

**INTEGRATED LEARNING SPACES IN ADULT EDUCATION: A
CASE OF KWAZULU - NATAL**

By

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A dissertation submitted to the Faculty of Humanities, Development and Social Sciences, University of KwaZulu-Natal, in partial-fulfillment of the requirements for the degree of Master of Architecture

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DECLARATION

Submitted in partial fulfillment of the requirements for the degree of Master of Architecture, in the graduate programme in Architecture, University of KwaZulu – Natal, South Africa.

I declare that this dissertation is my own unaided work. All citations, references and borrowed ideas have been duly acknowledged. I confirm that an external editor was not used. It is being submitted for the degree of Master of Architecture in the faculty of Humanities, Development and Social Sciences, University of KwaZulu-Natal, South Africa. None of the present work has been submitted previously for any degree or examination in any other University.

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18 March 2011

ABSTRACT

In February 2010, finance minister Pravin Gordhan said:

“None of us can rest or sleep peacefully until every South African can say:

I can see a better future, I can find a job. I can learn a skill. Hard work will enable me and my family to have shelter and food. If my children work hard at school and college, they will have a better future and a thousand opportunities.

Our people want action on jobs, growth and poverty. We must build a new common purpose so that we can use all of our talents, skills and resources to tackle our economic and social challenges.”

(Minister of Finance Pravin Gordhan, Budget Speech, 17 February 2010)

Education is an essential component of the reconstruction, development and transformation of the South African Society. Due to past governmental policies, a huge gap in the level of education between adults has developed. These people need to be given the skills so that they can reintegrate into their respective communities, becoming active citizens partaking fully in the South African economy. Therefore it is aimed to provide a centre that promotes vocational skills development in the adult sector of the population. It is aimed to promote social reintegration of people through skill development, and aim to enliven previously neglected communities and be a catalyst for community revitalisation, as the centre grows the human resource potential of the respective community.

Hence, the aim of this research is to investigate what architectural elements and design factors combine best to promote the most effective educational environments for the adult teaching and learning processes. It will consist of both primary and secondary sources, while conclusions will be drawn from precedent and case studies, but a balance between primary and secondary research is needed in order to create a workable, imaginative and sound architectural solution for the design of an adult education and vocational skills centre.

DEDICATION

First and foremost, I would like to thank my parents. Without their support, guidance and unfailing love over the past years, none of this would be possible. Mom and Dad – words honestly cannot express the gratitude for everything you have done for me, the sacrifices have not gone unnoticed, and for this I will forever be grateful.

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LIST OF ABBREVIATIONS

CETA	Construction Education Training Authority
NGO	Non Governmental Organisation
FET	Further Education and Training
CAD	Computer Aided Design
ABET	Adult Basic Education and Training
EU	European Union
NCV	National Certificate Vocational
RDP	Rural Development Programme
NQF	National Qualifications Framework
HIV	Human Immunodeficiency Virus
AIDS	Acquired Immune Deficiency Syndrome
RIC	Resource and Information Centre
ICC	International Convention Centre
CBD	Central Business District

CHAPTER 1: INTRODUCTION

1.1 Research Background

The Durban Region, with approximately 3.5 million people, of which 1.9 million live in informal settlements, is one of the fastest growing urban zones in South Africa with unemployment in many areas reaching 65%. South Africa's economic survival depends on being able to train and develop what is in essence its greatest resource – the ever expanding human population.

The South African education system has created a post apartheid economy that is defined by low levels of skills development and low participation and productivity in the economy by the majority of people in South Africa. Hence improving education and skills levels is of paramount importance.

Education is no longer only for a privileged few in South Africa. It is now seen as a basic human right, and all should have equal access to it. This education and training will enable people to

become active citizens in their respective communities, keeping them engaged in the economy for longer periods of time, therefore being beneficial to the country on a macro scale. Job creation and training are two mutually beneficial components in the race to eradicate poverty, crime and unemployment which plagues our country at present.

The South African government is constantly searching for new ways to up skill its people, thereby giving them the tools to improve themselves, thus enriching the country and its economy.



Fig 1.1.1: Adult Education – Vocational Skills
(Source: The Rossing Foundation, 2008 30 Year Report: 12)

It will be looked at in some detail as to how an architect can create such environments for adult education that fosters an environment for the healthy promotion of adult education. It is envisaged that the best possible architectural solution be created so that the wide gap in education levels between socio economic groups in South Africa can be bridged. People therefore feel more confident with the new skills they have acquired, enabling them to reintegrate back into their respective communities as active, value adding citizens. This has many benefits, not only for the individual, but for community revitalisation too, due to the fact that as people become more educated, they can begin to make more informed decisions with regard their everyday lives.

People who are unable to go to university to get a formalised degree could then be able to make themselves self sufficient. This is why particular emphasis has been placed on vocational skills development and training, in that no matter what their level of formal education, anyone can be taught a skill, if the desire to learn is there. The emphasis on having a tertiary degree can never be downplayed, but the notion of having to have a degree to make a success of one's life is not true.

Through this research, it is envisaged that a clear understanding be built up of how different architectural elements leads to a quality architectural solution that is best suited to the adult learning and teaching processes within South Africa.

Most social and economic problems cannot be solved immediately. However, the training process must be set in place and the confidence in long term solutions created.

1.2 Motivation

The South African government is constantly looking for new and innovative ways to improve training and skills development in South Africa. This is an ideal opportunity to marry this issue with the architectural design of adult learning spaces. The architecture can therefore be used as a stimulus for the development of people for social reintegration back into their respective communities.

For training to bring practical benefits, it must be linked to production (Herwood, 1994: 7). Therefore, adult trainees develop practical skills that they can immediately put to use.

1.3 Problem Statement

This research aims to approach various problems associated with the existing design of educational spaces and schools of arenas for adult learning. Well informed architects can design spaces that are best appropriate to the learning and teaching processes through the careful manipulation of various architectural elements.

Too often spaces are limited in their interpretation of the potential for learning, and so this research aims to investigate possible ways in which architectural form, planning and design can lead to a more imaginative and progressive solution.

South Africa needs to increase the human resource potential of its people. One is dealing not with people who are able to go to university and acquire a tertiary education, but rather people who have not had this unique opportunity, and are so willing to learn.

1.3.1 Aims & Objectives

The provision of access to information which is relevant to the community is an important theme to consider. The aim of this research is to make this information available in a manner that is accessible and legible, within a building that is not intimidating or condescending, but rather informal, comfortable and equitable. Therefore the objectives of this research will be:

- To investigate various architectural elements to ascertain how an architectural model can be set up that is effective to the adult teaching and learning processes.
- To investigate the notion of a flexible architecture, and how this can be integrated into the design of learning environments, due to the fact that the adult learner benefits most from a space that he can personalise, thereby instilling in him a sense of ownership of the space and a willingness to learn.
- To increase the human resource potential, through appropriate non formal education.
- To investigate the psychological influences architectural spaces and place has on humans and the learning and teaching processes.
- To investigate the principles of an architectural expression appropriate to this project.
- To investigate what architectural forms, spaces and architectural elements create suitable, informal and relaxed learning space for a modern learning context for adults within South Africa.

1.3.2 Delimitation of Research Problem

It is clearly intended through this research to investigate the direct influence of various architectural elements, such as natural light and ventilation, flexibility of space, form, colour and the flexibility of learning spaces has on the learning and teaching environment within South Africa.

A study will also be conducted into flexible architecture and how the careful integration of this element into the design of the educational environment can benefit the users of that space.

However, it is not the intention of this research to imply that the people of South Africa will be able to live a far better life, alleviating poverty and crime. However,

“most social and economic problems cannot be solved immediately, but the educational process must be set in place and the confidence in long term solutions created”.

(Herwood, 1994: 2)

It is this study's intention to research all of these factors that together form the best possible architectural solution for the positive promotion of adult education and teaching.

1.3.3 Definition of Key Terms

a) Integrated Learning Spaces:

The built form is the expression of an architectural style expressed by the architect as a composition of solid and voids, with each element making up the composition that informs the design purpose. In this sense, it is this study's intent to investigate the best suited elements of architectural design that make an environment most conducive to the learning and teaching processes for adult education.

b) Adult Education:

Education in its broadest sense is any act or experience that has a formative effect on the mind, character or physical ability of an individual. In its technical sense however, education is the process by which society deliberately transmits its accumulated knowledge, skills and values from one generation to another. Adult education is any learning or educational activity that occurs outside the formal education system and is undertaken by people who are considered to be adults within their respective communities.

1.3.4 Stating the Assumptions

- a) The South African situation is unique to any other in the world. Due to the problems that have arisen through past policies such as Apartheid, problems are not simply limited to educational issues, but instead also involve deeply rooted social issues and transformational concerns.
- b) South Africa has a high percentage of the population that are not in the position to go to University or Technikon in order to gain an education, and therefore need another opportunity to gain a skill that renders them employable.
- c) Any building can house an educational facility, but though this research it is aimed that the best possible solutions of built form be found to facilitate this adult learning process.

1.3.5 Hypothesis

An appropriate architecture for adult education is one which is accountable and responsible regarding the social, educational and economic aspects of its design and an environment that is comfortable, equitable, informal and relaxed, and is flexible to the adult learners own personal desires, is an environment that the adult is able to learn best in.

The need for training and skills development in South Africa is an ever increasing concern for the government in the continuing quest to eradicate poverty and crime. The correct architectural environments therefore need to be created, facilitating a skilled population that is self sufficient.

1.3.6 Key Questions

- a) What is the current state of the provision of education in KwaZulu Natal, and how can this be improved?
- b) Does the space that we work and learn in affect us psychologically and if so, how so? Therefore what is the role of the architect in providing suitable spaces for these processes through the use of various architectural elements?
- c) What influence does an educational centre have on a community and its people? Can the built environment and education be seen to play an active role for the social reintegration of people?
- d) How do various architectural elements influence the psychology and design of adult learning spaces?
- e) What are the implications of change and adaptability for the architecture for education?
- f) What social issues and policies in South Africa's history have led to the development of such a broad base of undereducated people in South Africa?

CHAPTER 2: RESEARCH METHODS

2.1 Research Process

The research carried out for this dissertation is aimed at developing the philosophical underpinnings for the design of adult educational spaces for KwaZulu Natal. The study area for this dissertation is set in KwaZulu Natal, and it is intended that a qualitative method of research be used for the research. The information assembled is of both local and international examples of precedent and case studies which allowed for the cross examination of conditions and characteristics which in turn sets up a sound knowledge base from which an appropriate solution be found.

2.2 Criteria for Eligibility

The Research study will apply primary and secondary data to an appraisal process based on a series of practical research methods and will be implemented in order to build up a solid base of information to inform the research and design process.

These include the use of:

- Questionnaire (See Appendix D)
- Physical Interviews
- Participant Observation

These methods are seen to be most effective due to the fact that it is mostly through personal observation that one learns the most. Drawing from other peoples experience of what works, and what doesn't work in these spaces is essential for a proposal that is a sound, interesting and imaginative architectural solution.

2.3 Questionnaire (Refer to Appendix D)

The questionnaire has been set up so as to evaluate what, from a personal point of view, the adult learner sees of value within the learning environment. Questions are asked about personal feelings and thought processes, as it is vitally important that one as an architect knows who he is designing for.

When the adult is learning, he has to be made to feel comfortable in the learning environment, and so it was decided to not ask questions from a general point of view, but rather from an intimate, user orientated perspective.

2.4 Observing Physical Traces

Zeisel (1981) describes an observation technique of *observing physical traces*. This technique means to systematically look at the learning environment in his case, to find reflections of previous activity and the way that people subconsciously interact with their environment (Zeisel, 1981: 89). Traces may have been unconsciously left behind (for example, paths across a field, in the case where there is no designated path), or they may be conscious changes people have made to their surroundings so that it better suits them and the task being carried out.

2.5 Analyses

From such traces that the users of a space leave behind, this method of environmental behaviour research and analysis can be used to begin to infer how an environment got to be the way it is, what decisions the designers and builders made about the place, how people actually use it, how they feel toward their surroundings, and generally how that particular environment meets the needs of its users (Zeisel, 1981: 89). Through this analysis then, one begins to form an idea of what people are like who use that place; their culture, and their affiliations.

Conclusions will be drawn from the questionnaire as to what the adults best respond to in the learning environment, and the questionnaire will also form a good guide as to what is required in the centre from an accommodation point of view.

CHAPTER 3: CONCEPTUAL FRAMEWORK

The Theoretical framework serves as a basis for the dissertation, in that it suggests a structure of thinking and analysis for conceptualizing the design process.

3.1 Designing with a Constructivist View:

Constructivism emerged as the “leading metaphor of adult learning by the 1980’s and 1990’s” (Liu and Matthews, 2005: 387 cited in Nathoo, 2009: 39).

Constructivism cannot be seen to be entirely a single, cohesive theory of learning. The term is used to denote a set of similar views that all rest on the assumption that learning is a process of constructing meaning, or described differently, a process of knowledge construction (Nathoo, 2009: 40).

Learning within a Constructivist Paradigm

When one talks about learning within a Constructivist paradigm, it essentially means that knowledge is not mechanically acquired, but is rather actively constructed within the limitations and offering of the architectural learning environment (Liu and Matthews, 2005: 387).

Merriam (2004) believes that learning within a constructivist paradigm is seen as an active process of constructing meaning and transforming understandings in interaction with the architectural environment. This is why the role of the architect is important, as it is the spaces in which these vital interactions occur. The environment therefore needs to be best suited, comfortable, informal, and change to these dynamic needs of the adult learner. This sentiment of Merriam is further backed up by Gravett (2001) when she states that the construction of meaning can be built up from a personal point of view, but it is often a social process that leads to shared meaning or the construction of knowledge (Gravett, 2001: 19). Knowledge is thus built up, or constructed, and not simply transmitted from one person to another.

Social Constructivism

Vygotsky (2004) placed the individual within the context of the learning environment. He placed the knowledge making process of individuals within a dynamic social context and influenced by the context of the individual's life (Gravett, 2001: 20). Social Constructivists essentially believe that the learning process then cannot be placed in isolation, but is rather positively influenced by the society in which the practice of learning takes place (Gravett 2001: 20).

As an adjunct to this theory of social constructivism, Wenger and Lave (1991) and Wenger (1998) talk about the social theory of learning. Mention is made of “communities of practice” where learning takes place within the social context of that particular community. They state that learning is not something that solely occurs with the person in isolation, but rather it is the rich learning experience that is influenced by the social community in which the learning takes place (Wenger and Lave, 1991: 52). Learning occurs when adults are involved in communities of practice, and they emphasise the fact that learning is a process of social participation. Therefore the architectural design of the spaces needs to be informal and promote this sense of group learning activity.

Knowles (1973), in his theory of Andragogy, describes how a person, over the full extent of his life, gathers experiences, and how these have either a positive, or negative influence on a person's ability to learn. These boundaries should never limit an individual, and can always be expanded through the process of education and the influence of other people's experiences and the social context as well as physical context or built environment in which they find themselves.

Thus, learning as viewed through the eyes of a social constructivist is seen as

“a process wherein complex psychological intra-action (i.e. thought) is mediated by social interaction (i.e. speech and social activity).”

(Gravett, 2001: 20)

The personal construction of meaning is vitally important when one talks about adult education. Knowles (1973) believes an adult learner brings with him into the learning context a wealth of personal experiences built up over his entire life. It is therefore vital that the physical architectural environment is safe, comfortable and inviting for the adult learner, to counter the feelings of anxiety he might have, on re-entering the learning environment.

3.2 Social Reintegration:

Social reintegration is a term given to the process whereby people, with either former or current issues, are integrated back into their respective communities (Annual Report of the State of the Drugs Problem in Europe, 2005: 2). These problems can arise from a variety of issues, but one of the key ways of in which one can initiate the reintegration process is by educating people. South Africa is unique in a sense that due to past policies, people have been given unequal access to education, and this is why many of these issues have arisen. As described in the Annual Report of the State of the Drugs Problem in Europe (2005), one of the three pillars for social reintegration of a person back into community is that of education, including vocational training. The other two are housing and employment for income generation (Annual Report of the State of the Drugs Problem in Europe, 2005: 2).

3.3 Linkages Theory

The Linkages theory, as set out by Trancik in his book *Finding Lost Space* (1986), is derived from imaginary lines that are used to link one element to another (Trancik, 1986: 106). These lines are formed by a number of different things, examples of which are streets, pedestrian ways, transparency of building form, linear open spaces or other linking elements that physically connect the parts of a city (Trancik, 1986: 106). This is especially relevant for this research as through linkages comes accessibility, and this centre needs to be highly accessible. The centre could have been site specific and placed in one township, but then it would only be catering for one specific group or community, and the full benefit of the centre would not have been taken advantage of. It is these links that create the accessibility of the centre, and therefore a large portion of the urban design proposal focuses on linkage creation and accessibility throughout the city, brought about by the current dispersed nature of CETA institutions in KwaZulu Natal.

Therefore, applying the linkage theory involves trying to organise a system of connections, or a network that establishes a structure for ordering spaces. Emphasis is rather placed on circulation rather than spatial organisation as in the case of the figure ground theory, also explored by Trancik (1986), and linkage is stressed as the controlling idea for ordering buildings and spaces in the design of learning spaces (Trancik, 1986: 108).

3.4 Blurring Boundaries

The Question of how one experiences the educational building in the urban environment has to be analysed. Adult education, in a sense is a common goal and blurs boundaries between differing social groups and economic classes within our society.

The boundaries are blurred between people, no matter what their background is, because they are learning for the same purpose. They have realised the need to come back to gain a skill in order to lead a better way of life, and so are in the educational environment following a common goal or purpose. The educational building for adults can be seen as a social place for the interaction and contact of people.

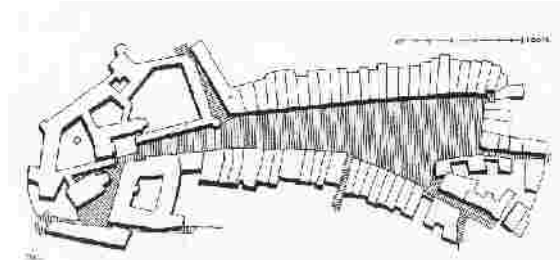


Fig 3.4.1: San Vittorino, Romano – The incorporation Squares in the urban Environment creates a social space for cross cultural pollination to occur. (Source: Gehl, 2001: 86)



Figure 3.4.2: St Marks Square – a constant sense of activity (Source: Retrieved from [www. members.cox.net](http://www.members.cox.net): 22 Sep 2010)

For the design of an Adult Education Centre, the focus is essentially on blurring the boundary that exists between the building, and the people who use it. Again it comes down to the flexible nature that the people feel in using the building and not being intimidated by the notion of the adult education stigma or alienation that has been created. Therefore the street provides the opportunities for people to interact informally, having a flexible, relaxed and casual relationship with the building.

The notion of Intermediary spaces or transition zones, consist of squares, pedestrian streets or resting areas (see fig 3.4.1 and 3.4.2) which act as breathing room between buildings. These areas can be seen as places for social interaction, encouraging cross cultural pollination.

Gehl's theories about urban spaces, in his book *Life Between Buildings using Public Spaces*, are formed around the basis of what actually happens in these spaces on ordinary days, and the multitude of outdoor spaces that surround us. His theories are formed by the everyday activities and their specific demands on the manmade urban environment that encourage this social interaction. It is in these daily situations that our cities and buildings must promote and provide enjoyment (Gehl, 2001: 9).

Life between buildings is discussed here because the extent and character of outdoor activities are greatly influenced by physical planning. Just as it is possible through choice of materials and colours to create a certain palette within a city, it is equally possible through planning decisions to influence the various patterns of activities within spaces between buildings, to create better or worse conditions for this cross cultural pollination, and to create lively, social learning environments (Gehl, 2001: 9).

3.5 Mezirow's Theory of Transformational Learning:

The transformational learning theory stems from the Constructivist theory discussed above, with specific focus to learning in adulthood (Gravett, 2001: 23). Mezirow regards personal cognitions as internalised by products of publicly shared discourse (Gravett, 2001: 23), and learning as a process of meaning making, which in return shape and delimit the meaning making (or learning) process.

Mezirow (1997: 6 cited in Gravett, 2001: 23) defines learning as:

“a social process of using prior interpretation to construe and appropriate a new or revised interpretation of meaning of one's experience in order to guide future action.”

Therefore the most conducive design conditions in which to promote transformative adult learning are those that allow full participation in discourse in a physical built environment that is comfortable and informal for the learning and teaching processes to be carried out (Gravett, 2001: 26).

3.6 Psychology of the Design of Learning Spaces:

Space has a major impact on learning. It can bring people together and it can encourage exploration, collaboration and discussion (Oblinger, 2006: 12).

It is assumed that the way in which educational learning environments are organised in terms of the spatial arrangements, can facilitate successful or conversely unsuccessful interaction between participants and teachers (Thurlow, 1987: 6). This has a major impact on the learning and teaching processes that take place in these environments. Learners do not touch, see or hear passively; they feel, look and listen actively (Oblinger, 2006: 76).

Hence the architect has a pivotal role to play in the active promotion of learning in society. It is through the way that he manipulates various architectural elements that he can create positive, informal spaces for adults to learn in.

3.7 Andragogy

The Theory of Andragogy was proposed by Knowles (1973) and is the study of Adult Learning. He stated that the theory and practise of adult education should be clearly distinguished from that of pre – adult schooling (Knowles, 1973: 51) (See fig 3.7.1).

An architect always has to be aware of who the space is being designed for. Hence it is of vital importance that a full analysis of the adult be carried out, and this will set up a framework from which to successfully design spaces for optimal learning.

Knowles outlines a couple of principles that make up the theory of Andragogy (Knowles, 1973: 55 – 59):

Changes in Self Concept: As one gets older and matures, one gains the ability to critically make his own decisions and becomes more self – directed. It is at this stage that he essentially becomes an



Fig 3.7.1: The Theory of Andragogy (Source: Retrieved from www.leanlearning.wikispaces.com: 17 June 2010)

adult. Therefore, with this new found independence, the internal need for the community in which he lives to recognise this becomes more and more prevalent.

The role of Experience: As one progresses through life, one acquires more and more life experiences. As this accumulation increases, these experiences become a valuable reference on which one can base new decisions and further learning experiences.

Readiness to Learn: As one gets older, one becomes more and more able to recognise the value of learning something new. It is no longer seen as a chore, but the recognition of the fact that what is being learnt is of value and benefit.

Problem Centred Learning: The subject that the adult is learning is often directly related to his or her immediate life challenges. This then makes the whole process a whole lot easier, as what he is learning can be seen to be of immediate value. Where a child is learning for what can be termed as *postponed* application, an adult is learning for *immediate* application.

Orientation to Learning: An adult learner seeks education to better himself because he feels inadequately qualified to carry out his proposed job. Therefore the want to learn is internally motivated rather than reliant on external factors.

Therefore, to summarise Andragogy:

- Adults need to know why they are learning something.
- Adults need to Learn Experientially – Task Orientated.
- Adults Approach Learning as Problem Solving.
- Adults learn best when the topic or process is of immediate value.
- An Environment best conducive to adult learning is one that they can personalise.

3.8 Flexibility – The Varying Needs of the Adult in the Learning Environment

Heimstra (2001) suggests that there is a vital need to incorporate flexibility into the adult learning environment. This is in part largely due to two reasons. Firstly, the way in which adults are being taught is constantly changing, and the need for the environment to adapt to these changes is essential (Hauf, 1971: 28).

Secondly, there is always a need for the provision of growth and future expansion as the needs arise. Many different things change over time. Not only do numbers fluctuate and change, but also, especially when one talks about vocational training, do the methods of instruction change as different tasks and techniques need to be learnt in order to accommodate the different learning goals of each group of adults (Hauf, 1971: 28).

The fact that class size varies so much in adult education is a very important factor to consider for the architect in the design of learning spaces for adults. Adult education varies a lot in comparison to that of child education, in that one is constantly dealing with a different class size as adults come and go. The adults learn something new, for immediate application and then leave. This varies in comparison to learning in childhood, as generally there are a set number of students in a class for an entire year, as this suits them due to the fact that the child learns for what can be termed prolonged application, or for use in later life (Knowles, 1973: 59). Therefore it is advantageous that flexible elements be incorporated into the learning environment that can be personalised by the group. This in a sense creates custom made learning environments, delivering the best possible set of circumstances for the group, and the task being learnt (Hauf, 1971: 29).

By providing rooms with partitions, the architect allows these spaces to be broken down into a number of smaller seminar rooms for example. On the other hand though, the space can also be amalgamated into one big venue for the use by the entire group. Again, it is what suits the task being undertaken at any specific time, and allows for differing methods of teaching as well – be it group seminars, discussions, lectures or more formal interactions – each important for the process of adult learning and teaching. Selection considerations for these partitions include materials, sound transmission and time period required for their placement and removal (Hauf, 1971: 30 – 32).

There is hence a need to create a variety of spaces within the adult educational institution, which can easily be accessed by the individual whenever required. However, it is vital that the primary function of the room never be forgotten, and that the element of flexibility only acts as a vehicle with which to enhance the learning process. It is still imperative that every occupant of the space be able to have uninterrupted views of the materials being taught, and also can hear everything being said. Careful attention then too must also be taken when considering lighting, ventilation and acoustics within the space (Hauf, 1971: 33).

CHAPTER 4: LITERATURE REVIEW - EDUCATION AS A DEVELOPMENT TOOL

4.1.1 Introduction

This chapter looks briefly into the idea of Social Reintegration, and the way that education can be used as a tool to implement this idea. The notion of social reintegration is extremely important in a country such as South Africa, due to the fact that we have such a large sector of our population that has virtually been untapped from the point of view that they have so much to offer which is simply not being used. If they are given the tools through education to be able to reintegrate back into society, the country can only go from strength to strength.

4.1.2 Education as a Social Reintegration Tool

Education can be seen as a tool to reintegrate people back into society by giving them the tools to be confident enough to participate on a mental, physical, as well as emotional level within society. This is why the analysis of the psychology of architectural elements in the design of educational spaces for adult education is so important.

Learning in Community is a term described as individuals coming together to exercise control and influence over the direction, content and purpose of their learning (Stein & Immel, 2002: 1). This is particularly relevant to adult education because adults have a willingness to learn and do not need the constant attention of an educator to guide them, and hence the architectural design of these spaces must reflect this ideal. They are able to get on with the task at hand on their own, and so the ability to work together, thus learning from each other, is very important (Stein & Immel, 2002: 1).

Learning in community is marked out by the characteristics noted by Stein and Immel (2002), the most important of which is a strong group identity, expectations for participation by the learner, contribution and working toward the greater good of all concerned. The learning environment therefore becomes the site of stored, collective thought and is sustained by the development of wisdom capital (Stein & Immel, 2002: 26).

Stein and Immel (2002) speak of adult education taking place in *cohorts*. A cohort is defined as a group of learners who come together to participate in further education (Stein & Immel, 2002: 83). In higher education programmes, participants usually enter cohort groups as strangers to one another connected only through the mental desire to learn, but through this integration, they learn to interact with each other on a social level as well as an intellectual level, gaining life skills as well as education.

4.1.3 Legibility and Symbolism of the Educational Building to its Context

When one talks of legibility of a building, it can best be described as an '*apparent clarity as viewed by the immediate community in which it is located*' (Lynch, 1979: 5). This is important as it is the people that are located in and around the building that are going to be using it the most and in a sense, must be comfortable in doing so, while the functions and locations of the building should be easily identifiable. This apparent clarity can be achieved by the architect in many ways, and can be manipulated through the use of colour, shape, motion, light, sound and touch (Lynch, 1979: 5).

The presence of such elements in the educational facility is vital, as the legibility of the building determines the ease with which people feel comfortable using the space (Lynch, 1979: 6). This is even more important given the context in which South Africa finds itself, in that many people in South Africa are illiterate and cannot read conventional signage. If one executes the design and readability of a building like this successfully, it can go a long way in improving one's emotional security (Lynch, 1979: 4) within a space and hence ease with which the adult is able to learn.

As an adjunct to this notion by Lynch, Herwood (1994) stresses that architects have a moral obligation towards society, especially in the context of a developing community such as South Africa. An architect needs to be sensitive to the needs and desires of the community for which he is designing, and to respond to these needs in a humanistic way that everyday man can understand, participate in and appreciate (Herwood, 1994: 12). Architecture should therefore create a quality environment sensitive to the human scale, aiding the ability to learn, and should be appropriate to its context (Herwood, 1994: 12). Architecture can therefore be seen as a tool essential for the remodelling of communities within South Africa, and should be sensitive to the interdependence between the characteristics of a place and the people's activities in that place, and be a vehicle with which this interaction is enhanced (Herwood, 1994: 14).

The Library building, or in modern terms the Resource Centre, is the heart of the learning environment and should act as the focal point of the centre. It is essential that the location be central and accessible to the campus, and legible in the urban context. The notion of transparency is a defining feature of the library, as this acts as an advert for the activities that are occurring inside, breaking the stigma of alienation of adult education, and acting as an advertisement for the opportunities that are occurring within (Architecture SA, 1994: 29).

4.1.4 Conclusions

South Africa finds itself in a very unique situation. There are a vast number of adults in the country that are not literate enough to hold down a decent job in order to earn an income. In many cases these people cannot read or write at all, and this is a major detrimental burden to have in today's modern, technologically driven society.

Therefore a means needs to be found to reintegrate these adults back into their respective societies, and one such way is through vocational training. One of the three pillars for social reintegration of a person back into community is that of education, including vocational training (Annual Report of the State of the Drugs Problem in Europe 2005: 2). What this does is create a source of income generation for a person, even though he cannot read or write. A physical skill is a practical task that anyone can learn through observation, regardless of formal education level, and what this does then is give the person a sense of worth and confidence to interact with people.

As noted by Stein and Immel (2002), the learning process occurs best when it occurs in a community environment, when this accumulated source of *wisdom capital* of the group can be taken full advantage of. This brings about the idea that perhaps the educational architectural environment should incorporate spaces that encourage adults to interact, and therefore initiate conversation, and cross cultural pollination. These spaces should act as the anchoring element within a scheme.

4.2.1 Introduction

In the past, there has been wide discrimination between racial groups in South Africa. Apartheid was the name given to this discriminative practice, and negatively and unfairly affected the lives of the black majority within South Africa from every aspect. While not going into too much detail, an overview of Apartheid must be understood, and in particular how it affected the education of these people, as this is largely the reason why South Africa finds itself with such a large group of adults without a sufficient education to contribute effectively to the community.

4.2.2 Background and Consequences of the Apartheid Era on Education

Education in South Africa was greatly affected by the apartheid rule. There was a massive divide in the level of educational provision between different racial groups, and it is this aspect that is largely responsible for the low level of education in many sectors of South Africa's population today.

Education can be seen as an essential ingredient to the reconstruction, development and transformation of the South African Society (Adult Basic Education and Training act no. 52 2000: 2).

After the 1994 democratic elections, South Africa has been slowly moving towards a culture of acceptance and equality. We are however still very far from having solved these issues. This has led to the fact that there are still huge amounts of people in South Africa that are without the education levels and skills that enable them first of

all to find a job, and second, keep that job (Adult Basic Education and Training act no. 52 2000: 3).



Fig 4.2.2.1: Bantu Education (Source: Retrieved from www.rebirth.co.za/apartheid_segregation_bantu_education3.htm 2000: 25 April 2010)

This problem is largely due to the Bantu Education act of 1953 under Mr. H.F Verwoerd. The aim of this education act was to direct black or non white youth to the unskilled or inferior labour market, so as to ensure white control and prosperity (Adult Basic Education and Training act no. 52 2000: 3).

Sutcliffe (1987) attempted to come to grips with black learning spaces in South Africa. The learning spaces themselves were usually nothing more than inadequate and traditionally designed classrooms set in townships where living conditions, transportation and job opportunities were inadequate and underprovided (Sutcliffe, 1987: 36), designed as instruments for social control. In contrast, the white schools were far better funded and this in itself showed unfair favouritism to white communities, but this thinking has thankfully, since 1994, been abolished.

4.2.3 The Post Apartheid South Africa and Governments Role in Education

Education is an essential component of the restructuring, development and transformation of society. Ever since the democratic elections of 1994, the government has developed new policies that stated that education is now a basic human right, and that it should be made widely available to the general population, or whoever wishes to access it (Adult Basic Education and Training Act 52, 2000: 2).

The right to basic education applies to all sectors of the population, whether it is the children, youth or adults. The purpose of Adult Basic Education and Training (ABET) is twofold. On the one hand, it attempts to incorporate literacy with basic education for adults, while on the other hand, it also incorporates the aspect of training for income generation – and the important thing is that it views both aspects to be of equal importance (Adult Basic Education and Training Act 52, 2000: 3).

4.2.4 Conclusions

The Apartheid rule was greatly unfair and in that the government decided to create the Bantu Education Act where the black sector of the population was prepared to form what was termed an inferior workforce under white minority rule.

In today's society, these past policies have had massive implications for the level of education in South Africa, and it is because of this that an appropriate solution needs to be hastily found for the successful implementation and education of adults in this country.

CHAPTER 5: FURTHER EDUCATION AND TRAINING

5.1.1 Introduction

The issue of adult education is not only prevalent in South Africa. It is a worldwide phenomenon where people are constantly seeking new ways to further their education in order to lead a better life.

However, saying this, South Africa does in fact have a very unique situation, unlike many other countries in the world. Due to circumstances brought on by our history, explored earlier in the research, we do in fact have a very wide gap of educational levels in our adult population.

It is therefore necessary to analyse how different cultures in the world and particularly Africa, approach the issue of learning. A brief exploration of native educational practice is carried out, as this is worthwhile to give some perspective of how society and technologies have advanced, and therefore describes how architects need to accommodate these changes within the built environment, best suited to the adult.

An outline of global trends in adult education is then explored, and how other countries and regions have approached the practice of adult education, so that implementation of adult education strategies here in South Africa can occur in the best possible way. Only once a thorough analysis has been carried out, can one then focus in on the South African context, moving from a macro context to that of a more micro context.

5.1.2 Global Adult Educational Trends

There has been widespread global consensus as to what the term adult education actually involves. In the Western world, and most parts of Asia, the notion of adult education has been expanded so as to include community education as well as continuing education aimed at facilitating modernisation and development in general (Indabawa and Mpofu, 2006: 5). The concept of adult education has been recognised in the western world for over 50 years (Mpofu, 1998 Cited in Indabawa and Mpofu, 2006: 4). It has been widely acknowledged that adult education therefore involves all activities in which capacities and capabilities of people, who are viewed as adults in their respective communities, are developed for specific purposes (Indabawa and Mpofu, 2006: 5).

Similarly, in most parts of Asia, adult education is seen to be much wider than just encompassing literacy education and remedial education (Indabawa and Mpofu, 2006: 6). For example, in Malaysia and Thailand, adult education is seen to be vital in the growth and improvement of human resources for the overall benefit of the economy (Indabawa and Mpofu, 2006: 6). Also in China, adult education is expected to facilitate national modernisation and development programmes in general.

Adult Education has an essential contribution to make in building social capital, fostering social inclusion and combating both direct and indirect costs of social exclusion (European Association for the Education of Adults, 2006: 1).

Cultural change is occurring in relation to older and younger people in society within these countries. Adult education is needed to keep these older generations active in the workforce for a longer period of time, and to help keep them engaged as active citizens in their respective communities for longer (European Association for the Education of Adults, 2006: 2). Perhaps the strongest and most distinct adult educational traditions within Europe belong to the Nordic countries. The main European Union (EU) adult education programme, takes the name of Denmark's *Gruntvig* (European Association for the Education of Adults, 2006: 2). However, other Western European countries have strong traditions in place as well, including the use of adult high schools, workers education and vocational training (European Association for the Education of Adults, 2006: 4).

Within the *Gruntvig*, the notion of lifelong learning embraces all areas and regards school, vocational training, university and adult education as components of a comprehensive system that are seen to be of equal value (European Association for the Education of Adults, 2006: 2). It is visionary in a sense that it shifts the emphasis of adult education to not merely teaching, but instead rather onto the learner where he is encouraged to explore, debate and enquire, and not merely listen (European Association for the Education of Adults, 2006: 5).

The demand for skills and qualification from employers is changing within these European countries. Also changing are the individual preferences for how, when and where learning is accessed. Demand for more education and training opportunities is also increasing and this requires great flexibility on the part of education providers and facilities in which this learning takes place (European Association for the Education of Adults, 2006: 9).

Within the *Gruntvig*, there are four essential pillars for the lifelong learning of society (European Association for the Education of Adults, 2006: 9). These are schools, vocational training, universities or higher education and adult education. Within adult education, a strong emphasis is placed on vocational training for employability (European Association for the Education of Adults, 2006: 9).

In essence, participation patterns in adult education have similar hallmarks all over Europe and around the world. For example (European Association for the Education of Adults, 2006: 23):

- Participation rates increase as the level of education of the participants rises.
- The worse the social situation, the less likely people are to take part in adult education.
- Participation is lower in rural areas as opposed to urban areas.

Within these countries though, as is the case all around the world, adult education suffers greater competition for public expenditure from health, welfare and other portfolios; meanwhile it is necessary to keep people active and employed longer for economic reasons, up to date and skilled to work (European Association for the Education of Adults, 2006: 23).

5.1.3 The Concept of Learning in Different Cultures

Every culture in the world today is unique, and has some kind of formal learning system, but it is the way that each generation passes knowledge down to the next that differs all over the world. It is what works best for each of these generations to ensure the successful transference of knowledge, ensuring the creation of a legacy.

The general aim of African traditional education was based on the socio – cultural and economic features shared by the various communities (Amino, 2000 – Internet). The harsh natural environment

made survival to be the main objective of education. Every skill, knowledge or attitude was learnt either for protection, acquiring of food or for shelter (Amino, 2009: Internet).

All descriptive knowledge used by pastoralists to manage their natural resources, have evolved and has been passed down through the generations (FAO, no date: Internet). This knowledge normally took the form of practical skills, as it was these that the communities needed at that time to stay alive. These skills, such as tree felling or hunting were usually taught by the elders during initiation ceremonies. Among the Fulani of Northern Senegal for example, children start pastoral duties at a very young age (FAO, no date: Internet). In almost all groups, the father teaches his sons by going out with them first, and the knowledge is already firmly established by the age of around 9.

Among the Bushmen, story telling's, based on everyday experiences are used to pass on information and knowledge (FAO, no date: Internet). They use an incredible array of non verbal arts when telling stories, such as song and dance, drama, poetry, music and tales, and this serves to help attract people's interest. These different kinds of communication reflect the group's interests and priorities for different parts of the environment (FAO, no date: Internet), and often took place under a tree, because this is what these people felt comfortable with. Games that children play for example show how skills have been acquired and hence practiced.

Essentially, African traditional education refers to ways of teaching and learning in Africa which are based on indigenous knowledge accumulated by Africans over long periods of time in response to their different physical, agricultural, ecological and socio cultural challenges (Amino, 2009: Internet). The indigenous knowledge is an amalgamation of diverse cultural experiences commonly generated by diverse African cultures, and passed on as valuable information from generation to generation (Amino, 2009: Internet).

5.1.4 African Adult Education – A Historical Overview

When one analyses African societies, they have generally remained behind in adopting this broader and more encompassing view of adult education (Indabawa and Mpofu, 2006: 6). There has been very little acknowledgement of the role of adult education development in these societies (Indabawa and Mpofu, 2006: 6). However, this lack of commitment towards adult education is not only limited to Africa.

Hinzen (Cited in Indabawa and Mpofu, 2006: 6) states that in some parts of South Asia the status of adult education remains somewhat sceptical. However, even though this is occurring in South Asia, the most acute resistance to this broader view of adult education is occurring in Africa. Hinzen surmised that in most African Countries adult education activities lack direction and focus and are characterised by a lack of clarity and holism (Cited in Indabawa and Mpofu, 2006: 6).

In a study (Mpofu and Amin, 2004 cited in Indabawa and Mpofu, 2006: 4) of perceptions of adult education in Namibia, it was revealed that the scope and perception of adult education remains very narrow. In these African countries, adult education has not really evolved and still only really encompasses remedial and literacy education. The concept of adult education remains blurred in most African countries, and consequently there is very little commitment at government level to the promotion of adult education activities (Indabawa and Mpofu, 2006: 6).

To fully understand this notion of underdeveloped adult educational policies in Africa, it is worth looking at a historical overview of the provision of education in Africa. The pattern of educational development during the colonial era was generally the same across the continent of Africa.

The colonial educational systems did not make any provision for the development of adult education in most African countries (Indabawa and Mpofu, 2006: 6). The colonial governments were not keen to promote a literate indigenous population as an enlightened black population would pose a threat to themselves. Due to this reason then, the greatest disparity in educational provision existed between the native black populations of Africa and the white settler communities, up to the attainment of independence of these countries (Indabawa and Mpofu, 2006: 6). Once the independence of these countries occurred, the newly formed governments were obliged to close this gap in educational levels. Hence a number of programmes were set up in order to try and tackle this problem. However, these programmes did very little to solve this problem and it is because of this that there is generally still a wide gap, although it is now slowly closing, in the education levels of racial groups in Africa.

5.1.5 What is Vocational Training?

Vocational training is the term given to the process in which a learner is taught practical job skills in order to be able to participate in the workforce and take advantage of self employment opportunities so that he can become an active member of society and be responsible for his own well being (McNamara & Pike, 1980: 33).

The role of vocational training, as set out by Brunette (2006), can best be described as skills development. It is giving those people that have no formal education, the means to acquire some sort of skill in order to earn an income and be responsible for their own livelihood (Brunette, 2006: 54). Vocational training is best when it is directly relevant to the people, as this allows the learners to see its direct potential.

The reinvestment in vocational training in the late 1960's began to seriously challenge the designers of new educational spaces (Gordon, 1974: 29).

Vocational training spaces should not be rigid, but rather flexible, informal and portray a relaxed atmosphere in their interpretation and should be able to adapt to the groups wants and needs (Brunette, 2006: 58), making the adult feel as comfortable as possible in the architectural environment, and hence more able to learn. Brunette (2006) believes that adult learners should rather be taught to be self sufficient through gaining the skills for self employment, rather than merely learning something by rote that they might not have any immediate application for.



Fig 5.1.5.1: Vocational Training – Essentially Skills Training for Adults (Source: The Rossing Foundation (2008) 30 Year Annual Report: 40)

5.1.6 The CETA Framework in South Africa

The structure of the South African education system is heavily biased towards the theoretical learning aspect of education. There are people that are unable to afford to go to university and so seek to short term practical skills courses in order to gain a skill so as to become employable.

This is where CETA comes into play. CETA stands for the Construction Education and Training Authority, and is involved with skills development in South Africa. Established in April 2000, its aim is to develop the skills of the South African Workforce (CETA information Brochure, 2010, 3).

CETA's primary objective is to influence the course of training and skills development in the construction sector (CETA information Brochure, 2010, 3). Various skills development projects and learnerships are initiated with a view of developing a pool of skilled and motivated adults whose skills are recognised and valued in terms of the national qualifications framework (CETA information Brochure, 2010, 3).

However, although this is a very good initiative, there are some fundamental flaws within the makeup of such.

With particular relevance to the KwaZulu – Natal situation, these CETA centres have been created all over the province, and so this has led to many centres that focus only on one or two aspects of practical skills education. As a result of this, the education department is trying to fund a number of different centres, leading to lack of funding of these centres, resulting in quantity of education, as opposed to quality of education.

This is particularly evident in many of the case studies that have been examined in this research, in that the potential of the campus is there, but due to lack of funding, their full potential is not being realised.

5.1.7 Conclusions

The aim of every country is essentially the same. They all strive to educate their people in an attempt to increase the human resource potential of their people. However, the difference comes in when one starts to talk about what are termed first and third world countries. Why this is important is that each country has different priorities, and these differ vastly when one compares a first world country in Europe for example, to that of a third world country in Africa. Their priorities are very different in that a country in Africa has far greater issues like food aid and health to take care of, and so an issue such as adult education just falls to the wayside. A first world country on the other hand has the wherewithal to direct resources at things such as adult education.

One can argue though that adult education is vitally important, due to the fact that if people are educated, they are given the tools to be able to make informed decisions with regard to health and being able to provide for themselves, and in many instances, if this were the case, many of these issues in third world countries wouldn't exist.

5.2.1 Introduction

An architect always has to be mindful of who he is designing for. Therefore a complete and in depth analysis of the adult has to be explored. First of all an understanding of education is given and the varying types of education that are available. This is because different kinds of education suit different groups of people within a community.

An investigation also needs to be carried out as to how the adult learner differs to that of the child or adolescent learner. This in turn will determine what impact, if any, this different approach to teaching and learning has on the design of the built environment for the adult learning and teaching processes.

5.2.2 Definition of Education

Education plays an enormous role in people's lives. It gives them the tools to acquire work after school, and by doing this, gives them the opportunity to earn an income to lead a better life. Education can be termed as the acquiring of knowledge to enable positive development (Herwood, 1994: 3). It should be perceived as a multi – dimensional process, involving both a physical reality and a state of mind. Empowerment is the process of realising the rights and capabilities of a community to take meaningful decisions which will positively affect their quality of life.

Education and Training should not be seen to be two separate entities, but rather two mutually beneficial activities that are essential for the success of the other. Through these processes, it ensures that the beneficiaries of these respective activities can take advantage of certain employment opportunities (Herwood, 1994: 3).

“Training for self employment is essential. It is necessary to have a holistic approach to training. People must have access to training in business skills and an access to capital... to give people more opportunities and enable them to compete on a much wider scale; multi skilling should be looked at”.

(Bosman, KTT's Senior Manager, Development and Training. Developer, vol 5, 1993: 32)

There are essentially two different educational systems presently at work within the country of South Africa – formal education and non - formal education.

Formal education can be best described as the highly institutionalised, hierarchically structured and chronologically graded education system, extending from pre – school right through to adults (Winship, 1992: 7). There are many advantages, as well as disadvantages to this system. Some disadvantages include the system's lack of flexibility to adapt to changing needs of society. Another inadequacy of this highly structured system is its inability to cater for different learning needs that may be unique among different sectors of society, and these include not only differences in interests among communities, but can also be cultural differences (Winship, 1992: 7).

Non – formal education is seen to work in conjunction with the idea of formal education. The idea of non – formal education doesn't necessarily undermine the process of formal education, but rather adds another dimension to the learning process feeding off each other's strengths, thereby creating a parallel educational system that is stronger than the sum of its parts (Winship, 1992: 8).

The focus on non – formal education is to teach people in specific areas of skill deficiency or vocational skills, for the direct improvement of the individual as well as community well being (Adult Basic Education and Training Act 52, 2000: 3). It is unique from formal education as it promotes the idea of lifelong learning in that it is indiscriminate of age and other factors, and is far more flexible in terms of its ability to changing to suit different community's needs as they present themselves over time.

The architect therefore plays a huge part in this educational process, as he is the one who designs the spaces that are going to be used for the promotion of the educational process. The role of the architect in education has been analysed in some detail by Claude (1987). The architect's role may therefore best be summarised as the requirement to produce in good time and within a determined budget, a collection of spaces, solids and voids which will satisfy the varying requirements of the users (Claude, 1987: 69), by providing a congenial and efficient environment for teaching and the discoveries of learning. At the same time however, the resultant building becomes part of the fabric of society and, therefore, ought to provide a life enhancing experience for all those who encounter it (Claude, 1987: 69).

5.2.3 The Adult Learner – Gaining an Understanding

We are now in our 16th year of democracy in South Africa, but our complex history and subsequent issues still play a major role in the way in which the South African adult educators and learners depict themselves within our country.

If one was born within the Apartheid era in this country, it didn't matter how intelligent you were, or what gender you were. The sole mitigating factor to your social grouping within society was that of your race or ethnic origin (Nathoo, 2009: 26). An adult educator is relatively easy to define, as he is the person employed to educate adult learners. As one searches for a definition of an Adult learner on the other hand, one finds that this is entirely a much more difficult affair.

In South Africa, the legal age at which a person is defined an adult is 18 years. However, due to many reasons, the age of an adult learner can actually vary significantly. According to Rule (2006), an adult learner is a person that is not involved in any form of formal schooling and has an education level less than that of grade 9.

However, due to the unique circumstances in which our country finds itself, it is somewhat careless to give such a clear-cut definition of the adult learner. This is due to the fact that there has been such a disparity between different levels of education in the past. The concept of adulthood is rather socially constructed (Gravett, 2006: 6), and one should not look solely at age, but rather at the events that tend to occur in one's life as one grows older that are seen by the community to be generally part of adulthood.

Many adult learners attending adult basic education have not participated in educational activities for a great period of time, and very often the first thing that comes to their mind when thinking of an educational environment is a negative one, being based upon the idea of primary education received in a controlling manner that is a typical trait of the schooling of children. This being the case, in many instances in South Africa, many adults in the rural areas of the country have not been educated at all, where they have not even had the opportunity to be able to learn to read and write.

According to Heimstra (2002: Internet)

“The fear of the new, uncertainty of pushing back boundaries, and remembrance of past learning failures also can affect the adult engaged in learning.”

Due to this reason then, there is usually a sense of anxiety and angst felt by the adult learner when re – entering the educational system. Due to these emotional boundaries that exist within the mind of the adult learner, the architect must be aware of this when designing the spaces and must aim to counter these feelings through the clever use of relaxed, informal elements within teaching and learning space (Hartl, 2008: 47).

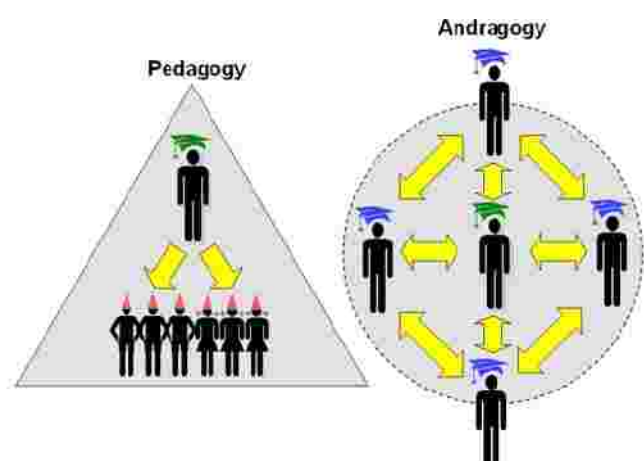


Fig 5.2.3.1: The Theory of Andragogy
(Source: www.leanlearning.wikispaces.com: 17 June 2010)

When one feels more comfortable in a space, it is far easier for that person to in fact learn in that space, and so the whole learning and teaching process becomes easier and more successful. The architect must therefore strive to design an environment that the adult learner can relate to, is humanistic in scale and proportion, reflects a warm comfortable nature and that is comfortable. All of these aspects of design are vitally important for the successful learning and teaching endeavours (Hartl, 2008: 47).

The architectural learning environment is made up essentially of two parts – the physical setting and the emotional mindset of the learner. It is the responsibility of the architect to create an environment that instils this sense of learning and promotes the activity of learning within the space.

5.2.4 Defining the Adult Learning Architectural Environment

As an architect, one must be very aware of the fact that one is designing for the adult as opposed to the child, as they vary significantly. Adults are psychologically, physically and sociologically far more advanced than children (Long, 1991: 25), and an adult's ability to learn is affected by a number of different factors, including health, prior knowledge and skills levels and their emotional and mental state (Long, 1991: 25). Knowles (1973) believes that while children learn for a postponed application, being in later life, adults learn for immediate application (Knowles, 1973: 59).

As described by Knowles (1973), adult learners are different again to child learners in that they are self directing. They are able to see the benefits of the learning exercise, and because of this, they are in fact voluntarily entering the education facility and have a willingness to learn and are committed to the learning and teaching processes.

The adult learner is able to direct himself, and this is vastly different to the pedagogic way of teaching where children need a hierarchical figure to initiate the learning process (Lieb, 1991: 21). The adult learner therefore sees the educator essentially on the same level as him, but is still respectful of the educator because of the awareness of the knowledge being passed on for his benefit.

Due to the fact then that the adult is self motivated, both his sense of discipline and value of education is self instilled (Lieb, 1991: 23), the mood and feeling of the architectural environment for the learning and teaching process to be successful must therefore be informal, human and responsive to the needs of the adult and the spaces must be flexible enough to the adult's wants and needs, so that the adult is as comfortable as possible in the learning and teaching environment.

The architectural learning environment for the adult learner is very different as opposed to that environment for the child or adolescent learner. From the initial outset, it should be the aim of the architect to design a space that is friendly, informal, open and spontaneous (Galbraith, 1990: 17). The need for the establishment of an informal learning environment for adult education is to reinforce the qualities of accessibility and equality. An informal architectural environment is far more conducive in creating a democratic, accessible learning environment than would be a formal environment.

The educator should engage in dialogue and negotiation with the adult learner on a mutual level (Gravett, 2001: 27). This allows learners to be more comfortable so as to express their wants, needs, thoughts and ideas with greater ease. What this in turn does is allow the adult learner to feel that he is contributing to the outcomes of his own education (Gravett, 2001: 27). The learning process is however inhibited when a learner feels stressed, threatened or anxious, and so it should be the aim of the architect to establish a design that is democratic open, collaborative, challenging, but non threatening (Gravett, 2001: 32).

An effective way to address this challenge is to design an informal spatial environment in which learners feel comfortable to express their thoughts and ideas without fear of judgement from peers and educators (Gravett, 2001: 32). This then encourages the users to participate fully thereby gaining the most from the learning process.

5.2.5 Implications of Theory of Adult Education for Architectural Form

The Learning environment for the adult is essentially made up of two component parts – the physical environment and the psychological environment (Knowles no date (internet): 46). Hence an environment that is most suited to the learning and teaching processes for adult education is one that is stimulating to be in, and that triggers positive responses for the adult, both on a physical, as well as psychological level.

However, one can only begin to design these spaces after a full investigation has been carried out as to what in fact the adult learner actually positively responds to in the learning environment. Only once this has been done, can the architect begin to design a space that incorporates these elements, thereby ensuring the effectiveness of them in the learning process for the adult.

Lieb (1991) believes that an adult, over his whole life, has accumulated a number of life experiences. He uses these life experiences on which to base future decisions, and these experiences, whether positive or negative, can affect the ability to learn readily. Therefore, it is imperative that the learner can make a connection between these past life experiences, and what he is learning, as this allows him to see the value that the learning activity will add to his life (Lieb, 1991: internet).

As an adjunct to this, these life experiences vary significantly from adult to adult, and this is why it is so different to designing a learning space for the adult as opposed to the child or adolescent learner. These differences may include psychological, physiological and sociological factors (Long, 1991: 28). This huge variability therefore requires flexibility in the design of these learning spaces, so that they can be flexible to adapt to the wants and needs that each adult or group of adults present over time. This is a vital component to any adult education space if it is to carry on educating in a progressive manner.

With adults, these past life experiences can either be positive, or very negative. In many cases these adults are coming from poor or neglected environments, and this has led to a difficult way of life. Adults therefore seek this education as a means to better their present lives, and so it is imperative that these educational spaces foster an environment that makes the learners feel as comfortable as possible, respected and supported (Knowles, no date (internet): 46).

In the learning environment, when the opportunity presents itself to be able to personalise the space to the group's wants and needs, a sense of ownership is fostered towards the space. This makes the adult

feel as comfortable as possible in the educational environment, and therefore his ability to learn in that space is maximised.

5.2.6 The Influence of Teaching Methods on the Learning Environment

There are many different teaching methods that have a direct influence on the architecture for the teaching and learning processes for adult education. Certain points have to be considered before the design can be successful, and some of these include being aware as the architect which cultural group is going to be using the space, the number of people that are going to be in the space at any one given time, as well as the type of interaction that wants to be encouraged in that space between the learner and educator (Galbraith, 1990: 157). This has a vital role to play in a space either being successful, or conversely, unsuccessful. Some of the most pertinent methods of teaching are described below.

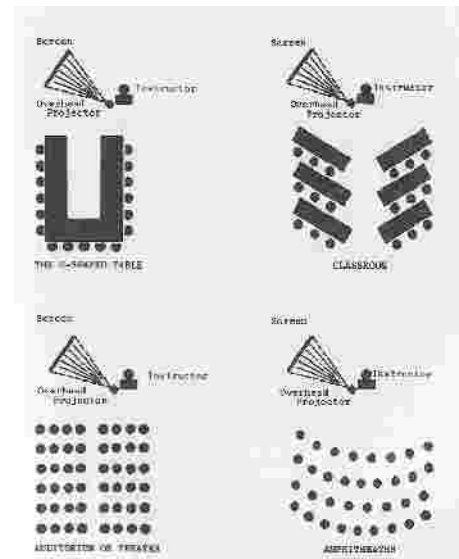


Fig 5.2.6.1: Four Common Seating Arrangements common to Lecture (Source: Galbraith, 1990: 175)

Lecture

The main focus of the lecture is to *teach*. It is not merely standing in front of a group of people and just talking (Galbraith, 1990: 163). A good lecturer encourages participation, and so instils in the learner a want to enquire and explore the topic at hand, while a bad lecturer on the other hand will promote little or no interest at all.

A good lecturer facilitates learning through acknowledging the educational value of the adult's rich life experiences, and relating whatever is being learned, to these experiences. This in turn encourages active participant involvement and initiates the adult learner to personally critically reflect on his own thought processes, without feeling intimidated to do so in front of the educator or other learners (Galbraith, 1990: 165).

Most adults are familiar with the lecture process and feel comfortable with the lecture process. It is also useful for participants who perhaps are illiterate and cannot read printed materials (Galbraith, 1990: 165).

With regard room size and seating arrangements, a room with the correct mix of teaching and audience participation is important for the effective oral presentation of the lecture (See figure 5.2.6.1). Ideally, the room should neither be too small or too large – a crowded small room has both physical and psychological drawbacks for the learning process (Galbraith, 1990: 166).

Discussion

Discussion is a very effective method in the learning and teaching process for adults, due to the fact that it puts the educator and the learner on an equal level, making neither party superior to the other, encouraging a mutual relationship beneficial to both parties (Galbraith, 1990: 187).

Essentially, the purpose of discussion is to help learners explore their own unique experiences, encouraging them to become more critical thinkers (Galbraith, 1990: 192). That is to allow the learner to become more contextually aware and develop reflective scepticism, and to be able to critically reflect on his own decisions based on what he is being taught.

Demonstration and Simulation

Much of the adult learning process involves the acquiring of some combination of knowledge and skill, and so is task-based (Galbraith, 1990: 262). Very often, listening to a lecture on how to do something is therefore insufficient and does not do the full learning process for this application justice (Galbraith, 1990: 262). Hence, the demonstration and simulation method (See fig 5.2.6.2) of teaching is a vital component of the adult learning process, as they provide the adult learners the opportunity to observe the exact way of performing a skill. This enables learners who would possibly find having to learn the procedures to a task difficult to observe and learn a task in a short period of time.

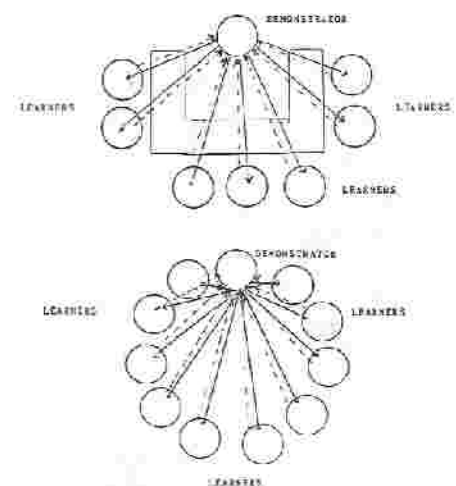


Fig 5.2.6.2: Demonstration Room Layout and lines of communication.
(Source: Galbraith, 1990: 271)

Computer Aided Instruction

In the past, books were the key tool of instruction. However, in the 21st century, computers are playing a greater and greater role in the teaching and learning process (Galbraith, 1990: 303). The computer is an incredible tool for instruction, but it is argued by Galbraith (1990) that the notion of computer aided instruction should never override the basic human interaction that takes place between the educator and the learner. If the computer however is used simply to enhance this interaction, it can only be beneficial and enhance this learning process (Galbraith, 1990: 303).

5.2.7 Campus Making – Improving the Quality of Learning Environments for Adults

The creation of a quality learning environment is vital to the success of the learning and teaching processes for adult education. There are certain elements that go a long way in achieving these positive teaching and learning processes. The campus should be seen as an integral part of the urban fabric, with which all the people who use it must identify. The elements that are vital to this creation of a positive campus is the centre and the space around it, the urban street edge, landscaping and the campus as a symbol of upliftment of people.

5.2.8 Conclusions

What can be determined through this analysis of the adult learner is that he varies significantly from that of the child or adolescent learner. As described by Knowles (1973), adults respond better to a mutual relationship between themselves and the educator in comparison to the need for a highly institutionalised or pedagogical relationship for child or adolescent learning processes, and therefore the architectural design of the spaces for adult education should strive to portray a relaxed, informal, comfortable and spontaneous environment that is flexible to the adults wants and needs as they change over time. A space that the adult can personalise gives them a sense of ownership in the space and hence a willingness to learn, because he is more comfortable in that space, therefore, it is the architectural challenge to incorporate all of these elements so that the learning and teaching process is of full value to the adult.

CHAPTER 6: ATTRIBUTES OF SPACE MAKING ELEMENTS FOR ADULT EDUCATIONAL ARCHITECTURAL DESIGN

6.1.1 Introduction

In the previous chapters, a full analysis of the adult learner has been carried out. In this chapter however, the analysis of space is explored, as to what architecturally designed spaces are ideal for the optimal learning environment for adult education.

An architect's job is all about the design of spaces, and it is the way in which this is carried out that determines the success of the learning environment. It is a widely known fact that if a building is designed correctly, it can enhance whatever process or application that is being carried out in the space. This is especially true for adult education, because if the adult learner feels comfortable in the space, he is more willing and able to learn.

6.1.2 The Use of Space for Learning

In formal education, learning occurs in classrooms and is fairly rigid in its interpretation of the learning and teaching processes (Oblinger, 2006: 10). Non-formal education refers to the less formal, by chance interactions that occur between individuals, and while appearing to be more casual in its approach to the learning process, is by no means less effective. The only differences between the two are the kinds of learning that each promotes.

The spaces in which this kind of learning occurs is therefore of paramount importance, and so the role of the architect is vital. The space can bring people closer together, encouraging interaction, as well as encourage exploration, collaboration and discussion regarding the study material (Oblinger, 2006: 12). On the other hand though, if the space has not been designed correctly, the space can also carry an unspoken message of silence and disconnectedness (Oblinger, 2006: 12). This can cause problems to the learning and teaching processes, as the learner will never feel comfortable in that space, thereby never feeling free to learn.

This notion of the design of space, as mentioned by Oblinger (2006), is further supported by the work of Thurlow (1987) in his work on schooling and space. He states that we as people do not often talk particularly about the design of space (Thurlow, 1987: 5). However, we are in fact constantly in space, and are subconsciously frequently making decisions influenced by the space that we are experiencing at any given time.

Teaching and learning can be seen as elaborate processes involving the transmission of knowledge (Thurlow, 1987: 6). Differently designed educational physical environments encourage different methods and ideas with regard to teaching and learning methods and therefore have a direct influence on the character of the interaction that takes place.

The way in which the adult learning environments are designed, in terms of their spatial arrangement and architectural design, can promote or discourage certain types of interaction among individuals. Due to this differing interaction, one can either positively or negatively affect the learning process within this space (Thurlow, 1987: 6). We often tend to think of architecture in terms of walls and roofs, of style and decoration. But what we actually live in are the spaces surrounded by these elements. Even when we are outdoors we move about in spaces defined by buildings, walls, fences and hedges. And the shape, size, and organisation of the spaces we make reflect the needs and the values of the society we live in (Thurlow, 1987: 6).



Fig 6.1.2.1: Manipulation of Natural light is Essential for the Success of the Learning Environment
(Source: Retrieved from www.wiki.eu: 15 May 2010)

Space is not just a functional necessity. It is the quality as much as the quantity of space that we respond to, and that has a profound influence on the ability to learn in an environment (Thurlow, 1987: 8).

All learning takes place in a physical environment and each of these environments are unique to each other. Each of these environments have unique characteristics, and these can either promote or demote the ability to learn and teach in a space (Oblinger, 2006: 74).

Different examples of learning spaces can vary enormously, but it doesn't matter where one is – either under a tree, in a large lecture hall or in front of a computer screen, one is constantly experiencing different environmental factors that influence the learning experience (Oblinger, 2006: 74). An adult learner's attention can be drawn from many factors within the environment, and people are always subconsciously monitoring environmental factors such as the amount of light, temperature and smell. In any learning environment, this can affect the ability to learn in a space, and so it is the responsibility to ensure that these properties of a space are sufficiently designed so as to reach mediation between all of them for the successful interaction of people during the learning process (Oblinger, 2006: 76).

Learners do not touch, see or hear passively; they feel, look and listen actively (Oblinger, 2006: 76). Due to the numerous stimuli that actually exist in the learning environment, the adult learner cannot possibly take in all of them and hence the ability to understand all information is not possible. Bramble (2003), while talking about the practice of Feng Shui, believes that one is drawn inexorably to whatever our eyes see first, which in turn, affects how we proceed on entering (Bramble, 2003: 58). However, the problem with this kind of thinking is that the image at the eye has countless possible interpretations. Humans construct what they see and as a minimum they also construct what they hear, smell, taste and feel – all human perceptions and sensations are constructions (Bramble, 2003: 58). Due to this, each learner is unique in a sense in that whatever they choose to take in is completely unique (Canter, 1974: 56). What the learner then tries to do is piece these different stimuli together subconsciously, and because of this, each and every learner's point of view, and therefore ability to learn in a space, will be unique. A learning environment though with circular tables may look different at first, because it is different to what is understood to be the general norm of the standard desk facing the front. These tables however are far more effective in encouraging a successful learning environment for adults as they encourage the learners to interact with each other and discuss issues, where with the usual desk setup all facing the front, this is not possible (Canter, 1974: 56).

The physical characteristics with regard the design of learning environments therefore can affect learners emotionally and greatly affect their ability to learn in a space (Oblinger, 2006: 85). Environments that evoke positive emotional responses in the minds of the learners may lead not only to enhance learning abilities within the space, but also to a powerful, emotional attachment to that space. This is vitally important to the adult learner, as a space that he feels comfortable in, and evokes this sense of belonging to a space, can only be advantageous to the learning and teaching process as a whole.

Clearly, some learning environments are more comfortable and offer fewer distractions than others. In any learning environment, physical characteristics that cause discomfort for the user or learner occupying the space can be expected to inhibit the learning and teaching process. On the other hand though, environments that produce positive emotional states of mind for the learners can be expected to facilitate the learning process in a completely positive manner (Oblinger, 2006: 87).

Based on the above, the aspects of architectural design that probably affect the learning environments the most are that of environmental design considerations, and educational and human design characteristics. The learning process can be affected by things such as inadequate light, ineffective use of colour in the learning environment, the incorrect use of temperature control within a space, and so careful architectural design needs to be considered for these spaces (Oblinger, 2006: 87). Weinstein (cited in Oblinger 2006: 91), concluded that environmental factors can impact on learners indirectly and each environmental factor affects a learner differently depending on what task is being carried out at any given time.

Oblinger (2006) concludes that if the architect has designed a space that is pleasant, is of human proportions, and designed with lots of open space and plenty of light, a learner feels comfortable in that space and is able to learn to his full potential (Oblinger, 2006: 93).

‘Our first reaction to the learning environment is sensory and emotional, intellectual analysis comes later’

(Oblinger, 2006: 94)

6.1.3 Space Making for Contemporary Educational Architecture

The built environment can be seen in terms of a spatial organization – the differentiated organization and functionality of space is a fundamental feature of buildings around the world (Rodgers, 2004: 1). It is this relationship between the two, with the different use of materials, form, and function that in fact creates the built environment that we live in today.

Leckie (2007) argues that educational places are cultural institutions, as well as being a physical, social and intellectual place within the hearts and minds of its clientele and the public at large. Leading from this, they also develop a place – based character in a sense. Therefore, what is the difference then between the educational building as a space and the educational building as a place? Does it matter if it is a space, or place? If so, what ultimately makes the learning environment a place?

The differentiation between space and place has been articulated for centuries (Leckie, 2007:5). According to Greek mathematicians such as Euclides, place was subordinate to the space of geometries, with place being points in a matrix – a location within finite dimensions. Conversely, Greek Philosophers such as Plato, Aristotle and Philoponus saw place though as the more prominent concept integrated into their respective ideas about the cosmos, and the void (Leckie, 2007:5). Not until the seventeenth century however did modern notions of space emerge.

Engel (1964) discusses the notion of space. Engel believes that the specific property of architecture and design in its purest, and most unadorned form, is space (Engel, 1964: 251). Architectural substance is “space”, and all space forming elements become absorbed and immaterial through the supreme dominance of this void. However, any further attempt to analyse or describe this space discloses the astounding fact that current languages have failed as yet to establish a vocabulary that pertains directly to the distinctive quality of architectural space (Engel, 1964: 251). Architects rather try to manipulate this space to achieve a desired effect through the use of balance, rhythm, proportion, light, texture, structure, contrast and emphasis, and it is through these elements that the architectural space, and hence quality of the educational building is judged (Engel, 1964: 251).

Space was the established backdrop against which human societies arranged their affairs, whereas places were human creations, such as educational buildings in this case. Leckie (2007) captures this distinction succinctly when he states:

In the simplest sense, space refers to location somewhere, and place to the occupation of that location. Space is about having an address and place is about living at that address – place is specific and space is general.

(Leckie, 2007: 12)

Most recently Ching's (1943) theories and concepts of space and place are perhaps the most pertinent of modern day theories regarding the matter. He believes that entering a place involves the act of penetrating a vertical plane that distinguishes one space from another and separates the 'here' from the 'there' (Ching, 1943: 250). He argues further that we pierce doors and windows to make a house for example, but it is on the spaces that there is nothing that the utility of the house depends (Ching, 1943: 93).

What is meant by this is that the physical built form of a building is not necessarily the most important element of the structure as a whole. Rather it is the aura of the educational space in and around a building that is created from this that is far more important, and that in fact influences the people that use the building, and therefore the success of the learning activity that takes place inside.

6.1.4 The Role of Colour and Light in the Learning Environment

When one enters a building for the first time, our reaction to colour within the environment is almost instantaneous. We are constantly judging the environment in our subconscious. Colour psychology in architecture refers to the investigation of how colour and light affects the inhabitant of a building (Goethe, 1973: 12). This interrelationship occurs within buildings either consciously, or subconsciously, and affects the user of that space in many different ways -either positively, or negatively.

Colour is the property of objects, spaces or surfaces. Colour is only seen because of the way that the quality of light is perceived by our brains. Therefore light and colour go hand in hand, and without the one, the other could not exist (Mahnke & Mahnke, 1987: ix). Therefore, as the architect, careful attention to detail must be given to the interplay between the two, such as their psychological, physiological, visual, aesthetic and technical aspects (Mahnke & Mahnke, 1987: ix). Both light and colour therefore have a profound effect on the inhabitant on the ability to learn in a space.

When an external factor stimulates the brain, a reaction is triggered in order to deal with the incoming information (Mahnke & Mahnke, 1987: 3). Colour therefore has an enormous impact on the way in which inhabitants of a space first of all react to the space as well as affects us in the way that we operate in a space.

Research has shown that different colours elicit different responses related to both subjective feelings and objective physical behaviour (Porter & Mikellides, 1976: 88). We can then manipulate this in the design of the educational environments of today. One of the most dynamic aspects of coloured illumination is how it can be used to modify the colour, pattern and form of architectural components and the spaces they define.

While each and every person reacts to colours differently and perceptions of colour are somewhat subjective, there are some colour effects that can be said to have universal meaning (Porter & Mikellides, 1976: 90). Colours in the red area of the colour spectrum for example are known as warm colours and include such shades of red, orange, and yellow. These warm colours evoke emotions ranging from feelings of warmth and comfort to feelings of anger and hostility.

From observation, it has been found that a room decorated in full - chromes, particularly in warm colours, makes one restless (Porter & Mikellides, 1976: 91). Warm colours make time appear to drag and keep people on the move. A principal therefore who wants to stop people from dawdling in the corridors within the educational environment would choose strong warm colours because they tend to stimulate.

Cool colours on the other hand, are calming and quietening (Frean & Calderwood, 1959: 5). They have a relaxing effect. Surroundings of cool colours can help to make lessons seem shorter in an educational environment. However, it must be noted that if one designs a space with the use of a single colour, and doesn't vary it, it can often create a negative connotation to that space, and hence the ability to learn and teach efficiently in that space is greatly affected.

This varying degree of over or under stimulation through the use of light and colour can result in a number of physical reactions in the human body. These reactions can include changes in pulse and breathing rate, blood pressure, muscle tension as well as psychiatric reactions (Mahnke & Mahnke, 1987: 4).

All of the above reactions can result in a distracted observer in the learning environment. Therefore, in order to avoid this type of reaction to spaces and it is important that a balance be reached between creating interest and avoiding monotony or over stimulation. This may be best achieved through the use of a variety of colours, with changing degrees of brightness, temperature and strength of colour.

The use of colour also has an effect on the perception of size and space. Warm and luminous colours with high levels of light produce a *centrifugal* action, directing attention outwards (Mahnke & Mahnke, 1987: 16). This effect relays a sensation of cheerfulness in the space, but can also make a space seem smaller if long periods of time are spent in the space.



The use of cooler colours with lower levels of illumination produce a *centripetal* sensation, where attention is drawn inward and creating spaces that are conducive to concentration (Mahnke & Mahnke, 1987: 16). The use of lighter colours however, gives the sense of a space being larger than what it is. These basic principles can be used to distinguish between spaces for higher energy activities and those which are more focused on calmness and concentration.

Fig 6.1.4.1 : Contrasting Colour on the Front Wall Contrasts with Display of Learning Material and rests Learners Eyes. This is not the case at the Umlazi V Adult Education Centre (Source: Author, 2010)

The location of colour within a space can also have an effect on the room's character. Colour may be perceived differently in different locations, and therefore the reactions to the stimuli will vary (Mahnke & Mahnke, 1987: 75). It is through the use of an understanding of these various principles that colour and light can be manipulated in the learning environment to improve the atmosphere for its specific functions.

Considering this, the correct use of colour will result in an environment that is best conducive to learning while also promoting mental stimulation. As Mahnke & Mahnke (1987: 82) argue

“Studies have shown that a functionally and thoughtfully planned school interior facilitated learning new subject matter and improves scholastic performance.”

Mahnke & Mahnke (1987) recommend the use of cooler shades of beige, pale green, light green and blue green are the most effective colours to be employed in a learning environment. The wall that is faced by the learners should be treated in a different colour to the rest of the room, this serving the function of relaxing the learners eyes when they look up from concentrated work, while also providing contrast between the display materials and teaching aids (Mahnke & Mahnke, 1987: 83) (See figure 6.1.4.1). In rooms equipped for the teaching of crafts and trade skills, luminous hues are recommended.

6.1.5 Feng Shui – A Natural Approach to Design

Feng Shui is an enticing composite of mystical beliefs astrology, folklore and common sense. This ancient Chinese practice is a very complex wisdom, based on the Chinese understanding of the dynamic flow of energy throughout the universe, and described through colourful symbolism (Too, 1996: 10). The laws of Feng Shui are used to differentiate between auspicious and inauspicious sites of land for new development, and they provide guidance for the positioning of buildings on sites for maximum user comfort for the particular task to be carried out within the building (Too, 1996: 11). It is for this reason that a brief investigation into the various principles of Feng Shui is being explored.

The primary purpose of Feng Shui in Architecture is to build with the flow of the land (Bramble, 2003: 79). This means development maintains and follows the natural environment. Studies have shown that the use of this principle increases comfort within a building, lowers costs, and reduces the need for artificial heating and cooling (Bramble, 2003: 79). It diminishes or eliminates what Feng Shui experts call *revenge effects*.

Popular ‘cut and fill’ or ‘clear cutting’ development produces an ugly, disharmonious landscape of bad Feng Shui notorious for its revenge effects. Too often the long term effects of this so called economical solution are not considered, including costs and maintenance (Bramble, 2003: 79). An example of this is that in the developing world, houses placed on deforested hillsides causes heavy flooding that destroys homes and lives. Therefore as an architect, one should try to leave the site of a new development as untouched as possible.

Feng Shui in architecture stipulates that when the natural world has been destroyed, it should be restored (Bramble, 2003: 79). Feng Shui principles express the need for harmony with local conditions and resources – restore habitat and wildlife to its proper place and provide human appreciation of the natural world. In cities this practice can lower the effect of heat islands that add to global change (Bramble, 2003: 79). Due to this then, the architect should try and incorporate as many natural elements into the design of a new building as possible, such as the use of water features, and extensive landscaping. This has a hugely positive influence on the inhabitants of the building, and hence ability to learn in a space for the adult.

According to Bramble (2003), working with nature in the design process is the key to success (Bramble, 2003: 86). This means following the natural contours of the land, paying attention to the natural cycles and respecting and restoring habitat. As an architect, responsible Feng Shui design is to research the history of the site, design with due diligence and give thoughtful consideration to the life of the project and its contribution to the community (Bramble, 2003: 86).

Bramble (2003) believes that new architecture should be sensitive to the site and genius – loci of the place. Too often a new building is site – blind and poorly built (Bramble, 2003: 71). This contributes to a barren spiritual landscape within the building, and so the effect of the inhabitant's ability to carry out their necessary task, in this particular case learning, is negatively affected (Bramble, 2003: 71).

When one talks about the actual design of the building within Feng Shui principles, in China and in many other cultures, the traditional house plan takes the form of a square or rectangle. Larger structures consist of connected squares, L – shapes, circles or rectangles with courtyards in the middle (Bramble, 2003: 68). Feng Shui experts believe though that the objective before any design is even initiated, a full analysis of the site needs to be carried out. Only once this is done can the building design be started. However, the overriding concern with the design should be to gently place the structures and entities in the natural flow of the land (Bramble, 2003: 72).

Analyses by a variety of researchers into favourable spiritual locations for architecture according to traditional rules of Feng Shui demonstrate these locations comprise highly suitable microclimates (Bramble, 2003: 72). Ancient Feng Shui experts said that these locations provide the ability to accumulate creative potential, which could be of benefit to the adult learner.

In general, a site determined to have 'good features' provides favourable conditions, a site with 'disorganised features' has no positive features. 'Good form' for a building consists of strongly defined slopes and an undamaged shape that makes it easily categorised. 'Bad form' consists of unidentifiable or confusing shapes and deteriorating conditions. This is particularly relevant to the adult educational building, as the design of such a building needs to be central and accessible to all, while also being a symbolic building that the community can feel part of and have a sense of responsibility towards (Gravett, 2001: 11), while the functions and facilities of the building should be easily identifiable at first glance.

6.1.6 Conclusions

Each learning environment is different, and affects each individual differently. These different learning environments each affect the learner in psychological, conscious and subconscious ways. However, Craig (1987), in her attempt to come to terms with how these learning environments affect the adult learner psychologically, concluded that every adult learning environment is affected by the adult's prior life experiences. This can affect the ability to learn in a space either positively or negatively, but there are a few basic characteristics that all adult learning environments should incorporate (Craig, 1987: 60):

- Spaces should be conducive to easy transaction between learner and objects, events and people.
- Spaces should enable the tutor to have such access to learners so that mediation can occur in such a way which elicits the generative power of transaction.
- Spaces should have an inherent ability to be personalised so that the adult can feel a sense of responsibility towards that space, and be able to be adapted over time.
- Spaces should create the conditions that emphasize contradictions between the learners existing knowledge and the unfamiliar demands of new situations and challenges.
- Spaces should allow for the dissemination of knowledge about new situations to all those involved in the process of change (Craig, 1987: 64).

6.2.1 Introduction

Through the analysis of firstly the adult learner, and then that of space, it can be determined that the best possible environment for adult education is one that incorporates elements that can be personalised towards the groups needs and wants. What this does is allow the learner to feel comfortable in the space and therefore more able to learn.

When the learner is in a flexible learning environment that can be personalised to his or the group's desires, optimal learning potential can be reached. Therefore a full analysis of what flexible architecture actually is, and how it can be incorporated into the learning environment therefore needs to be carried out.

6.2.2 Adaptive Architecture: A Historical Background

Adaptive architecture is an architectural movement which began in the 1950's and which concerned itself with the adaptability of buildings to the requirements of people (Bubner, 1975: 42). This adaptability can apply to whole towns or cities just as much as to individual houses or parts of buildings.



Fig 6.2.2.1: The Houses of the Pueblo Indians is a very early example of Adaptive Architecture. (Source: Bubner, 1975: 46)

Practical examples of this method of building were to be found even in early historical times; the housing of the Pueblo Indians of New Mexico (see figure 6.2.2.1) were spontaneously reconstructed when they no longer fulfilled their original function. With the simple building material of loam, an optimal adaptability of the building to the needs of its occupants and the requirements of the climate was achieved.

The so-called "compounds" of the Sahara area are examples of the alterability of complete building complexes: if the head of the family died, then the whole compound was restructured. Since for religious reasons the house of the deceased may not be disturbed until it falls down, a new living area is built for the new family head and his wives and children. These buildings can be said to be adaptive because they are constantly adapted to changing family circumstances (Bubner, 1975: 42).

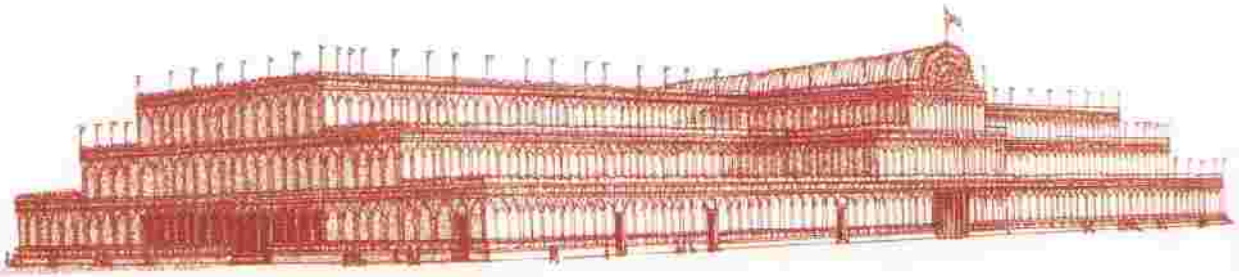


Fig 6.2.2.2: Chrystal Palace – Another example of Early Flexible Architecture. (Source : Stephenson , 2003: 14)

In the pioneer days, the American home had already what could be called a changeable ground plan; individual wings were added or removed as social or economic conditions required.

The conception of the Japanese Home has always paid particular attention to the needs of the occupants: a module based on the size of the people, the unit size of the tatami mat, is used as the basis for the internal dimensions of all buildings. In addition, adaptability of the inner rooms is achieved through the use of a number of moveable walls (Bubner, 1975: 43). This notion of the Japanese Home will be explored in more depth later in the document.

In times of industrialization, building technology can take advantage of innumerable and newly discovered technical achievements and methods. Paxton's Chrystal palace (see figure 6.2.2.2) for the Great Exhibition in London is an example of a pre-fabricated and dismountable, therefore mobile construction. A transportable glass roof that could be removed in the summer is said to have been erected in 1848 over the whole of the Botanical Garden in Paris (Bubner, 1975: 43).

At the beginning of the 20th century, Frank Lloyd Wright, influenced by the construction of the Japanese houses, was speaking of a space as an "organism." Wright developed this theory in a free and flexible ground floor plan for the inner spaces. For him, adaptability of spaces meant embracing the various rooms of the house into a single enclosed identity (Bubner, 1975: 43).

As a rule, the possibility of making a construction adaptable to varying conditions increases with the reduction of the weight of construction. Internal adaptability through the use of light building components is to be found, above all in the Japanese house.

Among others that spoke for freedom in the arrangement of the floor plan were Kiesler, Le Corbusier and Mies van der Rohe (Cited in Bubner, 1975: 43). Alongside internal mobility, other ways were

found to build adaptively – by combining prefabricated building elements, learning environments can be constructed that can be altered at any time.

6.2.3 Flexibility and Adaptability of Architectural Form

Flexibility in architecture can best be described as how well a space is able to adapt to change (Zuk & Clark, 1970: 4). Darwin (cited in Zuk & Clark, 1970) examined the notion of flexible architecture and came to the conclusion that the problem of survival always depends on the ability of an object to change to adapt to different environmental factors over time (Zuk & Clark, 1970: 4). Hence, he called for an architecture that could no longer be called static but one that has the capability of adapting to change over time (Zuk & Clark, 1970: 4).

This research by Darwin (1970) is further backed up by the work of Medlin (1975) in his presentation of the varying types of adaptability in architecture. He argues that architects have, within the heritage of twentieth century functionalism, generally designed buildings as end products, with a singular predetermined function with no capability of evolving (Medlin, 1975: 170). Bramble (2003) believes that buildings are built for a particular market at a particular time. Developers and architects can misjudge a market or follow a design philosophy that fluctuates as fast as any fad (Bramble, 2003: 101). Because these buildings cannot fluctuate like the market they are quickly out dated and reduced to functional obsolescence (Bramble, 2003: 74). Architecture has traditionally been perceived as enduring, permanent structures. The architect has therefore searched for materials and structural systems that would increase the length of time a building might be effective for the purpose for which it was designed.

Saying this though, it is vital that the sole purpose and functionality of a building and its internal spaces should never be forgotten, and should be critically designed for. If this was to occur, one would end up with an urban environment that is a mixture of buildings trying to be everything, but in essence not fulfilling one exact purpose (Medlin, 1975: 171). In theory, a resolved design or building that serves optimally for all conditions is impossible. But this is not to say that a building can't have flexible elements to it that within the fabric of the building can change and adapt to the needs of the inhabitants, and therefore enhancing the activity taking place within.

A building must have certain areas of it that are well designed for a specific purpose, so that the building is easily read by the users of that space, but functionality of rooms can be enhanced by incorporating flexible elements within it, so that the maximum potential of space is utilised.

In practice though, a complete lack of flexibility of architectural design can lead to extraordinary operational inefficiency (Medlin, 1975: 171). Therefore it is the responsibility of the architect to recognise differential rates of change as they relate to potential levels of adaptive response. Then on the basis of this, means can be developed within the building fabric that will enable, at the user's prerogative, limited term optimization of space for the task being carried out at any one given time (Medlin, 1975: 171).

When one talks about the architecture and the spaces designed for education, the need for flexibility then of learning spaces increases. Architecture is, by its very nature, influenced by many changing forces over time (Heimstra & Brockett, 1994: 21). Also the needs and practices (particularly with vocational training) of education are also changing all the time, as different aspects such as social, economic and demographic change and technologies advance.

When one discusses the complex nature of adult education, it is critically important that the learner feels comfortable, accepted and supported in the environment in which he is learning (Knowles, 1973: 46- 47). It is therefore imperative that the inhabitant feels as comfortable in that space as possible, thereby allowing him to be able to adapt the environment to the groups wants and needs.

An environment which encourages a feeling of mutuality between the adult learner and the educator can be enhanced by the existence of flexibility and choice in the environment, and what this does is instil a sense of comfort in the learner, and hence a willingness to learn.

6.2.4 Kinetic Architecture

Kinetic Architecture is essentially a type of architecture that lends itself to accommodate change (Zuk & Clark, 1970: 9). It is the design of buildings in which transformative, mechanized structures are able to give the building an ability to change with climate, need or purpose.

This adaptability can be accommodated by means of a number of different elements which employ a variety of kinetic elements within the building envelope. Some of These kinetic elements include examples such as doors, windows, shutters, temporary and retractable roofs, rotating signs, and folding partitions (Zuk & Clark, 1970: 29).

When one speaks of the design of educational buildings for the adult learner in particular, the most essential kinetic element which is most pertinent to this field of research is that of the moveable partition.

This element is becoming more and more prevalent in the design of office buildings and schools all over the world, where architects are beginning to realise that the arrangements or layouts of rooms are subject to constant change over short periods of time. These moveable partitions are non load bearing and therefore it is an essential requirement that the structure of the building form long spans which result in floor area free of structural supports (Zuk & Clark 1970: 61). This free plan allows the free location of these particular partitions anywhere in the space and therefore it is only the user's imagination that is the boundary for the learning space. This then, as discussed above, makes a space that is ideal for the learning and teaching processes of adults to take place, as they are adaptable to the wants and needs of the group using the space at that particular time.

With the constant change inherent in the spaces which accommodate moveable partitions, the changing needs for lighting, electricity, ventilation air conditioning and communication require an interstitial space, either above the ceiling or below the floor, which is sufficient to accommodate these services (Zuk & Clark, 1970: 62).

6.2.5 Dynamically designed Educational Environments

Steven Holl is a well renowned name when it comes to the idea of hinged space in buildings. His work includes that of housing, educational campuses and landscaping and mixed use developments. He has experimented with a number of architectural elements within these developments, but one such pertinent example is that of "hinged space" (Kronenburg, 2002: 56).

Hinged space in architecture refers to space that is able to be manipulated by moveable walls, creating interactive environments. By having moveable partitions in the educational environment for adults, people can reassemble the space in whatever configuration is needed at that particular time.

This dynamic of these mobile architectural elements becomes a canvas with which the occupant can interact with his environment, adjusting it to whatever suits the group at any given time. As wants and needs change, the environment can be adapted to suit.

What Steven Holl believes in, is that the architecture should be reflective of the inhabitants wants and desires for that space, and not the other way around. Architecture should not impose a rigid way of life on the inhabitant, as this is not truly reflective of a comfortable place in which to live. This instils in the group of adult learners a sense of individuality and freedom within a space, both essential ingredients he believes to be comfortable in a space (Steven Holl: Internet). This therefore has a profound effect on the ability of the group to learn in a space.

6.2.6 Conclusions

It is widely believed that the adult educational environment should incorporate flexibility. This is due to the fact that adults respond best to environments where they feel they can personalise their wants and needs, and also because the material and teaching methods, with particular focus on that of vocational training, is constantly changing as expectations from society change and adapt to different circumstances.

As has been explored, there are many ways in which the architect can do this, but the one vital point with regard to the architecture of the space, is that the sole defining purpose of the space should never be forgotten, and should always be at the forefront of the architect's design focus.

The incorporation of these flexible elements into the adult educational space is greatly beneficial, however they should only serve to enhance the learning experience, and not be the focus of the design all together, otherwise a space's sole function can become confusing, leading to an ambiguous architectural environment.

CHAPTER 7: SUMMARIES AND CONCLUSIONS

The learning environment consists of two equally important components – the physical and the emotional. It is the responsibility of the architect to address these concerns in terms of built form.

This research has attempted to come to terms with what architectural elements and aspects of architectural design best combine to form the most appropriate adult learning and teaching architectural environment.

What is clearly outlined by this research is the fact that the adult is a complex character and varies greatly to that of the adolescent or child learner. The adult therefore responds to different stimuli and requires different things when he is in the learning environment.

The Architecture needs to relate to the human scale. The edges between the building and site need to be addressed by taking into account which are vibrant, busy edges, and which are the quieter, more subdued edges. Stimulation at the active edges of the site would encourage people to interact with the centre. In this way the people that use this building are not intimidated by the fabric and structure of the building. The line between public and private spaces need to be carefully articulated – while being definitive, the architecture must achieve this subtly. The transition between these two types of space need to be dealt with in a sensitive manner whether the site is within an urban or rural context.

It was found that there are a couple key points with regard the design of learning environments for adults that need to be dealt with. The adult needs to know why they are learning something. Hence the fact that practical, vocational skills development is a relevant topic and practise to be included in this centre for adult education. The adult learns best when the task that is being carried out is for immediate application, and hence of immediate value.

Saying this though, as more and more research has been carried out; it has come to the fore that this centre needs to encompass much more than simply practical skills training for adults. The question arises of what in today's modern information age encompasses the idea of learning? No longer does learning simply revolve around books, but information avenues have now been opened up to the learner so that we now live in what can be termed a global village, with information at our fingertips through the use of computers and the internet.

An environment that is best conducive to the adult and teaching processes is one that can be manipulated by the group so as to best suit the learning outcomes of the task being carried out at that particular time. However, through analysis of flexibility of architectural elements in the learning environment, the notion of flexibility cannot be carried too far. Flexible spaces therefore need to be incorporated with permanent and simplistic support spaces, so that the building is still legible to the new comer. The architecture still needs to be purpose built with only flexible elements incorporated within it so as to simply enhance the learning environment and processes.

The architectural challenge is however far more than this. The adult, as discussed in this research, can often feel intimidated by the learning environment, as it is quite intimidating to come back into the learning environment after a substantial period of time. Therefore the environment needs to be architecturally designed in order to promote a relaxed, informal physical setting that is friendly, open, spontaneous and accessible. This is the architectural environment that is best conducive to the teaching and learning processes of the adult. The design of the spaces needs to be democratic and flexible to the wants and needs of the adult learner, so that the adult is comfortable enough in the environment to express his own thoughts and ideas on a mutual level without the fear of being judged by his peers and educators.

Essentially, the architectural challenge is to design space that is open, democratic and challenging, but non – threatening to the adult. This allows him to feel that he is contributing to his own educational outcome, and this ensures a successful learning and teaching outcome.

The Precedent and case studies that have been chosen are to be used as a guide towards the development of a design brief, and also a detailed schedule of accommodation.

CHAPTER 8: KEY PRECEDENT STUDIES

8.1 PRECEDENT STUDY 1:

COLLEGE OF NEW CALEDONIA – JOHN A. BRINK TECHNICAL TRADES AND TECHNOLOGY CENTRE

Prince George, British Columbia: *McFarlane Green Architecture + Design*

8.1.1 Background and Issues

The College of New Caledonia (CNC) has offered a wide range of university credit, technical, vocational, and general interest programmes to students in British Columbia's central interior since 1969. Its main campus lies on the outskirts of the city of Prince George, an area characterised by big – box retail stores and other vehicle-orientated uses (Taggart, 2006: 39). This centre has been studied so as to obtain an insight into the specific spatial requirements required for a vocational school, and the desired interplay between spaces, as well as specific functional requirements of specific vocational



Fig 8.1.1.1: With an Illuminated Wood Screen and Open ended Canopy, the use of simple materials are well executed and create a welcoming entrance to the centre. (Source: Canadian Architect, No 10 Oct 2006: 39)

8.1.2 Accessibility and Public Engagement

There were huge overriding architectural and urban design challenges presented by the project (Taggart, 2006: 40). The existing structure had many of the characteristics associated with a “big box” kind of architecture; large setbacks for parking that isolated the building from its surroundings, and an almost windowless envelope in which the only significant glazing was at the main entrance lobby (Taggart, 2006: 40).

McFarlane Green’s analysis of the project set out four key design initiatives – the rationalisation of interior space to improve legibility and coherence; the introduction of natural light wherever it was possible to improve the working conditions of the spaces; the creation of an internal meeting space to facilitate interaction between students; and finally creating a connection to the existing campus and responding more appropriately to the site’s urban context (Taggart, 2006: 41).

8.1.3 Building Fabric and Structural Form

From the outset, the architects were determined to work with an uncompromising material palette and industrial detailing of the existing structure, deeming it was acceptable for a trade school (Taggart, 2006: 41), and hence almost forming a didactic purpose. This enabled them to concentrate on the careful detailing of key areas in which the building’s occupants would interact with one another. These elements create a human scale within the larger existing box, and a refined contrast to the

rough backdrop of the existing structure (Taggart, 2006: 41).



Fig 8.1.3.1: Ground Floor of the New Vocational School of New Caledonia. Hallways, locker Rooms, labs and Cafes are articulated through the language of designing a building within a building. (Source: Canadian Architect No. 10 Oct 2006: 40)

8.1.4 Spatial Organisation and Flexibility

The new revised brief consisted of a range of activities, including specialised shop areas for carpentry, wood technology, electrical training, auto – repair and customised industry training in addition to classrooms and faculty offices (Taggert, 2006: 40).

In plan, major programme areas are arranged around clear and simple circulation areas connecting to the two main building entries. A new entry vestibule responds to students approaching from the heart of the main campus (Taggert, 2006: 42).

The simple and orderly plan allows for easy reconfiguration in the future. The shop areas are designed to maximise their available open space, facilitating equipment reconfigurations as the need arises (Taggert, 2006: 42). Noisy shop spaces are grouped to the West separated from the quieter classroom areas by an acoustic buffer of storage and service spaces. Distinct entry portals into each of the different shops provide a strong threshold to areas where safety is paramount. Classroom spaces, used by all of the various trades divisions are designed to be multi – purpose and flexible. Faculty offices are grouped around a shared glazed meeting area to support the exchange of ideas (Taggert, 2006: 42).



Fig 8.1.4.1: A view into the Electrical Wiring Workshop (Source: Canadian Architect No. 10 Oct 2006: 40)

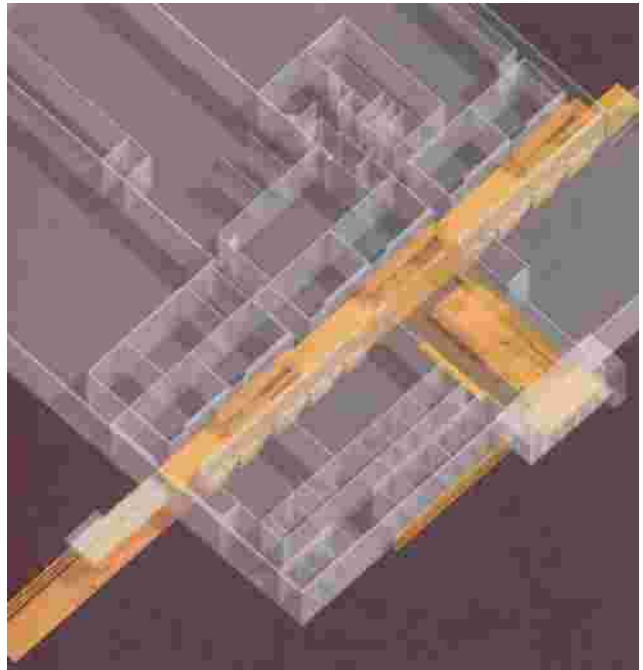


Fig 8.1.4.2: A Rendering of the new College illustrates the Internal street that the Architects pursued as the focal point of the campus (Source: Canadian Architect No. 10 Oct 2006: 40)

The architects have located key pragmatic elements adjacent to the three existing window openings, and have introduced three large skylights into the ceiling of the central corridor. The heavy masonry construction of the external walls precludes the introduction of new perimeter windows (Taggart, 2006: 42). Natural light is thus borrowed from the circulation areas through a glazed display case at each of the classroom entries. These display cases are intended to act as conversation starters and to be an advert for each trade taking place in the school. Additional skylights supplement the major shop areas while preserving valuable wall space for shelving and displays.

A lounge, cafe and gallery area are located in the light filled centre of the building, where it is hoped that informal interactions among people will occur (Taggart, 2006: 42). The freestanding cafe is located as an object within a large central volume, and this acts to mediate between the human scale and the scale of the larger box.

8.1.5 Conclusions

The design of this new vocational school concentrates an emphasis on flexibility within space, so as to make maximum use of available space and resources. This is evident in the design of the workshops as well as the classrooms, where sliding partitions can be manipulated in any way along the length of the corridor to accommodate whatever activity or number of occupants that are in the space at any given time. It is important to note though that where a specific room function is required, the design of such is specifically designed for – in for example the carpentry workshops.

This building is extremely successful in its execution – a retrofit project, and adds value to the urban context in which it finds itself. Through the clever manipulation of light and flexible elements within the building fabric, maximum use of resources and space has been achieved.

8.2 PRECEDENT STUDY 2:

COMPLIMENTARY LEARNING CENTRE

Keetmanshoop Namibia: *CS Studio Architects*

8.2.1 Background and Issues

Keetmanshoop is a town situated in the Southern part of Namibia. This centre aims to give people the skills in order to be able to earn an income. The Complimentary Learning Centre (See fig 8.2.1.1) caters for grade 7 – 12 learners during the day, and then during the evening caters for career guidance, computer training as well as healthcare education for adults within the community as a whole (SA Architect, Feb 1999: 36).



Fig 8.2.1.1: View of the Centre from the North.
(Source: SA Architect Feb 1990: 38)

8.2.2 Community Revitalisation and Public Engagement

The organisation approached the architects, with the vision of building a centre to accommodate their future needs. The architects then provided them with a outline of how to facilitate local unemployed people in the building project (SA Architect, Feb 1999: 38). A workshop was organised by the complimentary learning centre with the architects, and this was carried out essentially to formulate a brief and accommodation schedule. A building committee was then established, electing people from the broader community to oversee the entire project from inception to completion (SA Architect, Feb 1999: 38).

8.2.3 Context and Structural Form

The site is characterised by a large amount of rocks and small boulders and by little vegetation, which is typical for this arid region of Southern Africa, where temperatures soar to $\pm 40^{\circ}\text{C}$ at midday and drop to other extremes during nightfall (SA Architect, Feb 1999: 38). This has been taken into account in the design of the building, with convection wind driven turbine ventilators on the apex of the roof spaced at regular intervals to extract excessive heat and create good cross ventilation within the building (SA Architect, Feb 1999: 38). The roof is also constructed with galvanised corrugated roof sheeting. The architects have solved the problem of temperature control within the building by using 25mm vinyl clad polystyrene insulation ceiling panels fixed on top of purlins as this aids in the regulation of temperature fluctuations within the building at night (SA Architect, Feb 1999: 38).

8.2.4 Entry Sequence and Spatial Arrangement

The building is of an L – shaped plan (See fig 8.2.4.1), consisting of two wings. The main entrance is on the South Western side of the building and circulation is by means of an internal courtyard bounded by building wings and a pergola structure for transition through the building. The West wing houses the reception, four offices for staff, one meeting room, a library and resource centre, a computer room and the toilet facilities (SA Architect, Feb 1999: 38).

The South wing houses three classrooms, one small multi –

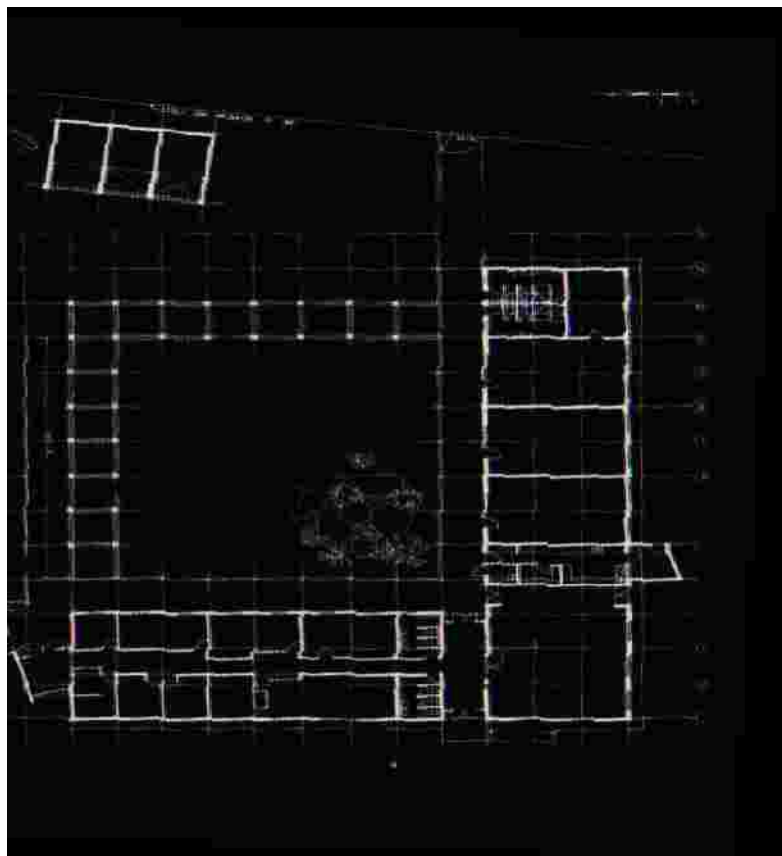


Fig 8.2.4.1: Plan of the Complimentary Learning Centre.
(Source: SA Architect Feb 1990: 38)

purpose hall with toilet and kitchen facilities.

This multi – purpose hall is able to be used for large seminar groups of students, as well as doubling as a large venue for meetings within the community. The central square is lined by a pergola arcade on the Northern and Western side and a 3 metre covered stoep on the East and South sides. The building was set out to accommodate an existing boulder formation which has been incorporated into a rockery with indigenous plants (SA Architect, Feb 1999: 38).

This is not a very expensive building with regard building materials, but clever use of materials have been integrated into the structure by the architects to satisfy functional requirements in a sound, imaginative and well articulated manner.

8.2.5 Conclusions

Ninety five percent of all the work force employed were employed from local and surrounding areas. The building is a good example of how local materials and human resources of the community can aid in the development of a project such as this (SA Architect, Feb 1999: 38). This community involvement in the project backs up the sentiment of community revitalisation and social reintegration as mentioned in the research as it plays a vital role in the upliftment of the community, instilling an inherent responsibility towards the centre from a maintenance point of view, while also preventing vandalism.

8.3 PRECEDENT STUDY 3:

ADULT EDUCATION CENTRE FOR ROSSING FOUNDATION

Namibia: *Kerry McNamara & Associates*

8.3.1 Background and Issues

Having had firsthand experience of the huge skills shortage in the country, the Rossing Foundation decided to build a centre for adult education. They opted to concentrate on practical skills that would be immediately marketable (Grobler, 2008: 14). The centre set about designing suitable training courses in this regard and these would seek to address

the most immediate and pressing educational needs: adult literacy courses, practical

English for teachers and nurses, office skills and typing, and a variety of vocational skills such as sewing courses, plumbing, bricklaying, leatherwork courses and training in auto mechanics (Grobler, 2008: 14).

The Centre serves 300 students, primarily for instruction in languages, literacy training, commercial courses, and also health, hygiene and nutrition (Momberg, 1982: 61). There are also courses in welding, electrical wiring, and other practical skills. There are also communal and resource facilities to attract a wide range of people, so that they have access to digital media as well.

8.3.2 Informality and Visual Comfort

The interface between the site and the street is inclusive, rather than exclusive. People are welcomed by the openness and the easy awareness of the activities in the centre. One of the keys to creating the correct environment required to break down alienation and apprehension for adult education is the feeling of informality (Momberg, 1982: 61). To achieve this, the relationship of the buildings is organised to avoid formality.



Fig 8.3.1.1: Plan of the Adult Education Centre for Rossing Foundation.
(Source: Architecture SA, Dec 1982: 61)

The mood is relaxed and there are no imposing axial relationships or formal spaces. The interconnection between spaces is casual, allowing people to slip in and out of spaces as they so please (Momberg, 1982: 61). The centre is also very human in scale; the normal status identifying, heavy handed discipline inducing scales that typify schools is dispensed with. Therefore, the scale of the buildings are always human and personal, not oppressive and institutional (Momberg, 1982: 61).

8.3.3 Legibility of Architectural Form

The person approaching the complex must be able to see where to arrive at, at any part of the complex (Momberg, 1982: 61), while at the same time allowing for surprise and discovery as a kinetic experience. There is a well defined central arrival and assembly area, strongly linked to the public/private pavement area. Arranged around the participants, upon arriving in this central area, are the administration, the social facilities, and the three spinal extensions serving the academic, technical and commercial zones (Momberg, 1982: 61) respectively.

8.3.4 Flexibility of Form

Change is given a high priority (Momberg, 1982: 61), both as flexibility for future addition, and also in possibilities for flexibility. The modular nature of the unit makes incremental development possible. The units initially consist of supporting columns and a roof providing shade and rain protection and the definition of areas. Screen walls with further enclosing elements, doors and windows are then added to quantify and qualify the function of the space and to temper the elemental environment to whatever degree required.



Fig 8.3.4.1: Rand Street Elevation of Adult Education Centre for Rossing Foundation. The Typical, low scale architecture is evident in the elevation, humanistic in scale. (Source: Architecture SA, Dec 1982: 61)

8.3.5 Spatial Organisation and Facilities

The public area provides communal facilities to give the space relevance and a richness of activity. The assembly area is the heart of the whole scheme. The human and informal character of this area sets the tone for the complex (Momberg, 1982: 61), creating a comfortable and equitable environment in which to learn. The social centre, administration, the library and many classrooms have access and therefore give life and take life from this space (Momberg, 1982: 61). One of the important by products of all education centres is the place where people get together; the place where conversation is initiated; where ideas and thoughts are exchanged and where cultural 'cross pollination' takes place (Momberg, 1982: 61).

The Social Centre is a multipurpose hall with informal foyer access to the assembly area and to the parking area to the East of the complex. Within the foyer area, there is a canteen area that conveniently serves the hall and also the assembly area (Momberg, 1982: 61).

There are three educational zones or spines. These are the academic, the technical and the commercial. These spines, immediately surrounding the assembly area cater for the more sophisticated and urban orientated subjects such as languages and literacy classes. As the spines get longer and hence further away from the assembly area, the spines cater for more basic activities and the needs of less urbanised students. The technical spine for example, caters for training in the various building trades. The facilities on this spine are as well, from set theoretical classrooms, as well as simple shaded areas with a water supply which is all that is required (Momberg, 1982: 61). The south facing slope of the site is used to achieve a solution that obviates the need for the typical industrial character of industrial workshops (Momberg, 1982: 61). They are one large area under one roof providing shade with partitions to allow for a flexible floor area (Momberg, 1982: 61). This roofed area moves down the hill, on three levels, thus breaking the mass of the built area while also affording the opportunity to take in South light to the working areas.

One major element that is apparent in this facility that is not often seen elsewhere is the provision of onsite accommodation. This serves to provide people coming in from outlying areas the opportunity to come to the centre and take part in say a two week course, and to be able to stay on site not having to travel to and from the centre (Momberg, 1982: 61).

8.3.6 Conclusions

This complex is a good example of the way in which a centre for adult education needs to relate to the human scale. Careful attention has been paid to the way in which the building related to its immediate context. The design makes use of a central public area and from this radiate out each of the wings. This is an important design consideration as it is these sorts of basic architectural elements, such as legibility, accessibility and comfort that create an ideal environment in which to learn for the adult.

8.4 PRECEDENT STUDY 4: THE TRADITIONAL JAPANESE HOUSE

8.4.1 Background and Issues

The notion of the Japanese house is discussed in this research because it is a good example of early kinetic architecture. It is also relevant because this architecture is of a similar scale to that of the teaching and learning environment for adult education in South Africa.

The analysis also shows how a certain space can be used for different functions as the need arises. However, very pertinent in this example is the fact that the flexible nature of the Japanese house serves only to enhance the functionality of the space, but is not reliant on it for its sole specific purpose.

8.4.2 Flexibility of Space

Within the Japanese house, while it is through the character of the room – to room and interior to exterior space relationship that the essence of space finds substantiation, the “physique of space or the space forming (walls, ceilings, floor) and space occupying elements (furniture, people) functions as modifier of space (Engel, 1964: 249). In the Japanese residence, these tangible elements follow the very nature of space and do not obstruct, but confirm and enhance space.



Fig 8.4.2.1: The interior of the Japanese House, Showing Tatami mats and operable Walls. (Source: Engel, 1964: 309)

8.4.3 Flexibility only as an Enhancement Tool

All living rooms, regardless of their size and function, are controlled by the same material, same treatment and same scale (See fig 8.4.2.1). Consequently, each room possesses an ability to allow for both addition and fusion of rooms of different sizes to suit the function that is occurring at any time (Engel, 1964: 249). A prime example of this is the way the rooms functions differently for day and night functions. During the day, the room can be opened up and function as a large reception room for functions with lots of people, but during the evening, the room can be divided up again into separate sleeping quarters.

However, it must be noted that even though the rooms are flexible, in that they either fuse completely or if they remain separate, the rooms do not compete with each other; space, in spite of all flexibility of the partitions, remains in balance and static (Engel, 1964: 249). Once the partitions are in place, they stay like that for a reasonable amount of time, until such time the need arises that the room needs to be adjusted. If this were not the case, it would lead to a confusing architectural environment.

8.4.4 Conclusions

The Japanese house is perhaps the best example of how kinetic architecture has been incorporated into early architectural design. This study is interesting as the architectural scale of the Japanese house is not dissimilar to that of the educational environment for adults, and so it is a pertinent and relevant design precedent for which to study.

Perhaps the biggest thing that has come out of this study of the Japanese house and its use of the moveable partition is that the flexibility of space cannot be overdone, or incorporated too much into the design of these spaces. Flexibility in the learning environment must therefore only be used to enhance the function of a space, and not be reliant on it. If this were the case, the legibility of the scheme could be compromised which could lead to a confusing architectural environment.

8.5 PRECEDENT STUDY 5:

SENDAI MEDIATHEQUE

Sendai Japan: *Toyo Ito*

8.5.1 Background and Issues

This centre has been studied due to the fact that in today's modern world, the question arises of what by today's standards, constitutes learning? A modern adult education centre has to house an array of digital media, including computer resources, as well as books to aid in the process of learning. It is widely accepted that in order to be successful in today's world, one has to have access to the internet in order to carry out even the most menial of tasks. This centre is viewed to act as the catalyst for community revitalisation, and so must house an array of resources for the community to make full use of, and that they may not be able to afford otherwise in a private capacity.



Fig 8.5.1.1: The Sendai Mediatheque by Toyo Ito in Sendai, Japan. (Source: Architectural Record, May 2001: 191)

This centre also approaches the design idea of flexibility of spaces in a unique, interesting manner, making it a worthwhile example to study.

8.5.2 Spatial Organisation and Facilities

From the ground floor, all paths lead to the second floor information centre containing loosely designated areas for periodicals and internet ready computers, as well as administrative offices and children's book sections separated by diaphanous screens that keep visual barriers to a minimum. The formal, double height library, with its casual seating overlooking the street, open stacks for 160 000 books, and quiet study areas at the rear, occupies the third floor while the reference section fills a fourth floor mezzanine (Pollock, 2001: 191).

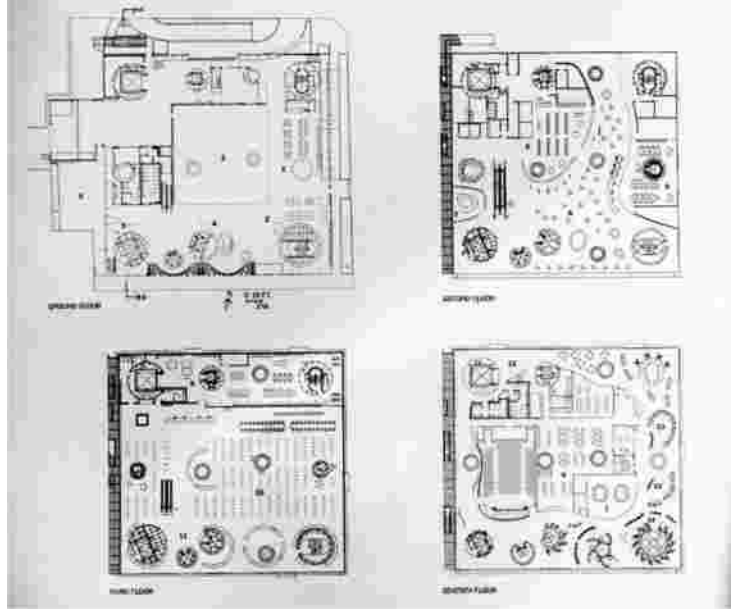


Fig 8.5.2.1: Plans of the Sendai Mediatheque
(Source: Architectural Record, May 2001: 194)

At the top of the building is an audio visual centre where visitors have access to an array of computers, CD Players and DVD monitors, arranged in little groupings around the floor perimeter. Floor to ceiling glass offers views over the city and of the mountains (Pollock, 2001: 191). A 180 seat theatre, a conference room, and an administrative area all ganged together behind a curvy glass partition fill the centre of the floor. Though each level corresponds to a “different mode of communication between people or between people and different types of media”, says Ito, within each floor functional borders are blurred and fixed barriers are few.

8.5.3 Visual Comfort

Visually, the most extraordinary feature is the structural tubes that hold up the entire building. Each of them are differently shaped and irregularly placed, and they seem to undulate as they thread between floors. From roof to basement the tubes retain their fluent image, but most double as conduits for vertically circulating air, water, electricity, people and even light. Two enormous tubes guide light down into the centre of the building, ensuring that all reading spaces are adequately lit for reading and visual comfort, as well as limiting the need for artificial lighting (Pollock, 2001: 192). Although these tubes required complex calculations and fabrication, the unorthodox structure creates a remarkably open perimeter and flexible interior (Pollock, 2001: 193) see figure 8.5.4.1. and 8.5.4.2).

8.5.4 Flexibility of Form

Out of Ito's system emerged a new form of flexible space free from constraints of structural grids, service cores and set ceiling heights. To take full advantage of this openness, Ito avoided boxy rooms and fixed partitions wherever possible (Pollock, 2001: 199), favouring glass panels, operable curtain walls, and temporary panels where explicit separations were required.

“Designating room spaces specific to functions limits free action”, explains Ito (Pollock, 2001: 199). *“We want the building to allow users to discover new places and uses for themselves”*. For the most part, floor levels are loosely divided into the “differentiated specialities that occur naturally where the tubes and other vertical elements are placed in a horizontal field. Unlike most public buildings, Mediatheque has few functional or spatial divisions inside it.



Fig's 8.5.4.1 and 8.5.4.2: Custom made furniture in the different areas define and create a sense of place as well as underscore functional distinctions without having definitive boundaries. (Source: Architectural Record, May 2001: 200)



While Mediatheque's transparent or flexible walls act somewhat like furniture, on the other hand its custom furniture works almost as walls. Architectural in scale, the pieces define and create a sense of place as well as underscore functional distinctions without limiting other possible uses (Pollock, 2001: 199). The elliptical tables and wheeled chairs, for example, animate the information centre's computer area, and the clover shaped seating designates the periodical section. By contrast, the bright yellow seating for the art gallery and brilliant red reception desk on the first floor are whimsical and sculptural pieces that guide visitors through the building rather than mark territory (Pollock, 2001: 201). Together with different materials and lighting on each floor, the furniture helps establish a unique identity for each level.

8.5.5 Conclusions

Even though construction of the building is finished, Mediatheque is still in design (Pollock, 2001: 201). But now the job is in the hands of the local citizens of the community, who must figure out how best to use the spaces to their own functional desire. This marks a clean break with the set programmes of many recent libraries, museums, community centres, and other public buildings commissioned by the government in an effort to jump start the country's flailing economy (Pollock, 2001: 201). It is hoped that, by endowing the public with the freedom to use and modulate the building as they see fit, Mediatheque will have a lasting impact on the next generation of Japan's public architecture (Pollock, 2001: 201).

This building is an ideal example of what in fact the learning experience entails in today's modern world. Learning is no longer a one dimensional practice, but involves an array of technological innovations. It is for this reason that this building was studied in this research. Mediatheque is a perfect example of how architectural innovation, through the clever use of building materials and architectural elements and innovative design, can house such a facility in an interesting, imaginative and cutting edge manner.

8.6 PRECEDENT STUDY 6:

DUDUZA RESOURCE CENTRE

Duduza Gauteng, South Africa: *Jo Noero*

8.6.1 Background and Issues

The Duduza Resource Centre, which was opened in early 1992, is located in the adjoining area of Nigel (Architecture SA, 1994: 27). Essentially the purpose of the centre is to provide a general community service to the people of Duduza. The specific focus of the centre is to provide accommodation for informal education projects which have been developed in response to the Crisis of the “Bantu” National Education System of the Nationalist government regime, explored earlier in the research (Architecture SA, 1994: 27).

What was clear at the outset was that the centre’s initial purpose would in all likelihood be made redundant once a new government was installed who would put in place a new equitable education system accessible to all (Architecture SA, 1994: 27). Therefore, the centre was designed to be multi – functional in use with the specific purpose in mind of being able to be adapted to the needs of a community college in the future.

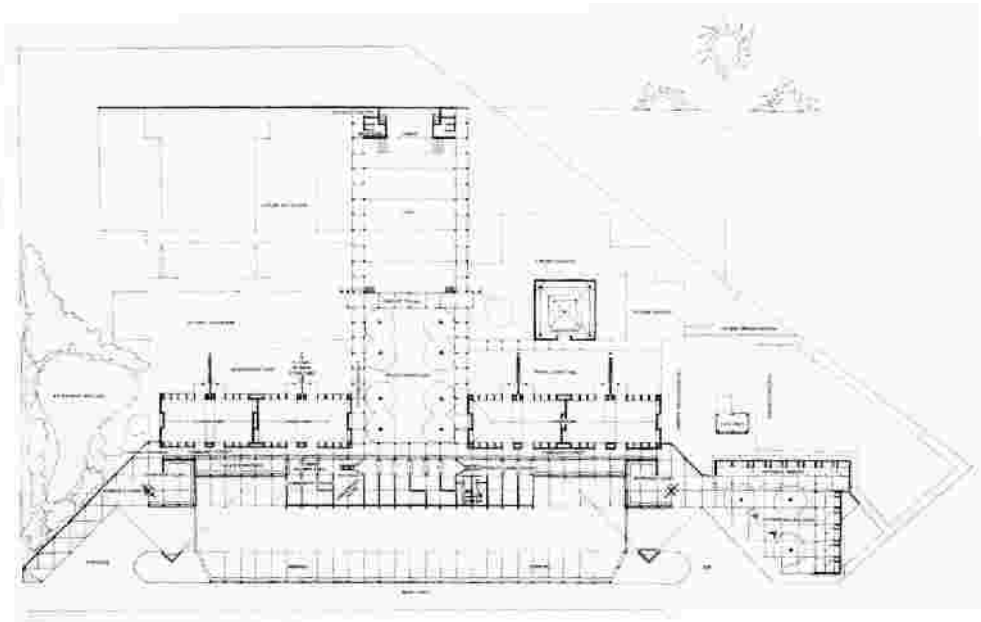


Fig 8.6.1.1: Ground Floor plan of the Duduza Resource Centre. (Source: Architecture SA May/June 1994: 27)

8.6.2 The Need for Quality Buildings

This develops from a notion that there are two worlds in South Africa – The First and Third Worlds, and most important, a repudiation of the assumption that one is superior to the other. In technological terms, this means a rejection of the belief that when we build for the poor we must employ so – called third world technologies (Architecture SA, 1994: 27). This simply reinforces the cycle of technological poverty and dependence.

No matter who one is designing for, one must design buildings of integrity. Building projects must be designed creatively to engage the enthusiasm and creativity of the people and to enable not only fine buildings to emerge, but community revitalisation as well (Architecture SA, 1994: 27).



Fig 8.6.2.1: Different Architectural Elements of the D...a Resource Centre Showing various Construction Methods. (Source: Architecture SA Nov/Dec 1993: 39)

8.6.3 Building Fabric and Structural Form

Firstly, since the majority of workers on site were unskilled or semi – skilled, the precision of the steel frame required an equivalent precision from those people involved in on – site construction (Architecture SA, 1994: 27). This process therefore not only created opportunities for income generation, but due to its precise nature, resulted in the upgrading of the building skills of those people working on site. The centre is designed in such a way as to achieve optimum comfort levels in terms of light and temperature in all workrooms (Architecture SA, 1994: 29).

To many people who will be using the centre, architecture is foreign to them. Underpinning the detailed designs lies in the principle that the nature of construction, the way in which the buildings are assembled, and how the structure is supported should therefore be made apparent (Architecture SA, 1994: 28). In this way, it is hoped that people can engage consciously with the building.

8.6.4 Accessibility and Legibility of Architectural Form

The main entrance should be clearly demarcated and the circulation system made apparent (Architecture SA, 1994: 29). The different functions of the complex must be formally recognisable, while the buildings must be both accessible and legible (Architecture SA, 1994: 29). The sections of the centre are therefore modelled so as to create comfortable, human proportions giving a sense of scale between people and object. The sections are designed to maximise usage by providing both built – in features and partitioning systems which allow for alternative functions (Architecture SA, 1994: 29).

Due to cost constraints, the centre comprises generally single storey buildings. The main entrances to the centre are set into deeply flared recesses since the entrance should be strongly differentiated from its immediate surroundings. The centre is spread across the site and the landscape is defined by the buildings around it. The buildings form a series of courtyards comprising a major courtyard and a series of smaller, more intimate courtyards for semi public gatherings (Architecture SA, 1994: 30). The landscape has been designed to become an integral part of the spatial system of the centre, and to serve pedagogic purposes. Each courtyard has been planted in a specific way to support a specific ecological system ranging from a wet to a dry land environment (Architecture SA, 1994: 30). In turn, these areas are used to support teaching programmes run by the centre.

8.6.5 Community Accessibility

The centre is accessible to all members of the community 24 hours a day. A community street was created along which people could move and adjacent to which community and project offices would be located in a very similar manner to a shopping street (Architecture SA, 1994: 29). In this way the opportunities offered by the centre are constantly on display and the public moving through the centre could be exposed to the opportunities located within the centre.

8.6.6 Expansion

The centre can easily facilitate future expansion (Architecture SA, 1994: 29). The single most important fact when one considers expansion of a centre is that it should not affect the day to day functioning of the centre at all. This led to the layout in which future additions would occur as separate buildings that are detached from any existing buildings. The form chosen to facilitate this was a series of circulation spines along which rooms can be added as independent detached units (Architecture SA, 1994: 30). It was decided to provide a clearly defined spatial focus, which would both centre phase one, as well as all future expansion. A large central courtyard fronting onto the double storey administrative block was built part of phase one. The courtyard fronts onto the community street at the centre line of the street, both providing respite for people walking along the street, as well as centring the design (Architecture SA, 1994: 30).

8.6.7 Creation of Active Edges

The centre has been designed to contain an area which is marked as community territory as distinct from the area dedicated to services (Architecture SA, 1994: 30). The community space contains two main elements – the major courtyard and an area given over to the “street” and community projects.

Due to the location of the site alongside a busy thoroughfare, the edge to the street is important. An informal market, entrance courtyards, and a taxi and bus rank have been located at this juncture. Due to this, the edge will be active and will be used to support activities that support community activities such as meetings, interacting and selling (Architecture SA, 1994: 30).

8.6.8 Form Independent of Cultural Association

One of the invidious consequences of apartheid was the spurious assignment of cultural identity to various so called ethnic groups (Architecture SA, 1994: 30). As a result, white architects for example, designing for black people, would embellish the design with various ethnic symbols. This often takes the form of mosaic patterning reflecting a paternalistic “white” reading of “African” decoration (Architecture SA, 1994: 30).

The client body of the centre were vehemently opposed to any gratuitous, paternalistic reference to black culture, and so the board specifically demanded that the form of the complex should be derived, in a sense independently from any form of cultural association (Architecture SA, 1994: 30).

As a result, the forms are derived as a direct consequence of dealing with the issues of space, climate, material use and structure (Architecture SA, 1994: 30).

8.6.9 Conclusions

Noero attempts to come to terms with the design of a centre that was intended to uplift a predominantly black community. At the time of construction, being just as South Africa was going through political change; many very sensitive issues had to be dealt with in the execution of this design.

It can be said that Noero was successful with this centre as he was extremely sensitive to the context and the people for whom he was designing. This precedent outlines some of these principles that are extremely important to consider for the design of an adult education centre, and it is for this reason that the study of this centre has formed part of the research. Most pertinent perhaps is the fact that even though one is designing a centre aimed at the upliftment of previously disadvantaged people, the architecture must not be condescending, but rather uplifting, spontaneous and comfortable, establishing a comfortable environment in which to learn.

CHAPTER 9: CASE STUDIES

9.1 CASE STUDY 1:

UMLAZI V ADULT EDUCATION CENTRE

Umlazi, Durban, South Africa.

9.1.1 Background and Issues

Umlazi V Adult Education Centre is a government funded initiative located in Umlazi, near Isipingo in Durban, and is part of the larger Coastal College network. The Centre aims to address the needs of the education crisis in South Africa, by giving people practical skills training, particularly in the fields of civil engineering and building construction.

The centre runs the education programme called National Certificate Vocational (NCV). This is one of the high skills, high quality and high knowledge programmes intended to directly respond to the priority of skills demands in today's modern economy of South Africa, equipping students with the necessary knowledge and practical skills that they can apply in the workplace.

This National Certificate Vocational is a qualification at National Qualifications Framework (NQF) Levels 2, 3 and 4 and each level takes a full year of study (Umlazi V Programmes brochure, 2009: 1). In order to obtain a National Certificate, a student is required to take a total of seven subjects. These include 3 fundamental subjects and 4 vocational subjects (Refer to Appendix B).

While enrolled at the Umlazi V Adult Education Centre, students have access to participate in the operation and maintenance of construction equipment and machinery, as well as participate in the construction of roads, bridges, dams, railways and houses (Masinga, 2010: Discussion on Facilities of Umlazi V Adult Education Centre [interview] Personal Communication: 13 May 2010).

9.1.2 General Location

Umlazi V Adult Education Centre is located in the heart of Umlazi Township, just South West of Durban. Umlazi Township is the largest township in KwaZulu Natal, and began in 1845 when the British occupied what was then Natal and established a number of what were then termed 'Native Locations' for the Zulu's. In 1967 it was established as a black township under the ruling Nationalist Government and was one of the places where many of those displaced from Cato Manor ended up being relocated to (eThekweni Online: Internet). Now free of the oppression that was so characteristic of the rule of Apartheid, Umlazi is a vibrant example of township life in Durban.

9.1.3 Building Type

Umlazi V Adult Education Centre is a campus facility that is spread out over a sizeable tract of government owned land, and has an array of facilities for the training of adults in fields that range from garment making and sewing to cabinet making (See figure 9.1.8.5), motor mechanics, graphic design and construction based skills training (Umlazi Programmes Brochure, 2009: 1). The adult education centre houses all the facilities for this training on this campus (see figure 9.1.6.1).

9.1.4 The Client

Umlazi V Adult Education Centre is a government funded initiative and the National Certificate Vocational (NCV) is one of the programmes that has been put in place to address the needs for skills development in the country (See Appendix C). The centre is therefore funded mainly by the government.

9.1.5 The Site

The township of Umlazi in Durban is home to some 750,000 occupants (eThekweni Online: Internet). The site is very close to the main N2 highway that links the township to Durban, and the means with which most people get to the centre is by Taxi or bus. The site is relatively large and is serviced by water, electricity and sanitation. There is quite a steep gradient across the length of the site, and the facilities are thus located following the slope of the ground (See fig 9.1.5.1 and 9.1.6.1)

The centre is set back quite far from the roads edge and this serves to buffer the facilities from the active street on which the main entrance to the centre is located.

9.1.6 Response to Context

The Umlazi V Adult Education Centre is a campus made up of a number of different buildings that have been added over the course of time, to address the need for expanding numbers of students, and differing facilities.

From the initial outset, it should be the aim of the architect to design a learning space that is friendly, informal, open

and spontaneous (Galbraith, 1991: 17). What this does is create an environment that the adult learner feels comfortable in and hence is most able to learn. However, in this centre, in most cases the architecture is simple and robust. Buildings are located haphazardly on the site with little thought going into orientation and design of each facility.



Fig 9.1.5.1: The site is quite steep in Gradient, and the buildings are each located following the slope of the land. (Source: By Author, 2010)



Fig 9.1.6.1: The slope of the site is clear, and there is no differentiation between pedestrian and vehicular movement, leading to a confusing environment for the Adult Learner. (Source: By Author, 2010)

What is also noted is that there is no differentiation between spaces for pedestrians and for cars. This is a result of poor architectural design (See fig 9.1.7.1)

The method of construction varies throughout the site, varying from plain fair-face brick construction, to large scale corrugated metal warehousing, and also the inevitable temporary classrooms that are simply erected with little thought, just as a response to the need to cater for ever increasing numbers.

Across the site, there is very little thought given to vegetation and landscaping, and thus the campus appears stark and very uninviting. There is no differentiation between hard and soft landscaping and this as a whole, does very little to make the learner feel comfortable in the architectural environment.

9.1.7 Legibility of Architectural Form

Each building is connected via a tarred driveway that is completely dilapidated. This does little for the integration of the facilities over the entire site, and students just seem to mingle throughout the campus from place to place, with very little direction (See fig 9.1.6.2). On the day of the site visit, the weather was sunny and temperate, but movement around the site would be severely affected if it were to rain. Hence there is no linking mechanism within the site, and so facilities are not very legible to the outsider.



Fig 9.1.6.2: There is no Architectural Linking mechanism within the campus, connecting each building to the next. This results in a confusing environment for the adult, where students tend to just amble along with no purpose. (Source: By Author, 2010)



Fig 9.1.6.3: Accommodation on the Campus is necessary, however accommodation facilities on the campus are badly run down and unkempt, mainly due to a lack of funding. (Source: By Author, 2010)



Fig 9.1.7.1: At the bottom of the drive are the auditorium and the Divine Life Society Building, housing the Four Computer Labs. (Source: By Author, 2010)

9.1.8 Accommodation

The campus is entered through a main security gate and boom that is manned by 24 hour security. As one enters, the accommodation blocks are to the right (see fig 9.1.6.3). These accommodation facilities are used by the learners at the centre and are either rented on a 3 months (1 trimester) or yearly basis (Masinga, 2010: Discussion on Facilities of Umlazi V Adult Education Centre [interview] Personal Communication: 13 May 2010). These accommodation blocks are however extremely old

and run down, and are poorly designed.

Further along the driveway, one passes three temporary classrooms and the boardroom of the campus. Again, the notion of almost every facility being fragmented from each other is highly evident. Directly ahead is the auditorium where audio visual equipment is housed. The auditorium is also used to teach larger groups of learners and is also able to be hired out by small to medium

businesses in the area to conduct meetings and small seminars. Further down is the Divine Life Society Building which houses 4 computer laboratories, used for is the teaching of learners in not only computer skill but also computer aided design (CAD) and drafting, where they are taught how to first draw up whatever they are learning in a software programme, and then how to complete their project practically using these drawings. Tests are then carried out to adjudicate the learners according to the National Qualifications Framework as outlined by the education department (Refer to Appendix B and C).



Fig 9.1.8.1: The Computer Facilities are quite high tech, and the environment is sufficiently naturally lit and can be mechanically ventilated. This is a necessity for such a facility. (Source: By Author, 2010)



Fig 9.1.8.2: The interior of the Tool making workshops are simple yet functional. (Source: By Author, 2010)



Fig 9.1.8.3: Building construction Training is carried out in the centre, and includes bricklaying, plating, roof construction and stair making – amongst others. (Source: By Author, 2010)

The computer rooms are adequately lit and can be artificially ventilated (see fig 9.1.8.1). They are well equipped with internet connectivity.

The administration block also accommodates college admin facilities such as boardrooms and support areas like photocopy rooms, as well as offices for staff.



Fig 9.1.8.4: The interiors of the classrooms have furniture that is able to arranged to suit whatever task is being carried out at that particular time. (Source: By Author, 2010)

Moving down the driveway, there are tool making workshops to the right (see fig 9.1.8.2) and the

large construction facilities teaching warehouse on the left.

While the workshops are rudimentary and run down, with exposed wooden roof trusses and hap – hazard fluorescent lighting, the construction warehouse, in its typically industrial shed style, is probably the best suited building to its function on the entire campus (See fig 9.1.8.3). This is partly due to the fact that it is one of the newest facilities on the campus, but the facilities that it houses, being carpentry, woodwork and construction training are adequately housed in this facility, although the space is still far from ideal from an architectural point of view, but this is due to lack of funding, hence making the most of available resources. The space is sufficiently lit with fluorescent lighting and natural South light being let in by the windows on either long facade of the building. The students are taught basic building construction, as well as how to build desks and



Fig 9.1.8.5: Mr Masinga Showing off some of the cabinets that are made in the classes and then sold to the community as a source of revenue. (Source: By Author, 2010)

cupboards for example (see fig 9.1.8.5). These are then sold back to the community, creating income generation for the learners. Practical training aspects are learnt in the middle of the facility, while the theoretical component is carried out in two classrooms on either side of the facility.

Also available on the campus are an array of teaching classrooms (see figure 9.1.8.4). While most of the classrooms are identical in size, the furniture has been arranged differently (either by the teachers or in most cases by the adults themselves) to suit the specific needs of the adults and learners at that particular time. In most cases however, the classrooms are quite overcrowded and little attention has been paid to orientation for natural light and the learners' comfort while undertaking the teaching and learning processes.

Other features included in the campus are classrooms for electronic tutorship and plumbing, while there are other, slightly larger rooms for more students to be accommodated. These larger seminar rooms have been furnished differently so as to better facilitate the activities occurring within. In most of the classrooms there is a whiteboard and other teaching aids, while in the seminar rooms the desks have been arranged in a U – shape in most instances to promote better interaction among the learners and initiate conversation. However, these rooms are not limited to this sole purpose of teaching, but the furniture is moveable, allowing larger spaces for play or demonstration to occur for example, as well as small group debates and tests.

Also on site is a resource library, with an array of books, textbooks and magazines for the perusal of the learners (Masinga, 2010: Discussion on Facilities Umlazi V Adult Education Centre [interview] Personal Communication: 13 May 2010).

9.1.9 Structural Form

When a new building is erected on the site, it is evident that very little architectural design goes into it. The structure, as illustrated in figure 9.1.9.1, is very utilitarian in nature, and is simply functional without aiding the teaching process. The design bears little consideration of natural light and ventilation, and incorporates very few other design elements to aid the learning process.



Fig 9.1.9.1: The new classroom block is very utilitarian in nature, with very little thought being given to orientation and other architectural design factors. (Source: By Author, 2010)

Most of the buildings are constructed out of load bearing brickwork, likely due to the fact that this is a relatively cheap means of construction, and is readily available.

Perhaps the newest structures on the site are the warehouse facilities for the teaching of carpentry and building construction. This type of learning requires large span roof structures with no structural supports interfering in the floor plan, and this has led to a steel portal frame structure being employed (See fig 9.1.9.2). This structure is quite rudimentary and functionalistic, but on the other hand is cheap and it does seem to be fulfilling its purpose adequately.



Figure 9.1.9.2: The interior of the building construction and carpentry warehouse is very functionalistic, but effective. It can however be too big and daunting though for a small group of adult learners. (Source: By Author, 2010)

Within this construction training block, the steel structure of the roof has been exposed, allowing for natural illumination and ventilation of the space via wivel type windows on either side of the structure to occur.

9.1.10 Theoretical Discourse

Very little architectural input has been implemented in the design of the centre. This though is mainly due to lack of funding and making the most of available resources.

The environment could be improved by the planting of some trees and other vegetation. This would in turn soften the environment somewhat, in contrast to the high tech activities that go on inside the buildings on campus.

One sorely lacking feature within the campus is a linking mechanism that ties all the buildings together, in order for it to read as a cohesive whole. This tends to make the environment somewhat daunting to the learner, as he needs to feel as comfortable within the learning environment as possible, to instil within him a readiness and willingness to learn.

9.1.11 Empirical Data

This research took the form of a site visit, in which a meeting was set up with Mr Masinga on the 13th May 2010 who is the campus manager at the Umlazi V Adult Education Centre.

A series of photos were taken of the building and facilities and an analysis was carried out observing the learners as they went about their tasks. Observations of physical traces were then recorded and analysed, which forms the basis of this case study.

9.1.12 Conclusions

The Umlazi V Adult Education Centre is the prime example of how a lack of funding can facilitate lost opportunities. The campus is probably one of the most comprehensive Adult Education Centres in Durban, from a facilities point of view. However, the centre has become so run down and disjointed that it hardly reads as an integrated campus at all. Poor forethought and obvious lack of proper design input has led to a campus characterised by a series of haphazard additions and solely lacking linking mechanisms within the campus, creating an environment that is confusing for the adult learner.

Most of the facilities that one could possibly need are catered for within the centre, and it has to be said that under the current conditions the centre is doing very well. However, it is realised that it is due mainly to a lack of funding that the centre is only operating at half the potential that could in fact be realised.

9.2 CASE STUDY 2:

TEMBALETU TRUST COMMUNITY EDUCATION CENTRE

Pietermaritzburg, South Africa.

9.2.1 Background and Issues

Tembaletu Trust Community Education Centre is a Non Government Organisation (NGO) and is situated in the town of Pietermaritzburg, KwaZulu-Natal. The Centre works in communities across KwaZulu-Natal offering adults and youth accessible and appropriate education and training opportunities, aiming to improve the literacy levels of the previously disadvantaged communities especially in the rural areas where resources continue to be limited (Tembaletu Trust Annual Report, 2008: 1).



Fig 9.2.1.1: Learners taking part in Carpentry classes. (Source: By Author, 2010)

Education and training courses offered by the centre are aimed at meeting the needs of those who, for historical and political reasons have not had equitable access to education, and thus are economically disadvantaged as well (Tembaletu Trust Annual Report, 2008: 1). The centre offers unemployed adults and youth with relatively low levels of formal education the opportunity to gain valuable technical skills (See fig 9.2.1.1). This enhances their job seeking potential and self employment opportunities (Tembaletu Trust Annual Report, 2008: 17).

People and communities within KwaZulu Natal have a vast, untapped reservoir of potential (Tembaletu Trust Annual Report, 2008: 1). The prospect for realising new skills, gaining deeper insights, reaching higher levels of understanding and achieving better and more humane modes of organisation and interaction, has hardly been tapped (Tembaletu Trust Annual Report, 2008: i).

The centre offers a wide range of programmes inclusive of the Adult Basic Education and Training (ABET) for the illiterate, home based palliative care for victims of HIV/ AIDS, study and career counselling, subject specific tutorials for in – school youth, computer literacy skills and technical skills training for the out – of school adults. Additionally, access to information, advice and counselling on personal, study and work related issues are offered to a host of people from the Pietermaritzburg and surrounding communities through the Resource and Information Centre (RIC) (Tembaletu Trust Annual Report, 2008: 1).

Further, the facility offers a number of rentable offices, which they offer to associated organisations which also generates additional income for the centre. These various organisations then work with Tembaletu Community Education Centre to go out into the various communities and carry out educational courses that they are unable to offer at the centre due to a lack of facilities (Rangiah, 2010: Discussion on Facilities of Tembaletu Resource Centre [interview] (Personal Communication: 8 April 2010).

9.2.2 General Location

In 1986 Professor G.D Schreiner proposed that an “Education Park” should be established in the old Girls’ Collegiate Building in Burger Street (Stobie, 1991: 33). Conveniently located some 650 meters from the city hall, Tembaletu is made up of 2500m² of floor space, and this consists of a theatre/ hall, 26 classrooms, a resource and information centre, and 36 other rooms which are used as offices as well as training, conference and seminar venues.

9.2.3 Building Type

Tembaletu Trust Community Education Centre is an integrated campus designed to facilitate the training of technical skills, as well as other non formal and formal educational activities for adults. It houses most of the facilities necessary for this training, and where it doesn’t have the means to carry out a particular task; it outsources this task to other associated organisations within the Pietermaritzburg region.

9.2.4 The Site

Pietermaritzburg is a dynamic commercial, educational and industrial centre that has carried its history fully into the present. The Site is located amidst the forested hills of the Natal Midlands, conveniently located between Durban and Johannesburg. To the North of the site is the main arterial road which connects Pietermaritzburg to Durban in the South East and Johannesburg in the North West. The site is relatively flat. The positioning of the building on the site allows the entrance to relate strongly to the quieter secondary road (Burger Street) on which it is located, while the orientation of the building shields activity from the busier Commercial Road to the South East of the site. The entrance to the scheme is axial, and therefore portrays a sense of formality. However, once one enters into the beautifully maintained gardens, one is aware of the casual and comfortable environment that this centre radiates.

9.2.5 Response to Context

This building, a beautiful example of fine Edwardian Architecture (See fig 9.2.5.1), had been purchased from the Province in the early 1960's but was left to become derelict over almost 3 decades (Stobie, 1991: 33). It was acknowledged that for such an "Education Park" to gain credibility within the community there could be no pre-empting of the form it should take or the courses to be offered (Stobie, 1991: 33). A "people's seminar" was held and followed by open workshops where communities at a grass roots level were able to make a contribution to the centre right from the very initiation of its existence.



Fig 9.2.5.1: The wrap around verandah creates human scale within the centre and acts as a linking mechanism. (Source: By Author, 2010)

There is a complexity in scale in the scheme which is amalgamated by the linking mechanism of the continuous walkway veranda around the centre (See figure 9.2.5.1). What this achieves is brings the large, somewhat imposing volumes of the double storey structure down to a human scale, making the learner feel comfortable as he moves through the centre.



Fig 9.2.5.2: The interior of the resource Centre is well lit by natural, South light. (Source: By Author, 2010)

The method of construction of the building is also considerate to the context. The large mass of brickwork acts as effective thermal mass, creating a comfortable environment for the learners. The brick absorbs the heat during the day, and dissipates it to the sky in the evenings when the temperature cools.

The main orientation of the building is faced North-West. This affords ample north light into the main teaching classrooms at second floor level, while the main circulation spaces are sheltered by the veranda roof from the driving rain. The upper mezzanine level of the Resource Centre takes advantage of South light let in by high level windows (See Figure 9.2.5.2).

9.2.6 Accommodation

The centre is entered through the main gate off Burger Street, and while there is no formal guard house, there are a number of security guards that patrol the centre. To the left and right, there is ample car parking and the entrance to the Resource Centre is straight ahead, with the administration block to the right.

As mentioned, this building was originally a Girls' Collegiate, and so the spaces, while adequate for some activities, are not ideal for the practise of adult education. In many cases, the classrooms are too small for fluctuating numbers of learners and seem to be crammed full of desks (See figure 9.2.6.1), and spaces are reminiscent of the hierarchical, pedagogical method of teaching young children or adolescents. While this is not ideal, it is acknowledged that this may be a consequence of wanting to make maximum use of available resources.

While the classrooms are arranged in the traditional, forward looking way, the bigger seminar rooms (see figure 9.2.6.2) are arranged in a slightly friendlier manner that encourages some sort of user participation and interaction among learners. This furniture is moveable or flexible and so the room is able to be used for other activities such as class group activities, and different teaching methods and activities.

Further along the covered veranda there is a hall that caters for large groups of learners at a single time, and this also doubles as a large venue for community meetings throughout the year (Rangiah, 2010: Discussion on Facilities of Tembaletu Resource Centre [interview] - Personal Communication: 8 April 2010).



Fig 9.2.6.1: The classrooms are small and cramped, and not able to be manipulated for different needs and teaching methods. (Source: By Author, 2010)



Fig 9.2.6.2: The interior of the seminar rooms are larger than the classrooms and furniture is arranged in a way to encourage interaction. (Source: By Author, 2010)



Fig 9.2.6.3: The interior of the Information Resource Centre is informal and casual. (Source: By Author, 2010)

The Resource Information Centre (See figure 9.2.6.3) is available to the students of the centre as well as the public. Facilities include varying forms of literature, including newspapers, magazines, study guides, textbooks and a selection of audio visual materials including computer based software for language learning.

9.2.7 Theoretical Discourse

Although this is an old building, and the facilities are outdated and need to be upgraded, Tembalu Community Education Centre seems to carry out its community intentions pretty admirably. It is clear that in an attempt to make the learning environment as comfortable as possible for the learners within the centre, the gardens have taken top priority, and it creates an environment that is visually pleasing and tranquil for the adult learner.

9.2.8 Empirical Data

This research took the form of a site visit, in which a meeting was set up with Mr Rangiah on the 8th April 2010 who is the Executive Director of the Tembalu Trust Adult Education Centre.

A series of photos were taken of the building and facilities and an analysis was carried out observing the learners as they went about their tasks. Observation of physical traces were then recorded and analysed, which forms the basis of this case study.

9.2.9 Conclusions

As discussed above, this centre operates sufficiently for its task, but it is clear that the notion of almost retrofitting the activity of adult education into a building that was not originally designed for it is by far the ideal architectural solution.

Certain aspects however must be given credit – one such being the idea of the outsourcing of sister facilities to outlying areas, while still being under the control of the parent centre. This creates interest among community, while giving people responsibility and the power to influence their own education.

One other notable aspect of this centre is the fact that the gardens and landscaping is highly successful in creating a relaxed and casual atmosphere within the design of the centre. This in a sense creates an environment that is spontaneous, open and collaborative, allowing the adult learner to express his thoughts without fear of judgement from peers and educators. This in turn allows him to feel comfortable in the learning environment, and therefore more able to learn.

9.3 CASE STUDY 3:

OTHANDWENI ADULT EDUCATION CENTRE

Somtseu Road, Durban, South Africa.

9.3.1 Background and Issues

Othandweni Training Centre is located in Somtseu Road in Durban, within a semi industrialised area just west of the railway line. The centre focuses on giving people the tools to better themselves in order to become employable. The centre focuses on adult education in specific building trades within the construction industry in particular but also has training courses in health and safety, First Aid, HIV Awareness as well as Fire Fighting. At the core of the centre is the belief that true empowerment involves the transfer of Knowledge. The centre is accredited with the Construction Education Training Authority (CETA) and is a privately funded organisation. Othandweni's vision is to empower people, develop communities and create an opportunity for the individual to become self employed and marketable in the labour market of South Africa.

9.3.2 General Location



Fig 9.3.2.1: Aerial Photograph of Othandweni Training Centre, showing the close proximity to the Stadium precinct, but being cut off from it by the railway line running North South across the site. Source: Retrieved from citymaps.durban.gov.za/website/master/viewer.htm: 17 May 2010)

Othandweni Training Centre is located off Somtseu Road in Durban, on the Western side of the train tracks. It is in very close proximity to the ABSA Stadium as well as the new Moses Mabhida Stadium precinct (See fig 9.3.2.1 & 9.3.3.1).

9.3.3 Building Type

Othandweni Training Centre is a facility made up from a number of component parts. There is the administration block that houses the main offices for the teaching staff and the reception. These offices are at second floor level, and at ground floor, is the motor mechanics training workshop as well as a seminar room and the trades yard.

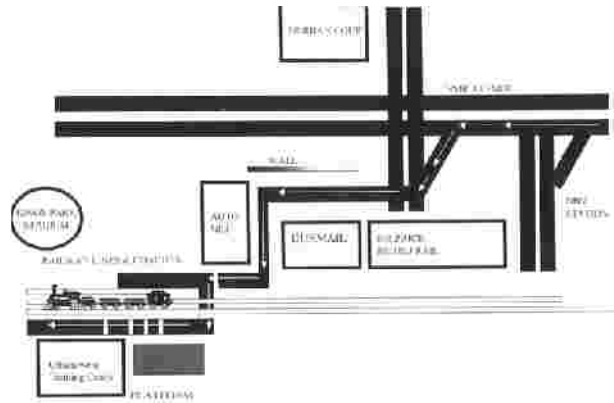


Fig 9.3.3.1: Diagrammatic Location map of Othandweni Training Centre. (Source: Othandweni Advertising Pamphlet)

All of the classes are carried out on the campus in the yard, and although the facilities are not ideal, the centre seems to work sufficiently within its means.

9.3.4 The Client

The Othandweni Training centre is a privately owned organisation and is therefore not funded by the government at all. It does however subscribe to government educational programmes and trade tests, with which it uses to evaluate students.

The centre targets in most cases adults, who recognise the fact that they need to learn in order to better themselves in order to gain more skills and become more marketable (Human, 2010: Discussion on Facilities of Othandweni Resource Centre [interview] - Personal Communication: 10 May 2010). The centre does however enrol some people of school going age, as they would rather, instead of going to school and learning subjects such as maths, biology and geography, learn practical tasks that they can put to immediate use for income generation when they leave school.

9.3.5 The Site

The centre is cut off from the rest of the city by the railway line (See fig 9.3.5.1), and prevents any East – West movement from the site across to the main stadium node that has just been developed. Therefore the only access to the centre is down a deserted road where a lot of vagrants sleep and mill about. This is a far from ideal location for such a centre, to promote the comfortable, relaxed and spontaneous environment best suited for the teaching and learning processes for adults. One positive about the site though is that is quite close to main transport networks, such as Umgeni Road, hence transport to and from the site is no problem for prospective learners.



Fig 9.3.5.1: The centre is cut off from the rest of the city by the railway line, and there is a stark contrast between the two tracts of land – the one with the centre being extremely run down, but the other has had millions spent on it to upgrade it. (Source: By Author, 2010)

9.3.6 Accommodation

The site is located on the Western side of the railway line, separated from the Moses Mabhida Sports precinct. There is no easy way to get to the site, and students either have to catch a taxi or bus to Umgeni road or Masabalalayenga Avenue (Formerly NMR), and then walk from there to the education centre. There are two accesses to the centre – the main entrance to the admin block

down the road from the parking lot or there is a service entrance into the yard also from the parking lot (See fig 9.3.6.1). As one enters, there is no security to speak of at all, which is somewhat surprising given the location. As one immediately enters the admin block, there is the reception desk at ground floor with the administration offices on the second floor. Within the building, there is only one medium sized seminar room (See fig 9.3.6.2) that is used for teaching theoretical classes, staff meetings and other group discussions. The table and chairs are located in a circular manner so that all learners can see each other at any given time. This promotes lively debate and discussion and promotes an interactive learning experience.

As one exits the administration block at ground floor, one is taken directly past the welding and carpentry workshops (See fig 9.3.6.3). These are crude structures that are poorly lit and poorly ventilated, and little care has been taken to ensure the comfort of the learners.



Fig 9.3.6.1: Security is non-existent in the centre, which is surprising given the location. (Source: By Author, 2010)



Fig 9.3.6.2: The seminar room is of adequate size, but poorly lit – having very little natural light. The furniture is arranged in a manner to initiate conversation amongst learners. (Source: By Author, 2010)



Fig 9.3.6.3: A learner gets to grips with welding techniques. (Source: By Author, 2010)

From the workshops, one transcends through a narrow passageway and into the motor mechanic training workshop. This again is a very poorly lit environment; with little advantage taken of the high roof structures that could possibly have made clerestory lighting possible.

From the motor mechanics workshop, one moves outside into the building construction yard. This seems to be the core function of the Othandweni Learning Centre, as this facility seems to be the best equipped and best suited for its function. All training takes place within the building construction training yard, and particular trades that are covered are tasks such as bricklaying and plastering, shuttering for columns and beams (See fig 9.3.7.4), and roof layout and construction (See fig 9.3.6.5).

The learners are also taught in plumbing and painting techniques (Human, 2010: Discussion on Facilities of Othandweni Learning Centre [interview] - Personal Communication: 10 May 2010). Other practical learning tasks that they are taught are painting and plumbing (See fig 9.3.6.6 and 9.3.6.7), and also carpentry and welding.

To the west of the building Construction yard, there is a small terrace for the students to eat lunch, as well as an old railway carriage (See figure 9.3.7.1) that is used for the teaching of theory classes and also to hold small group discussions and meetings. This is however far from ideal, as the carriage is old and run down. It is too narrow and cannot hold a large amount of pupils at one time.



Fig 9.3.6.4: Brick Laying and Beam Shuttering. (Source: By Author, 2010)



Fig 9.3.6.5: Roof Construction Techniques. (Source: By Author, 2010)



Fig 9.3.6.6: Painting Techniques. (Source: By Author, 2010)



Fig 9.3.6.7: Plumbing. (Source: By Author, 2010)

9.3.7 Structural Form

The building construction yard is simply a wide open space with a large concrete surface bed. This is purely functionalistic, with only half of the yard being covered with a simple steel construction lean-to structure. This has exposed the rest of the yard to the elements, and this results in the fact that no teaching can occur if there is inclement weather. This has a huge effect on the day to day running of the centre with only the theory component of the courses being able to be taught if this were the case. These classes are carried out in the old railway carriage (Human, 2010: Discussion on Facilities of Othandweni Resource Centre [interview] - Personal Communication: 10 May 2010).

9.3.8 Theoretical Discourse

The correct learning environment for adult education is one that should be open, light and relaxed. This centre is far from that, and is by extremely functionalistic. The centre has made use of resources close to the site – a good example of this is the use of the abandoned carriageway. However, the ideal environment for the adult learner has not been considered at all. This is not a very pleasant place to be, let alone learn in.



Fig 9.3.7.1: The raised seating terrace and the old railway carriage where the theoretical component of the courses are carried out. (Source: By Author, 2010)



Fig 9.3.8.1: The theory classroom is far from what one would call the ideal learning environment. (Source: By Author, 2010)

9.3.9 Empirical Data

This research took the form of a site visit, in which a meeting was set up with Mr Human on the 10th May 2010 who is the campus manager at Othandweni Training Centre.

A series of photos were taken of the building and facilities and an analysis was carried out observing the learners as they went about their tasks. Observation of physical traces were then recorded and analysed, which forms the basis of this case study.

9.3.10 Conclusions

A centre such as this can be described as simply adequate at best for the teaching of adults. Although the centre has all the basic requirements, the architectural execution of such is extremely poor, if existent at all.

The centre is insensitive to the adult learner while the sequence of entry and spatial relationships between various facilities are not ideal, resulting in an environment that is not very comfortable for the teaching and learning processes. It has to be argued though, that against all odds, the centre seems to operate efficiently, and that given a situation in which the basics of this centre were incorporated into a comprehensive, architecturally designed environment, the success of the centre could be twofold.

9.4 CASE STUDY 4:
COASTAL COLLEGE DURBAN ADULT EDUCATION CENTRE
Franks Road, Durban, South Africa.

9.4.1 Background and Issues

Coastal College Durban Training and Education Centre is an organisation that has set up a number of different colleges in and around the greater Durban area. The centre caters for adult learners that have not had equitable access to education and offer programmes that are relevant and aimed at gaining a skill in a chosen field.

A large portion of the courses offered are aimed at females, which is different to that of other case studies, which aim their skills courses generally at males (Goswell, 2010: Discussion on Facilities of Coastal College Durban Adult Education Centre [interview] Personal Communication: 4 May 2010).

9.4.2 General Location

The Coastal College Durban Adult Education Centre is located off Umbilo Road in Durban, KwaZulu - Natal. The Durban College is a merger of the former Durban Technical College and Swinton Road Technical College. The college is well known for catering for unemployed adults, out of school youth, and then placing them as project linked trainees in suitable jobs. People enrolled in the centre range from learners with low educational backgrounds to those that are seeking the opportunity to enhance their educational level.

The aim of the merger of these two campuses is to position itself to be able to take leadership in addressing socio – economic needs of the broader community, through innovative training and the delivery of specific, appropriate courses.

9.4.3 Building Type

The centre has an array of facilities including a number of larger rooms for the training of practical fields such as electronics and tool making, and then a number of smaller classrooms that are used to cover the theory components of these subjects.

9.4.4 The Client

This centre is set up by the department of education and is therefore a solely government funded initiative. The government has recognised the huge gap in skills within our country and so this campus is an example of how the government aims at tackling the skills shortage problem in our country.

9.4.5 The site

The site is located in Franks Avenue (see fig 9.4.5.1) in Umbilo Road, Durban. The building is located very near to main traffic networks, and this is very appropriate due to the fact that many of the students enrolled in the centre do not have their own transport, and hence have to make use of public means. This also enables the centre to cater for learners that do not necessarily stay in and around the immediate vicinity of the Coastal College Durban Adult Education Centre.



Fig 9.4.5.1: Aerial photograph showing the location of the Coastal college Durban Training and Education Centre. (Source: Retrieved from www.durban.gov.za/durban/discover: 14 May 2010)

The Centre has two main entrances. There is a main entrance in the South off Jameson Crescent, and a secondary entrance for staff and pupils off Franks Avenue in the North. This is appropriate as these are quieter secondary roads off the main transport node - Umbilo Road.

9.4.6 Response to Context

The Coastal College Durban training Centre makes use of an old high school education building (Goswell, 2010: Discussion on Facilities of Coastal College Durban Adult Education Centre [interview] Personal Communication: 4 May 2010). It is rather a situation where the centre rather fits into the building, instead of the building best being designed to suit the learner's needs from an accommodation and design comfort aspect.

9.4.7 Accommodation

As one enters through the reception, the learners access the campus via a secondary entrance into the main circulation corridor. This corridor forms a very dark and uninviting first encounter with the facility (see fig 9.4.5.2). Learners just seem to mingle in and around the corridor, being a result of the fact that there is no other area such as a cafe or garden in which to sit.

The centre is spread over four floors, and courses that are catered for within the centre include beauty technology, tool and die making, hairdressing, engineering and electrical courses, and jewellery design (refer to Appendix C).

Vertical circulation through the building is achieved by a series of open concrete stair cases or a concrete ramp (see fig 9.4.6.1)



Fig 9.4.5.2: The uninviting Corridor one is first greeted with as they enter the centre. (Source: By Author, 2010)



Fig 9.4.6.1: The concrete ramp is used for disabled access to the upper floors. (Source: By Author, 2010)



Fig 9.4.7.1: The furniture inside the classrooms is formerly structured with little manipulation possible. (Source: By Author, 2010)



Fig 9.4.7.2: The interior of the beauty therapy Training room – one of the best suited rooms in the centre for its function. (Source: By Author, 2010)

that caters for wheelchair access.

Classrooms are uniformly sized with only a couple, usually at the end of the passageways, being slightly larger and being used to house practical tasks such as the hairdressing studio and the beauty therapy classes (see fig 9.4.7.2 and 9.4.7.3). In the theory classes, desks are arranged in a uniform nature all facing the front, with little opportunity to manipulate the desks in any other fashion, so as to facilitate different forms of communication and interaction among students and educators (See fig 9.4.7.1).



Fig 9.4.7.3: Interior of the hair dressing studio. (Source: By Author, 2010)

The computer and IT centre (See fig 9.4.7.4) is located on the first floor and is adequately equipped but not artificially ventilated. In an IT centre, it is important that there is an air conditioner, due to the fact that with a large facility such as this, a large build up of heat occurs. While it is important to create a cool environment so as to ensure the computers run at a cool



Fig 9.4.7.4: The IT Centre. (Source: By Author, 2010)

temperature, it is also important that the environment is cool so that the adult learners are comfortable while learning. However, this is not possible due to a funding problem (Goswell, 2010: Discussion on Facilities of Coastal College Durban Adult Education Centre [interview] Personal Communication: 4 May 2010).



Fig 9.4.7.5: The Carpentry Workshop is well lit. (Source: By Author, 2010)

Located on the first and second floors are mechanical and carpentry workshops, as well as other theory classrooms and tool making rooms (See fig 9.4.7.5).

9.4.8 Structural Form

The architecture of the building is very institutional and not very conducive for the teaching of adults.



Fig 9.4.7.6: The building is not related to the human scale at all, and tends to be very intimidating and daunting. (Source: By Author, 2010)

There is an overbearing hierarchy to the structure (see figure 9.4.7.6), and little if any alteration to the building has been carried out since the function of the building changed from a high school to that of a facility for the teaching of adults.

The structure is generally constructed of load bearing brick work. The size and scale of the building is rather overbearing, and does not relate to the human scale at all. The form of the building comes across as quite intimidating and there is very little evidence in attempting to soften the site with any landscaping or use of vegetation. The site is therefore harsh and any landscaping that is evident generally takes the form of hardy shrubs, patches of unkempt grass and palm trees.



Fig 9.4.8.1: Possibly the only imaginative use of light in the entire campus. (Source: By Author, 2010)

The building too appears to be very rigidly structured, resulting in a learning environment that somewhat mimics this sentiment.

Perhaps the only creative aspect of the building is evident in the foyer area, where light has been imaginatively manipulated to come through a series of coloured glass panels, resulting in a hue of colour that fills the interior admin spaces (see fig 9.4.8.1).

9.4.9 Theoretical Discourse

In Heimstra's checklist for analysing the learning environment (Refer to Appendix A), he outlines a number of factors that one can use so as to judge an environment according to its suitability for the teaching and learning processes for adults.

This centre has not taken many of these points into consideration, and is poorly suited for its function of adult learning. One such example is the use of adjustable seats for alternative use, but in the classrooms, desks are formerly arranged in rows with little flexibility possible. Another example the list makes mention of, is the fact that one should pay special attention to sensory elements within the learning environment, such as adequate temperatures, acoustics and absence of glare, but little evidence of proper consideration of these design factors is apparent.

9.4.10 Empirical Data

This research took the form of a site visit, in which a meeting was set up with Mr Goswell on the 4th May 2010 who is the Tooling manager at the Coastal College Durban Training Centre.

A series of photos were taken of the building and facilities and an analysis was carried out observing the learners as they went about their tasks. Observation of physical traces were then recorded and analysed, which forms the basis of this case study.

9.4.11 Conclusion

This centre, although its intentions are good, is extremely poorly equipped and suited for the success of the learning and teaching processes for adults. Mr Goswell (Goswell, 2010: Discussion on Facilities of Coastal College Durban Adult Education Centre [interview] Personal Communication: 4 May 2010) makes mention of the fact that although most facilities are catered for, the facilities are not at all suited to the function of each particular course, but rather one has to make do with the facilities to the best of their abilities, as there is a lack of funding by the government.

9.5 CASE STUDY 5:

ICC DURBAN ARENA

Durban, South Africa: *ZAI Architects – Robin Herbert*

9.5.1 Background and Issues

This case study is being carried out in this research purely as an example of how the architects have achieved flexibility of use in a large arena so that the facility can be used for a variety of functions and uses, and how the brief and schedule of accommodation for a flexible building such as this was formulated. What this flexibility achieves is to ensure that it can be manipulated to whatever the requirements of the use may be at any given time, so as to ensure longevity of the building and sustained use of facilities. Although this building is large and complex in scale, the fundamental architectural principles behind the design are the same.

9.5.2 Flexibility of Space

The arena was designed in such a manner so that the internal spatial organisation could be flexible allowing for simultaneously held events which allow for the optimum utilisation of the meeting spaces (ICC Arena Design Report, 2004: 23). What this does is vastly improves the business model (Herbert, 2010: Discussion on

Facilities of the Durban International Convention Centre Arena [email] - Personal Communication: 13 May 2010). Flexible halls allow for rapid turnaround times so that the set up between conferences, community meetings and exhibitions are reduced, making the arena space far more economically viable (See fig 9.5.1.1 and 9.5.2.1).

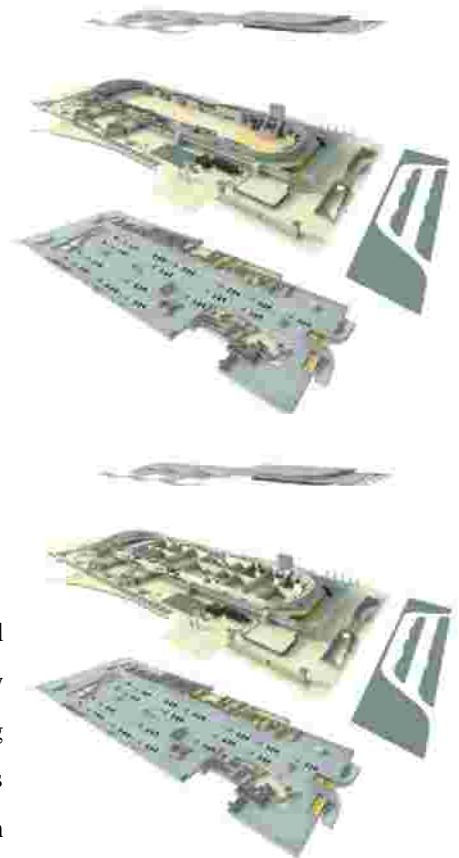


Fig 9.5.1.1: Diagrammatic 3D perspective of the Arena, showing the space as one large arena (Top) or split into various functions (Below) (Source: ZAI Architects)

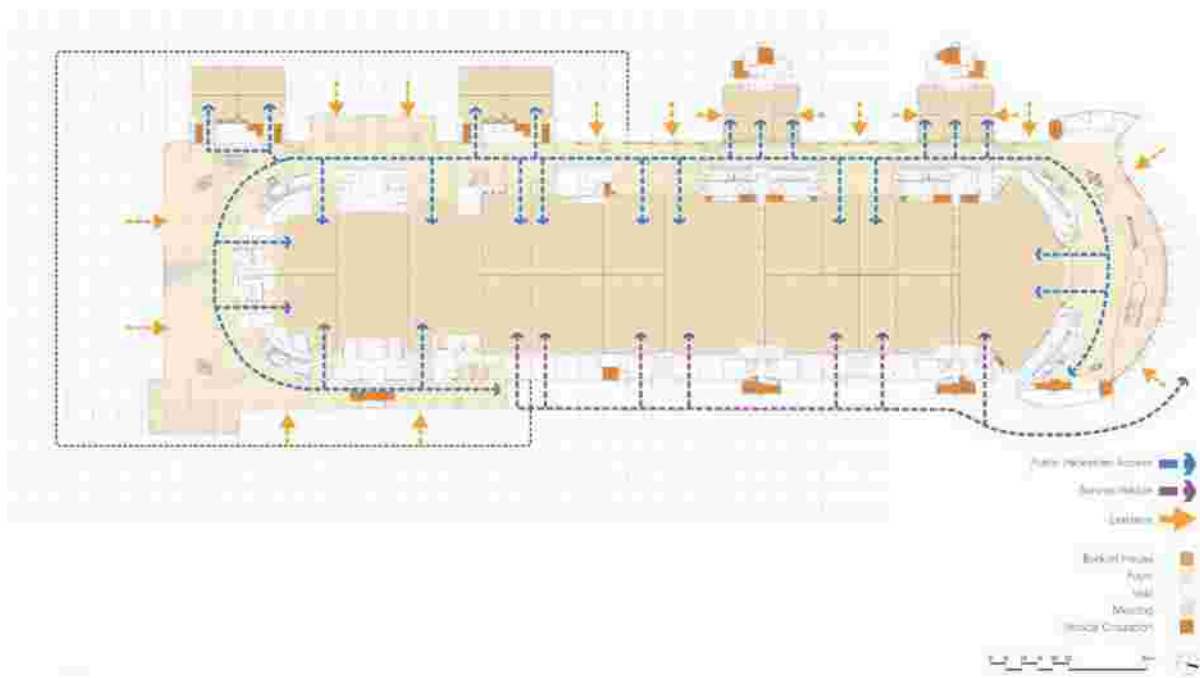


Fig 9.5.2.1: Ground Floor Plan of the arena, showing access into the arena from the simple support spaces as well as the various spatial configurations brought about by the operable panels. (Source: ZAI Architects - ICC Durban Arena Design Report, 2004: 110)

9.5.3 Structural Form

Although this arena is obviously massive and complex in scale, the general characteristics of the multipurpose hall are essentially the same. The panels that were specified so that the arena could be flexible to whatever configuration was needed, as in figure 9.5.3.1, are the extreme case, due to the nature and scale of the project.

The panels (See fig 9.5.3.1 and 9.5.4.1) that were specified were driven by acoustic considerations regarding noise transfer from one space to another (Herbert, 2010: Discussion on Facilities of the Durban International Convention Centre Arena [email] - Personal Communication: 13 May 2010).



Fig 9.5.3.1: Installation of the Various Panels. (Source: ZAI Architects - Usher, V: 2006)

This is of vital consideration should two functions be occurring at the same time. The scale of the panels were also compounded by the hall volume (Herbert, 2010: Discussion on Facilities of the Durban International Convention Centre Arena [email] - Personal Communication: 13 May 2010).

9.5.4 Brief Derivation

This building typology has no finite brief. The market is continuously developing while it adapts to new industry needs and demands (ICC Arena Design Report, 2004: 30). Therefore the design of the building had to ensure that it could adapt to the various demands of the occupants (ICC Arena Design Report, 2004: 30).

Although the current demands and expectations have formulated the current brief, the building has been designed for maximum flexibility (ICC Arena Design Report, 2004: 30). The key elements that the public come into regular contact with meet their optimum needs and have been installed permanently, while other elements that have variable demands make use of temporary or flexible installations (ICC Arena Design Report, 2004: 30).



Fig 9.5.4.1: The acoustic panels allow for a variety of spatial configuration to take place within the larger master space. (Source: ZAI Architects - Usher, V: 2006)

9.5.5 Empirical Data

This research took the form of a site visit, in which a meeting was then set up with Mr Usher on the 11th May 2010 who is responsible for a large amount of design on the ICC Durban Arena. Email communication was also made with Robin Herbert, who is the architect. A Physical interview was not possible, due to the fact that he is based in Melbourne, Australia.

A series of photos were taken of the building and facilities and an analysis was carried out using observation techniques. Observation of physical traces were then recorded and analysed, which forms the basis of this case study.

9.5.6 Conclusions

This building has been studied as an example of how flexibility of space can be incorporated into a structure so that the building is sustainable and economically viable, so that it serves a community in a resourceful, progressive manner over the period of its life.

This building typology can host an array of functions, and although the centre that one is proposing in this research is to be far smaller in scale and complexity than this building, a lot of the principles that it employs is worthwhile studying, learning from, and implementing.

CHAPTER 10: ANALYSIS AND DISCUSSION

10.1 Informality and Comfort in the Design of Learning Spaces for Adults

An adult learner learns best when the environment is informal, casual and relaxed. The environment cannot be too structured or hierarchical, as is the case for child or adolescent learners. The environment needs to portray the feeling that the adult learner is on the same level as the educator, where a mutual relationship is entered into, and this encourages mutual interaction between not only learners and teachers, but also amongst fellow learner, and it is through this collaborative, comfortable interaction that the best learning outcomes are achieved.

One of the keys to creating an environment required to break down alienation and apprehension for adult education is to create an environment that portrays informality. To achieve this, spatial relationships amongst buildings are relaxed, with no formal axial relationships or formal spaces. In the adult education Centre, for Rossing Foundation, the interconnection between spaces is casual and relaxed, allowing people to slip in and out of spaces as they please.

The architectural challenge is exactly this – to create an informal environment that the adult feels most comfortable to learn in. The adult, as discussed in this research, can often feel intimidated by the learning environment, as it is quite intimidating to come back into the learning environment after a substantial period of time. Therefore the environment needs to be architecturally designed in order to promote a relaxed, informal physical setting that is friendly, open, spontaneous and accessible. This is the architectural environment that is best conducive to the teaching and learning processes of the adult. The design of the spaces needs to be democratic and flexible to the wants and needs of the adult learner, so that the adult is comfortable enough in the environment to express his own thoughts and ideas on a mutual level without the fear of being judged by his peers and educators.

Essentially, the architectural challenge is to design space that is open, democratic and challenging, but non – threatening to the adult. This allows him to feel that he is contributing to his own educational outcome, and this ensures a successful learning and teaching outcome.

10.2 Accessibility and Legibility of Architectural Form

One must create buildings that people can easily inhabit. The main entrance should be clearly demarcated and the circulation system made apparent. The different functions of the complex must be formally recognisable and the buildings must be both accessible and legible. The sections of the centre should therefore be modelled so as to create comfortable, human proportions giving a sense of scale between people and the architectural environment. The sections should be designed to maximise usage by providing both built – in features and partitioning systems which allow for alternative functions.

The main entrances to the centre should be strongly differentiated from its immediate surroundings. The centre could be spread across the site and the landscape defined by the buildings around it. The buildings form a series of courtyards comprising a major courtyard and a series of smaller, more intimate courtyards for semi public gatherings. The landscape should be designed to become an integral part of the spatial system of the centre, and to serve pedagogic purposes. In turn, these areas are used to support teaching programmes run by the centre, and the centre should be designed in such a way as to achieve optimum comfort levels in terms of light and temperature in all workrooms.

At the Umlazi V Adult Education Centre, there was simply no order at all to the organisation of the facilities on the campus. This resulted in a very disjointed architecture with students just mingling around, with no clear path or direction. At the College of New Caledonia – John A. Brink Technical Trades and Technology Centre though, the brief consisted of a range of facilities, including specialised shop areas for carpentry, wood technology and electrical training, in plan, major programme areas are designed around clear and simple circulation areas connecting the two main building entries. The simple and orderly plan allows for easy reconfiguration in the future, and shop areas are designed to maximise their available open space, facilitating equipment reconfigurations as the need arises.

What the design of an adult education therefore calls for is an array of facilities. There must be a comprehensive mixture of spaces for learning – both spaces for practical skills training and also innovative spaces for the theoretical component of classes as well. These spaces must allow for imaginative use and arrangement of furniture, that encourages interaction and discussion, as it is in this way that adults learn the best.

10.3 Community Revitalisation and Public Engagement

The street edge needs to be designed so that it is an active edge and promotes activity. The architect therefore needs to deal with this aspect of the design in a sensitive manner, so as to blur this boundary. This can be achieved by taking into account which edges of the site are active, busy edges and which are the more subdued edges. Stimulation at the active edges of the site would encourage people to interact with the centre, and in this way, people are not intimidated by the structural form of the building.

People need to be given a sense of indirect ownership and responsibility towards the building. What this also achieves is a deterrent towards vandalism. This needs to be seriously considered by the architects, but if the community feels part of the centre from the outset, this is unlikely to occur. The centre is seen as a sense of revitalisation of the community, and so anyone disrespecting it would be frowned upon.

10.4 Structural Form

The building needs to relate to the human scale as much as possible. People need to be made to feel welcome, and the building should not feel intimidating to the newcomer, and should be easily legible within his frame of reference.

There are obviously times that a complexity of scale is unavoidable, but then steps need to be implemented so as to limit its affect on the user of the space. As in the Tembaletu Trust Community Education Centre, the building is comprised of different scales, but the architect dealt with this by creating a low level roof structure covering the wrap around veranda that forms the linking mechanism in the design of the centre.

The structure of a building can dramatically influence future development and revitalisation of a community as well. The centre should be designed in such a way that it can easily facilitate future expansion. The single most important fact when one considers expansion of a centre is that it should not affect the day to day functioning of the centre at all. The aim of the architect therefore is to pursue a layout in which future additions would occur as separate buildings that are detached from any existing buildings. The form chosen to facilitate this could be a series of circulation spines along which rooms can be added as independent detached units. It is essential to provide a clearly defined spatial focus, and gathering space in the layout. This could come in the form of a large central

courtyard fronting onto a community park at the centre line of the axis, which centres the design and acts as a focal point for the centre, initiating conversation and promoting cross cultural pollination

10.5 Flexibility of Form

An adult learner learns best when the environment is flexible to his or the groups needs at any given time, so as to suit the task being carried out at that particular time. However, this notion of flexibility cannot be carried to far; otherwise the building becomes illegible and confusing. Flexible elements should only be incorporated within the design simply to enhance the learning experience, and should be accompanied by simple support spaces within the design.

This flexibility can be achieved in many ways. In the Adult Education for Rossing Foundation, change is given high priority, both as flexibility for future addition, and also in possibilities for flexibility. The modular nature of the unit makes incremental development possible.

In the Sendai Mediatheque however, this notion of flexible space is dealt with differently. Out of Ito's system emerged a new form of flexible space free from constraints of structural grids, service cores and set ceiling heights. To take full advantage of this openness, Ito avoided boxy rooms and fixed partitions wherever possible, favouring glass panels, movable curtain walls, and temporary panels where explicit separations were required, resulting in blurred boundaries instead of solid barriers. Ito believed that designating room spaces specific to function limits free action, and that when designing the Sendai Mediatheque, he wanted the building to allow people to discover new places and uses for themselves. While Mediatheque's transparent or flexible walls act somewhat like furniture, on the other hand its custom furniture works almost as walls. Architectural in scale, the pieces define and create a sense of place as well as underscore functional distinctions without limiting other possible uses.

10.6 CONCLUSIONS AND RECOMMENDATIONS

10.6.1 Collaborative Learning

In the case studies that have been studied, too often classroom spaces are one dimensional in their interpretation of learning. Adult education is a group learning experience and so the design of the educational environment for adults needs to facilitate this, so that knowledge is socially constructed. What is evident is that there are very seldom opportunities for the manipulation of furniture in the classroom, so as to facilitate different types of learning experiences and teaching methods. Classrooms seem to be too small and overcrowded, but in many cases this is as a result of having to make the most out of available resources.

10.6.2 Harsh Learning Environments

In most of the case studies, it can be deduced that although facilities are essentially all there (in particular the Umlazi V Adult Education Centre); they tend to be quite run down and neglected.

In all the case studies that have been studied, there is an overwhelming sense that the intentions behind the all the adult education centres are great, but their full potential are being seriously compromised due to a huge lack of funding. In most cases these centres are government run and funded initiatives, and to curb this lack of funding, most of these centres are retrofit projects that are being forced to make do with facilities that are just not suited to the teaching of adults, with little, if any architectural input into the design of these learning environments.

The notion of adult learning is not being approached in the correct manner, as what is evident in the case studies is that the environments are not comfortable at all, and do very little to aid the teaching and learning process of the adult.

Very often they are merely functional, cold spaces, with very little thought given to the notion of spaces that encourage communal learning – the environment that the adult thrives in. The adult learns best in a social environment, but in the majority of the case studies the environments are extremely hard and uninviting. The learning environment therefore needs to be softened, with lots of landscaping, creating an informal learning environment that the adult can thrive in. He therefore feels comfortable to express his own thought processes, hence feeling as if he is contributing to his own learning outcomes and gaining the most out of the learning process.

10.6.3 Questionnaire Conclusions

Birth Date and Gender:

Male: 46.66%

Female: 53.33%

For the Research, it was aimed to target adults in particular, with as much of a 50/50 split as possible between female and male.

Race:

Candidates were chosen as randomly as possible.

Current Activities:

There is a wide range of Activities that the candidates were involved in, but most were menial tasks due to the fact that the majority were uneducated.

Reason to Study Further:

The majority of candidates wanted to gain a skill in order to get a better job, hence earning more money.

Highest School Year Achieved:

Candidates Range from Leaving School between matric, as young as Grade 9 or std 7

Preferential way to Learn:

Practical task orientated: 73%

Practical & theoretical: 27 %

The Architectural design of the Environment, and the facilities and accommodation offered must accommodate these statistics, and be orientated towards practical, task based learning, with some theoretical component as well.

Preferential Learning Environment:

Light, airy, informal flexible Environment:	73%
Normal formal classroom Environment:	20%
Outdoors in an open classroom:	7%

It is clear from the results that an adult prefers to learn in an informal, flexible and relaxed learning environment, with negative connotations associated with the formal style classroom, due to previous learning in childhood.

Afford Extra Studies:

Not many of the Candidates could afford extra studies.

Preferred Method of Transport:

Bus:	20%
Taxi:	60%
Train:	8%
Car:	6%

Better Supplied:6%

The majority of candidates use taxi, bus and Train Transport, and so the site and proposal must accommodate this.

Proposed Further Study:

The Majority of the proposed study subjects are orientated towards practical skills and the construction and services industries.

10.7 CONCLUSIONS TOWARDS THE DEVELOPMENT OF A DESIGN BRIEF

10.7.1 Site Choice and Accessibility

With particular relevance to the KwaZulu – Natal situation, the CETA centres that have formed the basis for the case studies of this research, have been created all over the province, and so this has led to many centres that focus only on one or two aspects of practical skills education. As a result of this, the education department is trying to fund a number of different centres, leading to lack of funding of these centres, resulting in quantity of education, as opposed to quality of education. This is particularly evident in many of the case studies that have been examined in this research, in that the potential of the campus is there, but due to lack of funding, their full potential is not being realised.

It is possible that such a centre be placed within a township environment, but through thorough analysis it has been deduced that then the centre would only be accessible to a select few, or that immediate community. Within an urban environment, the centre is accessible via established transport nodes, to anyone who wishes to attend such a centre, and this is why the notion of accessibility has played such a pivotal role in the selection of the sites.

10.7.2 Building Typology

Therefore a centre that involves the incorporation of many skills programs, in a sense a mega-campus is proposed. This would solve the problem of having to have a series of smaller, almost one dimensional campuses eating into the very precious funding of the government. This is particularly evident in many of the case studies that have been examined in this research, in that the potential of the campus is there, but due to lack of funding, their full potential is not being realised.

The best placement of a centre such as this, by analysing the case studies, therefore seems to be within the inner city limits of major cities, as a centre such as this certainly cannot exist in isolation. It is critical that the centre be placed in an established urban framework off which it can feed and thrive.

10.7.3 Funding

It is blatantly evident that there is not a lot of architectural input that has gone into these centres for adult education. Again, this is a cost cutting initiative, but the thought then occurs that with sufficient funding and some architectural intervention, and through applying some theoretical discourse with regard architectural design for learning spaces, these centres could be far more successful than they are at present. A centre such as this definitely needs to have some sort of association with the government, as they obviously play a pivotal role in the education system of South Africa. However, by analysis of case studies, it is also necessary that a private enterprise such as a large corporate enterprise be involved with such a project, as they can provide the funding that is necessary for the success of such a centre. How they benefit from their association, is that as they are seen to be training people and creating skilled people in the process, they are then able to get rebates from the government.

10.7.4 Spatial Organisation

The research has outlined a couple of key points that a centre such as this has to incorporate. The design calls for an informal relationship between spaces, with no heavy linear or axial relationships dictating movement patterns throughout the building. Streets with heavy pedestrian activity serve as entrances into the public realm and ensure that people can interact with the building at street level. This ensures that people are not intimidated by the building and the functions that occur inside, while also creating activity which serves the dual purpose of passive surveillance for the centre.

Service access should be off a quieter street and out of site from the student and public. It also has to be noted that as the research points to a facility that needs to be flexible to the adults' needs as they learn various things, the primary function of facilities still needs to be blatantly evident to the user of the space. If this is not the case, it can lead to a confusing environment for the learner, hindering the learning process.

REFERENCES

BOOKS

Alexander, C (1977) *A Pattern Language – Towns, Buildings, construction*. New York: Oxford University Press

Bramble, C (2003) *Architects Guide to Feng Shui* Oxford: Architectural Press

Bubner, E. Medlin, L. Otto, F direction. (1975) **Expanded Report on the international colloquium ADAPTABLE ARCHITECTURE – A Collection of Papers from Various Authors: Bubner, E, Medlin, L** Stuttgart: Druckerei Heinrich Fink KG

Buschman, J & Leckie, G (In collaboration) (2006) *The Library as Place – History, Community & Culture*. Westport, Connecticut London: Libraries Unlimited Publishing.

Canter, D (1974) *Psychology for Architects – Architectural Science Series* England: Applied Science Publishers Ltd

Ching, F.D.K (1943) *Form Space and Order*. New Jersey: Wiley John and Sons

Claude, D (1987) *Cited in* Criticos, C & Thurlow, M (1987) *Design of Learning Spaces* Durban: Media Resource Centre, University of Natal

Craig, A (1987) *Cited in* Criticos, C & Thurlow, M (1987) *Design of Learning Spaces* Durban: Media Resource Centre, University of Natal

Criticos, C & Thurlow, M (1987) *Design of Learning Spaces* Durban: Media Resource Centre, University of Natal

Engel, H (1964) *The Japanese House: A Tradition for Contemporary Architecture* Vermont: Charles E. Tuttle Company Inc

Flade, A (2002) *Psychological Considerations of Dwelling*. In Schwartz-Clauss, M ed. *Living in Motion: Design and Architecture for Flexible Dwelling* Weil am Reim: Vitra Design Museum

Frean, R & Calderwood, DM (1959) *Colour and the Child – colour and its contribution to school and hostel buildings* Pretoria: South African council for Scientific and Industrial Research

Galbraith, M.W (1990) *Adult Learning Methods* Malabar Florida: Robert E. Krieger Publishing Co, INC

Gehl, J (2001) *Life Between Buildings: Using Public Space* Copenhagen: Architektens Forlog

Goethe, J. W (1973) *Theory of Colours* London: MIT Press

Gordon B.F ed. (1974) *Interior Spaces Designed by Architects* USA: McGraw- Hill

Gravett, S (2001) *Adult Learning: Designing and Implementing Learning Events – A dialogic Approach* Pretoria: Van Schaik Publishers

Hauf, H.D, Koppes W.F, Green, A.C, Gassman, M.C, Haviland, D.S (1971) *New Spaces For Learning: The Design of College Facilities to Utilize Instructional Aids and Media*. Centre for Architectural Research

Indabawa, S and Mpofu S (2006) *The Social Context of Adult Learning in Africa* Cape Town: UNESCO Institute for Education and Pearson Education

Knowles, M (1973) *The Adult Learner: A Neglected Species Second Edition* Houston Texas: Gulf Publishing Company

Kronenburg, R (2002) Modern Architecture and Flexible Dwelling. In: Schwartz – Claus, M (ed) *Living in Motion: Design and Architecture for Flexible Dwelling* Weil am Reim: Vitra Design Museum

Lave, J and Wenger, E (1991) *Situated Learning: Legitimate Peripheral Participation* Cambridge: Cambridge University Press

Long, H. B Galbraith M.W ed. (1991) *Understanding Adult Learners* Florida: Krieger Publishing Company

Lynch, K (1979) *The Image of the City* Massachusetts: M.IT Press

Mahnke, F & Mahnke, R.H (1987) *Colour and Light in Man Made Environments* New York: Van Nostrand Reinhold

Merriam, B & Caffarella (1991) *Learning in Adulthood* San Francisco: Jossey – Bass Publishers

Mezirow, J (1991) *Transformative Dimensions of Adult Learning* Oxford: Jossey – Bass Publications

Oblinger, D.G ed. (2006) *Learning Spaces* USA: Educause

Otto, F dir. (1975) **Expanded Report on the international colloquium ADAPTABLE ARCHITECTURE – A Collection of Papers from Various Authors: Bubner, E, Medlin, L**
Stuttgart: Druckerei Heinrich Fink KG

Porter, T & Mikellides, B (1976) *Colour for Architecture* London: Cassel & Collier Macmillan Publishers Ltd

Stein, D.S & Imel, S ed. (2002) *Adult Learning in Community, New Directions for Adult and Continuing Education* San Francisco: Wiley Subscription Services

Stephenson (2003) *The Architecture Time Charts – World Architecture from Prehistory to the Skyscraper* United Kingdom: Worth Press Limited

Sutcliffe, M (1987) *Cited in* Criticos, C & Thurlow, M (1987) *Design of Learning Spaces* Durban: Media Resource Centre, University of Natal

Too, L (1996) *The Complete Illustrated Guide to Feng Shui – How to Apply the Secrets of Chinese Wisdom for Health, Wealth and Happiness* Great Britain: Element Books Limited

Trancik, R (1986) *Finding Lost Space* Victoria: Van Nostrand Reinhold

Wenger, E (1998) *Communities in Practice: Learning, Meaning and Identity* Cambridge: Cambridge University Press

Zeisel, J (1981) *Inquiry by Design: Tools for Environment – Behaviour Research* Cambridge: Cambridge University Press

Zuk, W & Clark, R.H (1970) *Kinetic Architecture* New York: Van Nostrand Reinhold

DISSERTATIONS

Hartl, L (2008) *Adaptable Architecture for an Evolving Educational System: Design of Facility for Adult Basic Education and Vocational Training in the Greater Warwick Junction Precinct* M.Arch Dissertation. Durban: University of Kwa Zulu Natal

Herwood, A.L (1994) *A Skills Training and Development Centre* Post Graduate Diploma in Architecture. Durban: University of Natal

Nathoo, R (2009) *A Case study Investigation into the Identity Constructs of Adult Educators and Adult Learners Involves in the Certificate in Education* Master of Education. Durban: University of KwaZulu Natal

JOURNALS

Human Resource Development (1993) *Planning for transition* **DEVELOPER** vol 5 (June)

Liu, C.H and Matthews, R (2005) *Vygotsky's Philosophy: Constructivism and its criticism examined* **INTERNATIONAL EDUCATION JOURNAL** 6 pg 386 - 399

Merriam, S (2004) *The Role of Cognitive Development in Mezirow's Transformational Learning Theory* **ADULT EDUCATION QUARTERLY** 55 (1) November pg 60 - 68

Momberg, C (1982) *Adult Education Centre, Namibia for Rössing Foundation.* **ARCHITECTURE SOUTH AFRICA** December 1982 pg 61

Pollock, N (2001) *Toyo Ito Imagines what the Future of Information and Digital Technologies might be, then Builds it in Sendai, Japan, at Mediatheque.* **ARCHITECTURE RECORD** No. May 2001 pg 190 - 201

Smuts, C (2002) *Zolani Multi – Purpose Centre, Nyanga, Cape Town November 2002.* **ARCHITECTURE SA** July/ August 2003 pg 8 - 13

Stobie, G (1991) *Tembaletu Community Education Centre.* **INNOVATION** No 3 December pg 33 - 34

Taggart, J (2006) *Outside the Box.* **CANADIAN ARCHITECT** No. 10 October pg 39 – 42

Vygotsky, L (2004) *Imagination and Creativity in Childhood.* **JOURNAL OF RUSSIAN AND EAST EUROPEAN PSYCHOLOGY** No 42 Jan Feb 2004 pg 7

Young, E (2004) *Spot the Difference.* **RIBA Journal** February pages 30 – 34

No Author (1993) *Traansvaal Duduza Resource Centre – Jo Noero.* **ARCHITECTURE SA** Nov/ Dec 1993 pg 39

No Author (1994) *Libraries and the Like Duduza Resource Centre.* **ARCHITECTURE SA** May/ June 1994 pg 27 - 30

No Author (1999) *Learning and Arid Country* **SA ARCHITECT** February pages 36 – 38

RESEARCH PAPERS

European Association for the Education of Adults (2006) *Adult Education Trends and Issues in Europe*

McNamara, K & Pike, G (1980) *Adult Education Centres: An Analysis of Precedent of Adult Education in South Africa and Zimbabwe* Windhoek: The Rössing Foundation

Winship, G.A (1992) **Principles and Processes in Appropriate Non – Formal Education for Self – Sustaining Community Development**

COMPANY PUBLICATIONS

CETA Information Brochures (2010), from personal communication with CETA Offices (Musgrave Road, Durban.)

Tembaletu Resource Centre (2008) *Tembaletu Trust Annual report 2008* (from meeting with Mr Richard Rangiah – April 8th 2010 – 14:00

ZAI Architects, (2004) *ICC Durban Arena Final Design Report* Prepared for Ethekwini Municipality

Othandweni Advertising Pamphlet – For Centre advertising, obtained from Mike Human: From Interview on 10 May 2010

GOVERNMENT LITERATURE

Gordhan, P (2010) *Minister of Finance Budget Speech* Government Literature accessed from Personal Communication [email] with Samantha Enslin 18 February 2010

INTERNET

Amimo, C (2009) *The Characteristics and Impact of African Traditional Education Available from:*

<http://www.articlesbase.com/education-articles/the-characteristics-and-impact-of-african-traditional-education-752852.html>

[Accessed 19 May 2010]

Brunette, H.C (2006) **Technical Education in Namibia: Past Trends, Present Circumstances and Future Prospects** PhD Thesis. University of the Free State (Internet) Available From:

<http://etd.uovs.ac.za/ETD-db/theses/available/etd-06132007-112613/unrestricted/BrunetteHC.pdf>

[Accessed 17 August 2009]

FAO – Traditional Education FAO Corporate Document Available from:

<http://www.fao.org/docrep/t6260e/t6260e04.htm>

[Accessed 19 May 2009]

Hiemstra, R & Brockett, R (1994) **From Behaviourism to Humanism: Incorporating Self Direction in Learning Concepts into the Instructional Design Process** Available from:

<http://www.distance.syr.edu/iiindex.html>

[Accessed 21 August 2009]

Heimstra, R (2001) **A Checklist for Analysing the Learning Environment**. Available from:

<http://www-distance.syr.edu/lechecklist.html>

[Accessed 13 March 2010]

Knowles, M.S (no date) **The Modern Practice of Adult Education: from Pedagogy to Andragogy**

Cambridge: Cambridge Adult Education Available from:

http://www.hospitalist.cumc.columbia.edu/downloads/cc4_articles/Education%20Theory/Andragogy.pdf

[Accessed 21 August 2009]

Lieb, S (1991) **Principles of adult learning** Available From:

<http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/adults-2.htm>

[Accessed 16 August 2009]

Portela, C (2007) **Light and Architecture** Available from:

<http://www.starlight2007.net/pdf/proceedings/CesarPortela.pdf>

[Accessed 17 August 2009]

Rule, P (2006) **The Time is Burning. The Right of Adults to Basic Education in South Africa.**

Journal of Education. No 39 pp 113 – 135 Available from:

<http://www.unp.ac.za/cae/caepubs/joe39rul.pdf>

[Accessed 16 April 2010]

Rodgers, D. (2004) **Disembedding the City: Crime, Insecurity and Spatial Organization in Managua, Nicaragua.** Work Review online. Email: d.daley@ise.ac.uk Available from:

<http://eau.sagepub.com/cgi/reprint/16/2/113>

[Accessed 16 April 2010]

Steven Holl Architects Available from:

<http://www.stevenholl.com/project-detail.php?id=36&worldmap=true>

[Accessed 27 / 04 / 2010]

Durban City Maps Available from:

<http://www.durban.gov.za/durban/discover/history/our-town/introduction-to-our-town> -

[Accessed May 14 2010] *and*

<http://citymaps.durban.gov.za/website/master/viewer.htm>

[accessed 17 May 2010]

Grobler, J (2008) *Rossing Uranium - The Rossing Foundation Report – 30 1978 – 2008* Namibia:

The Rossing Foundation Available from: <http://www.rossingfoundation.com/publications.htm>

[Accessed 29 April 2010]

<http://www.sahistory.org.za/pages/hands-on-lassroom/classroom/pages/projects/grade12/lesson22/02-apartheid-legislation.htm> (Image)

[Accessed 14 September 2010]

http://www.rebirth.co.za/apartheid_segregation_bantu_education3.htm 2000 (Image)

[Accessed 25 April 2010]

<http://www.wiki.eu> (Image)

[Accessed 15 May 2010]

<http://www.leanlearning.wikispaces.com> (Image)

[Accessed 17 June 2010]

<http://www.members.cox.net> (Image)

[Accessed 22 September 2010]

Whole Building Design Guide: Productive Committee Design for the Changing Workplace

Available From: http://www.wbdg.org/design/design_change.php

[Accessed 17 August 2009]

The Annual Report of The State of the Drugs Problem in Europe - Social Reintegration –

Available From: <http://ar2005.emcdda.europa.eu/en/page078-en.html>

[Accessed 19 August 2009]

Adult Basic Education and Training Act 2000 (no.52) Cape Town, Government Gazette Available

From: www.info.gov.za/gazette/acts/2000/

[Accessed 20 August 2009]

Annual Report of the State of the Drugs Problem in Europe 2005 – Available From:

<http://ar2005.emcdda.europa.eu/en/page078-en.html>

[Accessed 12 February 2010]

INTERVIEW SCHEDULE

Masinga, Thulani; Head of Department Umlazi V Adult Education Centre, Umlazi, Durban - 13 May 2010

Goswell, Terry; Manager of Coastal College Durban Adult Education Centre, Durban – 4 May 2010

Rangiah, Richard; Executive Director of Tembalethu Trust Community Education Centre, Pietermaritzburg - 8 April 2010

Human, Mike; Training Manager of Othandweni Training Centre, Durban – 10 May 2010

Usher, Vic; Associate of ZAI Architects CC, Durban – 5 May 2010

Herbert, Robin; Director of ZAI Architects Pty Ltd Melbourne Australia.
[Personal Communication - Email]

APPENDICES

APPENDIX A – CHECKLIST FOR ANALYZING THE LEARNING ENVIRONMENT

Roger Hiemstra



April, 2001

Following is a checklist for analyzing various aspects of the learning environment.

SENSORY CONCERNS	SEATING CONCERNS	SOCIAL/CULTURAL CONCERNS
___ Adequate lighting	___ Adjustable seats or alternative choices	___ Overt or subtle gender discrimination existing
___ Absence of glare	___ Adequate cushioning if devices used for long periods	___ Overt or subtle age discrimination existing
___ Lighting adequate for A/V	___ Can person's legs be and decorations crossed comfortably	___ Overt or subtle racial discrimination existing
___ Attractive/appropriate colors	___ Straight back and flat pan for people with back problems	___ Facilitators trained for age, race, and gender sensitivity
___ Adequate acoustics	___ Adequate sturdiness/size	___ Sociopetal discussion/seating relationships facilitated
___ Adequate sound amplification	___ Easily moved around	___ Knowledge of various cultures and associated histories incorporated into learning
___ Any noise to be reduced or eliminated	___ Seat height from floor	___ Women learners disempowered or devalued in any way
___ Temperature adequate for season of the year	___ Left handed learner provided for	___ Learners whose first language is not English given extra time, help, counseling
___ Adequate ventilation or air adequate conditioning	___ All ergonomic concerns addressed	___ Barriers related to various social issues (male domination, child care needs, etc.) addressed

FURNISHINGS CONCERNS	GENERAL CONCERNS	PSYCHOLOGICAL CONCERNS
___ Adequate table or writing space	___ Adequate access/egress to site for learners	___ Learners helped to become acquainted with each other
___ Can furnishing be rearranged for group work	___ Adequate signage to direct learners to appropriate sites	___ Learners helped to feel at ease and relaxed
___ Table space available for refreshments/resources	___ Lavatory/cafeteria/refreshment machines nearby	___ Special attention given to the very first encounter with learners
___ If sitting at tables can the learners cross their legs	___ Adequate parking nearby	___ Barriers learners may face addressed by facilitators
___ Can tables be arranged in square, circle, or U shape	___ Adequate lighting in parking area and building hallways	___ Barriers learners may face addressed by administrators
___ Absence of ragged or sharp edges on furnishings	___ Adequate space shape and size in learning site	___ Learners helped to take more control of own learning
___ Adequate sturdiness for all furnishings	___ Breakout rooms/areas available if needed	___ Facilitators trained in adult learning literature and theory
___ Can learners see each other okay when seated	___ Does the learning site have flexibility	___ Facilitators trained in adult teaching techniques and theory

APPENDIX B – NCV EXAMINATION



education
Department:
Education
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

DRAWINGS, SETTING OUT, QUANTITIES AND COSTING
(First Paper)
NQF LEVEL 4

NOVEMBER 2009
(12011004)

23 November (Y-Paper)
13:00 – 17:00

REQUIREMENTS: Answer book and A2 drawing paper
Drawing Instruments may be used.
Calculators may be used.

This question paper consists of 6 pages, 2 diagram sheets and 1 reference sheet.

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Please turn over

**TIME: 4 HOURS
150 MARKS**

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. ALL drawings must conform to the latest SANS Codes of Practice (SANS 282: 2004; SANS 0144).
 4. Number the answers according to the numbering system used in this question paper.
 5. ALL drawings must be done neatly using drawing instruments.
 6. ALL work you do not want to be marked, must be clearly crossed out.
 7. Write neatly and clearly.
-

QUESTION 1: READ, INTERPRET AND PRODUCE SPECIALISED CONSTRUCTION DRAWINGS

- 1.1 Civil construction draughtspersons communicate their drawings by means of different types of lines. Draw an example of each of the following types of lines and state the purpose of these lines:

NOTE: Draw each line 150 mm long.

- 1.1.1 Break lines (4)
- 1.1.2 Centre lines (4)
- 1.1.3 Thick lines (4)

- 1.2 Give a brief description of a material list using the following headings:

- 1.2.1 What is a *material list*? (2)
- 1.2.2 What is the purpose for the material list? (2)
- 1.2.3 How does the material list differ from a bill of quantities? (2)

- 1.3 State why abbreviations are used in construction and civil drawings. (2)

- 1.4 TABLE 1 below shows various types of materials and components that are commonly used in construction drawings. Complete the TABLE by filling in the full wording or abbreviation in the blocks numbered (i) - (x). DO NOT copy the TABLE, write only the answer next to the question number (1.4.1 – 1.4.10) in the ANSWER BOOK.

	MATERIALS COMPONENTS	ABBREVIATIONS
1.4.1	(i)	RWP
1.4.2	Not to scale	(ii)
1.4.3	Mild steel	(iii)
1.4.4	(iv)	NF
1.4.5	Polyvinyl chloride	(v)
1.4.6	(vi)	DRG
1.4.7	(vii)	DPM
1.4.8	(viii)	Asph.
1.4.9	Concrete	(ix)
1.4.10	(x)	COL

TABLE 1

(20)

- 1.5 One of the methods used to ensure a water-free basement is the tanking method. Give a brief description of what *tanking* means and name any TWO membranes that are used in the tanking method.

(3 + 2)

(5)

- 1.6 FIGURE 1, DIAGRAM SHEET 1 (attached), shows a line diagram of a one-and-a-half brick wide (330 mm) basement wall reduced to a one-brick wide (220 mm) wall to receive a 100 mm thick RC floor.

Draw, to scale 1:10, a vertical section through the basement wall to indicate clearly the position of the vertical and horizontal damp-proofing and the surrounding construction.

SPECIFICATIONS:

Reinforced concrete foundation:	630 mm x 250 mm reinforced with Y16 main bars at 175 centres both ways	
Concrete surface bed:	100 mm thick resting on the foundation	
Sub-floor:	75 mm thick	
Top floor:	100 mm thick resting on the basement wall	
Damp-proof membrane:	Horizontal polythene sheeting sandwiched between the concrete surface bed and sub-floor. Vertical polythene sheeting 110 mm in from the external wall.	
Height between floors:	2 100 mm from the top of the basement floor to the underside of top floor	
Finishes:	19 mm plaster applied to the inside walls 25 mm screed applied to both the floors	(30)

- 1.7 Make TWO neat sketches to show the difference between *tension* and *compression* forces acting on a beam. (8)

- 1.8 FIGURE 2, DIAGRAM SHEET 1 (attached), shows an isometric view of a corner section of the balcony of a building. The structural elements consist of a concrete slab, up-stand beams, a T-beam and a column. DO NOT copy this view but draw the following to scale 1:20 in first-angle orthographic projection:

- 1.8.1 The front view as seen in the direction of 'F' (4)
 1.8.2 The end view as seen in the direction of 'R' (4)
 1.8.3 The plan view (3)

The completed drawings must be fully dimensioned. (4)

ALL the hidden details must be indicated. (2)

- 1.9 Give brief descriptions of the following types of reinforcing steel commonly used to reinforce concrete:

1.9.1 Plain round mild steel bars

(3)

1.9.2 High yield stress deformed bars

(3)

[106]

QUESTION 2: IDENTIFY, INTERPRET AND PRODUCE WORKING, REINFORCED CONCRETE DETAIL DRAWINGS

- 2.1 Explain why reinforcing bars need to be overlapped. (4)

- 2.2 FIGURE 3, DIAGRAM SHEET 2 (attached), shows the top view and a sectional front view of a reinforced concrete pad foundation and starter bars for a column. DO NOT copy these drawings, but copy and complete the attached bending schedule for TWO similar pad foundations and columns.

Use the following information:

- Base size: 1 950 mm x 1 950 mm
- Column size: 400 x 400
- Reinforcement: Base - Y16 and Y12
Column starter bars - Y12
Stirrups - R8 at 150 c/c
- Concrete cover to base: 50 mm
- Concrete cover to stirrups: 30 mm

HINT: Use the attached SANS 282 – 2004 reference sheet.

(20)

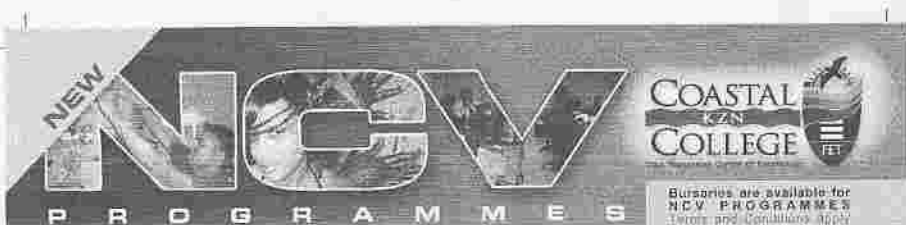
- 2.3 Draw to scale 1:10 a vertical section through the top FOUR steps and landing of a single flight staircase. The end of the landing is supported in the centre by a single 200 diameter concrete column.

Use the following specifications:

- Treads: 215 mm
- Risers: 165 mm
- Waist: 170 mm

Landing:	900 mm wide (measured from the front of the top step) and 150 mm thick.	
Column:	200 mm Ø. Show at least 450 mm of the top of the column.	
Reinforcement:	Y10 tension reinforcement at 150 centres and R8 distribution steel at 175 centres.	
Waist and landing:	6Y12 main bars and R8 helical binder at 150 mm pitch.	
Concrete column:	Staircase, landing and concrete column 25 mm.	
Concrete cover:	19 mm plaster applied to underside of the staircase and landing.	
Finishing:	15 mm screed applied to the top of the steps and landing	(20) [44]
TOTAL:		150

APPENDIX C – NCV COASTAL COLLEGE INFORMATION BROCHURE



NCV PROGRAMMES

Bursaries are available for NCV PROGRAMMES Terms and Conditions apply

CENTRAL ADMIN OFFICE
 (Kwame Ninsin)
 Tel: 031-800 7000

DURBAN CAMPUS
 (Candela)
 Tel: 031-208 0510

SWINTON CAMPUS
 (Mwambi)
 Tel: 031-842 2221

UMLAZI CAMPUS
 (Lashu)
 Tel: 031-841 2222

UMLAZI CAMPUS
 (Lashu)
 Tel: 031-841 2222

UMLAZI CAMPUS
 (Lashu)
 Tel: 031-841 2222

UMLAZI CAMPUS
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UMLAZI CAMPUS
 (Lashu)
 Tel: 031-841 2222

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ENTRY REQUIREMENT FOR NCV: GRADE 9 PASS OR HIGHER

NCV PROGRAMMES OFFERED:

PROGRAMMES	DURBAN	SWINTON	UMLAZI-V	UMLAZI-BB	UMLAZI-BULU	AS-SALAAM	UBUHLE BOGU
Civil Engineering & Building Construction	•	•	•				
Electrical Electronic & Communications	•	•	•				
Engineering & Related Design	•	•	•				
Financial Economics & Accounting				•	•	•	•
IT & Computer Science	•			•	•		
Manufacturing		•		•	•	•	•
Chemical Engineering		•		•	•	•	•
Primary Agriculture		•	•				
Transport		•			•		•
Education & Development	•	•					
Management	•	•					

If you have decided which career path to follow, don't wait, visit our new, exciting and modern NCV Programmes and start studying for your career.

OTHER PROGRAMMES OFFERED BY THE COLLEGE:

PROGRAMMES	DURBAN	SWINTON	UMLAZI-V	UMLAZI-BB	UMLAZI-BULU	AS-SALAAM	UBUHLE BOGU
NATED PROGRAMMES							
Business Studies (NS-NV)		•	•	•	•		
Civil Engineering (NS-NV)		•	•	•	•		
Electrical Engineering (NS-NV)		•	•	•	•		
Mathematical Engineering (NS-NV)		•	•	•	•		
GENERAL STUDIES							
Health Technology NCV Level 3 & 4 (6 Months per level)	•						
Healthcare NCV Level 2, 3 & 4 (6 Months per level)	•						
Home Based Care (12 Months)					•		
Information Technology		•					
INFORMATION AND COMMUNICATION TECHNOLOGY							
Radio (12 Months)		•		•	•	•	
TVET (12 Months)		•		•	•	•	
SKILL DEVELOPMENT PROGRAMMES - SKILLS TRAINING							
Garment Making / Sewing (12 Months)			•	•	•	•	•
Garment Making / Sewing (12 Months)			•	•	•	•	•
Baking			•	•	•	•	•
Cooking			•	•	•	•	•
Cabinet Making			•	•	•	•	•
Carpentry		•	•	•	•	•	•
Welding / Blacksmithing		•	•	•	•	•	•
Apprentice	•	•	•	•	•	•	•
Plumbing	•	•	•	•	•	•	•
Bricklaying	•	•	•	•	•	•	•
Motor Mechanics	•	•	•	•	•	•	•
Motor Body Repair	•	•	•	•	•	•	•
Refrigeration	•	•	•	•	•	•	•
Tool Making	•	•	•	•	•	•	•
Welding	•	•	•	•	•	•	•
Coaching	•	•	•	•	•	•	•
Refinery and Supplies	•	•	•	•	•	•	•

www.coastal.ac.za

Name: Leanne

Telephone: 071 754 3896

Date of Birth: 1973-03-07

Sex: Male ☐ Female ☒

Ethnic Origin:

White ☒

Black ☐

Indian ☐

Coloured ☐

Other _____

Marital Status: Single

Dependents: None

Current Activity: Working ☒

Unemployed ☐

Studying ☐

Details of Current Activity/work: See website, I Community Police Forum

EDUCATIONAL BACKGROUND

Highest School Year Achieved: Eight

Highest Tertiary Qualification: _____

Subjects Studied: Mathematics, Afrikaans, English,
Home Economics, Business Economics,
History, Geography.

Did you enjoy school? Yes

Why? Because I learnt a lot, and I had a lot of friends.

Preferred Language: English

Language taught in: Afrikaans

ADULT EDUCATION

If given the opportunity, would you study further?

Yes ☒

No ☐

What would you study?

Isometric course, or nursing

Do you think that if you studied further, you would find it easier to get a job?

Yes ☒

No ☐

Why?

Because I'm struggling a bit because of the fact that I haven't
got matric

Do you think that if you studied further, you would feel you would be benefitting yourself?

Yes ☒

No ☐

Why?

Then I'll be more skilled and I'll earn a decent salary

Why do you want to learn something new?

Because I'm struggling in life without a good job, and I
love to work with sick people. I would like to help
people who suffered in car accidents.

How do you prefer to learn?

☒

Practical, task orientated

☐

Theoretical learning

Why?

I would enjoy the practical course of paramedic work, because
I like to help the injured, but I can't bend my knee anymore.
I broke it badly in a crash, and that is also
interfering in what I want.

How would you prefer to study?

Short course full time (+/- week) ☐

Full time: ☐

Part time: ☒

Other: _____

Reasons: _____

Did you enjoy your schooling?

Yes: ☐

No: ☐

Why? _____

Did you feel you could interact with the teacher on a mutual level?

Yes: ☒

No: ☐

Why? I never really had problems with the teachers, we got along well.

Did you find the classroom a stimulating place to be?

Yes: ☒

No: ☐

Why? Because most of the time it's ~~so~~ quiet and you learn.

Where would you prefer to learn?



Indoors



Outdoors

Why?

Because then I would have more time

How do you feel the classroom environment could be improved?

Please choose the option that best describes the environment in which you would feel most comfortable learning something new in:

Standard, public school

☐

Style formal classroom

Light, airy, relaxed and informal
environment



Outdoors in an open air
classroom

☐

FUNDING AND TRANSPORT

Would you be able to afford extra studies?

Yes ☐

No ☒

Would you work overtime in order to study further?

Yes ☒

No ☐

What is your usual method of Transport?

Motor Vehicle ☐

Taxi ☒

Train ☐

Bus ☐

Would be better to have it
Supplied. ☒

THANK YOU

