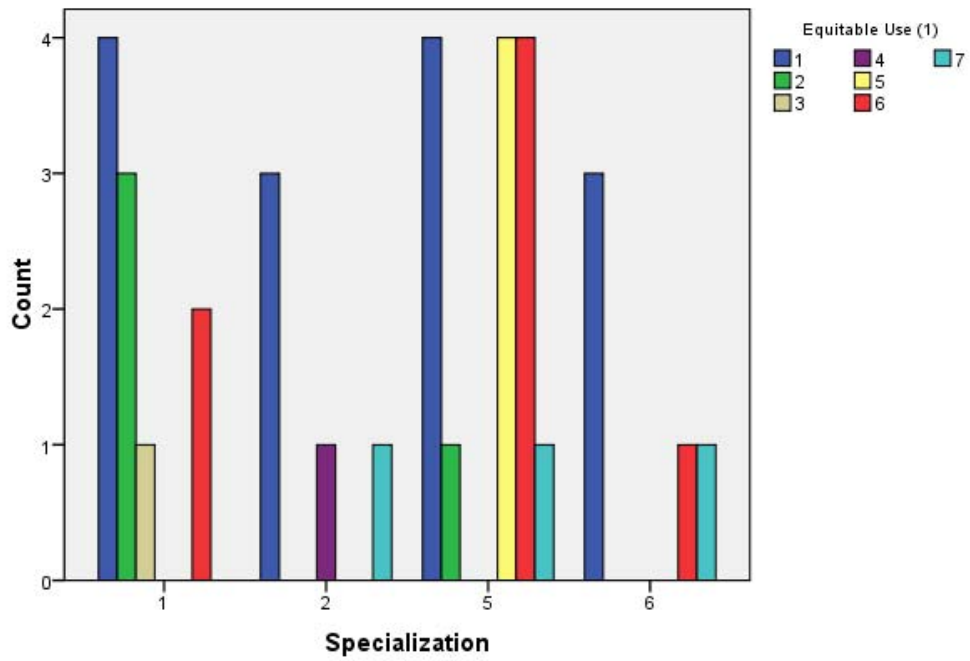
Specialization * Equitable Use (1) * Year of Study Crosstabulation

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	3	0	1	2	0	0	0	2	5
	5	10	0	0	0	0	3	3	16
	6	1	0	1	0	1	3	0	6
	Total	20	2	6	0	2	8	5	43
2	Specialization 1	4	3	1	0	0	2	0	10
	2	3	0	0	1	0	0	1	5
	5	4	1	0	0	4	4	1	14
	6	3	0	0	0	0	1	1	5
	Total	14	4	1	1	4	7	3	34
3	Specialization 1	6	0	2	0	0	0	1	9
	2	1	1	0	0	1	2	0	5
	3	2	0	0	0	0	2	1	5
	5	4	2	0	0	0	0	1	7
	6	2	0	2	0	2	0	4	10
	Total	15	3	4	0	3	4	7	36
4	Specialization 1	9	0	0	0	0	0	0	9
	2	0	1	1	0	1	1	1	5
	3	1	1	0	1	0	1	1	5
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	Total	19	4	1	2	3	3	2	34

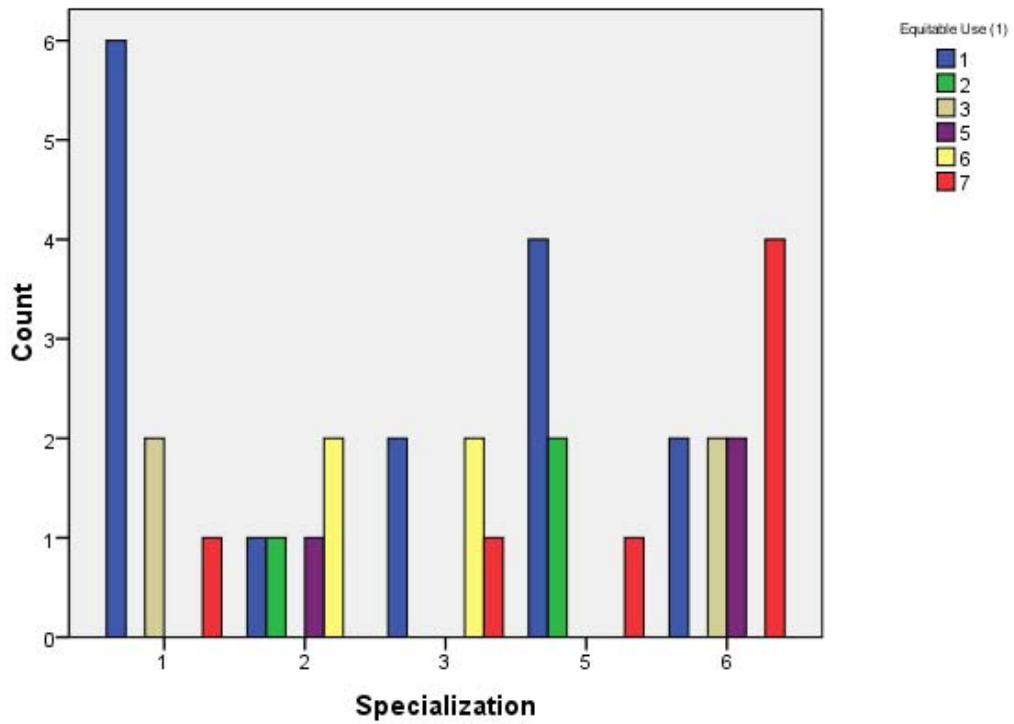
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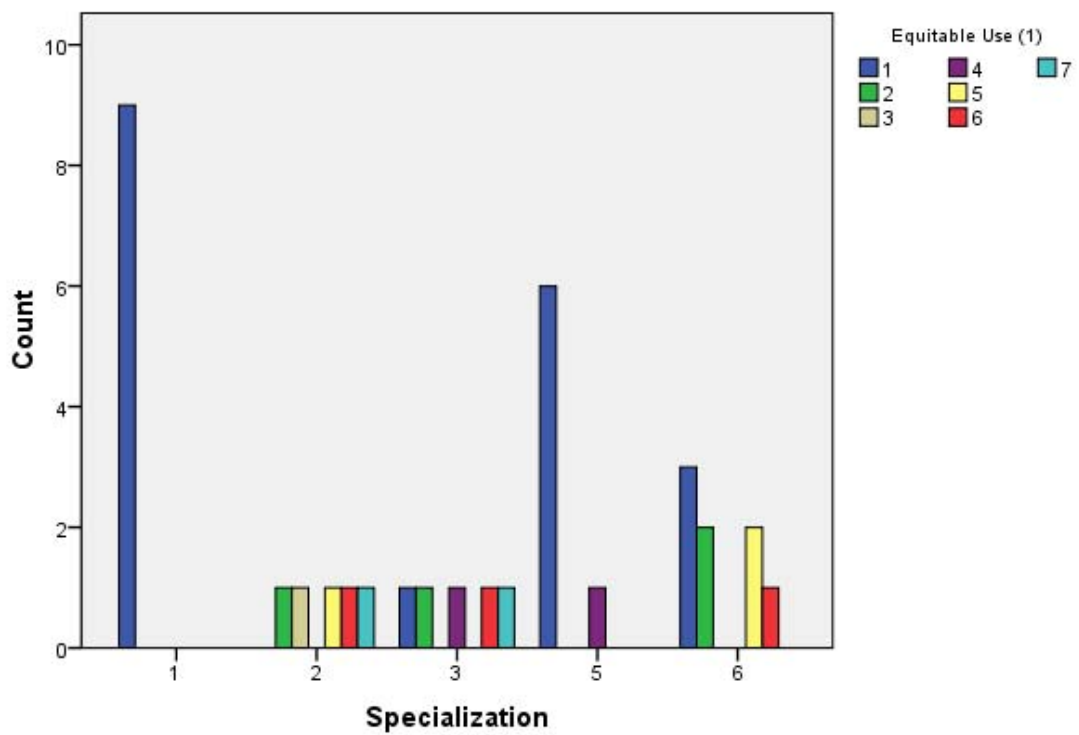
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Year of Study=4

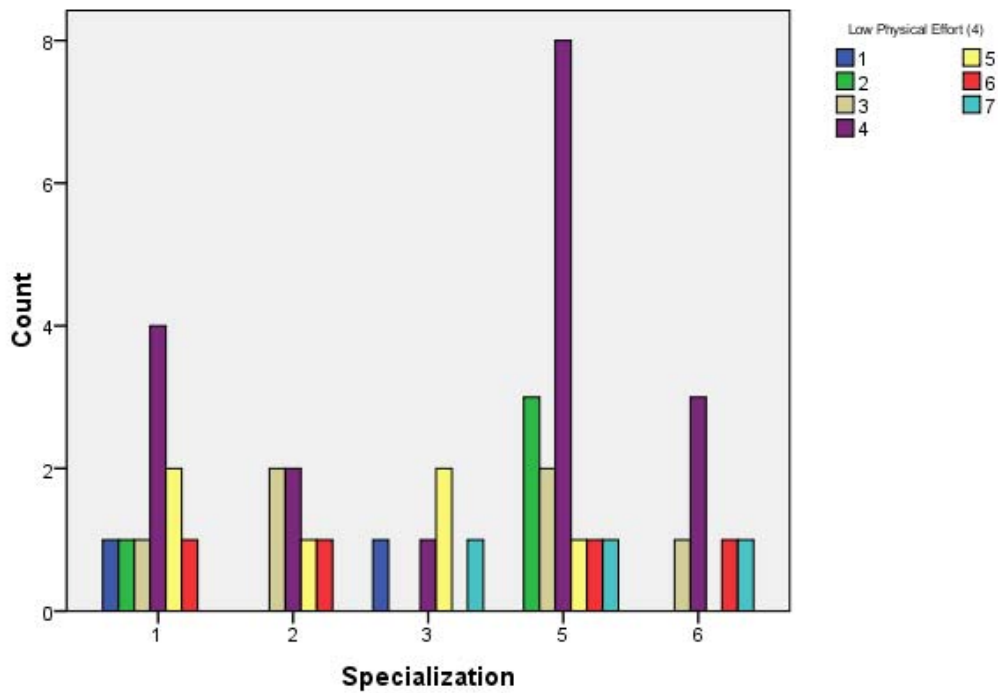


Specialization * Low Physical Effort (4) * Year of Study Crosstabulation

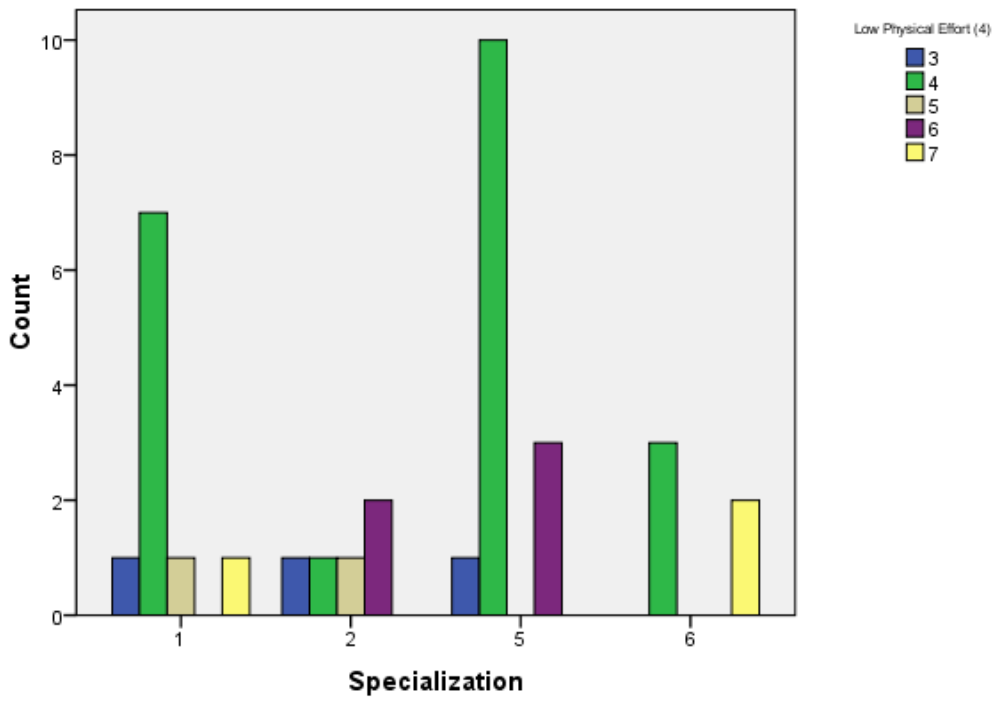
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		3	1	0	0	1	2	0	1	5
		5	0	3	2	8	1	1	1	16
		6	0	0	1	3	0	1	1	6
		Total	2	4	6	18	6	4	3	43
2	Specialization	1			1	7	1	0	1	10
		2			1	1	1	2	0	5
		5			1	10	0	3	0	14
		6			0	3	0	0	2	5
		Total			3	21	2	5	3	34
3	Specialization	1		0	1	7	0	0	1	9
		2		0	0	2	1	2	0	5
		3		1	0	1	2	1	0	5
		5		1	1	3	1	0	1	7
		6		1	2	5	0	1	1	10
		Total		3	4	18	4	4	3	36
4	Specialization	1	0	0		9	0	0	0	9
		2	2	1		1	0	0	1	5
		3	0	1		1	1	1	1	5
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		Total	2	3		20	2	2	5	34

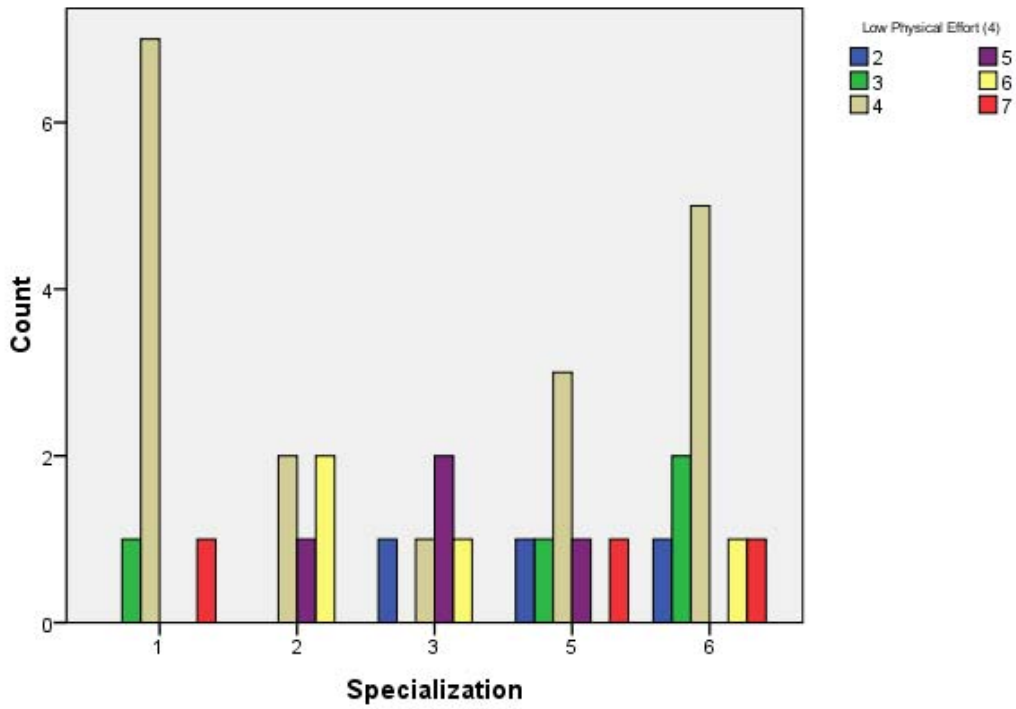
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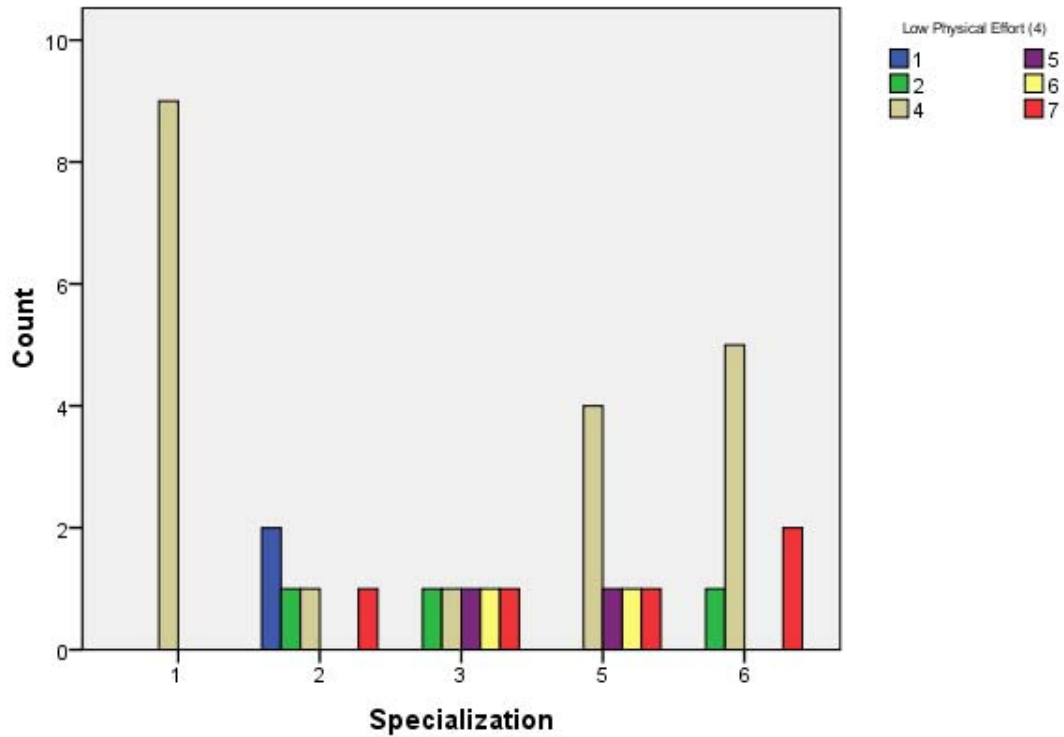
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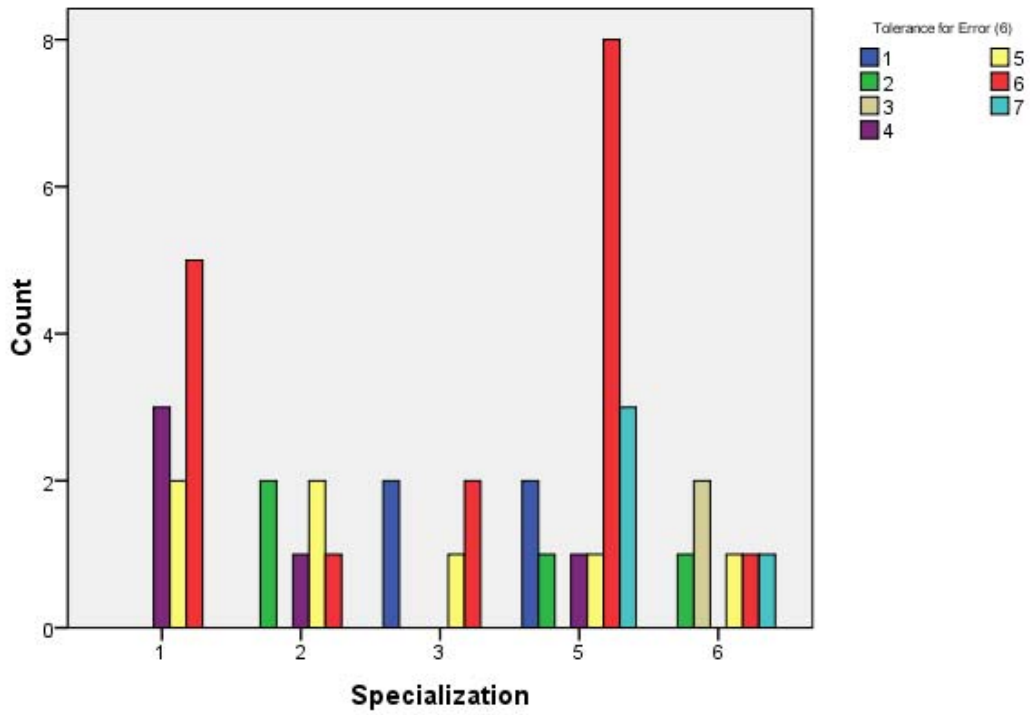
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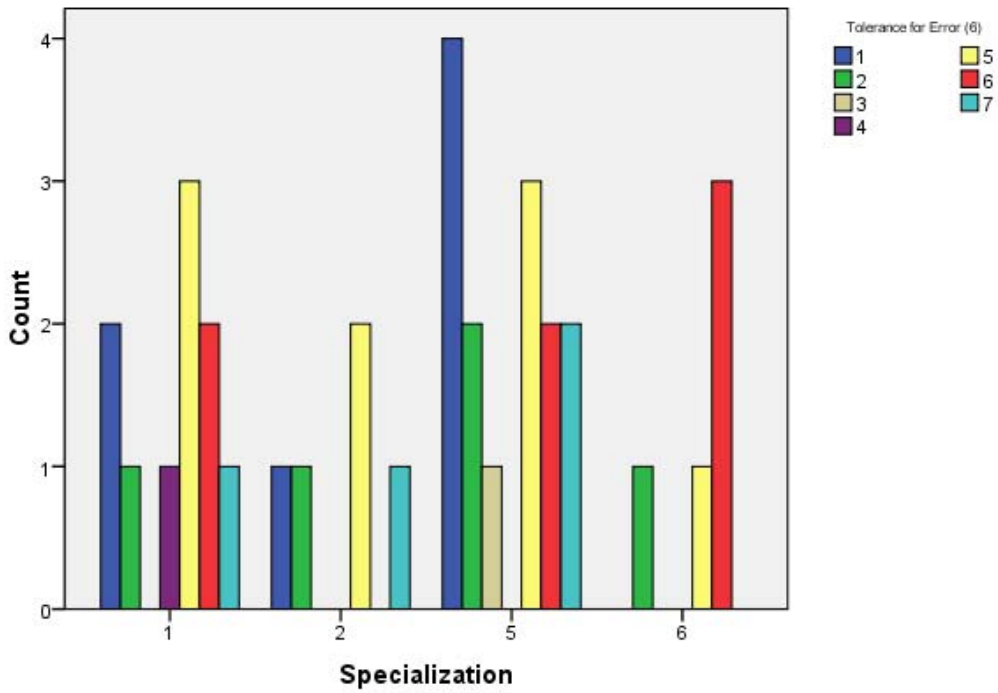
Specialization * Tolerance for Error (6) * Year of Study Crosstabulation

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	3	2	0	0	0	1	2	0	5
	5	2	1	0	1	1	8	3	16
	6	0	1	2	0	1	1	1	6
	Total	4	4	2	5	7	17	4	43
2 Specialization	1	2	1	0	1	3	2	1	10
	2	1	1	0	0	2	0	1	5
	5	4	2	1	0	3	2	2	14
	6	0	1	0	0	1	3	0	5
	Total	7	5	1	1	9	7	4	34
3 Specialization	1	1	0	0	3	4	1	9	
	2	1	2	0	1	0	1	5	
	3	0	1	1	2	1	0	5	
	5	0	0	0	1	6	0	7	
	6	0	1	0	5	4	0	10	
	Total	2	4	1	12	15	2	36	
4 Specialization	1	0	0	0	0	9	0	9	
	2	0	2	0	0	3	0	5	
	3	0	1	1	0	2	0	5	
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	6	0	0	1	1	1	4	8	
	Total	0	4	3	2	6	14	5	34

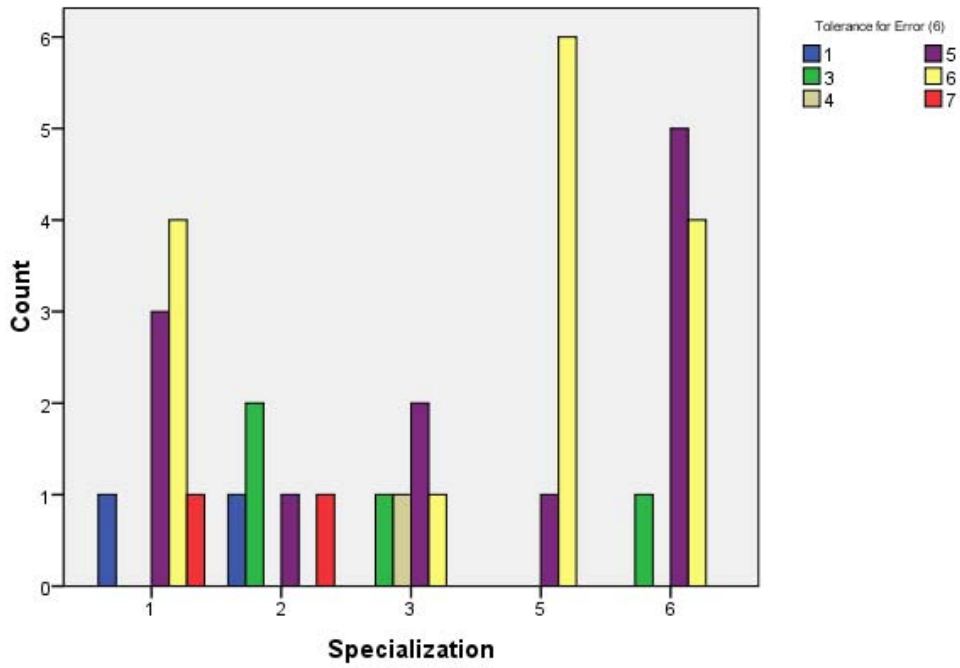
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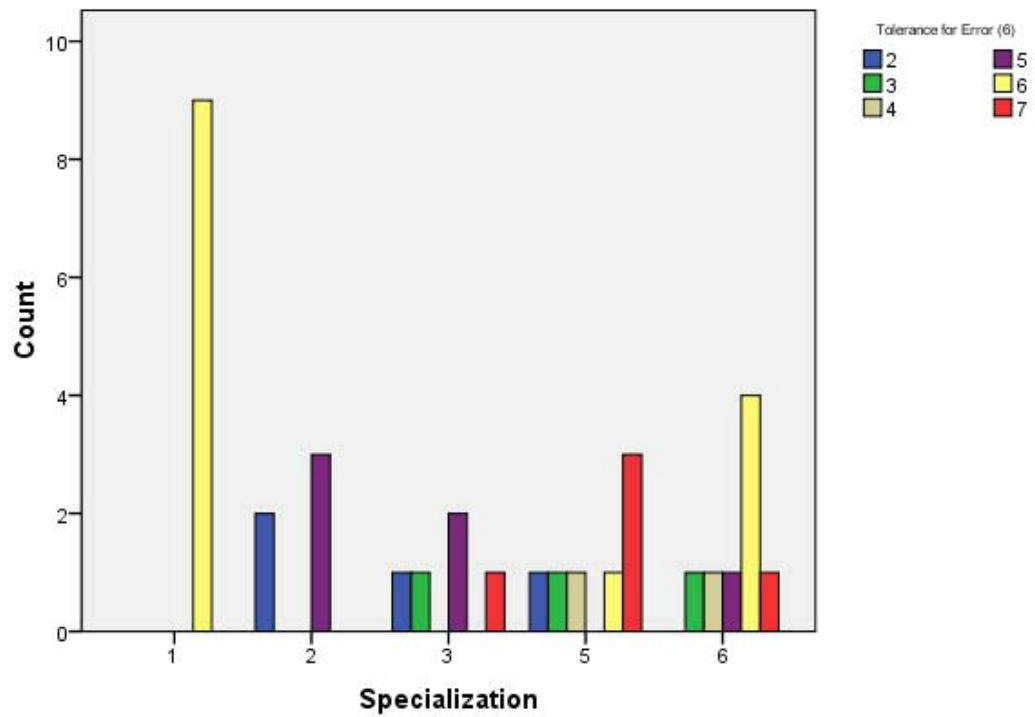
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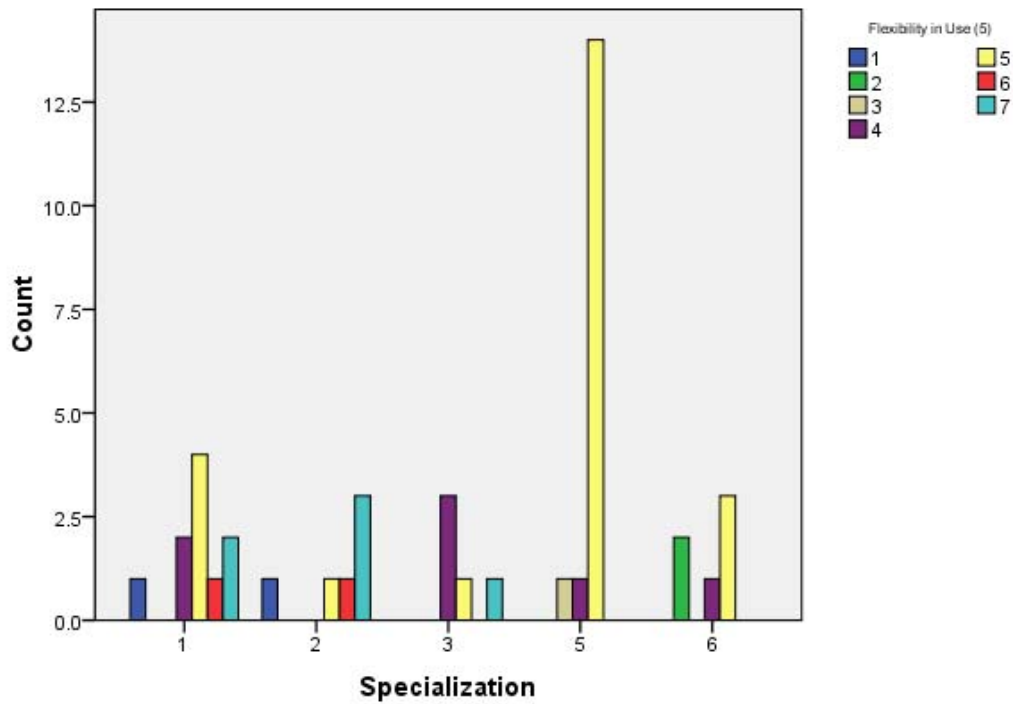


Specialization * Flexibility in Use (5) * Year of Study Crosstabulation

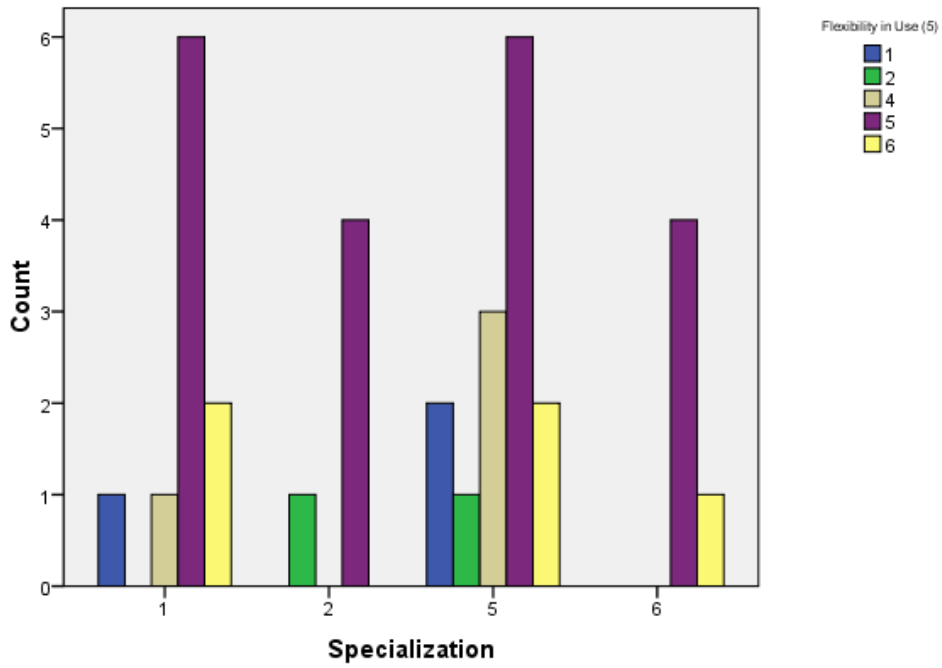
Count

Year of Study			Flexibility in Use (5)							Total
			1	2	3	4	5	6	7	
1	Specialization	1	1	0	0	2	4	1	2	10
		2	1	0	0	0	1	1	3	6
		3	0	0	0	3	1	0	1	5
		5	0	0	1	1	14	0	0	16
		6	0	2	0	1	3	0	0	6
		Total	2	2	1	7	23	2	6	43
2	Specialization	1	1	0	1	6	2	10		
		2	0	1	0	4	0	5		
		5	2	1	3	6	2	14		
		6	0	0	0	4	1	5		
		Total	3	2	4	20	5	34		
3	Specialization	1	0	0	2	5	1	1	9	
		2	0	0	2	2	0	1	5	
		3	1	0	3	1	0	0	5	
		5	0	0	3	4	0	0	7	
		6	0	0	4	4	1	1	10	
		Total	1	1	14	16	2	3	36	
4	Specialization	1	0	0	0	9	0	0	9	
		2	0	0	0	0	1	2	5	
		3	0	0	0	3	1	1	5	
		5	0	0	0	1	6	0	7	
		6	2	1	1	1	1	1	8	
		Total	2	1	1	5	18	4	3	34

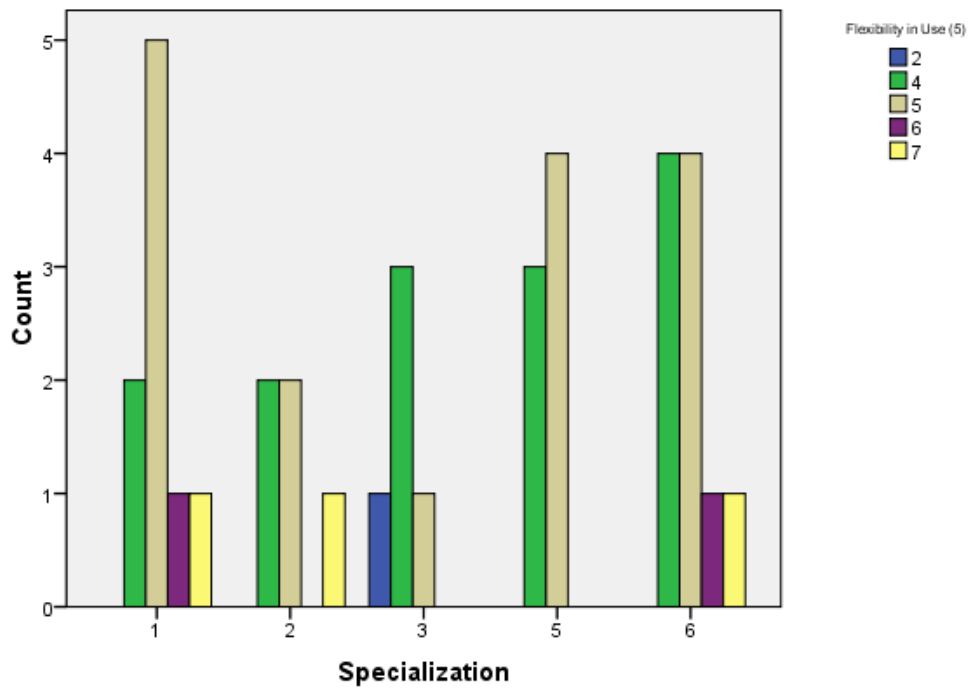
Year of Study=1



Year of Study=2



Year of Study=3



Year of Study=4

