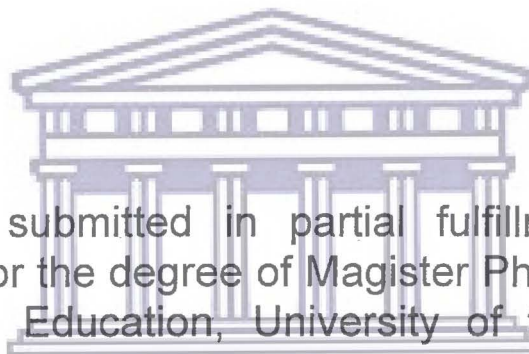


Implementing Lifelong Learning At A Technikon In South Africa

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A mini-thesis submitted in partial fulfillment of the requirements for the degree of Magister Philosophiae in the Faculty of Education, University of the Western Cape.

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Supervisor: Prof. Shirley Walters

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Implementing Lifelong Learning At A Technikon In South Africa

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ABSTRACT

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M.Phil mini-thesis, Centre for Adult and Continuing Education,
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The nature of lifelong learning in the context of a South African technikon is the investigation focus of this mini-thesis. It argues for the adoption of a holistic and humanistic conceptualization to lifelong learning in this context. The argument that the implementation of lifelong learning has significant implications for all aspects in the functioning of a higher education institution, is supported.

Belanger's (1994) holistic and humanistic framework on lifelong learning is positioned as a viable conceptualization based on the contextual realities of South African higher education where the tensions between access provision, equity and economic development are contested. It is argued that under these circumstances higher education institutions are compelled to adopt lifelong learning approaches that support holistic and humanistic values. Through the adoption of more inclusive approaches to lifelong learning, the development of skills, attributes and qualities of individuals in society can reach beyond the narrow requirements of the economy and workplace to include active citizenship and democracy.

An interpretative case study approach is used to investigate whether the learning and teaching processes currently used by subject lecturers in the Mechanical Engineering Department at Peninsula Technikon are supportive of lifelong learning teaching and learning processes suggested by the Candy Study (1994) and Cape Town Statement (2001). Based on the case study results the complexity of introducing a holistic and humanistic lifelong learning philosophy to direct and shape curriculum and pedagogical developments are raised. The interrelated nature of the classroom structures with those espoused by the institution as a whole is recognised. The mini-thesis also highlights the value of the systematic and holistic approach to implementing lifelong learning in higher education as proposed by the Cape Town Statement. It argues that without such an approach the kinds of curriculum and pedagogical formulations proposed by the Candy Study is unlikely to be implemented at a classroom level. The case study also reveals that when accepting Belanger's (1994) framework, the interrelated nature of learning activities undertaken during the life cycle must be acknowledged. It is therefore counterproductive to consider only one aspect of learning i.e. higher education without considering the impact of other parts i.e. initial and diffuse learning environments.

The study concludes by offering implementation possibilities for lifelong learning teaching and learning approaches in higher education in South Africa. A key issue includes the acknowledgement that holistic and humanistic strategies represent a visionary yet complex approach to higher education requiring major structural, pedagogical and curriculum interventions.

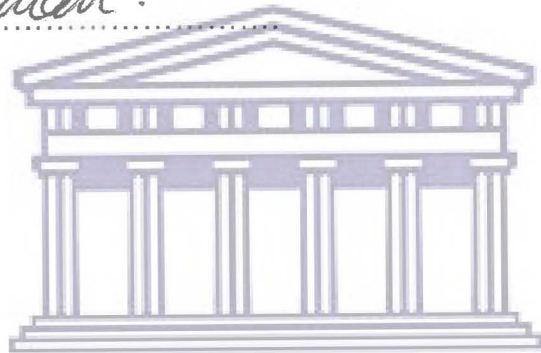
DECLARATION

I declare that *Implementing Lifelong Learning At A Technikon In South Africa* is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Lynn Coleman

November 2001

Signed:.....*Lynn Coleman*.....



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DEDICATION

To my students, past and present, who constantly challenge me to reflect on my teaching practice and inspire me to make lifelong learning a meaningful concept and a reality for everyone.

ACKNOWLEDGEMENTS

The assistance and encouragement received from the following individuals helped to make this mini-thesis a reality. Prof Shirley Walters, my supervisor, for her much needed and appreciated pragmatic and gentle guidance. The kind words during needy times offered by Prof Zelda Groener and Prof Nelleka Bak. Hermine Engel at the UWC Writing Centre and Michael Erfort for the proofreading and editorial assistance. The encouragement, support and patience provided by family and friends, especially my partner Joseph Williams.

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CONTENTS

Title Page		i
Key Words		ii
Abstract		iii
Declaration		iv
Dedication and Acknowledgements		v
Introduction		1
Chapter 1	The Concept Of Lifelong Learning	9
	<ul style="list-style-type: none">▪ Historical development of the concept of lifelong learning▪ The meaning of lifelong learning and its contextual framing▪ In search of meaning▪ Belanger's conceptualization of lifelong learning▪ Theoretical approaches to lifelong learning▪ A conceptual framework for lifelong learning – a conclusion	<ul style="list-style-type: none">121618192430
Chapter 2	Lifelong Learning And Higher Education	33
	<ul style="list-style-type: none">▪ Lifelong learning and higher education in the South African context▪ The Candy et al Study▪ The Cape Town Statement	<ul style="list-style-type: none">374144
Chapter 3	Research Design	47
	<ul style="list-style-type: none">▪ Framework design▪ The case study approach	<ul style="list-style-type: none">4751
Chapter 4	Data Collection And Findings	55
	<ul style="list-style-type: none">▪ Peninsula Technikon▪ Interview context▪ Thematic description	<ul style="list-style-type: none">565963
Chapter 5	Research Interpretations	85
	<ul style="list-style-type: none">▪ Views on lifelong learning▪ Characteristics of teaching staff▪ Teaching approaches and methods▪ Curriculum issues▪ Student descriptions▪ Limitations of the case study▪ Concluding comments	<ul style="list-style-type: none">8587889296100102
Conclusion	Implementation Possibilities	106
Bibliography		109
Appendices		120

Contextual Rationale for the research study

Post 1994 heralded South Africa's rapid entry into the global economy and market place. In order to successfully compete in a highly competitive global economy the South African education system needs to *"provide quality learning, (that) is responsive to the ever changing influences of the external environment and promotes the development of a nation that is committed to life-long learning"* (SAQA: 2000; 3). Government departments, in their education and training policy documents, have expressed such sentiments, but calls to foster and develop lifelong learning are increasingly being made by institutions of higher education. Peninsula Technikon's (Pentech) mission statement makes calls to "... foster lifelong learning". What however does the adoption of such a philosophy mean for higher education? What impact would such a philosophy have on the core functions (teaching and learning) and structures (political and organizational) of higher education institutions like Pentech? Lifelong learning is increasingly positioned as a means to develop appropriately skilled graduates to provide the South African economy with the competitive edge required in a globalised world. Increasingly industry requires graduates who have to perform job specific functions, but are required to be flexible, multi-skilled, able to work in a team environment and have critical thinking and problem solving skills. More humanistic approaches view lifelong learning in a broader context promoting the development of the individuals who can participate not only in the workplace, but also within civil society. Concerns for social justice and equity also underscore these considerations. The question is how do current methods of teaching and learning within engineering education at technikons help to develop the certain skills and abilities and what assistance if any can the pedagogical approaches of lifelong learning bring to this scenario?

Motivation for research study

Having worked at Peninsula Technikon for more than four years and most recently in the Engineering Faculty, I have often wondered about the types of teaching methods commonly used. A lifelong learning approach to pedagogy, (promoted by Candy et al's description of undergraduate courses, and the Cape Town Statement's teaching and learning processes) offer a new and dynamic approach to learning and teaching within a South African context. Before introducing new approaches it is important to establish and define what current teaching and learning methods are used in academic classes at Pentech. Secondly, current methods must be assessed using the teaching and learning framework proposed by the above documents. Insights generated by the above interrogation into the viability of using these pedagogical and curriculum approaches within the South African technikon environment are then gained.

Teaching and learning processes at technikons are often not fully researched, especially how these practices seek to encourage and foster lifelong learning. It would be useful to describe what happens in engineering education classrooms at Pentech, with the specific aim of describing the types of teaching and learning methods most commonly used. The importance of such research will firstly, resonate at an institutional level where on one level descriptions of current teaching and learning approaches can be made and on another level to introduce the possibilities of lifelong learning. Secondly, on a broader level the research might provide new insights into current understandings of lifelong learning teaching and learning practices.

Conceptual framework of the research study

The initial conceptualization of lifelong learning in this thesis was framed by Belanger's (1994) definition of lifelong learning. Lifelong learning is viewed as the totality of all learning activities undertaken during the life cycle. Belanger

provides a useful analytic framework for these learning activities, separating these activities into three specific constituent elements, viz Initial education, Adult education and Diffuse learning environments. Belanger's work provides a firm base from which to explore the complexity and contradictory nature of lifelong learning. The exploration started with a simplistic polarization of humanistic and human capital approaches. Further research highlighted the limitations and one-sided nature of such an approach, clearly failing to account for more sophisticated interpretations of the debates ranging within current lifelong learning discourses. The duality of lifelong learning is exposed due to this process, acknowledging that any conceptualization of lifelong learning is informed ultimately by a political and ideological position. Active citizenship conceptualizations were introduced as the '3rd generation' of lifelong learning concepts (Bron, 2001:2). Continued refinement of the active citizenship notions resulted in a distinction between lifelong learning for active citizenship, which encapsulates more human capital traits, and active citizenship for democracy, which reside in the more humanistic approaches to lifelong learning. The end result of this exploratory process is a conceptualization of lifelong learning that is systematic, sophisticated, acknowledges the political, socio-cultural and economic needs of South Africa without neglecting the humanistic values embedded in any learning and teaching activity.

Higher education presents a unique dimension to conceptualizations of lifelong learning. The contextual and learning realities of South Africa further represent key challenges and demands for framing lifelong learning in this environment. Engaging with these debates highlighted the pivotal position of access and equity considerations and the possible contributions lifelong learning approaches can make. The debates confirmed the value of Belanger's framework and contextualised the learning, teaching and curriculum approaches proposed by the Candy Study (1994) and Cape Town Statement (2001). The visionary and transformative nature of a humanistic and holistic

approach to lifelong learning is stressed. Also raised are the levels of transformation needed within higher education if such notions of lifelong learning are to be actively and adequately embraced.

The research into the conceptual realities of lifelong learning and its application to higher education institutions provides a useful grounding for both the research topic and the research problem. The research process provides the necessary focus and perspective in relation to the aims and objectives of the study. It resulted in the adjustment of the research title moving from *an assessment of teaching and learning methods to ascertain if they subscribe to a lifelong learning perspective* to the current title *Implementing lifelong learning at a technikon in South Africa*. The new title is a reflection of an understanding that lifelong learning attributes cannot be developed only through pedagogical intervention. Rather it requires an enabling system within the technikon itself that facilitates, develops and regulates lifelong learning practices in all the functions undertaken by the institution.

Methodological framework

The key research problem is to investigate and interrogate the teaching and learning approaches commonly subscribed to in the engineering education setting of Pentech. The main research question of the research study therefore focuses on the learning and teaching practices in the classroom.

In what ways are the learning and teaching methods used by the Mechanical Engineering Design III lecturers at Peninsula Technikon supportive of the lifelong learning teaching and learning processes as suggested by Candy et al (1994) and the Cape Town Statement (2001).

The topic is investigated from a holistic and humanistic perspective on lifelong learning. The Candy Study (1994) and the Cape Town Statement's (2001) proposals provide the framework from which the pedagogical and

curriculum features are interrogated. The Candy Study suggests three categories linked to learning and teaching approaches viz. the characteristics of the teaching staff, the teaching methods used and more broadly speaking various curriculum related issues. A similar categorization is evident in the Cape Town Statement.

Research Design

The theoretical paradigm informing the research study is a qualitative approach embedded in the interpretive traditions. The research study can be described as descriptive, basic and qualitative in nature. The unit of analysis being investigated is the lecturers responsible for the Design III course in the Mechanical Engineering Department at Pentech. The phenomenon described in the study is lifelong learning teaching and learning practices in a South African technikon environment. The findings support the teaching and learning practices promoted by the Candy Study (1994) and Cape Town Statement (1994). It however suggests that without an enabling institutional wide framework as proposed by the Cape Town Statement, lifelong learning teaching and learning processes cannot effectively be implemented at a classroom level. The study by conforming to a qualitative framework attempts to be naturalistic, holistic and inductive.

Using a case study methodology in the research study is motivated by the rationale proposed by Merriam (1991). She suggests that a "...case study is often the best methodology for addressing problems related to educational practice in which understanding is sought to improve practice" (Merriam, 1991:xiii). The following research techniques ensure that design coherence is achieved.

The unit of analysis for the study is the social unit of lecturers associated with the Design III subject in the Mechanical Engineering diploma course at Pentech. The sample includes two lecturers (the current and recent past lecturer for the subject) and the curriculum designer responsible for the re-

curriculation process undertaken by the department in 1999-2000. Three sources of data collection are used in the study viz. 1) Documents - course design material, strategic plans, statistical data, vision and mission statements of the institution, faculty and department, student yearbooks and general institutional information presented on the institutions' website; 2) Interviews with two lecturers and a curriculum developer - these will take the form of in-depth semi-structured interviews with at least the three key staff mentioned above; and 3) Basic statistical information - obtained via a biographical questionnaire completed by the current student Design III subject cohort to ascertain a student profile. The data analysis process uses thematic identification and descriptions to define the data. Relationships between themes and the conceptual framing of the research are explored. A naturalistic inquiry, which is non-manipulative, obtrusive (conducting interviews where the researcher will engage in social interactions with the interviewees), and yet attempts to be non-controlling and open to whatever emerges from the research setting, is conducted.

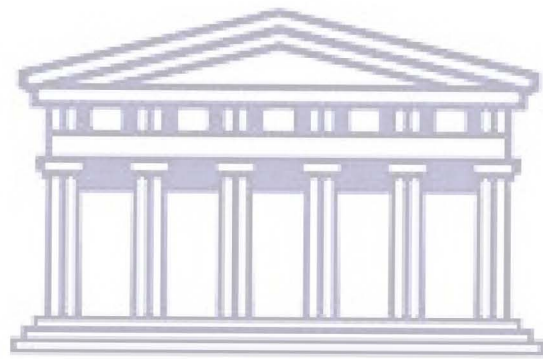
To ensure the ethical integrity of the case study the Dean of the Engineering Faculty and head of the Mechanical Engineering Department were consulted and supported the research study. Pseudonyms for all respondents are used to ensure confidentiality. In addition each respondent was sent a summary of their own interview for confirmation to ensure the validity of their statements during the interviews.

Chapter overview

Chapter one introduces the concept of lifelong learning. The key purposes of the chapter are to provide meaning and clarification for lifelong learning and to formulate a conceptual framework to guide the empirical research of the study. The historical development of the term is traced from its adult education roots to more contemporary usages. Detailed descriptions of the

humanistic, human capital and active citizenship perspectives on the concept are covered. Particular focus is devoted to Belanger's (1994) conceptualizations as the grounding perspective for the analysis of the other approaches. Lifelong learning in higher education becomes the focus of chapter two. The nature and significance of lifelong learning forms in higher education are presented and the fundamental implications for pedagogical and curriculum approaches are noted. The contextual realities of higher education in South Africa are described. The imperatives for the implementation of holistic and humanistic lifelong learning approaches in higher education are advanced. Finally, detailed descriptions of the lifelong learning teaching and learning processes advocated by the Candy Study (1994) and the Cape Town Statement (2001) are presented. Chapter three outlines the theoretical assumptions underpinning the empirical research associated with this mini-thesis. The theoretical framework guiding the study is based on the framework proposed by Durrheim (1999). A brief review of the merits and motivation of using a case study approach to collect and represent the data of the research are presented. In chapter four the descriptions of the data collection processes findings are presented. A brief contextual overview of the research process is explored, significantly describing the research participants in relation to gender, race and educational and institutional status indicators. Finally, a thematic depiction of the case study is presented focusing on the following issues; how lifelong learning is viewed by the case study staff, the department and institution; characteristics of the case study teaching staff; teaching approaches including how learning is facilitated within the case study; and general curriculum issues as they relate both to the case study classroom but broadly to the whole Mechanical Engineering diploma. Notions of the curriculum structure, the underlying culture or ethos it promotes, along with the skills and knowledges it aims to facilitate, are described. Finally, lecturers' perceptions of their students and their learning behaviour are also presented. The interpretation and analysis of the research study are presented in chapter five. The analysis

process reveals that not only are the teaching and learning processes of the case study classroom complex, but they are also dependent and influenced by a range of factors that literally resided outside the domain of the class environment i.e. departmental and institutional organisations and structures. The analysis is presented using thematic categories and is combined to suggest some overarching interpretations of the case study as concluding points. The concluding chapter articulates some of the case study insights representing certain possibilities within higher education for the implementation of lifelong learning approaches advanced by the Candy Study (1994) and Cape Town Statement (2001).



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Debates about the nature and purpose of education in all its forms, in both common sense and more theoretical circles, can be traced back to the inceptions of western styled learning centers in Aristotle's Greece. Throughout history these debates have taken many forms and have reflected the economic, political and social influences of the time. In the same vein the concept of lifelong learning first introduced or noted in the late 1960's has followed a similar route. The core issue at the heart of the phenomenon is society's grappling with the issue of what purpose education is supposed to serve. Moreover these conceptualizations of lifelong learning also seem to reflect and be influenced by the dominant socio-economic and political discourses of the day, which have made their impact felt on all aspects of the educational debate. Any historical review of the meanings and definitions associated with lifelong learning will support the above opinion.

In many respects the introduction of the concept of lifelong learning can be seen as merely the introduction of a particular perspective on the ongoing debate around the purpose of education¹. This does not however preclude that the common understandings (or theoretical for that matter) of the concept is homogeneous. Rather as with any fruitful debate and search for meaning related to a social concept such as education, the process is characterized by divergent meanings, influences and conceptualizations.

In the last two decades most countries have witnessed rapid and far-reaching technological, economic, political and socio-cultural changes. These changes most commonly associated with the term globalization, have affected most countries in the world on economic, political and socio-cultural fronts. Globalization is characterized as a "multifaceted process entailing a growing worldwide interconnectedness of structure, culture and agency and a paralleled de-differentiation of traditional boundaries" (Archer: 1991:13 in Christie, 1997:114). Similarly Webster and Bezuidenhout suggest that globalization is a set of ideas and practices that

operate on a political, cultural, economic and ideological level (2000:1). Its most common manifestations are in the economic and ideological arenas. Castells confirms this by suggesting that although globalization is multidimensional, it can be better understood starting with its economic dimension (2000:4).

On the ideological level it is most commonly associated with the re-emergence of neo-liberal economic and social thought. The emphasis is placed on the values of the economic market and the individual. (Webster and Bezuidenhout, 2000:1).

On the economic level its most common identifying aspects according to Korsgaard, seem to be the shift away from state control and invention of the economy to a situation where the dictates of the 'market' become the controlling factors (1997:11). The impact of globalization, particularly its economic and ideological manifestations as they relate to education, are well documented by commentators both nationally and internationally (Archer and Moll, 1992; Arnove, 1998; Carnoy and Samoff, 1990; Christie, 1997; de Clercq, 1997; Ilon, 1994; Kallaway, 1997 and Gordon and Whitty, 1997).

Faced with rapid change permeating through all dimensions of its social fabric, nations in both the 'north' and 'south' have been forced to reconsider their position in relation to the purpose and function of education. Within this climate the term lifelong learning and lifelong education has risen to its current state of prominence over the past decade. South Africa has not been spared by these developments, especially after the birth of its new democracy in 1994 and the formidable task of having to address the legacy of apartheid inequalities and 'catch-up' to the globalization trends set by the countries in the 'north'.

¹ Also see Duke, 2000:3

The South African education ministry like its counterparts across the world and various other national and international non-governmental organisations, education and economic agencies and intergovernmental organisations like UNESCO², OECD³ and the EU⁴ have increasingly used the concept of lifelong learning and lifelong education to convey its educational and moral philosophy to others. South Africa's National Qualifications Framework, is a "...set of principles and guidelines by which records of learner achievement are registered to enable national recognition of acquired skills and knowledge...", has been promoted as an integrated system that will encourage lifelong learning (SAQA, 2000:3). In a more local setting and the site of the empirical research associated with this mini-thesis, Peninsula Technikon's (Pentech) mission statement sets out to "...develop academically, socially and technologically competent students who are responsive to the broader needs and challenges of society". It suggests these objectives will be attained through a variety of strategies including "...fostering lifelong learning".⁵ The strategy of Pentech to foster lifelong learning can be linked within the South African context to an increasing need and attempt by the national government to indicate its willingness via its policy proposals to redress the past inequalities and inefficiencies in educational provisions.⁶

A review of policy documents (in South Africa and abroad) and the literature on the topic reveals the strong emphasis currently being placed on the value of promoting a culture of lifelong learning. It also reveals the multiple and often contradicting meanings, conceptualisations and purposes associated with this, at times, simplistic concept. In relation to the policy documents a key shortcoming is the failure of many of these policies to put forward a distinct conceptual understanding and

² See United Nations Education, Scientific and Cultural Organisation:-UNESCO's Delors Report, 1996 Learning the treasure within.

³ Organisation for Economic Co-operation and Development, (1996) cited in Rubenson, K & Schuetze, H (2000:355)

⁴ European Union (2000) A memorandum on Lifelong learning

⁵ See Peninsula Technikon's Mission statement: - Appendix 1

framework for lifelong learning. It includes acknowledging the many complexities associated with, on the one hand the meaning attached to the concept and on the other hand, its implementation possibilities and constraints.

The purpose of this chapter is therefore to clarify what the concept of lifelong learning means and to formulate a conceptual framework that will guide the empirical research associated with this mini-thesis. In order to achieve this objective the chapter will be structured as follows: Firstly, it will attempt to trace the historical development of the term from its adult education roots and note how the adoption of the term has in some quarters signalled the move from notions of teaching to that of learning. Secondly, explore, starting from common sense ideas about the meanings associated with the term, the range of theoretical approaches to its understanding. A detailed description of the humanistic, human capital and active citizenship perspectives on lifelong learning will be presented. Particular focus will be devoted to Belanger's conceptualisations as the grounding perspective for the analysis of the other theoretical approaches.

Historical developments of the concept lifelong learning

Based on the prominence ascribed to the concept of lifelong learning in the past decade or so, one would be forgiven in assuming that it is a fairly recent concept. Rather the idea and belief that learning and education should continue throughout the duration of an individual's life is not a new one (Cropley, 1989; Lengrand, 1989; Cave, 1981 and Duke, 2000).

Many authors identify the emergence of the terms lifelong education and lifelong learning as being associated with various conferences on adult education hosted by UNESCO in the late 1960's and early 1970's (Gustavsson, 1997:238; Korsgaard, 1997:18 and Himmelstrup, 1981).

⁶ See policy documents published by the Department of Education (1997) and Department of Labour (1997)

However King suggested that the phrase “lifelong education” was given prominence through the work of Richard Livingston during the 1930’s and 1940’s in Britain (1999:111). Here the term was generally understood to “...refer to cultural ‘extras’ or some sort of polishing on working life after formal schooling had finished” (King, 1999:111). What is clear therefore is that the terms are certainly not new comers to the discourse of education and more specifically adult education. In addition Jarvis highlights an even earlier inclusion to the discourse of lifelong learning through the work of Yeaxlee in 1929, who was the first to write a major book on lifelong education (1999:256).

Today lifelong learning has become the commonly accepted concept with lifelong education embodying the same meaning. This was not always the case. The following discussion, which traces the historical roots of the terms, will attempt to illuminate when and why the shift from using lifelong education to lifelong learning took place. It is also suggested that this shift in terminology coincided with key shifts in the prominent ideological discourses of the day.

From lifelong education to lifelong learning

UNESCO first introduced the concept of lifelong education during its 2nd International Conference on adult education in 1960 (Himmelstrup, 1981:12). Many of the initial debates about lifelong education / learning came out of the ranks of the adult education community (Himmelstrup, 1981:12 and Gustavsson, 1997:238). Furthermore it is proposed that until the late 1970’s most people even regarded the term lifelong education as being synonymous with ‘adult education’ and ‘popular enlightenment’ (Himmelstrup, 1981:12-13). Himmelstrup notes that as a result of the marginal position adult education⁷ typically found (and still finds) itself in, in most countries it was difficult to “...give the concept the necessary force to make a political breakthrough.” (1981:12-13). While identifying with Himmelstrup’s position, Gustavsson contends that concepts like recurrent

education and lifelong education appeared as a result of attempts to legitimize the need for adult education in society (1997:237). Crucial in signaling lifelong learning's acceptance into the educational debate was the 1972 UNESCO Report 'Learning to be' (Himmelstrup, 1981:16-17). The practical consequences of the views expressed in this report, was to regard lifelong education as the master concept for educational policy (Himmelstrup, 1981:17).

Around the 1980's the position of UNESCO, in relation to its notions of lifelong education /learning, was considerably weakened. The OECD, who professed a more economic position, began to exert more influence on educational policies. In general it stressed the value and importance of adult education for economic development (Korsgaard, 1997:18). The adult education discipline and UNESCO in contrast, embraced a more humanistic position on education. Education and indeed lifelong education/learning was seen as being connected with democracy and the development of the individual (Korsgaard, 1997:18; Gustavsson, 1997:239 and Dave (1975) in Himmelstrup, 1981:19). The OECD proposed the strategy of recurrent education as a strategy to transform the master concept of lifelong education into practice (Himmelstrup, 1981:20). Recurrent education from its beginnings, emerged from the perspective of the labour market. Its reintroduction in the early 1980's, recurrent education considered "...human beings as calculating their own advantage and often referred to the individual as the 'Economic Man'⁸" (Gustavsson, 1997:238). Furthermore recurrent education dealt mainly with post-compulsory education, emphasizing the close ties between education and the world of work (Himmelstrup, 1981:20). Clearly a shift in the current socio-economic and ideological discourses of the day was starting to impact on the conceptualization and meanings attached to educational concepts.⁹ This shift confirmed Gelpi's assertion that "...educational

⁷ see Duke, 2000:2-3 for a brief description of this position

⁸ Gesser, 1985

⁹ These issues will be dealt with in more detail in the next section of this chapter.

ideologies have been and are closely linked on one hand to social and economic factors and on the other hand to political, religious and social ideologies" (1985:8). Educational policy (embodied in the use of lifelong learning) can only be understood within its socio-economic and political context (Wallis, 2001:10). A result of these developments and shifts, lifelong education starts to embody particular meanings and associations with more neo-liberal ideologies. Another key indicator of this shift in meaning is seen in the trend of other government departments and ministries such as labour and finance getting involved in educational policy planning (Korsgaard, 1997 & Longworth and Davies, 1996). It is within this arena that shifts from the term 'lifelong education' to 'lifelong learning' increasingly using starts to happen.

Shifts from 'education' to 'learning'

Education can be described using Gelpi's (1985:181) understanding as "organized learning", learning can also be seen as part of the provision of lifelong education. Cropley's discussion of the key principles in lifelong education, procedures for fostering lifelong learning is seen as an integral component (1989:9). Lifelong learning exists within the notion of lifelong education. Education, or organized learning programmes are usually regarded as the responsibility of the state while the responsibility for learning generally resides in the realm of the individual. With shifts to embrace neo-liberal discourses of education, a crucial shift in the decreased level of state responsibility for education was signaled, with more responsibility being placed on the individual's shoulders for education and learning. As Edwards and Usher confirms, the increasing use of the term 'learning' favoured over the term 'education' affirms the significant place of learners in opposition to the institutional form (1998:84). Thus this shift appears to favour the individual and 'client' rather than the provider and system (Duke, 2000:8). Progressively education across the globe is experiencing what Longworth and Davies describe as a paradigm change towards putting the focus on learning and on individual responsibilities to define learning and make an investment in it (1996:21). These authors also

suggest that the change in thinking about education and the increased urgency in promoting a lifelong learning approach to education are spurred on by, among other things, the impact of globalization (and its accompanying ideologies), technological changes and the focus on the individual (1996:25).¹⁰

This short attempt to trace the historical developments of the concept had led to the following conclusions. Firstly, the notion of lifelong learning / education is not a new one; rather its first formal descriptions can be traced back to the 1930's in Britain. However, it is generally accepted that UNESCO introduced it to international audiences and educational debates through its promotion in the 1960's. Secondly, its first conceptualizations arose out of the adult education discipline and for a while lifelong education was regarded as being synonymous with adult education. Thirdly, the historical development of the concept clearly demonstrates how the concept has come under the influence and has been shaped by the prominent socio-economic and ideological discourses of the day. Hereby acknowledging how current neo-liberal ideologies have impacted on the initial use of lifelong education as the over arching phrase to the current position of using the term lifelong learning. Lifelong learning is now seen as being synonymous with lifelong education. Lastly, this process of tracing the historical dynamics associated with the concept of lifelong learning has helped to provide a backdrop for the next discussion focus of this chapter. Attempts will be made to unpack the various meanings attached to the concept while providing a more critical and detailed exploration of the contextual framing of these meanings.

The meaning of lifelong learning and its contextual framing

the phrase 'lifelong learning' and 'lifelong education' is a marvelous slogan and rallying cry around which diverse groups will unify, under the illusion that they share some common goals and means for achieving them... (Penelope Richardson (1981:211), Director of Lifelong Learning Project for the United States Government, 1976-1978)

¹⁰ Further comments on this position is noted by Duke, 2000:9
<http://etd.uwc.ac.za/>

Richardson's comment is perhaps a fitting departure point for the discussion on what the concept of lifelong learning actually means. It points to two key aspects that will be discovered through any exploration of the meaning attached to this concept. Firstly, the concept has and continues to be used and seen as a unifying or 'promotional banner' (Preston, 1999) under which diverse problems ranging from education, the economy and social evils can be solved. Secondly, it exposes the fallacy which suggests that irrespective of who is using the term, its meaning is the same, hereby hinting at the breadth and complexity in attempts to find a common meaning of the concept.

Many commentators in the field would recognize the broad scope and range attached to the meaning of the concept of lifelong learning (Rubenson & Schuetze, 2000; Preston, 1999; Larsson, 1997; Candy et al, 1994; Longworth and Davies, 1996; Gelpi, 1995; Brookfield, 1994; Lengrand, 1989 and Salling Olesen, 2000). There are literally hundreds of definitions and meanings attached to the concept with each, as suggested by Longworth and Davies, being appropriate to its own environment with a personal, educational, social and political meaning (1996:21). On the one hand this quality is seen as a weakness, (Gustavsson, 1997:238) as it is seen to be applicable for any purpose, rendering it an empty concept and unable to face the problems in adult education. Furthermore, as Larsson suggests, because it has all these meanings associated with it, lifelong learning risks losing its richness and precision as a concept (1997:251). As a result becoming "...too useful for too many purposes..." rendering its meaning 'obscure' and 'meager' (Larsson, 1997:251). However, on the other hand its broadness and ambiguity is regarded as one of its strengths. While it makes defining lifelong learning a difficult task, this in turn allows the term to be used and applied in different contexts and accepted as a "...universally good thing" (Preston, 1999:565). One could argue that it is precisely this particular quality that has allowed it to be used in a variety of contexts it currently enjoys, both nationally and in more global arenas.

In search of a meaning

Candy et al's(1994:xi) comment that lifelong learning is generally considered to be a very broad and comprehensive idea is a useful starting point in setting up the difficulty in trying to find a neat and all inclusive definition for the meaning of lifelong learning. In attempting to find a meaning, a practical place to start is to consider the more common sense understandings of the concept. A simple dissection of the term would literally suggest learning throughout one's life, as Longworth and Davies simply described it: "...lifelong learning is both lifelong and about learning"(1996:21). Thus at a simplistic level it is about the provision of learning opportunities using the popular phrase '*from the cradle to the grave*' (Preston, 1999:562; Soobrayan (1997) in Walters, 1999(a): 578; UNESCO (1979) in Candy et al, 1994:xi; Gustavsson, 1997:239 and Brookfield, 1994:24).

By implying that learning takes place throughout an individuals life it assumes that this learning includes formal schooling but also goes beyond this. It is when one attempts to understand or account for the kinds of learning that one is forced to move beyond the more common sense meanings of the concept.

Walters and Watters indicate that as a starting point, lifelong learning includes all types and levels of learning irrespective of its content, form or location (2000:5 and Walters, 1999(a): 578). Himmelstrup attempts to provide more focus to the kind of learning, by suggesting that lifelong learning is about "...the opportunity for individuals to engage in purposeful and systematic learning during the periods of their lives when this opportunity is most relevant." (1981:6). Similarly in the Candy et al study, lifelong learning is considered to be "...a very broad and comprehensive idea...It included...all formal, non formal and informal learning whether intentional or unintentional, occurring throughout the lifespan." (1994:xi). Gelpi starts to define who the learners are in more

detail, by putting forward that lifelong education (learning) is about the education and learning(s) of children, young people and adults in both formal and non formal educational and learning environments and provided via either institutional supports or through a process of self development (1985:181). This definition highlights and points to the cross-sectional nature of lifelong learning, which suggests that it is not only limited to formal education but also includes adult community education, workplace-based learning opportunities as well as access to the various learning chances present in society via libraries, museums, the internet etc...(Walters, 1999(a): 578). For Edwards and Usher this quality associated with lifelong learning implies the boundlessness attached to learning. Thus predetermined outcomes, formal institutions and epistemological control do not confine it. They further advocate that this quality provides the concept with significant power and socio-cultural contextuality (2000:97). Moreover, through the emphasis on learning instead of institutional education, Salling Olesen argues that the concept of lifelong learning is able to address the individual perspective on learning (2000:40).

The picture thus starting to emerge is one which locates or views lifelong learning as a boundless category, i.e. learning can be about anything, happen in a variety of contexts and locations and can be undertaken at any stage of any individual's life. This view of lifelong learning therefore represents an all-inclusive conceptualization of learning.

Belanger's conceptualization of lifelong learning

The work of Paul Belanger while acknowledging that lifelong learning in each society refers to the totality of learning activities, provides a useful analytic framework that separates these activities into three specific constituent elements viz. Initial education, Adult education and Diffuse learning environments (1994:354).

Initial Education

Initial education accounts for both the formal, informal and non-formal educational activities undertaken during the formative years of our lives and would include pre-primary, primary and secondary education. It thus includes all continuous educational processes young people participate in before their adult life (Belanger, 1994:354). It also includes learning opportunities created in the home, through the cultural environment and the value placed on these activities. Based on the fact that educational development is seen as a life endeavour and tends to be a cumulative one, individuals who received better and longer initial education seem to participate more in learning activities in their adult life (Belanger, 1994:355 & Walters & Watters, 2000:9). Conversely, limited initial education tends to produce low rates of adult participation in both formal and non-formal activities (Belanger, 1994:356). Oakes (1985) further comments that the level or exposure to formal initial education activities tend to parcel people into different life courses (cited in Belanger, 1994:356 & Walters, 1999(b): 218). Rubenson and Schuetze (2000:356) confirm this notion by stressing further that the formative years are of crucial importance with pre-primary and primary education being important building blocks. Formal education during this stage also tends to determine peoples' educational life courses (in Walters, 1999(b): 218, also see Walters, 2001:112). Initial education therefore is a crucial element in determining how learning will be viewed and valued in the other learning constituents.

Adult Education

Adult education activities include all learning opportunities undertaken during various stages of one's adult life (in Walters, 1999(b):218). Belanger describes adult education in the following way:

the entire body of organised educational processes whatever the content, level and methods, formal or otherwise, whether prolonging or replacing initial education whereby persons regarded as adults by society develop their abilities, enrich their knowledge, improve their technical or professional qualification. (1994:377)

This might include literacy training, part-time registration at post-secondary institutions or attending to personal development goals through education. As opposed to initial education, adult education provisions are diffused over many different structures and organisations (in Walters, 1999(b): 218-219).

Diffuse learning environment

The assumption that learning does not only take place through organised education, formal and non-formal processes forms the basis of the meaning attached to the idea of the diffuse learning environment. It also describes or accounts for the impact of socio-cultural life contexts of children and adults as they interact and operate in schools, their private lives, in their community, at work or through the media etc... While diffuse learning environments are related to the organised formal and non-formal educational processes, they are also distinct from them (Belanger, 1994:378). Thus diffuse learning is regarded as the informal dimension of education, the learning context present in the daily environment or the norms and cultural orientation embedded in the different initial and adult educational settings (in Walters, 1999(b): 219). It further includes the attitudes towards learning and the predisposition to specific types of learning in the family or immediate environment. For example if going to school is regarded as a key priority and valued, it would also include the availability of books and attitudes towards written communications, the presence of libraries, museums and the media. These would all be regarded as cultural factors influencing educational aspirations and learning achievements in initial and adult education (Belanger, 1994:360.).

Walters summarizes Belanger's notion of the three dimensions of lifelong educations by suggesting that the recognition of these dimensions and their relationship to each other leads to the acknowledgement that no educational policy can ignore the media, cultural industries, libraries and museums (1999(b): 219).

Paul Belanger's (1994) concept of lifelong learning has its starting point with the learner rather than the provider (in Walters, 1999(b): 218) and conveys the meaning that learning and education are possible at any age. It includes learning both in the formal education system and through everyday life (i.e. social movements, home and work) thus incorporating formal, non-formal and informal education. Lifelong learning is seen as integrative in horizontal (between home, community, media and work) and vertical (between different life stages) ways (Walters, 1999(b): 218; Gustavsson, 1997: 239). As a result Belanger argues that lifelong learning exists in all societies in different forms and as people move through different stages of their lives. Furthermore, there are 'many lifelong educations' as in each society lifelong learning refers to the totality of learning activities broken down into the three constituent elements of initial education, adult education and diffuse learning environments (in Walters, 1999(b): 218).

Vertical and horizontal integration of learning

This notion of vertical and horizontal integration of learning is not a new idea and links back to earlier discussions by Cropley (1989), Heinesen [1972 in Himmelstrup (1981)] and Himmelstrup (1981).

Vertical integration essentially acknowledges that learning experiences are part of a network of learning, which might commence in the past and stretch ahead unbroken into the future (Cropley, 1989:10). The various stages of learning as we move through life is therefore described through the process of vertical integration. (Gustavsson, 1997:239). It suggests an understanding of the need to create coherence within the education system, because it is supposed to cover the whole lifespan of the individual. Rather than assuming unification or conformity, it stresses coherence and taking the entirety into consideration. Vertical integration underscores that no part of the education system is an end in itself (Himmelstrup, 1981:17). Other authors also refer to vertical integration as

the 'lifelong' aspect of lifelong learning (Walters, 1999(b): 218 and Rubenson and Schuetze, 2000:356).

Horizontal integration comprises all aspects of human life and necessitates a widening of the traditional conceptualisation of education to include not only formal manifestations of learning but consider the human environment in its totality as a source for learning (in Himmelstrup, 1981:17). Furthermore, the horizontal integrative element would embrace not only the obvious education settings such as libraries and museums etc, it would also include the home, workplace, recreation and hobbies etc, (Cropley, 1989:10). Hereby putting forward the relationship between formal learning and both informal and non-formal learning environments (Cropley, 1989:10). Again horizontal integration is synonymous with what is described as the 'life-wide' aspect of lifelong learning (Gustavsson, 1997:239 and Rubenson and Schuetze, 2000:356). This 'life-wide' dimension implies that learning occurs not just in a school or formal educational settings, but also in many different settings. It recognises that many important learning experiences are found outside the formal education system (Cropley, 1989:189 cited in Rubenson and Schuetze, 2000:356). This conceptualisation implies a broad approach to knowledge in that it can be gained from many arenas not only in school. It also has a more holistic view of education in which formal and informal types of learning can be integrated with each other and considered in one context (Gustavsson, 1997:239). In addition as Edwards and Usher argue from a post-modern perspective

(that lifelong learning) signifies that learning could be inside or outside educational institutions and not necessarily within the modernist educational project and not necessarily bounded by what educators would traditionally define as the transmission of 'appropriate' or 'worthwhile' knowledge (2000:97).

In summarising Belanger's viewpoint on lifelong learning, the argument put forward by Walters and Watters (2000) is particularly constructive. They maintain that by accepting Belanger's stance on lifelong learning it would mean acknowledging

- That all learning, formal, informal, and non-formal is interlinked
- That taking lifelong learning seriously forces us to look at learning in ever increasing circles
- That the quality and quantity of learning in that first circle determines the pattern of lifelong learning for that individual
- That it does not help to focus on only one aspect (for example a sector) without considering the impact on other parts of the 'whole' (2000:10).

Theoretical approaches to lifelong learning

As suggested earlier in this chapter, many definitions and meanings exist for lifelong learning. It is therefore crucial to acknowledge that these are influenced by various contextual factors operating on ideological, economic and socio-cultural fronts. Thus any definition of lifelong learning is not a neutral one; rather it is offered in order to promote a particular theoretical position. An analysis of these perspectives provides a more critical insight to the underlying motivations embodied in the users' framework for lifelong learning.

One's view on the nature and purpose of education is central to the conceptualisation or framework of lifelong learning that you hold. Thus Soobrayan (1997) argues that lifelong learning is employed as a conceptual framework, which presents a comprehensive and particular understanding of educational priorities, the strategies required to address these and finally a fundamental assertion of a radically different and distinct pedagogy (cited in Walters, 1999(a): 578). Conceptualisations of lifelong learning can also be viewed as a meeting point between different critical traditions sharing an emphasis on examining education and learning within a context of societal and cultural historical development (Salling Olesen, 2000:407).

Often the contextual factors operating in society are put forward as providing the impetus for the use of particular perspectives on lifelong learning. It has been suggested that the re-emergence of lifelong learning into its current role has been spurred by the needs of late capitalism

(Walters, 2001(a): 2). In particular this includes the rate of changes in social, technological, cultural, legal and educational circles throughout the world, along with the increasing 'global connectedness' of societies and economies. The requirements of late capitalism have stressed the need for people who are adaptable and responsive to these changes (Himmelstrup, 1981:15; Copley, 1989:9 & Walters, 2001(a): 1). People should therefore be capable of continually learning in order to cope with these changes. It has also been seen as a means of promoting (OECD, 1996) and solving problems (Longworth and Davies, 1996) of employment, economic development, democracy, creativity and social cohesion.

Two distinct theoretical and ideological strands have been identified as framing any understanding of lifelong learning. Firstly, the human capital school, which is associated with neo-liberal ideology and concerned with the development of human capital in the pursuit of profit. Secondly, the humanistic school, which is more concerned with a social democratic, holistic approach to education and training and the promotion of social justice (Walters, 1999(a): 578 & Walters, 2001(a):1). In addition to focusing on an exploration of these two schools a brief discussion of the active citizenship approach to lifelong learning, which is currently gaining momentum, will also be presented.

Humanistic School of lifelong learning

Lifelong learning has from its beginnings related to a humanistic tradition of education. Encapsulated in this tradition is an understanding that human beings are considered capable of learning and developing their potential abilities (Gustavsson, 1997:239). Gustavsson links this position to the classical approach to education by asserting that even the classical motivations for education in society are rooted in mainly humanistic and democratic traditions (1997:239). Likewise Korsgaard maintains that when UNESCO first introduced lifelong learning, it was clearly associated with a humanistic tradition where education is connected with democracy and

the development of the individual (1997:18). These humanistic roots are clearly evident when reviewing Dave's (1975) thinking at the time.

Lifelong education is a comprehensive concept which includes formal, non-formal and informal learning extended throughout the lifespan of an individual to attain the fullest possible development in personal, social and professional life...Learning and living are closely intertwined, each enriching the other, thus lifelong education becomes a continuous quest for a higher and better quality of life (cited in Himmelstrup, 1981:19)

It is Cave's contention that the concepts' embrace of a humanistic belief of development suggests that it seeks to strengthen the links between educational pursuits and the life of the workers by identifying education with life and holding a dynamic conception of human life (1981:170).

Walters (1999(b)) argues that Belanger's paradigm for lifelong learning is clearly located within the humanistic school. His paradigm provides an "...all inclusive, holistic approach to education and training and its starting point is the learner rather than providers." (Walters, 1999(b): 218). A humanistic approach would therefore seek to promote the learner and his/her needs in the learning environment and seek to develop an array of skills, knowledges, attitudes and competencies that would allow the individual to interact with their social environment.

Human Capital (or) Human Development School of lifelong learning

While much evidence has been presented to suggest that historically discourses of lifelong learning were firmly rooted within the humanistic school, this position has however slowly been eroded. As mentioned earlier in this chapter, once the OECD started to exert more influence on educational policies so the shift from more humanistic approaches to adult education and lifelong learning began to give way to approaches which stress the importance of education for economic development (Korsgaard, 1997:18). Furthermore, Wallis proposes that recently, particularly during and after the "neo-liberal experiments of the Reagan - Thatcher era..." and the creation of global markets for goods, services and finance, the

dominant discourse of lifelong learning has been linked to human capital development (2001:6). The development of human resources has increasingly become a key factor in the economy in the wake of transformations in the world of work in the modes of production and the organisation of work. As a result increasing demands for education (particularly adult education) and calls for lifelong learning can be seen in light of these changes and demands for greater competitiveness which in turn has led to new demands in relation to qualifications (Belanger, 1994:363).

The human capital or human resource development mode of lifelong learning, views education in terms of the market and investments in human capital. It reduces education to the needs of the economy (Walters, 1999(a): 578 & Gustavsson, 1997:240). It also puts forward according to Belanger, a discourse of 'return on investment' where the gains on investment in learning (through qualifications) have a direct effect on earning potential (1994:371; also see Wallis, 2001:7). Under the human capital banner, lifelong learning can become narrowly defined as work-related education and training (Preston, 1999:562 and Hunt, 1999:198). Lifelong learning had also increasingly been integrated in ideas like 'organisational learning' and 'workplace based learning', which according to Salling Olesen refers to an organisational culture approach. Terms such as 'organisational learning' and 'workplace based learning' therefore link lifelong learning to constricted management strategies (2000:409). Korsgaard provides evidence for this discourse of lifelong learning being favoured by Canada and the EU (2001:18).¹¹ In contrast the most striking clue that discourses of lifelong learning and education are increasingly falling within the ambit of human capital approaches can be seen in the increased attention paid to educational policy initiatives by ministries of

¹¹ Hunt also suggests that similar moves are evident in Blair's Britain (1999:198).
<http://etd.uwc.ac.za/>

Labour, Finance and Employment (Korsgaard, 1997:18-19 & Longworth and Davies, 1996:18).¹²

Humanistic vs. Human Capital

Salling Olesen's contention that lifelong learning fulfills a dual role, "...as a vehicle of humanistic political programmes for social autonomy and empowerment and a necessary adaptation of humans to their role as commodity labour", helps to provide some perspective on the humanistic vs. human capital debate (2000:407). As Hunt argues it is not about an either-or scenario where you choose one approach above the other. She further claims that one cannot only locate lifelong learning entirely within the economic paradigm. If one does this, you 'obscure' and 'neglect' the other side or role of the concept. Thus lifelong learning is not only about the "...production of knowledgeable workers and successful businesses..." – the economic side. Rather it is about "...the development of an informed citizenry capable of participating fully in local activities, including the provision of services as well as within the workplace." (Hunt, 1999:198).

While the human capital paradigm of lifelong learning relates to the economic reasons for education and learning, Gustavsson maintains that a serious shortcoming is the fact that it has nothing to say about how the learning process works or how to develop the optimal resource in a human being (1999:240). Linked to Hunt's notion of 'informed citizenry', Belanger suggests that it has been recognized that problems of "...the environment, population and health cannot be resolved without strategies based on social participation and therefore on the empowerment of citizens, (and) ...learning opportunities to increase their social and cultural creativity..." (1994:365). Lifelong learning accordingly cannot simply be about human resource development; it also needs to direct the participation of

¹² South African legislation also attest to this trend in particular; The Department of Finance (1996) Growth, Employment and Redistribution: A macro-economic strategy and The Department of Labour's (1997 & 1998) Green Paper: Skills Development Strategy for economic and employment growth in South Africa and its Skills Development Act.

individuals in society to contribute and understand their collective role as democratic citizens.

Lifelong learning and active citizenship

The opinions expressed above by Belanger (1994), Gustavsson(1997) and Salling Olesen(2000), highlights the connection between lifelong learning and the cultivation of an active and participatory citizenry and resonates with Bron's (2001) belief about current shifts in the discourse of lifelong learning. Bron argues that the dominant discourse of the EU in the 1990's in relation to lifelong learning was an economic one. However, the EU Memorandum on Lifelong Learning (2000) signaled the shift in the discourse to one, which seeks to develop democracy. She suggests that this shift can be called the '3rd generation' of the lifelong learning concept. Bron claims that for the first time in a EU document the role of active citizenship is being equated with employability (2001:2). The two important aims of lifelong learning are regarded as the "...promotion of active citizenship and promoting employability..."(EU, 2000:5).

Historically, adult education has been concerned with the concept of citizenship and in many parts of the world it has played a significant role in establishing democratic citizenship and social justice. However as shifts from adult education to lifelong learning were made so has the notion of citizenship become central to debates about lifelong learning, particularly in Europe (Korsgaard, 2001:18). How citizenship is defined is however mirrored in these shifts. Here Korsgaard proposes that as the move from 'social citizenship' to 'active citizenship' took place, these were closely linked to moves from 'adult education for social justice' to 'lifelong learning for active citizenship' (2001:19).

The EU document (2000) regards active citizenship as "...focus(ing) on whether and how people participate in all spheres of social and economic life...feel that they belong to and have a fair say in the society in which they live." (2000:5). In addition employability is seen as a core dimension

of active citizenship but also a "...decisive condition for reaching full employment and for improving European competitiveness and prosperity in the 'new economy' " (EU, 2000:5). It can be argued that here active citizenship is interlinked with a more economic view of development and education if it is linked to lifelong learning.

Martin holds a similar position by arguing that current discourses of lifelong learning in terms of the construction of citizenship implicit in it, highlights its "...narrowly individualistic, instrumental and reductionist" tendencies (2000:255). He further states that there are two discourses of citizenship, which are currently dominating educational policy and practices. Both, argues Martin, are fundamentally economic in that they position at the centre of conceptions of lifelong learning, the idea that humans are essentially "economic animals". While both these discourses construct and reduce the adult learner to either worker/producer or customer/consumer, they "...simply do not account for enough of what adult education and lifelong learning should be about" (Martin, 2000:255). Martin (2000) advocates for a more holistic engagement of adult learners in their many roles in society rather than the current focus on their roles in the work and market place. Citizenship, like lifelong learning is not a neutral term and while it might imply an inherent goodness or humanism, clearly through this discussion on how the concept of active citizenship for lifelong learning has recently been used, this does not seem to be the case. There seems to be a distinction between lifelong learning for active citizenship, which encapsulates more human capital traits, and those, which propose active citizenship for democracy, which seems to reside in the more humanistic approaches to lifelong learning.

A conceptual framework for lifelong learning- a conclusion

In attempting to find a conceptual framework to guide the empirical research of this mini-thesis, this chapter has undertaken a brief historical review of the developments of lifelong learning. In addition an analysis of

the various theoretical positions associated with the concept was made. From these two activities it has become evident that any concept is bound by socio-economic and ideological influences impacting on society. No concept is neutral or exempt from these influences and through the process of attempting to unpack the meaning of lifelong learning this position is illustrated.

However, in order to conduct the research associated with this mini-thesis, a suitable meaning needs to be adopted. This means accepting that lifelong learning addresses the needs of production (the worker), society (the citizen) and culture (human being) to different degrees and at different times. When adopting a meaning or conceptualization of the concept it must be based on our analysis of the political, socio-cultural and economic needs of the country (Walters, 1999(a): 578). Recognizing the dual role embedded in any conceptualization of lifelong learning i.e. its economic and humanistic role, one also has to acknowledge the shortcomings of these roles and foreground the role which best suits the particular needs of the community or institution under review.

Conceding that more economic conceptualizations of lifelong learning have a particular purpose in contemporary society, the context of the case study in this mini-thesis is an educational institution. In the context of an educational setting we need to recognise that we are dealing with individuals in a learning environment and the economic position does not adequately account for the learning processes we will encounter. Furthermore South Africa (and Pentech) has a particular context¹³ and this context must be taken into account when selecting an appropriate meaning for lifelong learning. Based on these contextual realities, Belanger's holistic and humanistic conceptualizations of lifelong learning are accepted as the conceptual framing for this mini-thesis. Firstly, it is not

¹³ The educational history of South Africa is marred with gross inequities against Black and women citizens. For many of these people access to quality educational provisions at all levels i.e. initial, adult and diffuse learning environments, have been restricted. These contextual issues are discussed further in the following chapters.

narrowly economic and will account for a multiplicity of learning environments particularly the impact of initial and diffuse learning environments. Secondly, it acknowledges various conceptualizations of knowledge and arenas for its production and it is therefore best suited to the case study environment of Pentech. If a definition for lifelong learning had to be put forward, the description provided by The National Institute for Lifelong Learning Development (NILLD) is favoured as it clearly presents a definition, which recognizes the conditions prevalent in South Africa.

Lifelong learning is the development of human potential in all roles, circumstances and environments, through a continuously supportive process which stimulates and empowers individuals to acquire and apply all the knowledge, values, skills and critical understanding required to confidently and creatively attain their goals from cradle to grave (cited in Walters and Watters, 2000:19)



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In this chapter the focus of exploration narrows and is directed at a specific element within Belanger's(1994) notion of adult education namely, Higher Education (HE). As suggested in chapter one, the dimensions and meanings associated with any concept, particularly lifelong learning is strongly influenced by the contextual realities of the site of implementation. It can be assumed that within the context of the HE, lifelong learning will take a particular form both on a conceptual and implementation level. Firstly, lifelong learning in HE will be explored, with attention focused on the nature of lifelong learning in the higher education context and the significance to the institutional form of implementing lifelong learning. Secondly, the HE context of South Africa will be described. Of importance in this description are the factors which currently shape the landscape of HE in South Africa. The impact of these contextual framings creates specific implementation challenges for lifelong learning, in particular pedagogical and curriculum structures. Using the Cape Town Statement (2001) and the Candy Study (1994) approaches to implementing a lifelong learning philosophy in higher education institutions (HEIs) will be investigated. The Cape Town Statement (2001) proposes a list of the six characteristic elements regarded as crucial to ensuring the development of a lifelong learning higher education institution and the Candy Study (1994) provides an assessment of the teaching and learning approaches required to assist in developing lifelong learning competencies.

Higher education and lifelong learning

What is higher education?

Walters suggest that it is customary to divide the work of HE into three domains, namely teaching, research and community, with the purpose in each of these areas focused on the promotion of the facilitation of learning (1999(a): 579). Jarvis (2000:1), while acknowledging these key purposes adds that today HE's main mission should also be about education for responsible citizens and providing for learning throughout life. Identifying with this

contemporary view of HE's purpose, Taylor suggests that the 'development of the person' should be the central objective. However employer interest, contends that this development should be constructed primarily in economic terms i.e. "...the employable graduate with appropriate flexible and generic skills in addition to specific subject-based knowledge" (Taylor, 2001:138-139). A further function of HE is linked to its role in the knowledge-economy. HE's role here is as a key producer and disseminator of knowledge in addition to being the primary agent in the training of "...knowledge workers who are the foot soldiers of globalisation" (Division for Lifelong Learning, 2001:35).

The above description captures Jarvis's contention that increasingly the role of HE is changing in response to the changing world of production (1999:254). This suggests the creation of a tension between HEs' more traditional humanistically inspired liberal and general education role to a contemporary assertion that resides in more economic frameworks of vocational and professional development roles.

Nature of lifelong learning in higher education

It is noted that increasingly HE policy documents are using lifelong learning as a philosophical and conceptual framework for defining their role in education (Walters, 2001(a): 1). Taylor qualifies this statement based on research conducted by the Socrates programme under his direction into lifelong learning at four universities in Europe. Lifelong learning is beginning to make an impact on the policy and culture in HE, but has been unable to secure fundamental changes in attitude and practices. While lifelong learning is given an increasingly high profile in HE policy statements, Taylor concludes that there is a "...persistent lack of clarity over its definition and purposes". Furthermore, the priority within HE for lifelong learning is often given to Continuing Professional development and Continuing Vocational Education (Taylor, 2001:130-131). As with meanings associated with lifelong learning in general, Taylor comments that similar definitional tensions are

present in HE, with lifelong learning being used in two specific ways. On the one hand are the commitments relating to widening participation and social inclusion as well as skills development, and on the other is a focus on instrumental education, reflecting a “market orientated Human -Resource Management view of learning” (2001:129). Increasingly, however academics are challenging the latter’s conceptualization, suggesting that the economic views should be counterbalanced with the development of active or democratic citizenship, and related more to addressing concerns of poverty and equity (Simons, 2001:3). In this respect Walters’ emphasis that lifelong learning as a concept within HE should be viewed holistically and systematically, accounting for the different phases and levels of learning and education environments, not simply ‘adult education’, cannot be ignored. As a result HE should be viewed as being part of lifelong learning and not the other way around. Dominant views of lifelong learning see it as an ‘add-on’ to HE and this results in its marginalisation in the work and life of most HEI’s relegating it to adult education and continuing professional education domains as suggested by Taylor (Walters in Simons, 2001:4). Based on research generated by the Socrates programme, it is apparent that at HE level, the full and fundamental implications of lifelong learning are not fully understood and in general HEI’s are only starting to come to grips with lifelong learning (Taylor, 2001: 130-145). The same can be said in relation to the HE context in South Africa with Walters and Watters (2000), suggesting that South Africa is still in the early stages of developing a comprehensive lifelong learning approach.

Significance of lifelong learning in higher education

When assessing the significance and value of lifelong learning in HE, Candy urges that lifelong learning should be considered as more than just an attractive slogan (1996:5). If it is accepted that learning never ends, the obvious mandate of a HEI must be to support and foster lifelong learning in each of its functions (In Walters, 1999(a):579). Furthermore it is Duke’s

assertion that the acceptance of the term is a precondition that HE "...can be for all, across society and throughout life"(2000:3). Acknowledging this argument means that there are implications for many aspects of HE. These aspects can broadly be divided into two categories: (1) the provision of learning opportunities throughout life, including the articulation with learning contexts beyond the institution and (2) assisting students, graduates and staff to develop attributes and competencies of lifelong learners (Candy, 1996:5). In providing learning opportunities throughout life the traditional culture of HEI's is challenged. This culture has privileged the provision of education to 18-24 year old full-time students through contact-based teaching (Walters, 1999(a): 579). With regard to the provision of learning opportunities during the life cycle, Candy introduced the notion of "sideways", "downwards" and "forward" linkages.

Downward linkages refer to the relationship HE enjoys with the initial education (primarily schooling) and other adult education sectors. It implies the provision of multiple entry pathways from school, adult education and the recognition of prior learning provisions (Candy in Walters, 1999(a): 580). Sideways linkages allude to HE's relationship with diffuse learning environments like the home, the community and the workplace. This would signify the provision of academic credit for previous learning activities and flexible delivery structures for students. Finally, forward linkages refer to HE's relationship with its graduates through post-graduate studies, continuing education programmes and various forms of outreach. Forward linkages would allow for greater ease of access to postgraduate studies and increasing HEI would be seen as "community learning centers" (Candy in Walters, 1999(a): 580). Expanding Candy's ideas about HE's relationship with other learning activities, Walters argues that a holistic view of lifelong learning raises important issues about these relationships and linkages. It emphasizes not only the need to broaden educational access and provision in the various phases in the life cycle, it also fundamentally defines the

educational priorities of HE in terms of social purpose and substantive democracy (In Simons, 2001:4).

The development of lifelong learning attributes and skills for students, staff and graduates represents fundamental implications in the nature of the curriculum and pedagogical approaches adopted by HEI's. When discussing the Candy Study (1994) and the Cape Town Statement (2001) later in the chapter, the various implications of attempting to introduce lifelong learning approaches within a HE environment will be explored.

Lifelong learning and Higher Education in the South African context

The context of HE in South Africa

The National Plan for HE launched earlier this year by the Education Ministry sets out to address the key challenges facing South African HE. In addressing these challenges the plan "... (seeks) to redress past inequalities and transform the HE system to serve a new social order to meet pressing national needs" (In Walters, 2001(b): 3). Of its strategic goals and objectives, issues around equity of access and redress of past inequalities through guaranteeing that staff and student demographics adequately match the demographic realities of South Africa are high on the list of priorities (Walters, 2001:3). In addition as Munro asserts, the plan also alludes to the Human Resource Development stance adopted by the South African government which ties in with the objective that HE deliver highly skilled and socially committed intellectuals and professionals (Munro, 2001:1). The key imperatives for South African HE seems to indicate issues of redress of past inequality, the promotion of access and importantly the issue of meeting the workforce needs within a globalised economic world order. Walters summarises this by arguing that the discourse of social justice, redress and equity still seem to be in tension with the discourse of economic development within the objective framework of HE (2001(b): 1). Issues of access are interlinked with those of equity and redress

concerns for both students and staff, with an implicit push for greater social justice for those historically disadvantaged by the political system (Walters, 2001(b): 12). It is within this framework of plans and objectives to overhaul and transform the HE system that lifelong learning has been positioned, but as Walters suggests, similar trends noted by Taylor (2001) with regard to positioning lifelong learning within HE, seem to be evident in South Africa.

Imperatives for lifelong learning in South African Higher Education

Driven by South Africa's re-entry into the global economy and by the social and political imperatives of equity, redress and access after years of colonialism, segregation and apartheid, the imperatives of lifelong learning have been put forward (Walters, 1999:217). As a result it has not been surprising to find the discourse of lifelong learning influencing policy documents in the education and training arena (Walters, 1999:217; Walters and Watters, 2000:6).

Although most South African education documents written in the past five years use lifelong learning as a foundation, Walters and Watters believe that there is no vision for what this means (2000:15). The recent National Plan for HE also uses lifelong learning, but very little is said about what it means to be an institution that supports and develops lifelong learners (Walters, 2001(b): 8).

Lifelong learning in South Africa is seen as integral to the struggle for substantive democracy and social justice. Walters and Watters argue that for a concept like lifelong learning to contribute to social justice, equity and redress, a "comprehensive notion of lifelong learning is essential" (2000:6). When deciding which approach of lifelong learning to adopt, Walters' position that this should be guided by an analysis of the political, social, cultural and economic needs of the country is accepted (1999(a): 578). For lifelong learning to avoid being an instrument of the market and if it is to contribute to

emancipatory social goals, it needs to be qualified in relation to its social and universal purposes (Walters, 1999(a): 576). Conceptualisations of lifelong learning in HE within the context of South Africa therefore need to be those that promote a holistic, humanistic and social justice approach linked to the framing provided by Belanger (1994) discussed in the previous chapter.

Pedagogical implication

Reviewing the implications on HE of holistic and humanistic lifelong learning approaches, two issues seem to be important in the South African scenario. Firstly, is the issue of access. Soobrayan(1997) suggests that the temporal plane nature of lifelong learning places the emphasis on making education and learning available throughout the life cycle. The major question here relates to access and provision rooted in the discourse of equity and Soobrayan argues that this places no specific focus on pedagogy (in Walters, 1999 (b): 578). Pedagogical and curriculum issues are particularly affected when the provision of access provides for a wider student base essentially drawn from historically disadvantaged students¹ and considerations then need to be made about how their initial education experiences might impact on their new learning experiences in HE.

Secondly, Soobrayan argues that beyond the mere temporal plane assertions, any implementation of a lifelong learning policy in higher education would impact on issues such as pedagogy, organisational capacity and to a lesser degree political considerations (In Walters, 1999 (b):578).

Pedagogical implications would demand the implementation of learning and teaching approaches that foster and encourage lifelong learners and learning while organisation implication require organisational arrangements that

¹ As a result of apartheid most students regarded, as historically disadvantaged are either those racially classified as 'coloured', 'indian' or 'black', although this might differ across institutions with some only acknowledging 'blacks' as historically disadvantaged. A detailed discussion of the use of these racial classification terms in the mini-thesis is discussed in Chapter Four.

accommodate new pedagogical approaches and new access systems and structures. On the political side considerations in relation to other institutions offering similar courses, equitable access for all students and the recognition of prior learning (RPL) considerations are needed. (Soobrayan in Walters, 1999 (b): 578). It is acknowledged that all these factors will come into play, the focus of the mini-thesis relates specifically to the implementation implications for the learning and teaching approaches i.e. a focus on pedagogy and curricula.

Pedagogical and curriculum considerations are invariably dependent on who the student is. It is therefore deemed important to provide a brief illustration of the historically disadvantaged students most affected by the drive to provide more open access to HE in South Africa. Particular attention in this illustration is devoted to descriptions of their initial education experiences.

In recounting the schooling experience of most 'black' students Herman (1998:42) points to "... [the] poor teaching conditions, under-qualified teachers, inadequate facilities...educational boycotts...[which combined] have contributed to poor matriculation results for students formerly under the Department of Education and Training.² Walters (1999(b): 220) describes the quality of schooling provisions for 'black' people in South Africa as generally having been 'abysmal'³, suggesting that many 'black' students who reach HE, especially those at HBIs like Pentech, which specifically caters for students from disadvantaged educational backgrounds⁴, tend to be inadequately prepared by their previous schooling for the demands of the new learning

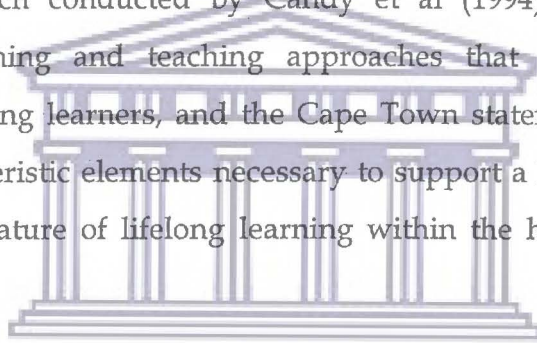
² The education department that controlled 'black' schooling prior to the formation of a single non-racial education department after the democratic elections in South Africa in 1994.

³ Cooper (1993:1) further notes that mathematics and science education at 'black' secondary schools in particular are extremely poor. The quality of the secondary schooling provision of most 'black' students entering engineering disciplines, which rely heavily on science, technology and mathematical concepts, is therefore exceptionally disadvantaged.

⁴ Herman (1998:41) notes that this trend is also prevalent at historically disadvantaged universities, where admission criteria are not as high as their historically advantaged/ white counterparts. As a result 'black'

environment. Similarly Hall (2001) argues that 'black' students⁵ who enter HE are disadvantaged not only as a result of the poor quality of their secondary education, but also as a result of what is referred to as their low levels of intellectual⁶ and social⁷ capital. In addition Hall (2001) puts forward the assumption that not only is intellectual capital required for the successful completion of HE but as a student progresses through HE her/his intellectual capital increases. If the conceptualization of lifelong learning as provided by Belanger (1994) is accepted, the pedagogical and curriculum implications as they impact on HE would need to consider how to accommodate the particular kind of initial education experience described above.

Exploring the research conducted by Candy et al (1994) which focuses particularly on learning and teaching approaches that resulted in the development of lifelong learners, and the Cape Town statement (2001) that puts forward characteristic elements necessary to support a lifelong learning HEI, the particular nature of lifelong learning within the higher education arena is unpacked.



The Candy et al Study (1994)

The main purpose of this study undertaken within the context of the Australian higher education system was to identify whether and in which ways the course composition of undergraduate degrees lead to the development of lifelong learning competencies.

students with higher matric results are invariably attracted to these institutions with HBI having to cope with students who are less prepared for HE.

⁵ Walters notes that due to the racial capitalist system that existed during apartheid in South Africa, there is some correlation between racial categories and social class, with it being particularly the case for black students (2001:5). The majority of 'black' students at HEI therefore come from working or lower working class family backgrounds.

⁶ Intellectual capital is a term used by Bowen and Bok (1998) to describe the set of assets primarily located in the family which accumulates into the present and acts as either a constraining or affirming entity in the fulfillment of individual abilities in life and in particular HE (In Hall, 2001:5).

⁷ Social capital refers to the combination of schooling and the social environment in which it is set, including the nature of support in the home environment and includes parent's educational levels (Hall, 2001).

...content, structure, teaching modes and assessment procedures of undergraduate degrees..., are designed to lead to the formation of attributes which both enable and encourage graduates to become lifelong learners (1994: xi).

In this study lifelong learning is considered to be very broad and comprehensive and including all formal, non-formal and informal learning whether occurring intentionally or unintentionally throughout the lifespan (Candy et al, 1994:xi). In addition it acknowledges the human capital and humanistic dimensions associated with the purpose of lifelong learning. The study maintains an equal assessment of these two considerations basing its "...findings and recommendations on both economic/technical and social/cultural rationales for continuing learning throughout life" (Candy et al, 1994:xi-xii).

Findings

The study's findings suggested that undergraduate education represented a potentially vital link in the lifelong learning experience of the individual (Candy et al, 1994: xii; Candy, 1996:6). Furthermore access to and critical use of information technology was regarded as being absolutely vital to lifelong learning (1994:xii). Courses seen to enhance lifelong learning had five basic characteristics:

- (1) they provide a systematic introduction to the field of study;
- (2) they offer a comparative or contextual framework for viewing the field of study;
- (3) they seek to broaden the student and provide generic skills;
- (4) they offer some freedom of choice and flexibility in structure; and
- (5) they provide for the incremental development of self-directed learning (1994:xiii and Candy, 1996: 7).

In relation to specific teaching methods that encourage graduates to become lifelong learners the following characteristics were seen as crucial:

- (1) They make use of peer-assisted and self-directed learning;
- (2) they include experimental and real world learning;
- (3) they make use of resource-based and problem-based teaching;
- (4) they encourage the development of reflective practice and

critical self-awareness; and (5) as appropriate, they make use of open learning and alternative delivery mechanisms (Candy et al, 1994:xii and Candy, 1996:7).

The study also suggests that the most vital determinant of whether or not graduates choose to become lifelong learners relates to the value placed on intellectual inquiry and learning by the institution and its academic staff.

...climate of intellectual inquiry in the institution, and the single most important factor influencing this climate is whether or not the academic staff members themselves manifest lively curiosity, a passion for their subject and a predisposition towards being continuing lifelong learners themselves (Candy, 1996:7-8).

In relation to curriculum issues the study identified four areas requiring attention if a course is serious about wanting to contribute to the development of lifelong learning competence. These are learning to learn skills, information literacy, Australian Studies (within the context of South Africa it would mean a focus on the importance and significance of South African history, social, economic and industry importance in relation to the rest of the world) and lastly the recognition of prior learning structures (Walters and Watters, 2000: 14).

In providing an evaluation of the contribution of the Candy et al study to understanding the nature of lifelong learning in higher education, Walters and Watters suggest that this work has produced the most detailed account and understanding into the factors that both enhance and inhibit the development of lifelong learners. The work also highlights the importance of the structural, the substantive and cultural factors working together towards the attainment of lifelong learning higher educational institutions (2000:12).

However while valuing its contribution to understanding the nature and form lifelong learning approaches should take within the HE institution, the primary focus of the Candy et al study is on learning and teaching processes

and the needs of individual learners. Although important, Walters, argues that this approach does not sufficiently highlight the social and universal purposes of lifelong learning (1999a; 581). Walters further argues that any debate about curriculum should also include notions of lifelong learning for active citizenship, which is clearly absent from the Candy et al study (1999a: 584). Based on the above considerations the position put forward by the Cape Town Statement is contemplated.

The Cape Town Statement

The Cape Town Statement was developed at the conference on Lifelong Learning, Higher Education and Active Citizenship held in Cape Town on 10-12 October 2000⁸. The statement is presented as an organisational tool that should be developed further in local contexts (Cape Town Statement, 2001:2).

When offering its particular perspective on what lifelong learning is, it adopts a holistic and cross-sectoral stance:

... lifelong learning is dependant on both the individual and social context and that learning occurs in institutions, but can also occur anyway, anywhere and at anytime throughout life. That is, it is life long, life wide and life deep (Cape Town Statement, 2001:4).

Lifelong learning is positioned as enabling "...students to learn at different times, in different ways, for different purposes at various stages of their lives and careers"(Cape Town Statement, 2001:4). In relation to HEIs all members of the institution, including staff are regarded as learners.

Six sets of characteristic elements are suggested as necessary to support a lifelong learning higher education institution. These are (1) Overarching Frameworks; (2) Strategic Partnerships and Linkages; (3) Research; (4)

⁸ This conference was hosted by the University of the Western Cape, UNESCO Institute of Education and the Adult Education Research Group of the Danish National University of Education.

Teaching and Learning processes⁹; (5) Administration policies and mechanisms, and (6) Student support systems and services (Cape Town Statement, 2001: 6)¹⁰.

When evaluating the Cape Town Statement's contribution to the development of lifelong learning higher education institutions, Walters suggests that the broad categories embodied in the statement indicate "...a systemic awareness of the interconnections between the macro environment, the meso organisational structural context and the micro cognitive and affective learning interaction" (2001(a): 4). Furthermore the framework as proposed by the statement forces one to look both inwards towards the individual and organisational learning and outwards towards relationships in the broader society (Walters, 2001(a): 4).

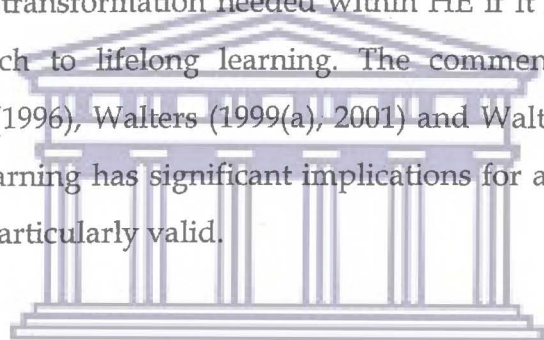
What the Cape Town Statement represents is a complex interplay, drawing together a multiple range of factors which account for the various roles and functions of higher education institutions in an attempt to suggest how best lifelong learning can be given a genuine "voice". It is interesting to note the lack of reference to the promotion of lifelong learning for economic development in the statement. Rather the development of a lifelong learning HEI's is promoted within the framework of a more humanistic approach to lifelong learning incorporating notions of lifelong learning for active citizenship. As commentators at the October 2000 Conference suggested, there is a need to ensure and prevent the dictates of market forces and the narrow concerns of the global economy to overrule the interest of social justice. Commentator, Prof. Pauline Murphy stressed this point by arguing that social justice should be an underpinning value in all activities of the lifelong learning institution (cited in Walters, 2001 (a): 6).

⁹ In Appendix 2, The Teaching and Learning Processes of the Cape Town Statement (2001) are presented.

¹⁰ Appendix 3 provides an overview of these characteristics as presented by the Cape Town Statement (2001). A brief synopsis of each element is also provided.

Finally the statement views the learning and teaching processes as being embedded in the overall functioning and operation of the institution rather than a separate and unique entity operating in isolation. The strength of lifelong learning approaches, as embraced by all the functions of the institution will complement, support and enable lifelong learning teaching and learning practices across the institution.

In many respects the comprehensive and all-enabling nature of the Cape Town Statement highlights the visionary and transformative nature of a holistic and humanistic approach to lifelong learning. It also highlights and points to the level of transformation needed within HE if it is to adequately embrace this approach to lifelong learning. The comments or warnings suggested by Candy (1996), Walters (1999(a), 2001) and Walters and Watters (2000) that lifelong learning has significant implications for all aspects of the function of HEIs are particularly valid.



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The theoretical framework guiding the study is based on the framework proposed by Durrheim (1999). While discussing these assumptions, attempts will be made to integrate Durrheim's proposals with the actual elements from the research study conducted. In addition, a brief review of the merits and motivation of using a case study approach to collect and represent the data of the research, will be presented.

Framework Design

The design of this framework is guided by Durrheim who suggests that a

...researcher must make a series of decisions along four dimensions: 1) the purpose of the research; 2) the theoretical paradigm informing the research; 3) the context of situation within which the research is carried out; and 4) the research techniques employed to collect and analyse the data (1999:33).

Furthermore it is suggested that while multiple considerations will result from the four dimensions, these must be woven together in a " ...coherent research design in a way that will maximize the validity of the findings" (Durrheim, 1999:33).

Theoretical paradigm informing the research

Durrheim suggests that paradigms act as perspectives that provide the rationale for the research and commit the research to a particular method of data collection, observations and interpretation. As a result paradigms are regarded as being central to a research design as it impacts on the nature of the research questions i.e. "...what is to be studied and the manner in which the question is to be studied" (Durrheim, 1999:37). As a result the theoretical paradigm that will guide my research is a qualitative one, embedded in the interpretative traditions. Interpretative qualitative research "...relies on first-hand accounts, tries to describe what it sees in rich detail and presents its findings in engaging and sometimes evocative language." (Terre Blanche and

Kelly, 1999:124). The main research question of the research study seeks to establish:

In what ways are the learning and teaching methods used by the Mechanical Engineering Design III lecturers at Peninsula Technikon supportive of the lifelong learning teaching and learning processes as suggested by Candy et al (1994) and the Cape Town Statement (2001).

Purpose of the study

Durrheim suggests that researchers need to ask two questions about the purpose of the research, namely "...who or what do you want to draw conclusions about; and what type of conclusions do you want to draw about your object of analysis?" (1999:37). The researcher, by defining the object of the research study, is therefore specifying who or what conclusions will be drawn about (Durrheim, 1999:37). The object of the study is also referred to as the unit of analysis. In the case of this study the unit of analysis is the social unit in the form of the lecturers responsible for the Design III course in the Mechanical Engineering department at Peninsula Technikon.

The purpose of a research study is also reflected in the type of conclusions the researcher aims to make or the goals of the research. Durrheim proposes that there are three different ways in which the types of research can be distinguished, namely "...1) exploratory, descriptive and explanatory research, 2) applied and basic research, and 3) quantitative and qualitative research" (1999:39). It is suggested that the research study can be described as descriptive, basic and qualitative in nature.

It is descriptive because it aims to describe a phenomenon and generate speculative insights, raise new questions and hypotheses and describe the phenomenon more accurately through narrative-type descriptions (Durrheim, 1999:39). The phenomenon described is lifelong learning teaching and learning practices as manifested in a South African technikon

environment. The research is deemed basic as the findings could be used to advance current understandings of lifelong learning teaching and learning processes. These findings might either refute or support the suggested theories relating to lifelong learning teaching and learning practices put forward by the Candy Study and Cape Town Statement. Finally as mentioned earlier, this study is firmly rooted in a qualitative framing. The purpose of the research is to study lifelong learning teaching and learning processes "...as they unfold in real world situations, without manipulation ...as interrelated wholes rather than split up into discreet predetermined variables... (Durrheim, 1999:43). In this sense the study by conforming to a qualitative framework, attempts to be naturalistic, holistic and inductive.

Research techniques

Research techniques consider sampling, data collection and data analysis that will be employed in the implementation of the research. To ensure design coherence the selection of techniques need to interlink and be consistent with the research study's paradigm, purpose and context.

The unit of analysis for the study is the social unit of lecturers associated with the Design III subject in the Mechanical Engineering diploma course at Pentech. The sample includes two lecturers (the current and recent past lecturer for the subject) and the curriculum designer responsible for the re-curriculation process undertaken by the department in 1999-2000. The unit of analysis dictated the sampling, it consists simply of all the lecturers who teach or have taught the subject in the past year (2001).

The data collection techniques employed by this study is that of an *Interpretative Case Study*.¹ The case study it is suggested by Yin (1984) and Punch (1998) are characterized by its use of multiple sources of evidence or

¹ A detailed description is presented later in this chapter.

data. This study uses three sources for its data collection viz. 1) Documents (course design material, strategic plans, statistical data, vision and mission statements of the institution, faculty and department, student yearbooks and general institutional information presented on the institutions' website; 2) Interviews with two lecturers and a curriculum developer (these will take the form of in-depth semi-structured interviews with at least the three key staff mentioned above; and 3) Basic statistical information (obtained via a biographical questionnaire completed by the current student Design III subject cohort to ascertain a student profile.

The data analysis process will use the theoretical and conceptual framing provided by the Candy Study and the Cape Town Statement's suggestions around lifelong learning, learning and teaching processes. These suggestions mould and provide a lifelong learning lens for analyzing the learning and teaching practices used by the Design III lecturers in their classroom. Thematic identification and descriptions will be used to define the data. Relationships between themes and with the conceptual framing of the research will also be explored.

Context

The final element to consider in any research design is the notion of context. Essentially this describes the researcher's attitude to the context of the study i.e. the extent to which the researcher would want to control and manipulate the context, whether the context is ignored or whether the context is acknowledged as having an impact on human and social behaviour and therefore is studied as they occur naturally (Durrheim, 1999:47-48). The situational context of the study is seen as a key determining factor in the types of findings or results that might be obtained. Teaching and learning practices are often associated rather closely with a lecturer or facilitators' personality and life views. As such it is seen as a sensitive and personal issue. A naturalistic inquiry, which is non-manipulative, obtrusive, (conducting

interviews where the researcher will engage in social interactions with the interviewees) and yet attempts to be non-controlling and open to whatever emerges from the research setting will therefore be conducted.

To ensure the ethical integrity of the case study the following measures were undertaken. Permission to conduct the study was sought from the Dean of the Engineering Faculty. When this was provided the head of the Mechanical Engineering Department was consulted about the research and together with the researcher a suitable subject offering was selected as the focus of the case study. Lecturers were then approached and their participation in the case study was obtained. Pseudonyms for all respondents are used to ensure confidentiality. In addition, sending each informant a summary of their own interview for confirmation will ensure the validity of respondent's statements during the interviews.

The Case Study Approach

Why a case study?

The key motivation for using a case study approach to conduct the empirical research associated with this mini-thesis is based on the rationale put forward by Merriam (1991). She suggests that a "...case study is often the best methodology for addressing problems related to educational practice in which understanding is sought to improve practice" (Merriam, 1991:xiii). Furthermore most case studies in an educational setting tend to approach the focus of the research from a holistic perspective, thus case studies are used in order to gain "...an in depth understanding of the situation and its meaning for those involved" (Merriam, 1991:xii). As mentioned earlier the research framework conforms clearly with a qualitative perspective where naturalistic, holistic and inductive qualities are prized, indicating a natural link with the case study approach. Merriam's view of the holistic and qualitative nature of the case study approach is corroborated by Punch who states

...the case study aims to understand the case in depth and in its natural setting, recognizing its complexity and its context. It also has a holistic focus aiming to preserve and understand the wholeness and unity of the case (1998:150).

What is a case study?

In attempting to define what a case study is, Punch, in agreement with Miles and Huberman [(1994) in Punch, 1998:152], concludes that a case can best be described as a "...phenomenon of some sort occurring in a bounded context"(1998:152) Merriam expands this by noting that a qualitative case study "...is an intensive, holistic description and analysis of a bounded phenomenon" (1991:xiii). While Cohen and Manion (1989:124) use the term 'individual unit' to refer to what Merriam terms 'bounded phenomenon', it essentially conveys the same meaning. A 'bounded phenomenon' could be identified as either a programme, a person, process, social unit or institution (Merriam, 1991:xiii).

Merriam attempts to clarify exactly what constitutes a qualitative case study by suggesting four fundamental characteristics of a case study;

- 1) It is particularistic i.e. it focuses on a particular situation, event, programme or phenomenon,
- 2) It is descriptive, thus the end product is a rich and thick description of the phenomenon under study
- 3) It has a heuristic element in that it illuminates the reader's understanding of the phenomenon under investigation. This brings about the discovery of new meaning, confirmation of the known and the extension of the reader's experience.
- 4) It is inductive, relying on inductive reasoning. It attempts to discover new relationships, concepts and understandings (1991: 11-13).

Most of the above merits suggested by Merriam resonate in the case study associated with this mini-thesis. It is evident that this study is focusing on a

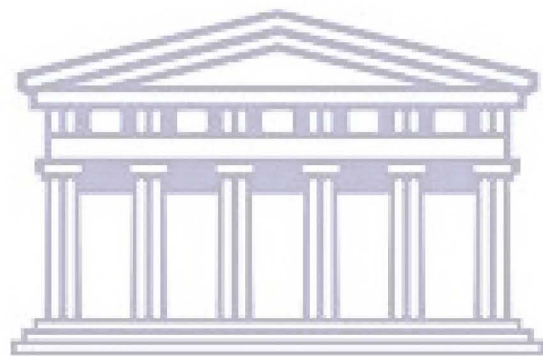
very particular educational situation and phenomenon namely, the lecturers and their teaching methods that are associated with the Design III subject offering in the department of Mechanical Engineering at the Pentech. Secondly, as already mentioned, this case study hopes to produce a thick description of the ways in which learning and teaching methods as practiced by lecturers of the Design III subject are possibly supportive of those suggested by the Candy and Cape Town Statement documents. Furthermore it is hoped that new meaning or the confirmation of known understandings of lifelong learning approaches to learning and teaching will be illuminated as a result of the case study. Finally, the discovery of possible new meanings, understandings and relationships with regard to the possibilities attached to implementing learning and teaching strategies at technikons, might also be made.

Types of case studies

In order to link up with the theoretical paradigm informing the overall research study, the type of case study needs to be established. Merriam provides some appropriate guidance here by advocating that case studies can be differentiated in relation to their end product into descriptive, interpretive or evaluative case studies (1991:22). It is proposed that this case study is best described as an interpretative case study type. In the first instance it contains rich and thick descriptions with the descriptive data being used to illustrate, support or challenge theoretical assumptions about lifelong learning and learning and teaching practices allied to lifelong learning held prior to the data gathering process (Merriam, 1991:27-28).

Clear motivation for using a case study approach in this research study is presented based on the premise that case studies provide the ideal method for obtaining an in-depth understanding of a particular phenomenon and social unit within a naturalistic and holistic context. Furthermore a qualitative case

study of an integrative nature ensures research design coherence as it compliments the overall framework design of this study.



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Presented in this chapter are the descriptions of the findings generated by the data collection processes. The contextual environment of the case study is also illustrated, as this context acts as a frame for both the analysis which has emerged from the study. It is the foregrounding of the contextual surroundings of the case study, which allows for the acknowledgement that no educational research study, irrespective of its size, can ignore the broader political, economic and socio-cultural factors affecting the educational landscape of South Africa. The legacies of the apartheid past are also acknowledged and noted as having a continual influence not only on the case study under review, but also the department and institution in which it finds itself.

Informed by an interpretive paradigm the case study recognizes that experience and meaning can only emerge through social interaction [Durrheim, 1999:49]. The context of the researcher and the respondents therefore cannot be excluded from the social interaction of the interview. Rather it affects and influences the nature of this interaction. For these reasons, the contextual descriptions in relation to the research setting and research participants, including the researcher, are described.

The description of the case study will take the following form; the institutional and departmental context will firstly be examined. Here focus will be directed on the nature of technikon education, Pentech's historical context and the demographic nature of its student and staff population. Secondly a brief contextual overview of the research process will be explored. Of significance here will be descriptions of the research participants in relation to gender, race, educational and institutional status indicators. Finally a thematic depiction of the case study will be presented focusing on the following issues; how lifelong learning is viewed by the case study staff, the department and institution; characteristics of the case study teaching staff; teaching approaches including how learning is facilitated within the case

study; and general curriculum issues as they relate both to the case study classroom but also more broadly to the whole Mechanical Engineering diploma. Notions of the curriculum structure, the underlying culture or ethos it promotes, along with the skills and knowledges it aims to facilitate, will be described. Finally, I describe the lecturers' perceptions of their students including student learning behaviour.

Peninsula Technikon

In the current higher education terrain, Pentech is regarded as a Historically Black or Disadvantaged Technikon¹ [HBT or HDT respectively], having been created initially to serve the population group classified as 'coloured'². In 1987 it opened its doors to all 'races' and students classified 'Black' or 'Indian' were allowed to register for classes. Current 2001 enrolment figures³ paint the following picture of student racial demographics. Of its 8762 students 64 % are 'Black', 33 % are 'Coloured', and 'White' and 'Indian' students make up 2% and 1% of the student population respectively. Thus in relation to its student population, Pentech's historical roots in serving a 'coloured' target audience has been radically overturned. The institution has also positioned

¹ This connotation is part of the legacy of the racialized education structures under apartheid. Peninsula Technikon until 1994 was therefore administered under the 'coloured' "own affairs" education ministry [Cooper, 1993:10]. Its origins are rooted in the 'coloured' apprenticeship classes under the Peninsula Technical College, which opened its doors in 1962. These classes were then incorporated into the Peninsula College of Advanced Technical Education in 1972 and finally through the Technikon Act it became Peninsula Technikon in 1979 [Pittendrigh, 1988]. Peninsula Technikon was therefore intended to cater for the needs of the 'coloured' population mainly centred around Cape Town [d'Almaine, Manhire and Atteh, 1994:437]

² The racial classification used here is influenced by the Population Registration Act [1950] instituted under apartheid laws which classified the South African population into three basic definitions: black, coloured and white. Black people were regarded as a member of any aboriginal race: - the term African is sometimes used interchangeably to classify people of indigenous origin who were not classified 'coloured'. 'Coloured' was defined as someone neither black nor white. Additional modifications allowed for various sub-groups within the 'coloured' category including Indian – the classification being based on a "national home" outside of South Africa [West, 1988]. In post apartheid South Africa many non-white people ('coloured' and 'indian') view themselves politically and sociologically as Black, but many demographic data still relies on apartheid era racial classifications, which is also the case at Pentech. In this mini-thesis the terms 'Black', 'Coloured', 'Indian' and 'White' will be used to distinguish the racial classification of staff and students.

³ Statistical data provided by the Department of Strategic Planning and Management Information at Pentech [23.10.2001].

itself as an access institution by offering programmes to educationally disadvantaged students.⁴

The academic staff profile however paints a different picture. 'Black' staff members account for only 6% of its 229 permanent academic employees. 'Coloureds' make up 67%, 'Whites' 25% and 'Indians' 1%. This displays a clear disjuncture between lecturer and student racial profile. Thus as a 'black' student one is more than likely to have a 'coloured' or 'white' lecturer. The Mechanical Engineering Department, the location of the case study, has only one 'black' lecturer and it would be quite possible for a 'black' student completing a three-year diploma to never be taught by this lecturer due to the subject electives chosen. This of course raises issues around role modeling and the ethos⁵ students are being exposed to and while these issues are outside of the focus of this study, its effects on learning and teaching cannot be underestimated. The gender distribution suggests a roughly 69%: 32% male - female ratio for academic staff.⁶ In the Engineering Faculty the numbers are slightly higher - 80%: 20% but are particularly disproportionate in the Mechanical Engineering department with only one female academic staff member on the academic staff roll of 167. In addition its only female academic staff member is also the lecturer tasked with teaching the non-mechanical discipline subjects of Communication and Computer Skills. Together with one of the Mathematics lecturers they are the only academic staff members who do not have any formal engineering qualification or work experience. The female students constitute roughly 53% of the student body, most female

⁴ This assumes that the primary and particularly high school education of these students would not have adequately prepared them for higher education study. It also assumes that the programmes on offer therefore caters specifically in relation to either course content or learning approaches to the needs to these kind students.

⁵ Language of instruction is a further issue, which might affect learning and teaching. The medium of instruction at Pentech is English, yet its student profile suggest that for most students English is either their second or third language.

⁶ Female staff numbers only challenge male figures in disciplines traditionally receptive to female professions i.e. 54.5% in Human Resource Management and 70% in Health Sciences (Nursing, Public health and Radiography) often regarded as 'caring' disciplines.

students are located in the Business Faculty (51.7%) with only 20% of the overall female population located in the Faculty of Engineering. The male: female student ratios in the Mechanical Engineering department roughly mirror those of the Faculty. The overwhelming majority (79.5 %) of the students are in the 17-26 year old age range.

The period of employment at the technikon for the department's staff ranges from 1 - 20 years of service with most (+- 70%) listed as being engaged in some formal further studies mostly in courses related to Mechanical Engineering. Two of the academic staff members are listed as having formal education based qualifications i.e. Higher Diploma in Education.

The main education focus pursued by Pentech is described as "...offering post-school programmes from the level of three year National Diplomas".⁸ The education focus is on skills proficiency, vocational and career orientated education with curricula at technikons being directed towards programmes and careers and not towards disciplines. The Engineering Faculty specifically suggests in its mission statement that students will be "prepared for a meaningful role in a high-tech, knowledge based global economy" and positions its academic programme as responding to this need. A further distinguishing feature of a technikon education as compared to university education is the inclusion of an in-service or experiential training component. Students are expected to complete a stipulated period in industry before being credited with a diploma in their respective course. The institution has three faculties viz. Science, Business and Engineering. The Mechanical Engineering Department is one of 10 departments based in the Faculty of Engineering. It

⁷ A similar scenario is present in Electrical Engineering where women make up only 3 of the 18 academic staff members.

⁸ Since 1993 legislation has granted technikons the opportunity to expand the qualifications they offer to degree courses, which include Bachelor of Technology [Btech] and Master [Mtech] and Doctorate [Dtech] of technology courses.

offers a National Diploma⁹, Btech, Mtech and Dtech in Mechanical Engineering.

Interview context

As mentioned, the researcher and her/his context, does inevitably influence the research process to some degree. The fact that as a 'coloured' female researcher, in a male dominated context the interaction may have been influenced both by what I said and how I acted as well as the responses of the interviewees. My association with Pentech dates back to 1994. I have held various positions with a mostly student development and lifeskills training focus. Since 1998 I have worked in the Faculty of Engineering where I headed a cross-institutional materials development project. I have had specific contact with the Mechanical Engineering department in this period where I conducted various lifeskills programmes with students in S1 and S4 levels. I currently work as a lecturer in the newly established Multimedia programme in the faculty. My long association with Pentech (and the Mechanical Engineering department) in particular has provided an insider sense of the political and cultural aspects as they affect the faculty and institution.

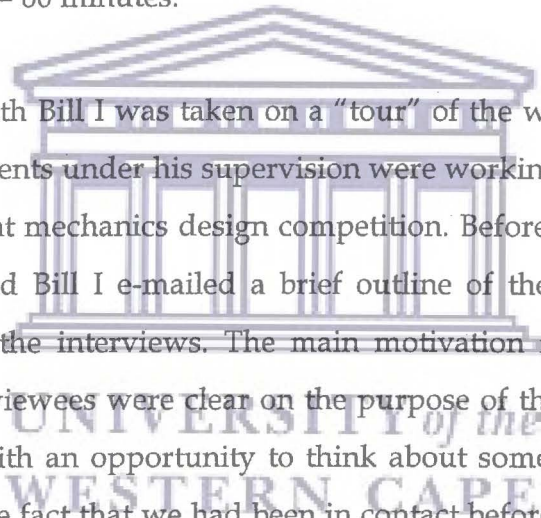
Interviews were conducted with three informants associated either directly (the current and past lecturers of the Design III subject) or indirectly (curriculum developer based at the Mechanical Engineering Department for 8 months in 1999-2000) with the case study classroom. All the interviewees were male, two, were trained Mechanical Engineers before they started working at Pentech. Consultation took place with the Head of Department [HOD] and together we selected an appropriate subject classroom to conduct the research.¹⁰ Towards the end of the first semester (June) Bill,¹¹ the then lecturer

⁹ See Appendix 4 for a further explanation of how the National Diploma qualification is structured and where the Design III subject is located.

¹⁰ Appendix 4 provides a brief synopsis of why Design III was selected.

¹¹ Due to ethical considerations pseudonyms will be used for all respondents.

for Design III, was initially contacted regarding the intention to conduct the research using his classroom as the case study. Due to time constraints it was agreed that the actual research would take place in the following semester but that he would no longer be teaching the subject. In early August I met with both Bill and Andrew (who is the replacement subject lecturer) and discussed the focus of the research and proposed format of the investigation. I also requested assistance with the student biographical questionnaires, which Andrew agreed to disseminate (and collect once students had completed them) in the next Design III class. At the stage of the interviews I had been in regular contact with both informants either telephonically or via e-mail. Both interviews took place in the informant's office and were mostly undisturbed and lasted between 50 - 60 minutes.



After my interview with Bill I was taken on a "tour" of the workshop where some of the Btech students under his supervision were working on their entry for the regional student mechanics design competition. Before the interviews with both Andrew and Bill I e-mailed a brief outline of the themes I was hoping to explore in the interviews. The main motivation for this was to ensure that both interviewees were clear on the purpose of the interviews. It also provided them with an opportunity to think about some of the themes before hand. Due to the fact that we had been in contact before, good rapport had been established which helped with a fairly free flow of information.

The interview with Clint had a slightly different context and purpose. Clint and I met formally in 1999 when he was working in the Mechanical Engineering department and we have worked together as co-editors of the in-house academic journal at Pentech. When I started my research I requested his participation. My motivation for including Clint as an interviewee was related to his experience with the curriculum reformulation process in the department and I felt that I could use him as a point of reference. I also wanted to interview someone who had a fairly good knowledge of the

department and in particular the curriculum structures, but who no longer had any formal ties with the department. I was hoping that this would provide a different reference point than interviewing the HOD of the department. This interview took place in Clint's' office and lasted for about 40 minutes.

In all the interviews I asked the same guiding questions¹² but adapted them and asked additional questions for clarity where necessary. At various points during the interviews I would summarise some of the issues raised by the informant, asking whether my understanding of the issue was correct. All the interviews were recorded and detailed summaries of each interview (with summarised responses for each question asked) were sent to each informant to check if they adequately represented what had transpired in the interview¹³.

Andrew is a 'white' male about 27 years old who has recently (July 2001) been employed (on a one year contract) as a lecturer in Design III in the department. Prior to this he was employed at various engineering companies. Except for his last job, the others were described as "boring" as they did not really relate to his design and 'pure' mechanics interest. Andrew graduated from a historically advantaged university in 1997 with a degree in Mechanical Engineering and has been involved in an array of informal learning projects closely related to his specialist interest area within the Mechanical Engineering discipline. This is his first experience of teaching in any educational context. As a result of Andrew being new to the Pentech environment and knowing that he will only be working in this environment for a year I got the impression that he was being open in the interview. He

¹² See Appendix 5 for list of these questions included those addressed to Clint.

¹³ I only received feedback from Bill who only commented on the spelling mistakes but was otherwise happy with the representations.

was expressing his feelings without having to be vigilant about who he may or may not offend.

Bill is a 'coloured' male about 43 years old who has been working at Pentech since 1997. He taught the Design III course for the past 4 semesters (2 years) and is currently in a seconded position as project, business and marketing manager for the Rapid Prototype Centre at Pentech based at the Mechanical Engineering Department. Bill also taught other subjects on the diploma programme in the department and acts as supervisor for [Btech] projects. Bill has over 21 years of industry experience relating specifically to naval, marine and mechanical design based on a long association with the SA Navy. His career development started as an apprentice in a naval dockyard and is dotted with various formal training courses including part-time studies at the then Peninsula College for Advanced Technical Education, the predecessor of Pentech. His career has taken him to England where, while working, he continued to pursue formal studies leading to a qualification as a Chartered Engineer. Bill is currently registered for a specialized masters programme sponsored by the TAFEISA¹⁴ project, which combines a subject discipline with an entrepreneurial focus. Bill seemed more circumspect and careful in the interview and may have been influenced by the fact that I was a 'coloured' woman. I also got the sense that he saw me as the typical female 'education or communication- type' person trying to understand what happens in a male dominated environment.

Clint is a 'white' male in his mid forties currently employed by the Educational Development Unit at Pentech as a curriculum developer. He previously worked in the Mechanical Engineering Department where he was responsible for the re-curriculation of the syllabus into outcomes based education [OBE] format. He was tasked with writing outcomes at appropriate levels and incorporating cross curricula outcomes and applied competence

¹⁴ Technical and Business Education Initiative in South Africa. This course is offered by Pentech and its sister institution in the UK.

into the curriculum. As a result he re-wrote the qualifications from diploma to Dtech level for all mechanical engineering courses offered at technikons in South Africa. A second aspect of his job involved working closely with lecturers to ensure that their subject teaching actually reflected the new OBE curriculum. Prior to working at Pentech, Clint worked in materials development initiatives and academic support programmes in higher education and NGO environments. Clint was interviewed after I had interviewed the two lecturers, with the focus on gaining his insights on the themes raised in the other interviews along with providing clarity on the specific issues of curriculum structures. The interview format was informal and consisted of me reflecting back some of the comments that emerged from the other interviews and asking Clint for his comments. Based on his perceived neutrality and our previous working relationship, my questions and comments were more direct.

Thematic descriptions

The basis for the selection of the thematic descriptions are firstly, closely related to the conceptual framing of the study i.e. lifelong learning, lifelong learning in higher education environments and more specifically learning and teaching approaches that conform to lifelong learning perspectives. With regard to the latter the work of the Candy study (1994) and the Cape Town Statement (2001) on learning and teaching approaches are pivotal. The Candy study suggest three categories which have been linked to learning and teaching approaches viz. the characteristics of the teaching staff, the teaching methods used and various curriculum related issues. A similar categorization is evident in the Cape Town Statement. These three categories therefore form the basis for the inclusion of themes relating specifically to the *characteristics of teaching staff, teaching methods and curriculum issues*. The general theme of how lifelong learning is viewed by the institution and the department is also

included. The interview questions directly sought to provide descriptions and comments on the above-mentioned themes.

Further themes emerged as a result of the data collection and interview process. These related to what has been broadly termed *student descriptions* and includes *descriptions of student demographics, how lecturers perceive students* and what are regarded as *barriers to their learning*.

View of lifelong learning

The institution's mission statement claims to "develop academically, socially and technologically competent students...responsive to ...needs and challenges of society" by amongst other things "fostering lifelong learning". Its dedication to foster lifelong learning is also cited as the key impetus for the expansion of the Centre of Continuing Education, which offers a range of short courses principally targeted at working adult audience with limited formal education qualifications. The "fostering of lifelong learning" also features in the Faculty of Engineering's mission, alongside the need to "independent, self -directed learning". None of the official documents reviewed however detail how lifelong learning is perceived or how the institution plans to implement or foster its notion of lifelong learning. In relation to the Mechanical Engineering Department, any indication of lifelong learning is absent from any of the official documents, vision statements or student handouts i.e. yearbooks. The two lecturers were not asked directly if they subscribed to a lifelong learning philosophy, but based on their comments about their own learning, lifelong learning to them is closely associated with formal and non-formal learning. Learning for them is closely or strictly related to career or job interests. Both Andrew and Bill recounted how most of their learning activities were directed within the field of Mechanical Engineering. In response to a question on how important staff development was at Pentech, Bill noted that staff learning should always be directed towards the benefit of the technikon. "You aren't going to study

something if you aren't going to use it" ...Students and the technikon must benefit from what I am studying" [Interview summaries:09.19.2001:14]

Characteristics of teaching staff

This thematic category relates to the particular ways in which academic staff "...manifest lively curiosity, a passion for their subject and a predisposition towards being continuing lifelong learners themselves" [Candy, 1996:7-8]. It is also about the ways in which educators facilitate learning, rather than transfer information and whether or not they are familiar with current theories and best practices as they relate to learning practices [Cape Town Statement, 2001:10]. This category can also included knowledge of current discipline innovations and best practices.

In general, due to the nature of technikon education, teaching staff with strong industrial experience is usually sought after. The Faculty of Engineering maintains strong ties with industry as its mission statement suggest.

Close contact with industry ensures that programmes remain relevant. Research is of an applied nature and is directed at the needs of industry and the community and is generally well supported by local and international partners [Pentech Website]

Academic staff at Pentech are also encouraged to continue formal studies in their respective disciplines through the institution wide staff development policy. There is thus a conscious attempt, in the relation to staff development and recruitment, to balance industrial relevance with sound theoretical knowledge.

Bill has more than 21 years of industry experience and notes that when he was interviewed for the job of lecturer he was told that the reason he got the job was because of this industry experience. Throughout the interview there was a clear sense that Bill values the importance of formal qualifications pointing

out all the qualifications he had. In addition he displayed an immense interest and passion for the discipline of Mechanical Engineering and went to great lengths to explain how the various design projects currently being tackled in the Rapid Prototype Centre worked. Even his extra-curricula activities seem to centre on Mechanical Engineering. At the time of the interview he was co-ordinating the Pentech entry of the Sasol Minibaja Competition and this was not regarded as a work function, it was seen as an extra-curricula activity.

There was the sense that Bill attempts to introduce a 'best practice' approach to design that emulates the norms in industry and tries to maintain a strong link between practices incorporated into the class and those that happen in industry. Thus the lecture session is regarded as a day in industry, starting off with a discussion about the 'business for the day', guest lecturers are a regular feature and there is an acknowledgement that the textbook can only be used as a guideline:

I only use the textbook as a guideline. As a reference. This comes as a result of my 21 years plus industry engineering experience...The textbook states the methods and procedures, [but] within practice this doesn't always happen. This is where my knowledge comes in. [Interview summaries: 9.19.2001:5]

A similar motivation resonates with the practice of maintaining a design file (where all the work and tests covered during the course is kept) which he insists students keep. The file also doubles up as a resource during assessments, which take the form of open- book tests.

If you are going to do a good piece of design work today you will record it, put it into your design file, record it on your computer, use it again as a reference. You will use it as an experience. ...In industry each day is not the same, I picked this up from my work environment [Interview summaries: 9.19.2001:13]

Bill clearly sees himself as a lifelong learner.

"I am a professional student because I haven't stopped learning and studying since 1965" [Interview summaries:09.19.2001:16].

Andrew also displayed this lively and passionate interest and curiosity for his career focus. He was able to relate how, since a child he has always and continues to take apart and rebuild various mechanisms and devices.

As he says:

If it's something I'm interested in then I'm going to learn until I can't learn no more or so that I can have a very serious conversation about it and argue a point [Interview summaries: 09.26.2001:13]

In response to whether he was a lifelong learner, Andrew commented:

Ja I think so but I'm very specific... I have no interest in Electrical Engineering so there is no way you are going to get me to learn about it unless there is something in there for me." ...If something happens and I can't figure out why it happens, I'm going to pick up a book and find out why this is happening [Interview summaries: 09.26.2001:13-14]

While clearly passionate about his subject, Andrew did express a difficulty in trying to carry this across to his students. When asked if he thought this interest in exploring mechanical functions comes across in the class, he noted only when the subject he was teaching related to all various activities he encountered on a daily basis (for example the work he was doing currently on his scooter). He suggested that

...what they are doing is rather basic stuff, but I don't think they'll understand what I'm doing with my scooter...I would like to talk to them about it, but whether they would be interested to hear about it or understand what I am doing I don't know ...don't know how I would get them interested [Interview summaries:26.09.2001]

A clear conclusion based on the interviews is that both lecturers displayed a clear curiosity and passion for their subject and displayed signs that they were both predisposed to being lifelong learners. Unclear is how this interest and curiosity is transferred into the classroom and how it encourages their own students to become lifelong learners. Some insight into this last aspect might be gained from the descriptions of the common teaching approaches used by the respondents and in general by other lecturers in the department.

Teaching approaches and methods

The Mechanical Engineering Department describes its educational methodology for its diploma course as utilizing the following methods: lectures, project work, assignments, group work, tutorials, laboratory work, experiential learning, workshop sessions and field visits. The departments' motivation to use continuous assessment is based on its integrated nature and its provision for a varied means of evaluation. Based on the course outline provided to Design III students there is no indication of how learning will be facilitated during the course, except to mention the method of assessment which includes open-book tests and individual assignments and a group combined subject level four assignment¹⁵.

For both lecturers, the main teaching approach used is the provision of content information in the form of lectures. Here 'chalk and talk' methods are predominantly used, interspersed with some 'interactive' and practical approaches like visits to workshops, use of models to explain concepts, encouragement of group work, students working out problems on the board and the illustration of examples.

Andrew's response to describing what might typically happen in his classroom was the following:

...Well the first thing I try to do is tell them something interesting to arouse their interest or wake them up ...and then I try and explain to them before I actually do something what I am going to do. So I will give a brief run over of what I will do. So I will refer to the course outline and say that 'We will be doing chapter whatever and it involves this and this and this'. Then it just involves lecturing to them and like I said I try to include as much practical examples as possible of what I am trying to teach them... (Interview summaries:09.26.2001:5-6)

Bill who actually named his approach "chalk and talk", summed up his motivation for its continued use in the following comment:

¹⁵ None of the lecturers mentioned this integrated project. Clint noted that one of the curriculum development initiatives for the institution was the introduction of an integrated project at each level of the diploma course.

I do chalk and talk, ...we have to do chalk and talk everyone says chalk and talk is not the way, but believe me the students want to see the calculations on the board...you are never going to get rid of chalk and talk (Interview summaries:09.19.2001:7).

Comments from Clint confirmed the above description as being common in the department. He did however suggest that there was a general feeling in the department that certain subjects demanded or lent themselves to certain kinds of teaching approaches. He had the following to say about approaches to Mathematics and CAD.

...Talk about some subjects like mathematics...the sense that students just need to learn mathematics and they are no good at mathematics...there isn't much room for critical outcomes ...problem solving, working in groups, managing yourself, communication, they really won't see any importance in that part for mathematics. Mathematics is a typical example of where learners just need to know the stuff" ...I had the same experience with the CAD [Computer Aided Design] lecturer who saw the subject as just a series of techniques which the students need to learn (Interview summaries: 10.03.2001:3)

Clint also related some of the difficulty he had in convincing lectures to consider making a shift to more integrated approaches to these subjects he however commented that

...with design it was a lot easier because design is about something and design matches very well with the whole OBE approach or the whole problem solving approach [would be a better way of describing it. (Interview summaries: 10.03.2001:3)

Design, it is suggested, tended to be easier because the subject lent itself to the inclusion of these types of real-life approaches.

A further impression created was the lecturer's position in relation to students in the class. Not only in terms of authority, but also in terms of how knowledge was regarded and who was active in knowledge creation. Bill described his approach to teaching, in the following way:

It is definitely not conservative its 'Raw'. Raw as is, its interactive with the students

Students are required to use the combined knowledges and skills taught at a particular level of their course to complete this project.

When describing how he usually approached the class he had the following to say:

When I march into class, I don't put the fear of God into them. I make it clear that I am still their friend but there is the matter of respect and its not because I come from the old school (Interview summaries:09.19.2001:12)

The key issue embedded here is the notion of knowledge, i.e. whose knowledge is deemed important and whether or not students are part of or active in creating their own knowledges and whether their existing knowledge is deemed valid. There is a suggestion of student activity, but whether this activity leads to or involves student participation in knowledge creation is uncertain. It is also unclear if Bill consciously attempts to facilitate the creation of new understandings of existing knowledge and the acceptance of different kinds of knowledge through what he describes as “interactive”. While noting that group work is encouraged (by himself and many of his colleagues) Bill is unable to provide concrete examples of how the group work process helps student to learn new skills or gain insights into new knowledges. When asked to clarify why group work is deemed important, the notion of group dynamics was raised. The response however suggests a disconnection between the values of group work in relation to facilitating knowledge or new insights within the subject area and the inclusion of group work as a learning tool.

Group dynamics – practically showing them how to apply group dynamics. What is group dynamics? It's working together and it cuts down on the time. This also comes from my experience in industry. When we brainstorm. For one or two people to brainstorm is pointless or its time consuming rather let the whole group think about it. Also the time factor. It cuts down on time (Interview summaries: 09.19.2001:8)

Andrews' comment about what typically happens in the class also illustrates the idea of an active lecturer and students who are passive bystanders.

Once I have done a group of work [sic] I usually do a question or example on that section. So I will lecture on a section and once I've covered it I will provide an illustration to show them how it comes about. I think using a drawing or picture is a good way to show this. I usually give them a chance to ask questions but they normally don't have questions. They don't know enough to ask a question and those who do know enough don't want to ask a

question because they think that the question is stupid (Interview summaries:09.06.2001:6)

When asked what he thought might be happening to his students while he was lecturing he pointed out that

I'd say the majority of them are just sitting there and aren't doing anything and not listening too well..."Students aren't doing anything, just sitting there, they aren't taking notes, they would rather print notes off the system. Majority of them come there and I don't know what they are doing here...(Interview summaries:09.06.2001:7)

Both lecturers however did display a willingness to change and adapt their teaching approaches and methods. The key motivating factor for any changes were located with student levels of understanding. The key methods used in this respect were the simplification of core concepts, increasing the use of examples, pictures and diagrams to accommodate student needs. Bill's comment illustrates this:

I noticed that our students, not only mechanical engineering but all engineering students actually lack basics...This is our biggest problem here, that is why I have gone more interactive with assignments and projects. When we cover a chapter on theory I take them to the labs, workshops or we make something to show when it comes to mechanisms... they actually want to see it." and " At times the pitch level is quite high and the students tend to battle... then I go down to basics (Interview summaries:09.19.2001:6)

Andrew also makes a similar comment, which illustrates the use of concept simplification:

When the situation arises if I can simplify something I will do this – break it down to the bear essentials to see how it fits together. But I can't do this for every single thing because it would take too long. (Interview summaries:09.06.2001:6)

The emergence of a distinct teaching style linked to each lecturer was also evident. While Andrew's style seemed rather formal, he favoured approaches which handed more responsibility for learning over to the student.

I don't spoonfeed them ...take every example and show them exactly how that example works. I give them the odd example and hopefully from that they will realize that they can use it for every example they come into contact

and hopefully this will be a continual process and they won't be happy with every answer they get (Interview summaries:09.26.2001:12)

Bill seemed conscious to create an adaptable and approachable environment in his classroom, where no lecture could be described as the same, depending rather on his mood or needs of the content or students. He also tended to use industrial experience as a key factor in his teaching.

"...In industry each day is not the same, I picked this up from my work environment". (Interview summaries:09.19.2001:13)

Curriculum issues

Any discussion about the curriculum needs to acknowledge that it can cover a range of issues relating to practically every aspect that impacts on what and how learning is facilitated both overtly and covertly. The descriptions presented below however take a very focused view of curriculum related issues. Broadly three issues are described: the kinds of skills and knowledges that the subject is trying to instill, the culture or ethos promoted by the curriculum (here there is an intermingling between the case study subject /classroom and the rest of the diploma courses) and finally the practical and structural characteristics of both the case study subject and the entire diploma. When dealing with curriculum issues it is difficult to separate subjects and course levels from each other, especially if the subject is offered as a final semester subject. The influences of the previous subjects therefore come into play.

A review of the course outline¹⁶ advocates that the Design III requires a range of rather complex problem-solving, integration and critical assessment and thinking skills where information and knowledges need to be combined to solve particular kinds of problems.

¹⁶ To introduce the student to the procedures followed when approaching any design tasks. The student is expected to utilise material from the other courses and apply this knowledge to complete the task. Projects set must be presented in correct report format as taught by the communication lecturer. At the end of the

Both lecturers related similar sets of skills when asked what they regarded as some of the important skills students needed to learn as a result of taking the Design III subject as well as being at technikon. Industry needs were the key determinants of skills deemed important. Bill's series of skills, qualities and abilities needed by students in industry included mathematical skills, effective communication skills, general engineering knowledge linked to knowledge areas specific to Mechanical Engineering (i.e. Fluids, Strengths of materials etc...), management and project management skills, computer skills, financial management and entrepreneurial skills. A glance at the overall course content of the diploma in Mechanical Engineering reveals that many of the skills listed above are actually catered for in specific subject offerings from S1 to S4 level. Pre-requisites for Design III included Design II, but also Strength of materials (S3), Communication skills (S1) and Management skills (S1 & S2). It is assumed that many of the skills listed by Bill would have been developed or taught either prior to or during the Design III subject offering. Andrew had a slightly different approach putting forward the idea that industry really does not require pure Mechanical Engineering knowledge per se and that one's studies should rather be about learning problem solving skills. Here Mechanical Engineering knowledge only serves as background knowledge, acknowledging that the discipline itself is too large to learn everything one needs to know.

...as far as I am concerned your studies are here to teach you how to solve problems not to learn all the theory of mechanical engineering (Interview summaries:09.26.2001:9)

What is interesting though are the responses both lecturers provided to the question of whether students are learning these skills as a result of their course and how students might be able to learn these kinds of skills, in particular problem-solving.

course, the student will thus be able to analyse a given problem, choose the relevant necessary solution and present a final design project, which may be implemented. (Design III Course Outline, 2001)

Bill felt that students would learn these skills best through interactive approaches, in particular brainstorming, but then introduced what he saw as certain barriers¹⁷, which prevent students from learning the kinds of skills pointed out above.

Bill: That's where the interaction come in ...Brainstorming but then we have this cultural interaction
LC: Can you explain that?
Bill: You find with the language thing...The language thing is the biggest thing that's what I mean by the cultural. I speak from experience when I taught management skills...dealing with conflict management the topic was Men and women in engineering and what are your dreams? I would especially ask the males if they would be happy with their wife as breadwinner or earning more money than them...This would be the conflict....The women are actually scared...this is where the cultural thing comes in. They are scared of telling the males no. And they have to accept what the male is saying. One guy actually stood up in class and said that where he comes from they must just listen and just stay at home and we actually laughed at him and that is where I picked it up. ...It's a language barrier, cultural, upbringing, traditional...coming from everyone, even those born in the Cape (Interview summaries; 09.09.2001:10)

As a result the question was not really answered except when he indicated later in the discussion that the courses students are undertaking at technikon did not adequately prepare them for what they would experience in industry.

Andrew was more forthcoming:

LC: The sense that I am getting from what you are saying is that there are all these skills that students should be learning, but that they aren't learning it.

Andrew: They aren't questioning it and that means that because they aren't questioning it they aren't learning anything from what they are doing. They are doing it to get an answer and they aren't questioning that answer...

LC: So the issue is that they aren't learning to problem solve only learning how to get to an answer (Interview summaries:09.26.2001:9)

On the question of how to teach students to problem-solve this was his response.

I don't think its something you can teach them. Its something they gonna want to do or something they don't. Either you want to do it or you don't - you need to have an enquiring mind.- either its your way of life or its not, ...it isn't something you can teach in a 4 week course (Interview summaries: 09.26.2001:9-10)]

¹⁷ The issue of barriers to learning will be raised later when the issue of lecturers' perceptions of students is dealt with.

While the lecturers are clear on the skills or qualities that need to be learnt, firstly, they are suggesting that there are barriers to learning these range of skills and secondly, it is not clear that the facilitation of these skills is happening in their classroom or as a combined result of the course. There is a level of scepticism at being able to teach these kinds of skills at all.

The culture or ethos promoted by the curriculum is more difficult to pinpoint and can be a combination of many things. The descriptions have been limited to the notion of the extent to which the case study subject and the overall course has engendered an ethos that was similar to the ethos espoused by the engineering profession. Andrew regards the value of problem solving as a key aspect of the engineering ethos and based on his comments in the interview, it was clear that it had certainly not become part of the students' culture. He also felt it was something that students either wanted to learn or they did, there was not a process to this kind of enculturation. Bill alluded to notions of an engineering culture and listed various barriers like language, culture and gender as factors that prevented students from entering or acquiring this engineering culture.

LC: Do you think that the instruction or course they are getting at technikon is preparing them for what is happening in industry, because what I hear you saying is that we need to adapt and change what we are doing so that they [students] can better adapt to the cultural values happening in industry
Bill: We have to...In [the] engineering industry or work environment in general women are fighting for equality so you have to stick to that and we need to encourage men and women to work together in class...Engineering has predominantly been seen as a male thing and I have picked this up at other institutions where you only see one woman in engineering classes. [It] stems from perception that engineering is heavy...We pick it up here in the workshop when women say that they don't want to get their hands dirty...then I usually say well maybe engineering isn't for you, but you also find it with the males [Interview summaries: 09.09.2001:11]

Bill did however point out that the department and faculty were making strides to correct certain imbalances particularly in relation to gender with the Women in Engineering programme that actively seeks to recruit and retain

women in the engineering disciplines¹⁸. Clint was however able to link the issue of engendering an engineering ethos with students to the actual overt and covert structures of the curriculum and actually introduced the idea of a particular disciplinary culture specific to engineering.

L.C: I would like to raise the whole issue of language, cultural and gender barriers – these were raised as things that stop students from learning these skills required in industry. The other issue I'm calling learning issues also include perceptions about students, expectations that students have about what will be given to them...your comments / thoughts?

Clint: I would say starting with cultural which is the hardest...if you regard engineering in the way you (sic) deal with knowledge and information as a form of representation language, an arena of problem solving peculiar to itself as different from other disciplines or how you deal with society...for anyone entering engineering there is a cultural gap. Whether one is a Zulu or English speaking South African. But certainly some students would be better prepared culturally than others and probably the mainstream engineering way of thinking would be closer, ...to the way language used and ideas put forward in white middle class homes than would be the case by and large to that in Zulu homes...That would be my view on culture and that is something that needs to be dealt with. In terms of language...incredibly linked up with culture. On the one hand (there is) grammar and vocabulary and on the other particular ways of thinking and structures which would be peculiar to specific subject areas like engineering. Again those have to do with enculturation or very linked to them...The [students] grammar and vocabulary [level], and given that the medium of instruction is English students have to be at a certain level but I'm not sure that all our students aren't at that level but there is something more complex going on with language which is more about the culture of engineering or discourse of engineering

In terms of the problem solving stuff I think that one of the things that has to happen along with staff changing their attitudes to what they do, (like) becoming interested in problem solving...is that they need to express that to learners. – That the world out there demands of them that they are problem solvers not that its something educational, but its something about being engineers and that in my mind is not coming through in any kind of introductory course what engineers do and how they do it and I think that its absolutely critical that students get told from day one – This is what engineering is about. I think they think, I don't know what they think engineering is about but they certainly get no clue about what engineering is about from moving from a mathematics class, CAD , communication

¹⁸ Figures provided by the Department of Strategic Planning and Management Information (see Addendix 6), suggest a steady increase in the numbers of women involved in the traditional engineering disciplines. Yet current figures for women still indicate that numbers for women are below rather than catching up with men.

class...where is the glue , where is the real world engineer? (Interview summaries: 10.03.2001:5-6)

There were speculations that lecturers were expecting students to know, understand and think like an engineer. As a result of the interviews the lecturers were unable to provide evidence that these expectations were formally being taught. Instead various barriers relating to the students were cited as preventing them from being able to think like engineers. Responding to these assumptions Clint made the following comments:

Lecturers response to why don't students think like engineers, well the obvious answer is because you aren't teaching them to think like engineers. Why don't they problem solve because you aren't teaching them to problem solve...They are very obvious answers...Why aren't you asking what are your colleagues doing in the previous semesters...why aren't they doing it...(Interview summaries: 10.03.2001:5-6)

Clint was also able to provide some insight into the curriculum structure of the diploma course as a whole. The overall Mechanical Engineering curriculum structure was described as being hierarchical in nature with clear linear progression from lower to higher levels. Though being unclear about what distinguished the lower from higher levels, whether the lower levels were more concerned with just teaching content, and the higher levels included more complex approaches, he did note the following issue:

At no point is the teaching done at the beginning aimed towards being able to do the problems solving stuff at Btech...so goodness knows where the students learn to do this, but do it they must, somewhere, somehow...you would think that if it were done logically you would start to introduce learners to problem solving stuff earlier on in the course

L.C: You are saying that (in) the lower levels, there doesn't seem to be any continuity between what is taught on the lower levels with what is expected by the high levels?

Clint: Then. When I was doing this work in 99'

L.C: I'm picking it up as well (Interview summaries: 10.03.2001:4)

Clint's comments about the disconnected nature of the course structure links up with some of the points raised in relation to the fact that engendering a particular type of engineering ethos was not happening from the start of the course. The disconnection between levels of the course might also account for

the issue raised by both lecturers that students displayed low levels of engineering knowledge even though they had already completed three semesters of specific mechanical engineering subjects. It was also noted that students were unable to take proper notes, yet all students complete at least one semester of communication skills and had finished three semesters of academic subjects requiring note taking.

A further structural feature noted by the lecturers and course outline was that of a stipulated timeframe, course content and assessment methods for the subject. Both lecturers made comments on how course content in relation to timeframe impacted on their teaching methods and approaches as this comment by Andrew illustrates:

When the situation arises if I can simplify something I will do this – break it down to the bear essentials to see how it fits together. But I can't do this for every single thing because it would take too long. (Interview summaries:09.26.2001:6)

Assessment as mentioned previously, takes the form of open-book tests which Bill suggests:

...encourages students to move away from rote-learning. So this chalk and talk and coping things from the board is linked to rote-learning I tell them this (Interview summaries: 09.19.2001:13)

This comment reveals the disjuncture between the features of teaching practices in relation to assessment methods. It could therefore be interpreted that students experience teaching methods that do not match the kinds of assessment techniques used. In the classroom students are expected to use methods linked to rote-learning, while in exams more open forms of learning are expected. Bill suggests that to prepare for these exams

...[Students need to] work through as many examples and if [they] do this [they] will notices a trend. You actually won't get the same questions (in the exam) and this is what they [students] think (Interview summaries: 09.19.2001:13)

These comments also uncover contradictions in Bill's teaching philosophy. He acknowledges that chalk and talk encourages rote learning,¹⁹ and that open book exams moves away from this approach, however previously he indicated that it was the mainstay of this teaching approach.

The curriculum also consists of what is called service and mainstream subjects. Service subjects are Communication skills, Computer Aided Design [CAD] and Mathematics which are offered alongside and as support subjects to the mainstream subjects which represent the fundamental mechanical engineering knowledge areas i.e. mechanics, thermodynamics, strength of materials etc. The course is also offered in a practical hands-on manner, a feature suggested as separating a technikon approach from its university counterpart.

Student descriptions

The data collection process provided interesting results not only in relation to how the student profile of the Design III class could be described in relation to demographic features, but also in relation to lecturers' perceptions of students taking the course and the factors presented as barriers to their learning. The Design III class currently has 37 students. 26 students completed the biographical questionnaire²⁰ accounting for a 72% sample. The student profile of the case study can therefore be described as consisting of students who are predominantly male (85%), 'Black' (81%) in the age group 18- 24 years (77%), 54% having attended other educational institutions before coming to Pentech (university - 15%, technical colleges or other technikons - 35% and other types of institutions - 4%), 81% of these courses were related to the engineering field and half the group had previous work experience with 61% of this work experience related to their current course of study. Of interest here is the gender and racial composition of the class, which do not

¹⁹ The comment that students expect the same questions to appear in the test is an indication that they are learning in a rote fashion and expect to find what they are exposed to in the class i.e. similar questions in the exams.

²⁰ Appendix 7 provides a copy of the question and the statistical analysis of the results.

correspond to the institutional or faculty²¹ norms. Of significance is the high number of students who, prior to registering for this diploma, had pursued related studies at other institutions.²² This is of interest especially when lecturers still suggest that students do not have an adequate engineering background. Normally it should take a student 1-½ years (without completing in-service training) to reach S4 level, the case study cohort suggest that only 15% of the class took the required time. 42% took 2 years to reach this level of the course with a further 38% taking between 2 ½ to 3 years. As only 12% of the cohort indicated that they completed in-service training prior to reaching S4, the figures could suggest that the delay in reaching S4 is due to repeating failed subjects.

During the interviews with the lecturers, a particular picture relating to their perceptions of students started to emerge. While the interview questions did not directly attempt to illicit specific responses on how lecturers viewed their students²³, this seemed to have emerged rather strongly in both interviews. Firstly, both lecturers described students in the case study as lacking basic engineering and technological knowledge and background and thus levels of understanding in relation to the subject was deemed low. Bill suggested that this did not only apply to the case study group but to engineering students in general: *"I noticed that our students, not only mechanical engineering but all engineering students actually lack basics"*. He further linked this inadequacy to previous educational exposure, particularly primary and

²¹ Faculty of Engineering: Male: Female ratio – 68.7%: 31.3% and racial distribution: - 58.4% 'Black', 39% 'Coloured', 2% 'White' and 0.6% 'Indian'. Figures in Electrical Engineering suggest 21.9% of the student population is female and 60% 'Black'. Civil Engineering has slightly larger female numbers, 24% and 'Blacks' constituting 64% of its student body. Female numbers in the non-traditional engineering disciplines which are part of the faculty at Pentech like Clothing and Textile Technology (75%), Journalism (85%), Information Technology (43.85) and Photography (51%) are the only courses where female numbers match or exceed male numbers.

²² The reasons for coming to Pentech were not a focus of enquiry. The high incidence of studies at technical colleges and technikons indicate previous exposure to mechanical engineering type course with possibly different foci.

²³ Some questions were directed at the possible skills and qualities lecturers valued as crucial for students to learn during their time at technikon and how these students could possibly learn these in the classroom.

Addendix 5 provides the list of interview questions.

high school education. *"How to remedy it...I think we need to go back to primary school level and educate the facilitators there because even they don't know"*

Andrew raised the issue of student's low levels of exposure to various concepts and even tools.

Also I realized it's a rather practical place a technikon, so I try to give them a lot of practical descriptions of the various things I lecture on, but even that they don't seem to understand, a lot of them haven't seen an example of what I am talking about [and] it gets abit hard at times to get them to understand. I would assume that they have seen a simple thing before but a lot of them say they haven't (Interview summaries:09.26.2001:4)

As indicated previously both Andrew and Bill made similar comments about students' inability to tackle problem solving tasks which seemed to be the cornerstone of the design subject. A discussion with Andrew attempts to get to the bottom of this issue:

LC: *The sense that I am getting from what you are saying is that there are all these skills that students should be learning, but that they aren't learning it*

Andrew: *They aren't questioning it and that means that because they aren't questioning it they aren't learning anything from what they are doing. They are doing it to get an answer and they aren't questioning that answer...*

LC: *This raises the issue that they aren't learning to problem solve [but] only learning how to get to an answer. (Interview summaries;09.26.2001:9)*

Students' levels of dedication to the course and discipline of mechanical engineering were also called into question, mostly stemming from perceived inactivity on their part and skewed expectations about how the course would be conducted. Students' lack of note taking during lectures was linked either to lack of skills, general unwillingness to take notes and an expectation students had about getting the notes elsewhere. As Bill describes

...lack of them taking notes. Even yesterday we had a seminar on thermodynamics which is a S4 project on steam plants and the lecture theatre was packed very few [students] were taking notes, a lot were sleeping...our thing is, Are they really interested? Are they dedicated? Do they really want to do engineering...That, really is our biggest problem! (Interview summaries:09.19.2001:7)

Andrew brought student inactivity and levels of dedication to the course into question in the following example.

...but what I am slowly starting to realize is that the students and I don't know if its through laziness or what, but they don't seem to know or care about what is going on. I don't know why they attend classes because if they aren't sleeping then they are in a daze really. If you ask them why they are there it's just to be seen, just to be sitting there. (Interview summaries:09.26.2001:4)

Andrew provided this illustration of the note-taking problem.

Students aren't doing anything, just sitting there, they aren't taking notes, they would rather print notes off the system. Majority of them come there and I don't know what they are doing here...

L.C. Do you think that the reason why students don't take notes is because they weren't told at the start that they should be taking notes. Where would they have learnt that they shouldn't be taking notes?

Andrew: I think its because they think assume that they will be given everything so they don't need to take notes...or they assume that the notes are on the system or that the textbook has everything in it

L.C: Has anyone explained to students that this might not be the case?

Andrew: I tried to explain this, but it doesn't really seem to bother them, they will get it somewhere...I honestly don't think that they would be able to make their own notes. I don't think that they have ever had to do their own personal shorthand. (Interview summaries:09.26.2001:7)

Both lecturers seem to be grappling with the reasons for student behaviour. My interpretation of this is while Andrew is ascribing student behaviour more to personal traits, Bills responses displays some insight into students' previous educational background in addition to personal behaviour. So its not just the students inability, the issue resides somewhere else, possibly primary and high school education. Again the issues raised earlier by Clint in relation to family environments and the development of social and intellectual capital resonates clearly with Belanger's (1994) notions of initial education and how its worth and quality impacts on any further education an individual might pursue.

Bill introduced the notion of various barriers acting against students in attempting to learn the various skills and qualities deemed useful in industry. In particular issues of language, gender and cultural "barriers" were raised.

He tried to express the disjuncture between the gender and cultural ideas and structures which the students come to technikon with and the new structures / cultures presented by the engineering discipline.

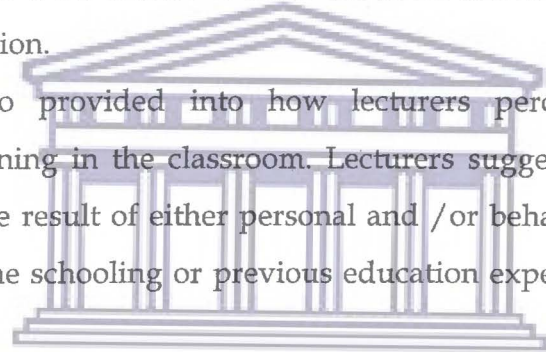
In many respects some of these issues emerged earlier in the chapter when Clint suggested it might be that students do experience problems adjusting to the culture or ethos of engineering (and most certainly the technikon as a learning environment as a whole) which is unfamiliar to them. He also raised the notion of how race and possibly socioeconomic circumstances might influence how smoothly the enculturation process may or may not be. While not clearly articulated, one does get the impression that the discipline itself promotes a specific ethos, which is distinctly foreign to most students. Unfortunately the focus of the interviews was not on these issues and therefore the questions raised did not seek to find a deeper understanding. Based on the limited information presented, only speculative claims can be made at this stage. However it might be a worthy site for further study.

To summarise some of the key findings this descriptive process has generated:

- Firstly, while lifelong learning is incorporated into the institutional and faculty policy documents, its meaning and strategies for implementation are lacking.
- The skewed racial ratio in relation to lecturer and students is noted. Thus lecturers who are either 'coloured' or 'white' are serving a predominantly 'black' student body. In the traditional engineering disciplines the gender ratios are even starker, particularly in the case study department. This raises the issue of positive role modelling and whether there is a reasonable amount of staff identification with the kinds of issues and needs a predominantly 'black', educationally disadvantaged or female engineering student body might be experiencing.
- Thirdly, the interviews revealed that both lecturers in the case study displayed lifelong learning traits. It was however unclear how these

qualities translated into their classroom practice and affected their students.

- The teaching methods predominantly suggest that more traditional forms of teacher instruction are provided primarily through the use of formal lectures. Some indications were noted about the inclusion of more student centred approaches like group work, but the connection between its inclusion and its purpose in facilitating learning and new knowledge creation was unclear.
- A distinct culture or ethos associated with the engineering discipline was presented. This engineering culture was distinguished from the personal culture held by students. It was this personal culture that was sited, as the reason why students were unable to learn the skills deemed necessary by their chosen profession.
- Insights were also provided into how lecturers perceived student behaviour and learning in the classroom. Lecturers suggested that these behaviours were the result of either personal and /or behavioural factors or due to gaps in the schooling or previous education experience of these students.



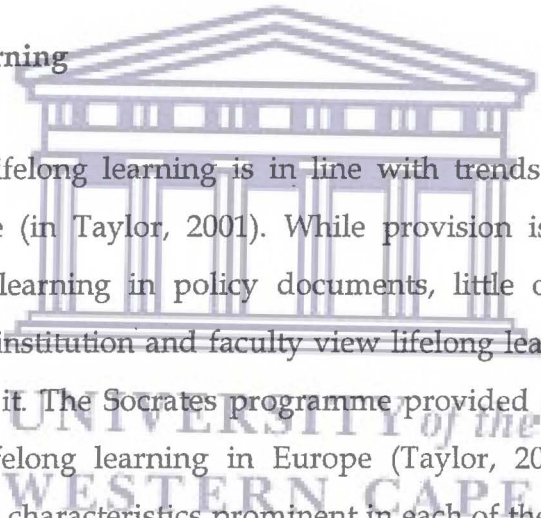
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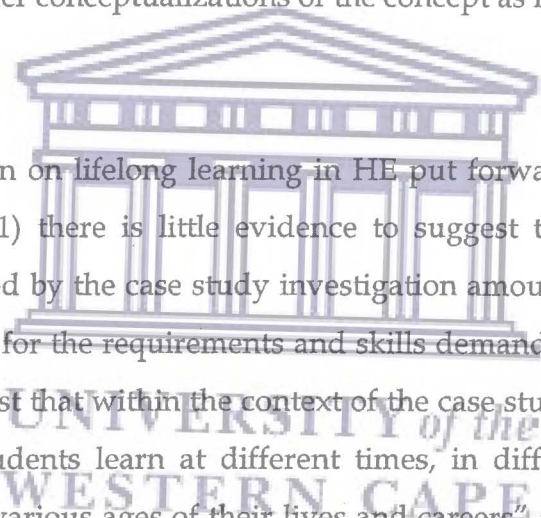
The interpretation and analysis of the research study is presented in this chapter. The case study findings are reviewed and located within the broad context of current understandings about lifelong learning, teaching and learning processes. The analysis process suggests that what is happening in the case study classroom in relation to teaching and learning processes is not only complex, but is dependent and influenced by a range of factors that literally resided outside the domain of the class environment i.e. departmental and institutional organisation and structures. The analysis is presented using the thematic categories used in the preceding chapter and are combined to suggest some overarching interpretations of the case study as concluding points.

Views on lifelong learning



Pentech's stance on lifelong learning is in line with trends present in HE institutions in Europe (in Taylor, 2001). While provision is made for the inclusion of lifelong learning in policy documents, little or no clarity is provided on how the institution and faculty view lifelong learning or how it intends to implement it. The Socrates programme provided similar insights into the nature of lifelong learning in Europe (Taylor, 2001:128). Taylor summarizes the policy characteristics prominent in each of the countries who participated in the study as follows: Lifelong learning is given a profile in policy statements but there is a persistent lack of clarity over its definition and purposes. Lifelong learning is also often prioritized in Continuing Professional Development or Continuing Vocational Education units (2001:131). This trend is also evident at Pentech where lifelong learning is relegated to functions associated with the Centre for Continuing Education that functions as a separate unit from the mainstream activities of the institution. Lifelong learning in this context is therefore consigned to the realm of adult education learning activities in specific career and work related areas within formal and non-formal learning environments.

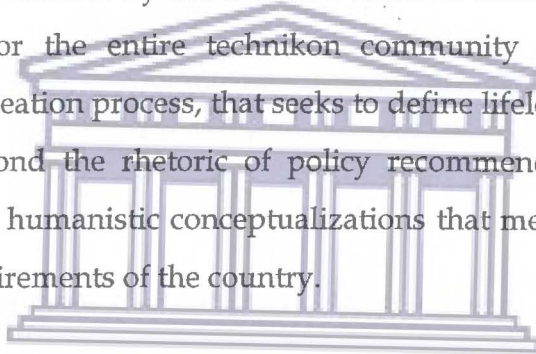
In the absence of an institutionally framed definition of lifelong learning, only speculative claims about an implied meaning can be presented. The stress on aligning courses with the demands and needs of industry and the promotion of "...skills proficiency, vocational and career orientated educations" resonates with more economic and human capital approaches to lifelong learning. As Preston (1999) and Hunt (1999) conclude, under the human capital banner, lifelong learning can become narrowly defined as work-related education and training. Taylor (2001:124) suggests that when HEIs envisage its role as being concerned mainly with vocational functions then its view of lifelong learning is linked more to market-orientated and human capital views of learning than broader conceptualizations of the concept as held by Belanger (1994).



In view of the position on lifelong learning in HE put forward by the Cape Town Statement (2001) there is little evidence to suggest that the notions about learning revealed by the case study investigation amount to more than preparing the student for the requirements and skills demanded by industry. There is little to suggest that within the context of the case study and Pentech in general that "...students learn at different times, in different ways, for different purposes at various ages of their lives and careers" as suggested by more comprehensive notions of lifelong learning like the Cape Town Statement (2001:4). Any conceptualization of lifelong learning at Pentech, seems to link more to simplistic and temporal plane notions about the provision of learning opportunities which seek to ensure that learning takes place 'from the cradle to the grave' (Preston, 1999:562; Soobrayan (1997) in Walters, 1999:578; UNESCO (1979) in Candy et al, 1994:xi; Gustavsson, 1997:239 and Brookfield, 1994:24). Viewed from Soobrayan's position, the temporal plane assertions of lifelong learning also places the emphasis on access to HEIs i.e. making education and learning available throughout the life cycle (In Walters, 1999(b): 578). The access provision implied here can also

be seen as linking with the South African National Plan for Higher Education's strategic goals around the issue of access and redress of past educational inequalities (Walters, 2001(b): 3).

The implied meaning of lifelong learning at Pentech lends itself to more economic discourses, but the fact that there is no implicit definition for the concept could be interpreted in one of the following ways: Its inclusion in policy documents could be an attempt by the institution to align itself with national and international educational and economic trends. Lifelong learning is therefore used, as suggested by Preston (1999), as a "promotional banner" under which diverse problems ranging from education, the economy or social evils can be solved. Alternatively the lack of a concrete meaning can be seen as an opportunity for the entire technikon community to engage in a significant meaning creation process, that seeks to define lifelong learning in a way that moves beyond the rhetoric of policy recommendations to more inclusive, holistic and humanistic conceptualizations that meet the educative and social justice requirements of the country.



Characteristics of teaching staff

The Candy Study (1994) suggests that the most vital determinant of whether or not graduates choose to become lifelong learners is the "...climate of intellectual inquiry in the institution" (in Candy, 1996:7-8). The factors regarded as most influential in affecting this climate, is the degree to which academic staff "...manifest a lively curiosity, a passion for their subject and a predisposition towards being continuous lifelong learners themselves" (1996: 7- 8). The case study was able to confirm these assumptions.

The case study lecturers tended to have strong industrial based experience. Together with the Faculty of Engineering's efforts to maintain close contact with its industry partners, the institution-wide staff development policy and the lecturers' predisposition to engage in learning projects, these lecturers

were aware of new developments within their discipline. What remains unclear however, is the extent to which these positive lifelong learning characteristics, displayed by the lecturers, translate or transfer into particular practices or methods in the classroom, which in turn assist students to develop lifelong learning attributes. This disjuncture is manifested by Andrews' inability to relate his design interest to his class.

I would like to talk to them about it, but whether they would be interested to hear about it or understand what I am doing I don't know ...don't know how I would get them interested (Interview summaries:09.26.2001:15)

Teaching approaches and methods

In relation to teaching methods, the Candy Study offers very specific pedagogical methods for HE, which when implemented are said to encourage graduates to become lifelong learners (In Candy, 1996:7). Similar comments can be made for the Cape Town Statement's position on lifelong learning teaching and learning processes. Both these documents suggest that when implemented, these teaching methods will result in the acquisition of lifelong learning behaviours in learners.

In discussing their teaching methods, the lecturers in the case study excluded or failed to make any connection between their teaching methods and student learning. A similar trend was evident in the Mechanical Engineering Department. It described its educational methods as a series of approaches and techniques, but failed to mention how learning would be facilitated or the expected kinds of learning which may result. In addition lecturers inability to articulate the relationship between their teaching style and the learning outcomes for students, and the specific teaching methods they employed in class (beyond Bill's identification of the chalk and talk method of instruction), may be linked to a lack of pedagogical knowledge. This interpretation illustrates a position held by Entwistle who argues that many academic staff

in HE only have a rudimentary grasp of basic teaching principles (1998:181)¹. In addition van Driel et al (1997) make the following comments about the theoretical basis of lecturers' understanding the classroom experience: "...academic staff on the whole have had little or no systematic training in teaching and lack any conceptual basis through which to consider their classroom experience" (cited in Entwistle, 1998:189). Clint's comments around lecturers not being able to understand the interrelationship between methods of teaching and the resultant student behaviour puts the above argument in perspective.

Lecturer's response to why don't students think like engineers, well the obvious answer is because you aren't teaching them to think like engineers. (Interview summaries:10.03.2001:5-6)

On the one hand the case study reveals that very few of the teaching methods advocated by the Candy Study and Cape Town Statement were actively used in the classroom, with the exception of Andrew's attempts to hand more responsibility to students which might be interpreted as attempts to introduce self-direction² in the learning process. On the other hand an exploration of the possible interpretations of why these methods and approaches to learning and teaching are absent might be far more beneficial to our current understandings of lifelong learning teaching and learning approaches.

I offer two possible interpretations: The first interpretation promotes Entwistle's (1998) position that lecturers lack the skills and understanding to implement the progressive pedagogy required by lifelong learning approaches. Both case study lecturers are qualified engineers who have no formalised education training. This lack of educational training might also

¹ This argument, is also confirmed when the staff profile of the department is reviewed to reveal that only two staff members have formal education and teaching qualifications.

² Candy (1991:411) suggests that self direction can refer to four distinct concepts. An interpretation of the implied notion of self direction espoused by Andrew in the case study links it either to what Candy suggest is the independent pursuit of learning without formal structures or a personal quality or attribute which suggest personal autonomy. Self direction as a means for organising instruction where the learner is given control of the learning situation or as a manifestation for a certain independence of mind and purpose in the learning situation where the learner is engaged in a self management process (Candy, 1991:411), however is not implied in Andrew's notion.

account for the confusion about terminology and general lack of insight into the relationship between their teaching methods and the learning outcomes of their students. The second interpretation is guided by the conceptual framework of the mini-thesis, which takes a more holistic and humanistic approach of learning in higher education and is supportive of the values encapsulated in the Cape Town Statement (2001). The categories of the Cape Town Statement (2001), Walters argues represent "...a systematic awareness of the interconnections between the macro environment, the meso organisational structural context and the micro cognitive and affective learning interaction" (2001:4).

The learning and teaching interaction in a particular class is therefore influenced and informed, by more than just the contextual realities of its participants i.e. the lecturer and students. Rather it is also a reflection of the departmental organisation, pedagogical and curriculum structures and ethos, which support and inform the practices in the class. The departmental structures are in turn framed by the norms and ethos espoused by the institutional framework, which also sets out a particular learning and teaching philosophy.

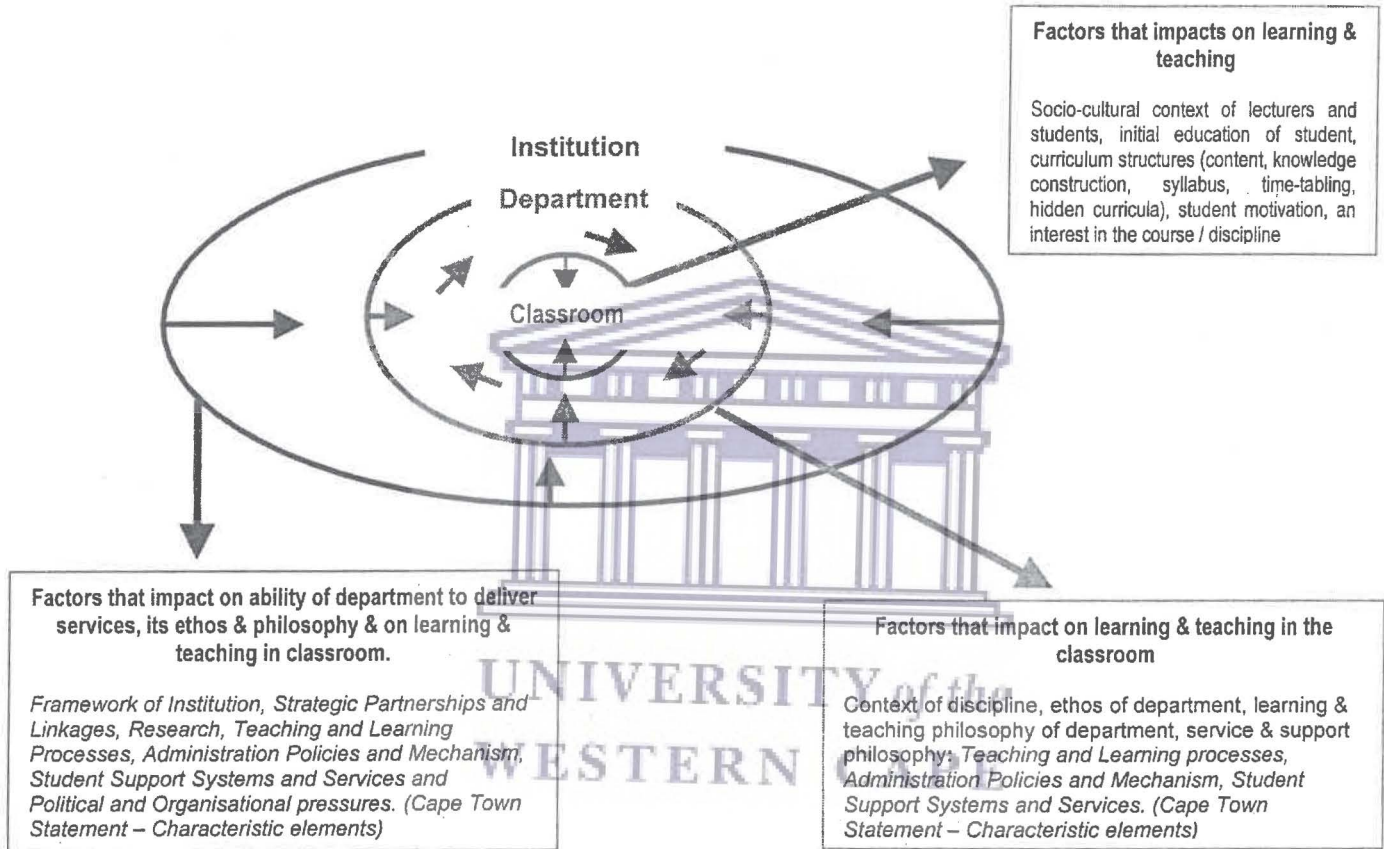


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In diagram 5.1 below this interconnectedness between the classroom and its participants and the rest of the institutional organisations and structures are illustrated.

Holistic view of possible influences on the learning & teaching approaches found in a classroom at Pentech

Diagram 5.1



If one accepts this interpretation then the reason for the marginal representation of lifelong learning teaching and learning processes in the case study is linked to the fact that the department of Mechanical Engineering, the Faculty of Engineering and Pentech as a whole do not support, promote and value these kinds of learning and teaching approaches.

Curriculum Issues

The assertion by the lecturers that industry determines the skills development occurring during the course can be construed as reducing education to the needs of the economy (Walters, 1999(b) and Gustavsson, 1997). Acknowledging that the nature of technikon education does align itself more to education for economic development paradigms than university education, evidence from the case study rarely suggests, as advocated by more humanistic approaches, the embracing of notions of learning where the learner is positioned at the centre of the learning environment (Walters, 1999(b)). Cave's (1981:170) contentions about strengthening the links between educational pursuits and the life of the worker by identifying education with life and holding a dynamic conception of human life, is also absent.

There is very little evidence from the case study to suggest that the curriculum structures put forward by the Candy Study (1994)[said to contribute to the development of lifelong learning competency] are incorporated into the Design III subject or in the diploma course in general³. While both lecturers were able to identify skills and qualities, students need to acquire and learn, there is a degree of scepticism of whether these skills are taught or could be taught at all.

³ The only possible curriculum trait, which could be interpreted as resonating with the Candy Study, is the subject's aim of developing a problem-solving competency. Problem-solving could be regarded as a 'learning to learn' skills advocated by the Candy Study (cited in Walters and Watters, 2000:14).

The curriculum of a subject cannot be isolated from the overall curriculum structure of the entire course of which it is a part. Data from the study revealed that the diploma course in Mechanical Engineering does not strongly comply with the five characteristics suggested by the Candy Study (Candy et al, 1994:xii and Candy, 1996:7). The course does not "...provide a systematic introduction to the field of study" [Mechanical Engineering] or "...offer a comparative or contextual framework for viewing the field of study". It attempts to broaden the student and provide generic skills, however lecturers of the Design III class still felt that students lacked basic engineering knowledge and were unable to take notes⁴ even though they were in the final semester of the course. The course offers little "freedom of choice and flexibility in structure"⁵ and it is difficult to ascertain that the "incremental development of self-directed learning" is provided for.

The strength of the Cape Town Statement's (2001) position on the curriculum is the inclusion of a comprehensive and progressive conceptualization of knowledge in the curriculum. The case study provided little indication that lecturers were engaging through their learning and teaching practice, with the various knowledges, interest and life situations presented by their learners as advocated by the above statement. Most of the learners were younger than 24 years old (77%) and more than half have previous engineering based, formal education or work experience (61%). One could speculate that this reservoir of experiences could be drawn on. Furthermore not only were different ways of knowing not valued, it was cited in some instances as being a barrier to learning. While the Cape Town Statement (2001:10) suggests that through valuing different knowledges, marginalized groups are allowed to participate

⁴ The lack of note taking and problem-solving skills can be attributed to the lack of attention and status given to 'learning to learn' and 'information literacy' skills during the course. These skills are in all probability relegated to the domain of Communication Skills which acts as a service subject to the mainstream mechanical engineering based subjects. This might also be raising questions about the status of service subjects in relation to the subject discipline subjects.

“...in the creation and dissemination of knowledge”, in the case study a sense of distance and exclusion for these groups is created. The analysis of how knowledge is dealt with in the curriculum is further confirmed when the curriculum structure of the diploma course is assessed.

The closest the conceptual frameworks provided by the Candy Study(1994) and Cape Town Statement(2001) move to promoting the development of a specific culture through the curriculum, is the implied development of a lifelong learning ethos. The Candy Study (1994:xiii), through the inclusion of provisions to provide a systematic introduction to the field of study and offer a contextual framework for viewing the field of study, could be interpreted to imply the development of a cultural orientation to the discipline being studied. As mentioned earlier, the investigation to ascertain if this was happening in the case study, could not be substantiated by the evidence collected. What did however emerge from the study, was the disparity between the cultural backgrounds held by students and the engineering culture that students were expected to acquire. James Gee's (1990:142) notion of primary and secondary discourses⁶ is offered to provide some clarity on this issue. A primary discourse is connected to our primary socialization and membership to an initial acculturating group (Gee, 1990:151). Any discourse, which is acquired or involve institutions (i.e. school, business, engineering) beyond the family, is developed by having access to and being able to practice the values, skills and language associate with this discourse. These discourses are regarded as secondary discourses. The engineering culture or ethos could therefore be seen as an engineering discourse, which regulates appropriate behaviours, values and beliefs for those who belong to it. What Clint in his discussion around the perceived barriers to learning, is alluding to, is the fact

⁵ While there is some freedom in the choice of electives, the rigid course structure allows little scope to move outside the lecture structures of the formal timetable.

⁶ A 'discourse' according to Gee is a "way of displaying (through words, actions, values and beliefs) membership to a particular social group or social network" (1990:142).

that students in the case study are not being given an opportunity through the course to fully acquire and learn a secondary discourse of engineering. As a result they resort or fall back on their primary discourse, adjusting it in various ways to try and fit to the needed functions of the secondary discourse. Gee suggests that this is a very common trait, which, nevertheless almost always results in socially disastrous consequences (1990:153).

The curriculum structure can be analysed using the approach advocated by Bernstein (1971) (In Ross, 2000:98). The curriculum is described in relation to its classification (which illustrate the construction and maintenance of boundaries between the contents of the curriculum, their interrelationship and stratification) and frame (which refers to the degree of control possessed by the lecturer and the student over the selection, transmission, pace of transmission and learning of knowledge) (cited in Ross, 2000:99). An inspection of the case study curriculum structure through the lens of Bernstein's model, suggests it would be regarded as a collection mode (in Ross, 2000:99). A collection curriculum has a strong classification: subjects are insulated and have strong boundaries with subjects arranged in an accepted hierarchy of importance and value. Its frame is characterized as being strong. A strong frame suggests that the lecturer or system (syllabus) determines the appropriate material and content to be transmitted, the pace of learning is determined either by the lecturer or curriculum (duration of course) and the lecturer is regarded as having all the information needed to be learnt by the student. In a collection code curriculum, lecturers are regarded as subject specialists who are responsible for the transmission of a body of knowledge defined outside the classroom (i.e. industry in relation to the case study), subjects are clearly distinguished and the pace and direction of learning is fixed either by the lecturer or the demands of the syllabus (Bernstein, in Ross, 2000:99). It could be argued that the kind of curriculum code proposed by the

holistic framework of the Cape Town Statement would be an integrated one⁷ (characterized by a weak frame and classification structure) where lecturers co-operate with each other and their students, the power and authority of the lecturer is concealed and projects and topics are used to organize content. Furthermore the direction of learning seems less focused and more open to negotiation and open to the needs and pace of the students (Bernstein, in Ross, 2000:99).

From this discussion it is clear that the structure of the curriculum also determines and shapes the construction of knowledge in the classroom, the relationship between lecturer and student and whether the needs of the learner is accommodated. Drawing on Entwistle's (1998) arguments about lecturers' understanding of pedagogical and curricula dynamics, one could speculate that the case study lecturers have not consciously interrogated how the curriculum structure, from its overt structural dimensions to its more hidden notions of culture, ethos and authority, combine to affect the learning experience of students. This inability to examine the impact of the curriculum ultimately impacts on the lecturers' ability to implement approaches in the classroom that are better able to prepare students for the world of work and life on the one hand and becoming lifelong learners on the other.

Student descriptions

When describing the findings of the research study, a distinction was made between curriculum issues and student description. If we acknowledge that at the heart of any curriculum are notions about students, - this would certainly be the case in any humanistic approach to curriculum development - then any discussion about the curriculum would include views and descriptions of the

⁷ The integrated projects mentioned by Clint might relate more strongly with Bernstein's notions put forward above.

student. I would therefore like to infuse the interpretations around student descriptions with those of the curriculum issues and suggest that these two categories are interlinking.

An assessment of the student profile of the case study suggests that the majority of students are 'black' and male. Arguments presented describe the initial education most 'black' students experience. These arguments illustrate a rather bleak initial education environment, which might negatively impact on the levels of preparedness these students have when entering HE learning environments. (Herman, 1998; Walters, 1999(b), and Hall, 2001).

What these authors are suggesting resonates well with Belanger's conceptualization of initial education within the framework of lifelong learning that acknowledges the totality of learning activities (1994:354). The quality of initial education, which accounts for all the formal, non-formal and informal learning activities encountered prior to venturing into adult learning domains, is seen as laying the foundation for all other learning activities, which follow. What Hall (2001) refers to as intellectual and social capital generated as a result of the home and family environment would also fall part of initial education. The quality of this initial education not only becomes the building block in determining success in future educational activities, it also impacts on how future learning activities are viewed and valued.⁸

Viewing learning from a holistic lifelong learning approach acknowledges that a disadvantaged initial education would affect all other learning activities including those in HE. The comments by the case study lecturers about students' lack of basic engineering knowledge are therefore valid

⁸ One could speculate that if Xolani's (a 'black' engineering student at Pentech) initial education experiences were predominantly moulded around rote-learning approaches, with little emphasis placed on the value of reading and asking questions, this would influence how learning at Pentech would be framed. It would not be

descriptions. Students' disadvantaged and poor quality initial education might account for their inability to successfully engage with the requirements and norms of their current learning environment.

It might also account for the reason why only marginally more than ¼ of the case study cohort took the minimum prescribed period to reach their current level of study. This finding aligns well with general throughput rates at HEIs in South Africa today (in Walters, 2001(b): 4). A tracer study conducted by Koen (2000) into the length of time students take to complete a 3-year degree at the University of the Western Cape⁹, found that only 1/3 of full time students completed their studies in the minimum prescribed period (cited Walters, 2001(b): 4). This low throughput rate might be indicative of many factors impacting on student's studies, i.e. financial and personal difficulties, levels of preparedness provided by their initial education cannot be excluded.

It is unclear how attuned the case study lecturers and the department as a whole are to acknowledging the influences of initial education on student learning during their period at Pentech. The case study suggests that lecturers are not completely unaware of the impact of previous learning environments on how students perform in HE, as attested by Bill's recognition of the influences on his students' schooling background, but this is not always the case. Andrew's comment about his students' behaviour however highlights the gap which exists between the world experiences of an inexperienced 'white' lecturer, - whose own initial education was certainly an affirming one and due to the wealth of his intellectual and social capital was able to reach

unlikely that Xolani would assume that learning in this new context would also be informed by those encountered in initial education.

⁹ A HBI located in Bellville, Cape Town, and less than one kilometer away from Pentech. These two institutions are literally neighbours.

the full attainment of his abilities,¹⁰ in relation to the socio-cultural and economic realities experienced by his predominantly 'black' students.

The final point made above raises the issue about the nature of the staff profile and how this impacts on how students are perceived. The correlation between the racial profile of staff in relation to students at Pentech is particularly skewed. Though as Walters (2001(b)) indicates this feature is not particular to Pentech. She suggests that while changes (sometimes dramatic as illustrated at Pentech) in the demographic profile of students have taken place, these have not been matched by similar changes in the composition of staff. As a result women and 'black' people remain under represented in academic and professional positions in HEIs (2001(b):6). Walters makes a crucial point, which helps to illuminate the disjuncture between lecturer expectations of student behaviour and the actual behaviour displayed in class. She argues that while representation of women and 'black' students have increased, these changes have not been matched with changes in "...the curricula, the pedagogical processes, the structural arrangements or the culture" of the institution (Walters, 2001(b):6).

The case study also exposed certain student behaviour (i.e. the inability to take notes, problem -solve and general inactivity in class), which lead lecturers to question students' levels of dedication to their course and field of study in general. The arguments presented earlier regarding curriculum structures and the quality of initial education provide some insights. The position of Beaty (1997) that correlates student approaches to learning (and possible behaviour in class) to their reasons for continuing their studies at higher education also needs consideration. Beaty suggests that students

¹⁰ In the interview with Andrew, he mentioned that while at school we worked in the motorcycle shop and had access to his own workshop with all the necessary tools. He ascribes these factors as crucial to the development of his current level of practical mechanical skills, even though he went to a university where the focus is more on the theoretical aspects of mechanics.

display differences in relation to their learning orientations. Learning orientations not only identify vocational, academic, personal and social orientations, but also account for variations in the focus of interest in ones studies. Students either have an *intrinsic* interest in the actual content of the course or an *extrinsic* concern with the qualification or with moving up the educational 'ladder' without any clear goal (In Herman, 1998:186). One could speculate that because technikons promote an image that closely links a diploma (particularly in the engineering field) with employment and status, for many 'black' students the extrinsic interest combined with the economic realities most have to face, far outweighs more intrinsic motivations for completing a course.

What has emerged from the analysis of factors present in the student description of the case study and Pentech more broadly, is a complex interplay between motivation and interest of the student and the quality of their initial education experiences (and the impact and influences it extends) on what students expect and how they approach the educational experiences encountered within the HE arena. In addition the inability of HEIs (including Pentech) to take cognizance of the need to adapt and change the various curriculum and pedagogical structures, to adequately accommodate the changes in the demographic profile of their student population, may account for some of the descriptions of the students presented in the case study.

Limitations of the case study

A key limitation of the case study methodology relates to generalisability (Punch, 1998: 153). Although Denzin(1983) argues that generalisation should not necessarily be the objective of all research projects whether they are case studies or not (in Punch, 1998: 154). As Riley (1990) suggests it should be recognised that the interpretations offered here are personal and other interpretations of the data and the findings will always be possible. This

research study is a limited case study and there is a certain level of uncertainty as to how far the interpretations can be taken outside the case study environment. The possibilities for implementation raised in the final chapter, therefore need to be viewed in light of these comments.

The focus of the study was on the lecturers' understanding and experience of their own teaching and learning approaches. A consequence of this is that the voice and perception of the student is absent. This lack of insight into the realm of student learning in an HE environment is an obvious limitation of this study. The use of observation methods may have helped to corroborate some of the behaviours described by lecturers. Furthermore, interviews with students would have provided valuable insights into some of the arguments presented in this chapter regarding the impact of initial education on the HE learning experiences of students, how student motivation for continued studies affects learning approaches and behaviours in class, the impact of the curricula on their learning outcomes and approaches and the extent to which the staff profile affects the learning environment for the student.

The analysis of the findings however point to the need for a more in-depth understanding of student learning experiences within the HEI context particularly within a lifelong learning framework. Such understandings would significantly assist any attempts to implement holistic and humanistic approaches of lifelong learning in a higher education context. Further research into the contextual realities of learners initial and diffuse learning environments and their impact and influence on learning undertaking in HE would be extremely beneficial to understanding the complexity of implementing lifelong learning strategies in the South Africa higher education context.

The case study focused primarily on the learning and teaching approaches advocated by the Candy Study (and to a lesser degree by those of the Cape Town Statement) that encourages students to become lifelong learners. As a result it did not adequately interrogate issues of knowledge construction in the classroom, lecturers theoretical understandings of pedagogical and curriculum structures and the underlying values promoted, by the curriculum or how the racial demographics of staff impact on the development of lifelong learning attributes. Only speculative claims on these issues have been offered.

Concluding comments

In summary, the analysis of the case study findings have resulted in the following concluding comments that will provide some answers to the main research question of the mini-thesis: *In what ways are the learning and teaching methods used by the Mechanical Engineering Design III lecturers at Peninsula Technikon supportive of the lifelong learning teaching and learning processes suggested by the Candy Study (1994) and the Cape Town Statement (2001)?*

The most crucial insight that the findings and analysis of this case study generated is the level of complexity and interrelatedness of factors that are both internal and external to the site of the classroom. As a result it was difficult to illustrate these interrelated connections by separating each of these influences (i.e. the view on lifelong learning, characteristics of teaching staff, teaching methods and curriculum issues) into the neatly defined boundaries of the various thematic categories. In the interest of continuity and clarity I however decided to present the interpretations using these thematic categories followed by concluding comments, which seek to illustrate the overall interconnections.

The case study provides a window into the reality of the current state of learning and teaching practices at Pentech. It also raises the complexity of introducing a lifelong learning philosophy to direct and shape not only curriculum and pedagogical development at a HEI but the overall functioning of the institution.

- Pentech's approach to lifelong learning seems to mirror current national and international trends in this area. While lifelong learning is given some priority in policy statements, little clarity is provided around its meaning or purposes for the institution. Any conceptualizations of lifelong learning held by Pentech are framed alongside adult education provisions through the Centre for Continuing Education and reside outside mainstream academic activities. Its implied meaning resonates more with human capital and economic discourses, through the high priority placed on vocational educational aims and objectives, than those of more holistic and humanistic considerations.
- The characteristics of the case study staff, support the proposed characteristics that the Candy Study suggests is "...the most vital determinant of whether or not graduates choose to become lifelong learners" (In Candy, 1996: 7-8). The case study was however unable to show how these characteristics are transferred in the classroom and actually results in learners displaying lifelong learning attributes. In relation to the staff racial profiles at the institution, evidence suggests these to be particularly skewed. It supported trends in South African HEI's that changes in the racial demographics of student populations have not been matched by those of staff demographics or changes in the nature of the curricula, pedagogy, structural arrangements or ethos. Since the study did not seek to investigate the racial demographics of staff impacts on lifelong learning, only speculative claims of racial and gender role modeling are made.

- The analysis of the case study further suggests that teaching and learning approaches used only marginally correlate with those proposed by the Candy Study (1994) and Cape Town Statement (2001). In accounting for the possible reasons for this, the analysis suggests that firstly, lecturers do not possess suitable pedagogical skills and understandings to implement these approaches. Secondly, the pedagogical and curriculum framework of the department and institution do not promote or facilitate the incorporation of these lifelong learning approaches.
- In attempting to understand whether the curriculum framework of the case study adheres to those suggested by the Candy Study (1994) and Cape Town Statement (2001), the analysis concluded that there was little evidence to confirm this. The lack of a systematic introduction into the field of study or offering a contextual and comparative framework for viewing the field of study is sited as resulting in the case study students being unable to learn and acquire the specific engineering culture and values required by their lecturers and industry. The assumed inability of students to take notes and complete problem-solving tasks is linked to the exclusion of effective information literacy and learning to learn skills in the curriculum content. The analysis concluded that the curriculum structure viewed from Bernstein's (1971 in Ross, 2000) framework resembled a collection code type and this had specific implications of how knowledge was constructed, the position held by lecturers and students in the classroom and how subject content was processed. It is proposed that curricula classified as collection code types do not support lifelong learning approaches. Suggestions were also proposed that the curriculum of the case study did not adequately acknowledge or accommodate the initial education experiences of its learners. Of particular importance is the realization of the interrelated nature of the classroom curriculum structures with those espoused by the institution as a whole. The value of the Cape Town Statement's (2001) systematic and holistic approach to

implementing lifelong learning at HEIs is recognised. Without such an approach the kinds of curriculum formulation suggested by the Candy Study (1994) is unlikely to be implemented at a classroom level.

- The descriptions of students in this case study confirm the importance of Belanger's (1994) framework of lifelong learning which sees learning as the totality of all learning activities undertaken during the life cycle. It concludes that all learning formal, informal and non-formal is interlinked and that the quality of learning in the first cycle i.e. initial education determines future patterns of learning for that individual. In addition it is counterproductive to focus on only one aspect i.e. HE without considering the impact of other parts of the whole i.e. initial education and diffuse learning environments (Walters and Watters: 2000: 10). Accepting Belanger's (1994) understandings would require that HEIs and in particular HBIs in South Africa not only recognise the initial and diffuse learning environments of their students, but also ensure that the curriculum structures of their courses adequately accommodate the influences of these learning environments.

The logo of the University of the Western Cape, featuring a stylized classical building with columns and a pediment.

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Implementation possibilities for lifelong learning teaching and learning approaches in higher education in South Africa.

The purpose of the case study was to obtain an in-depth understanding of the nature of lifelong learning teaching and learning approaches within the context of a South African technikon environment. Through the articulation of some of the case study insights, possibilities within higher education for implementing lifelong learning approaches advanced by the Candy Study (1994) and Cape Town Statement (2001), are explored.

The South African context presents a unique challenge to lifelong learning. The competing needs of economic development, social justice and equity demands, jostle for attention and advantage. Under these circumstances, higher education institutions are compelled to adopt lifelong learning approaches that support holistic and humanistic values. Only through the adoption of a more inclusive approach to lifelong learning can the development of skills, attributes and qualities of individuals in society reach beyond the narrow requirements of the workplace. Educational priorities can then also include the development of active citizenship and democracy, allowing individuals to engage meaningfully in the debates and activities of the country on social, political, economic and cultural levels. Lifelong learning from this position in higher education is presented as an opportunity to appease both the needs of the economy and those of social justice and equity in South Africa.

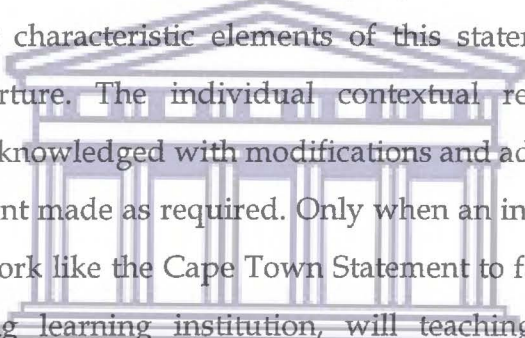
Holistic and humanistic approaches to lifelong learning represent a visionary yet complex approach to higher education, particularly to teaching and learning processes. It demands of institutions, educators and researchers in this context, to look beyond their learning environment and acknowledge the impact and influence of initial, diffuse and other adult education environments and formal, informal and non-formal learning activities. This

broadened focus is both a challenging and intimidating experience that requires the vision and political will of those who lead higher education institutions.

The implementation of lifelong learning from this position requires major structural, pedagogical and curricula interventions. Changes in pedagogical and curricula strategies can only occur over time and are very demanding. Changes of this nature therefore require continued commitment not only from academic staff but also from management. Pedagogical and curricula changes also necessitate intense skills development for academic staff in the area of pedagogy and adult education methodologies. Skills development will enable lecturers to understand the nature of the learning environment in higher education and be better equipped to implement the kinds of approaches advocated by the Candy Study (1994) and the Cape Town Statement (2001).

Any pedagogical and curricula changes implemented by higher education institutions need to take cognizance of the contextual realities of learning environments in South Africa. Of specific importance are the challenges presented by the character of its students, especially in relation to their initial and diffuse learning experiences, their interest and motivations for continued studies and their approaches to learning. The Candy Study (1994) provides a very useful assessment tool against which teaching, learning and curriculum development within higher education can be judged. It is a useful guide for identifying the kinds of lifelong learning methods that need to be introduced and a constructive benchmark to direct implementation approaches. On the cautionary side however the Candy Study is a valuable identification and assessment tool, but provides no practical direction or methods for implementing the teaching and learning processes it proposes. The generalisation of the Candy Study to the contextual realities of the South African higher education environment is also raised as a contentious issue.

The recommendations of the Candy Study, if implemented are insufficient on their own to enact an institution wide lifelong learning ethos. One could speculate that implementing the recommended approaches by itself might be insufficient to contribute to the development of lifelong learning attributes for students. Implementing a holistic and systematic approach to lifelong learning in higher education, assumes that students and staff are firstly, seen as lifelong learners and secondly, encouraged to become lifelong learners. Any attempt to introduce lifelong learning from this standpoint would need to approach implementation from the position of the Cape Town Statement (2001). The Statement proposes that only through an enabling environment (for both staff and students), that supports and regulates practice across all institutional functions will a true lifelong learning higher education institution be developed. The six characteristic elements of this statement provide a useful point of departure. The individual contextual realities of each institution should be acknowledged with modifications and adaptations to the elements of the statement made as required. Only when an institution adopts an overarching framework like the Cape Town Statement to facilitate its path in becoming a lifelong learning institution, will teaching and learning approaches start to reflect a lifelong learning philosophy.



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PENINSULA



TECHNIKON

VISION

- THE PENINSULA TECHNIKON SHALL BE A CENTRE OF EXCELLENCE FOR CAREER EDUCATION.
- THE TECHNIKON SHALL BE RECOGNIZED BY THE COMMUNITY, COMMERCE AND INDUSTRY AS WELL AS THE PUBLIC SECTOR AS BEING RESPONSIVE TO THE NEEDS OF SOCIETY.
- THE TECHNIKON SHALL BE A NON-RACIAL, NON-SEXIST AND DEMOCRATIC COMMUNITY.

MISSION

WE DEVELOP ACADEMICALLY, SOCIALLY AND TECHNOLOGICALLY COMPETENT STUDENTS WHO ARE RESPONSIVE TO THE BROADER NEEDS AND CHALLENGES OF SOCIETY BY:

- PROMOTING AN ENVIRONMENT CONDUCTIVE TO HUMAN DEVELOPMENT.
- FACILITATING APPROPRIATE TUITION, CO-OPERATIVE EDUCATION AND SUPPORT ACCORDING TO THE ACADEMIC NEEDS OF OUR STUDENTS.

VALUES

WE BELIEVE IN:

MUTUAL RESPECT
TRUST
FREEDOM WITH
RESPONSIBILITY
UNITY OF PURPOSE
LOYALTY
ACCOUNTABILITY
HONESTY

- ENCOURAGING STAFF COMMITMENT TO QUALITY EDUCATION AND SERVICE.
- OFFERING PROGRAMMES FOR EDUCATIONALLY DISADVANTAGED STUDENTS.
- FOSTERING LIFELONG LEARNING.

The Teaching and Learning Processes of the Cape Town Statement [2001]

Educators encourage self-directed learning, engage with the knowledges, interest and life situations which learners bring to their education and use open and resource based learning approaches.

- Educators engage with the knowledges, interest and life situations that learners contribute to the teaching / learning processes and they build on the resources and experiences of the learners. Different 'ways of knowing' are valued which enable marginalized social groups to be full participants in the creation and dissemination of knowledge.
- Educators facilitate and manage learning rather than dispense information. Learners are seen by educators as co-creators of knowledge and are often encouraged to participate in the design of learning activities including mechanisms of continuous evaluation and feedback.
- Educators recognise the need for reflective / practice based learning.
- Educators recognise the value of keeping up to date with theories and best practices of adult learning across age and other differences.
- Educators and learners recognise that learning in higher education can take place according to flexible schedules and at different locations. They incorporate this into course design and presentation and ensure that the materials and structures for learning made available through the institution overcome the barriers of place, space, time and pace which restrict opportunities for learning in traditional structures.
- The institution makes its resource-based learning environment accessible to learners wherever they are, not just on campus. Learners are encouraged to make use of support services such as the library. Such services are made available through suitable technology according to the needs of the students' off-campus as well as on campus.
- Course presentation and opportunities to enroll for an study courses include the use of multi-and combined-media delivery and support, utilising the technologies, both old and new, and the flexible learning structures of open and distance learning. This includes print, correspondence, mass media, occasional face-to-face tutorials and study groups, ICT etc.
- Provision is made for self-paced independent study by providing for students to study effectively wherever, whenever and whatever pace is appropriate for them.
- Assessment takes place in various forms and continuously.
- Programmes include opportunities for experiential learning (e.g. field work, workplace learning, community service learning).

The Cape Town Statements' six sets of characteristic elements, which are necessary to support a lifelong, learning higher education institution. [2001:6]

	Characteristic Elements	Description
1.	Overarching Frameworks	Overarching frameworks provide the context, which facilitate an HEI to operate as a lifelong learning institution. These are: Regulatory, Financial and Cultural/Social.
2.	Strategic Partnerships and Linkages	Partnerships and linkages include the following: forming relationships internationally; forming relationships with other institutions; forming relationships within institutions as well as forming relationships with other groups in society.
3.	Research	Research is understood in a broad sense and includes working across disciplines and / or across institutions. Lifelong learning is regarded as an important and legitimate research area.
4.	Teaching and Learning Processes	Educators encourage self-directed learning, engage with the knowledges, interests and life situations which learners bring to their education and use open and resource based learning approaches.
5.	Administration Policies and Mechanisms	Service to learners is the top priority of the administration
6.	Student Support Systems and Services	Learners are supported to become independent learners in various ways.

A brief synopsis of each element and the motivation behind its inclusion.

1. Overarching Frameworks

This category is included to promote the argument that individual programmes grounded in a lifelong learning framework cannot exist in a vacuum and needs the support of an enabling system. [Walters, 2001:5].

2. Strategic Partnerships and Linkages

The need for networking both within the institution and across institutions in civil society including the economy and government is promoted. [Walters, 2001:6].

3. Research

The promotion and recognition of a range of research approaches and research subjects is central to this characteristic, and as Walters argues represents in many ways some of the core shifts required by the institution [2001:6].

4. The Teaching and Learning Processes

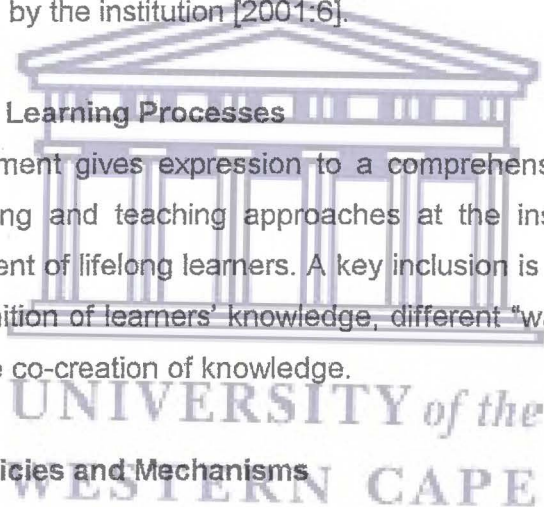
This characteristic element gives expression to a comprehensive list of provisions to ensure that the learning and teaching approaches at the institution encourage and promote the development of lifelong learners. A key inclusion is the focus on knowledge in particular the recognition of learners' knowledge, different "ways of knowing" and the role learners play in the co-creation of knowledge.

5. Administration Policies and Mechanisms

This characteristic suggests that crucial to whether a lifelong learning HEI can exist is the level to which the institution is effectively and efficiently administered. Lifelong learning HEI's therefore promote and embrace notions of lifelong learning in their information booklets and mission statements, prior learning is recognised and programmes are in place to facilitate implementation of recognition of prior learning, more flexible curricular options are introduced and there is increased flexibility in progression rates, movement between different study modes and entry and exit points.

6. Student Support Systems and Services

The provision of various support structures to ensure that learners are able to achieve and succeed in the higher education environment is seen as critically important. The needs of part-time, distant and students with disability are also put on the agenda.



Mechanical Engineering Course Structure

Mechanical Engineering Design III – Case Study class

Undergraduate engineering diploma courses at technikons are typically run on a semester basis (i.e. 6 months) In order to be awarded a diploma in any of the engineering offerings at Pentech, (this is also consistent at all other technikons in South Africa) students need to complete four semesters of theoretical study based at the institution and two semesters of in-service training or experiential training at a co-operating accredited industrial employer. Students at Pentech have two options when constructing their diploma:

1. They can complete the theoretical component of the course first and then complete the in-service training component [complete S1-S4 then go out on in-service training].
2. They can "sandwich" the in-service component between the theoretical ones [after completing S2 they can complete their in-service training and then come back to the technikon to complete the rest of their theoretical components].

At Pentech in general a greater percentage of students choose option 1, thus most students who reach S4 do so without having any formalized industrial exposure. A typical S4 student would have spent at least two years at the institution having gained a fair amount of theoretical exposure into the field of mechanical engineering. The current S4 cohort in the mechanical engineering diploma is made up of between 37 - 50 students. [Due to a number of students repeating certain subject electives this number may vary]. These students have to complete 6 subjects to be accredited with the S4 level qualification. Two of these subjects are compulsory electives and for the rest of their subject options they have a choice of 5 other elective options. In general each subject is allocated +/- 6 hours of formal contact time i.e. lectures, practicals, lab time or tutorials per week. This usually leaves the student with +/- 5 out of a total of 45 free periods a week, which is described as "normal" for the engineering disciplines.

The Mechanical Engineering Design III classroom is a S4 level subject. A pre-requisite for taking this subject is Mechanical Engineering Design II and Strength of Materials, which is offered at the S3 level and Communication Skills offered at S1 level. Students typically have contact time with the lecturer on a Tuesday with lectures running from 11 am – 4 pm. It is suggested that this subject offers the most integrated approach to the diploma and draws on many of the skills, practices, theories and knowledges developed during the course of the diploma.

Guiding Interview Questions

Questions directed at Design III lecturers

Overarching Question	Sub - questions
What kinds of teaching methods do you use in your classroom?	<ul style="list-style-type: none"> ▪ How would you describe your teaching approach? ▪ Describe a typical lecture period? ▪ What do you regard as the most important thing / things students should learn during your course and as a result of their technical studies? ▪ In what ways do you think students learn best? ▪ To what extent do you think students learn these important issues as a result of your class / or as a result of your approach to learning and teaching? ▪ What are the skills, attributes, qualities you believe industry / life will demand from your students? ▪ How does what is happening in your classroom help students to foster or develop these skills?
Learning as it applies to you.	<ul style="list-style-type: none"> ▪ How do you feel about Mechanical Engineering (the discipline) and the Design III course in particular? How did you end up doing what you are doing (now) in this field? ▪ Do you belong to any professional bodies associated with your field or any other field? ▪ How important do you think it is for academic staff to continue to study or learn? ▪ Are you engaged in any learning activity at the moment, either as part of your personal or work life? ▪ Are you involved in any research work? Could you tell me something about this? ▪ How does your studies / research impact on what happens in the classroom? ▪ Are you reading any books at the moment? Which books? ▪ Are you involved in any extra-curricula or other activities (in your community) besides lecturing at the moment? ▪ Would you regard yourself as a lifelong learning? Why? Why not?

Clint's interview themes

1. Background information
 - a. What was your role in mechanical engineering
 - b. When did you work there? What period did you work there?
 - c. In what capacity did you work in Mechanical engineering? What was your level of interaction with lecturers in the department?
2. How can the teaching methods most commonly be described in mechanical engineering department?
3. Issue of 'student profile' as defined by LC. Your comments on these
 - a. Cultural/Gender/Language barriers as perceived by lecturers
 - b. Learning issues noted by lecturers
 - i. Students don't seem interested in career / field
 - ii. Students do not take or are not able to take notes
 - iii. Lack of problem solving skills and critical thinking skills in students
 - iv. Types of expectations that students have i.e. notes will be provided, that course is the correct one for them, what field/profession is about and nature of job prospects
 - c. How does the department deal with these kinds of issues?
4. Course content – extent / impact of syllabus constraints on teaching?
5. Curriculum structure: Based on how the curriculum is structured, what is the key objective of the course? What does the course hope to achieve?

PENINSULA TECHNIKON
 WOMEN IN ENGINEERING: 1985, 1995, 2000, 2001 ENROLMENTS
 (Excluding Enrolments Subsequently Cancelled)
 As at 10/19/01

	Year	F	M	Total	%F
Civil Engineering	1985	0	62	62	0.0%
	1995	26	261	287	9.1%
	2000	94	300	394	23.9%
	2001	98	305	403	24.3%
Electrical Engineering	1985	1	49	50	2.0%
	1995	30	467	497	6.0%
	2000	103	432	535	19.3%
	2001	108	385	493	21.9%
Mechanical Engineering	1985	0	25	25	0.0%
	1995	38	468	506	7.5%
	2000	125	558	683	18.3%
	2001	148	593	741	20.0%
Chemical Engineering	1985	0	0	0	n/a
	1995	41	128	169	24.3%
	2000	100	133	233	42.9%
	2001	94	120	214	43.9%
TOTAL	1985	1	136	137	0.7%
	1995	135	1324	1459	9.3%
	2000	422	1423	1845	22.9%
	2001	448	1403	1851	24.2%

Note: The above figures represent enrolments for Engineering qualifications only.

They do not reflect total enrolments in Pentech Departments.

For example, Chemical Engineering students fall within the Department of the Physical Science. The Department also has Analytical Chemistry enrolments, but these are not reflected here.

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Lifelong Learning Research Study Student Biographical Information Sheet

Please complete the following questionnaire. It will only be used for research purposes and only the researcher will have access to the information provided.

Name			
Surname			
Date of birth		Current age	
Place of birth		MALE	FEMALE
Home Address	Study Address (if different from Home)		
Tel: (.....).....	Tel: ()		
Cell: (.....).....	Cell: (.....)		

Please indicate your choice with a cross in the appropriate box.

1. In what year did you complete your matric?

Before 1996	1996	1997	1998	1999
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2. At which high school did you complete your secondary school studies? Only provide the name of the last school you attended.

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3. Did you attend any other educational institution after you matriculated, but before you came to Pentech? If yes please indicate the name of the institution and the course you completed.

YES	NO		
Name of institution		Name of course	

4. Have you had any work experience before you started your diploma? If yes please indicate if it was related or unrelated to your current course.

YES	NO	Related to course	Unrelated to Course
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5. How long has it taken you to reach S4 level in the Mechanical Engineering Diploma?

1 ½ years	2 years	2 ½ - 3 years	More than 3 years
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6. In-service training: When do you intend completing your in-service training? If you have already completed in-service training please indicate this as well.

After S4	Completed after S2	Completed after S3	Received a credit	Other options
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7. When will you qualify for your diploma? In what year will you graduate?

2001	2002	2003	After 2004
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Many thanks for your participation



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