

**THE PROGRESS EXAMINATION AS AN ASSESSMENT TOOL IN A
PROBLEM-BASED LEARNING CURRICULUM:
A CASE STUDY OF THE NELSON R. MANDELA
SCHOOL OF MEDICINE**

BY

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DEDICATION

This thesis is dedicated to Mark, Samantha and Michael-Joshua, who offered me space, love and support throughout the course of the study. Thank you, Mark for your continual love and patience as I went through this journey. I could not have made it through without you by my side.

I am also deeply indebted to my parents, Marina Joan and late father, Jacobus Daniel Smartryk Sass, who have raised me to be the person I am today. Thank you for the guidance, support and unconditional love that you have always given me. You helped me to succeed and instilled in me the confidence and work ethic to believe that I am capable of doing anything that I put my mind to. Thank you for leading by example and teaching me about God's grace and mercy to us all.

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ABSTRACT

Medical schools have been reviewing their curricula to prepare caring and competent health professionals in the midst of a knowledge and technology explosion. The implementation of problem-based learning curricula signalled attempts to make learning more significant, based on constructivist perspectives that emphasise social interaction for meaning making and understanding.

Available literature suggests that learning in PBL should be assessed by authentic, contextual real-life tasks that support and encourage students' learning. To this end, the Nelson R. Mandela School of Medicine implemented the progress examination (PE) to complement the aims of *Curriculum 2001 (C2001)*. The potential formative function of the PE was specifically appealing in terms of allowing for the development of reflective, self-directed and deep learning. Early explorations revealed an apparent mismatch between the aims of *C2001*, the expectations of stakeholders and their experiences with the PE at the site and these resulted in a number of adaptations to the examination.

Cognisant of the influence of assessment on students' learning, this study sought to examine whether the educational principles governing the implementation of *C2001* also informed the implementation and adaptations of the PE. Using a qualitative case study methodology, the study investigated stakeholders' understandings of the PE and its goals and the lived experiences of its implementation as a suitable tool to assess students'

cognitive learning. In addition, the study also investigated the possible factors that influenced the reform.

Findings suggest that the PE was not suitable to assess students' learning in *C2001*. Despite the perceptions of a strong educational need for curriculum reform and the apparent suitability of the PE, some members of staff lacked understanding, skill and confidence to apply and implement its aims. Staff failed to apply transformative practices of teaching and learning, while the principles of the PE and *C2001* were not well diffused through the organisation. Members of staff expected the PE to differentiate between high and low performing students, while students came to regard the examination as just another hurdle in an already hostile learning environment. Factors such as the unstable and poor leadership, the restructuring of the health and education sectors, impacted on the implementation of the reform.

Curriculum and assessment reform is challenging for students and lecturers, requiring the transforming institution to actively prepare and support stakeholders in a conducive educational climate. This case study highlights the need for comprehensive planning for effective and sustained curriculum reform. Collaborative strategies and educational systems should be sought and implemented to sustain conceptual and practical reform.

Declaration

I, Jacqueline M. van Wyk; Student number: 951056590 declare that the research undertaken entitled: *THE PROGRESS EXAMINATION AS AN ASSESSMENT TOOL IN A PROBLEM-BASED LEARNING CURRICULUM: A CASE STUDY OF THE NELSON R. MANDELA SCHOOL OF MEDICINE* is my own original work for the above thesis.

All quotes and data sources in this thesis have been acknowledged and referenced to support the arguments.

This thesis has not been previously submitted to any other university.

Signed:

Jacqueline M. van Wyk

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CHAPTER 1

Introduction and overview

No student will be writing the Progress Examination, Progress Test or any other name that this examination may be called by in the future. It will not happen for the current final year class and we... [Medical Student Representative Council]...will ensure that this examination does not become a hurdle for any student in the future.¹

1.1 INTRODUCTION

Following international trends in medical education towards student-centred and self-directed learning (SDL) programmes, the Nelson R. Mandela School of Medicine (NRMSM) of the former University of Natal, now the University of KwaZulu-Natal (UKZN), introduced a problem-based learning (PBL) curriculum in January 2001. Curriculum 2001 (*C2001*), as it became known, brought about many changes in teaching and learning, the most significant being the replacement of discipline-based teaching with more holistic, integrated, interdisciplinary learning and the use of authentic, real-life patient problems to stimulate learning.

PBL is an instructional method that incorporates principles of active learning, the acquisition of retrievable and usable knowledge and the development of deep learning (Barrows, 1986, 1988, 1994, 1996, 2000; Barrows & Kelson, 2006). Self-direction, on the other hand, is defined, as a process in which individuals take initiative, without assistance, for diagnosing their learning needs. This may require students to generate their own learning objectives,

¹ The President, Medical School Student representative Council, Student Curriculum Conference, August 2004

identify own resources and to be able to evaluate and assess their own learning (DesMarchais & Hivon, 1994). The ability to self-evaluate is regarded by some as an important component of self-direction (Mifflin *et al.*, 2000; Tousignant & DesMarchais, 2002; Eva *et al.*, 2004). Self-direction is especially an achievement for students from disadvantaged secondary schooling experiences that lacked elements of critical thinking, problem-solving and self-direction as these students need more assistance from lecturers to identify and address their personal learning needs (van Wyk, McLean, & Peters-Futre, 2007). These concepts are more fully addressed in **Chapter 4.**

Curriculum scholars believe the effectiveness of a curriculum to be greatly influenced by the content and method of assessment (Frederiksen, 1984; Newble & Jaeger, 1983; Schuwirth *et al.*, 1996b). It is thus pointless to develop a curriculum that encourages deep learning approaches if the content and method of assessment drives students towards surface learning (Davis *et al.*, 1995). Cognisant of the overriding influence of assessment on learning, the NRMSM made a decision to complement and enhance learning in *C2001* with the introduction of an essentially formative Progress Examination (PE). This exam was designed to regularly assess the accumulation of students' cognitive knowledge while skills and attitudes were assessed by means of the Objective Structured Clinical Examinations (OSCE); Objective Structured Practical Examinations (OSPE) and the facilitators' assessments.

The PE at the NRMSM embodied the concept of progress testing (PT) implemented in the 1970s at the then University of Limburgh, in Maastricht in the Netherlands (Harris, 2002). The PT, a longitudinal testing approach (McHarg *et al.*, 2005), supports desirable and deep learning in PBL students by ensuring that they learn for understanding rather than trying to recall unrelated facts. The version on which the PE at the NRMSM is based originated from the concept of progress testing (PT) implemented since the mid-seventies in the medical curriculum of the University of Limburgh, Maastricht, Netherlands (Harris, 2002). Details of this examination are more fully discussed in **Chapter 2**.

In order to place the study and the modifications to the PE in a more appropriate context, it is necessary to describe the events and context leading up the January 2001 implementation of *C2001*.

1.2 SETTING THE STAGE: The Need for Reform

The section below describes the context and factors that informed the decision to change from a traditional teacher-centered curriculum to *C2001*, a learner-centred PBL curriculum. The description starts from the international context and progresses to include changes at national and local level in education in general and medical education in particular.

1.2.1 International Reforms

The 19th century saw a proliferation of medical schools, which produced large numbers of doctors with a poor public image (Edwards *et al.*, 1999).

Reasons for this poor image included the fact that doctors seemed more interested in curing than preventing disease. By the late 1930s the medical profession was thus perceived as an elite profession that had resulted in increased health care costs, the exclusion of large proportions of the population from health care and an apparent lack of interest in caring for the elderly (Edwards *et al.*, 1999; World Health Organisation, 1991). It was, thus, as head of the investigation of the Carnegie Foundation, that Abraham Flexner evaluated the standards and competences of American medical schools. He recommended in his report that a curriculum be designed for medical training where a period of exposure to basic sciences and liberal arts was followed by periods of dedicated clinical training, research and internship (Flexner, 1910). The resulting curriculum became commonly known as the traditional curriculum and it dominated the medical training from the mid-1910s to the mid-1960s. By the 1960s, faced with the knowledge and technology explosion, it became widely believed by medical educators, the World Health Organisation (WHO) and the World Federation for Medical Educators (WFME) that traditional programmes failed to develop skills, such as life-long learning and problem-solving, required for normal functioning as a competent health professionals (World Health Organisation, 1991).

The teaching model commonly used for medical training received increased criticism for being opportunistic and teacher-centred. Critics argued that medical training focussed on information gathering and was hospital-based rather than resolution orientated and community-based (Peabody, 1999). The lack of a systematic training programme stemmed from the exposure of

trainees to patients and disease profiles that coincided with their period of apprenticeship in training hospitals. These factors, together with the information and technological explosion, raised concern among medical educators regarding the value of teaching isolated facts, which might not be relevant when students eventually entered into practice. In fact, it was believed that students should rather be taught skills to improve learning; technology and research to prepare them better for future health challenges (Edwards *et al.*, 1999). A review of medical training was to follow and included more systematic, integrated, holistic and student-centred approaches to ensure a degree of standardisation in medical curricula (Harden & McGrew, 1984). Again accreditation bodies such as the Association of American Medical Colleges and the General Medical Council (GMC) (1993) led the campaign to improve professional standards, and large-scale curriculum reform (McGrew, 1985; Edwards *et al.*, 1999).

The first significant reforms from the traditional curriculum came in the 1960s with the implementation of PBL and systems-based curricula (Rothman, 1992). These curricula, while recognising the rapid growth in knowledge and the changing character of medicine, adopted more progressive educational philosophies to guide and redefine the educational process. This was done to prepare graduates for a rapidly changing knowledge-based society. Improvements were also evident in the structure and organisation of PBL curricula such as the increased integration of basic and clinical science; early clinical exposure; increased attention to patients and consideration of their socio-economic context (Rothman, 1992).

1.2.2 Medical Education Reform in Africa

Medical training in Africa had followed the traditional curriculum since the establishment of the first training facility in Cape Town in 1920 (De Villiers & De Villiers, 1999). Coinciding with global reform and to explore and debate the training of the 21st century African doctor, three conferences were hosted on the African continent in Abudja, Nigeria (1989); Yaoundé, Cameroon (1993) and Cape Town, South Africa (1995). These followed mainly from influences of international organisations such as the WHO and the WFME. The recommendations for training in Africa mirrored those that culminated in the Edinburgh Declaration (1993), which proposed a curriculum based on student-centered principles that also inculcate patient-oriented and community-based solutions to problems. In addition, the concept of an integrated, curriculum focussing on minimum and core competencies was further advanced at the 1995 Cape Town conference with a task team formed to implement the recommendations of the Cape Town Declaration.

The reform principles, initiated by the British accrediting body, the General Medical Council (1993) were also endorsed by the Health Professions Council of South Africa (HPCSA, 1999). The HPCSA's approval and recommendation of 5-year, medical curricula additionally came together with the 2005 implementation of the compulsory 2-year internship introduced for new medical graduates in South Africa (South African Ministry of Health, 2004). Following the Cape Town conference, most of the eight South African medical schools embraced the challenge of curriculum reform. Almost all the schools keenly considered PBL or problem-focussed methodologies due to

the reported successes of PBL schools on the international front (Barrows, 1985).

1.2.3 South African Medical Educational Reform

On the social front, the first democratic South African elections of 1994 brought an end to an apartheid legacy of racial discrimination and marginalisation and paved the way for political and social transformation. It encompassed large-scale restructuring in education and health to ensure more equitable access to national resources for all South Africans (South African Department of Education, 2002, 2004; South African National Department of Education, 1997).

Transformation in education resulted in various changes in the higher education (HE) arena. The first relates to the merger of some previously racially segregated institutions. The merger in 2003 of the School with the Faculty of Health Science (previously the University of Durban-Westville [UDW]) resulted in the formation of a College of Health Sciences. The second and more profound change nationally, relates to the implementation of the National Qualifications Framework (NQF), requiring all educational programmes to be presented in an outcomes-based format.

The objectives of the NQF are to create an integrated national framework for learning achievements and to enhance access, mobility and quality within education and training (South African National Department of Education, 1997). The outcomes-based structure has as its focus the transformation of

the country's pedagogical and ideological legacy. It essentially restricts the offering of an educational qualification without the appropriate written approval from the Department of Education (DoE). The qualifications are mainly structured in modular format each requiring the completion of programme and module templates specifying the programme/module purpose; minimum entry requirements, content details and outcomes (knowledge, skills and attitudes) to be achieved as well as criteria specifying student competence and its assessment. The NQF allows articulation for studies gained via formal schooling systems and for informal/alternative routes such as home-based or workplace training and has changed the landscape in the South African Further and Higher Education (HE) and Training arena.

The pace of transformation and restructuring of the HE sector has, however, not been accompanied by equivalent developments in the secondary schooling system. According to Kent & Gibbs (2004:121), 'it will take generations for substandard schools to be brought up to speed,' leaving tertiary institutions with the task of developing skills in the students who are not always adequately prepared upon admission. To address previous disadvantages and to meet the needs of South African communities, most medical schools, having previously admitted mainly White students, have since revised their entrance criteria (van Niekerk, 1999) to reflect the demographic representation of the province where the school is located. At the NRMSM, this decision led to the development of an alternate entry for

‘mature’ students who completed or partially completed tertiary qualifications and others in need of additional bridging in science subjects.

The restructuring of the South African health system to a district health system as part of social transformation (South African Ministry of Health, 2004) has also impacted on the training of medical students. In this regard, Ncayiyana (1999:714) claims that despite the noble intentions of achieving an equitable health system for all,

the redistribution has been too quick and too deep, throwing academic hospitals into chaos and resulting in random, drastic and often-crippling staff and service cuts.

The resultant excessive service loads and resource shortages have led to losses of staff, which have negatively impacted on teaching and research at academic faculties (Ncayiyana, 1999; Kent & Gibbs, 2004). South African medical schools are not only dealing with their own home-grown issues of equity and transformation, but in addition have been called upon to support reconstruction and development in the rest of Africa (van Wyk *et al.*, 2007). For the NRMSM, this has resulted in the admission of students from neighbouring African states, which has added to student diversity and has exponentially escalated student admissions to the MBChB course.

The Medical School of the then University of Natal enrolled its first cohort of 35 students in 1952. For more than two decades and until the establishment of the Medical University of South Africa (MEDUNSA) in 1976, it was the only

site that served exclusively to train Black medical students (Noble, 1999). The School, located adjacent to King Edward VIII Hospital (KEH) in Durban, served as the main teaching and training facility for nearly five decades. The hospital's dilapidated condition was often publicly discussed as it highlighted the gross Apartheid era inequalities that prevailed in state-funded Black health care when compared with that offered to other racial groups (Noble, 1999).

The development of the School was not without difficulty. Noble (1999) explains this reputation as stemming from the School's opposition to the apartheid government's philosophy to provide substandard facilities for medical training for Black students. Noble (1999) also cites the government's dissatisfaction with the School's association with the previously white-only University of Natal. Likewise, its location within a white residential area contributed to the ongoing conflict between students and staff at the school and the apartheid government. The School became renowned for its politically sensitised student body that publicly voiced their dissatisfaction and also demonstrated their discontent with government policies. The school became prominent for producing the country's first Black medical graduates and academics, with many of its graduates occupying prominent positions at academic institutions (Naidoo, 1976) in the post-apartheid government.

A recollection of one of the first female graduates relates to the use of the residential quarters and lecture venues at the disused army barracks in Wentworth (an apartheid Coloured township). She recalls how the apartheid

government tried to separate the students into racial groups after the establishment of the University of Durban-Westville that were to serve³ as institution for the educational needs of Indian students. That attempt, she recalls, to separate the students racially resulted in the School's first major student unrest. The School's substandard teaching and learning facilities resulted from the staff and students' resistance to falling in line with the Apartheid Nationalist government's philosophy. She also believes that the Government responded by not maintaining or upgrading the Umbilo Road campus.² The fact that the site still offers inadequate facilities for training and recreation was again highlighted in an accreditation report by the HPCSA which recommended that the School consider relocating to a more appropriate site (Health Professions Council of South Africa, 2005).

For nearly five decades and despite years of political harassment, inequitable state funding and a chronic lack of human resources, space, facilities and equipment, the Medical School established a national and international reputation for academic rigour and an unwavering commitment to the community it served (Noble, 1999). The significance of this reputation lies in the fact that this was achieved during a time when the School used mainly traditional, didactic methods for the training of its graduates (Naidoo, 1976). This reputation and tradition of excellence gained in the traditional curriculum were often cited by some members of the faculty as the reason for their resistance to the curriculum reform. They often asked, "Why do we need to

² Personal communication, Staff member and former student, August 2006

fix something that is not broken?”, or “I studied here and there is nothing wrong with me or my medical skills”.³

Thus, influenced to some extent by the changing level of health care provision, but largely by the global trend in medical education reform, the WFME and the HPCSA (1999) provided guidelines for the training and assessment of medical practitioners. They advocated the adoption of a five-year curriculum based on principles of PBL, student-centred and self-directed learning. They also suggest a curriculum that includes early clinical exposure, a multidisciplinary approach to health care and an increased focus on developing professional competence while cultivating social values (i.e. sensitivity to cultural, racial, language, gender and religion) in students (HPCSA, 1999). Most of the eight medical schools in South Africa subsequently revised their curricula to reflect some of these recommendations. To illustrate, the most radical changes have been the implementation of PBL at the NRMSM (McLean & van Wyk, 2006) and the change to a community-based curriculum at the former University of the Transkei (Meel, 2003). Four other medical schools complemented their traditional didactic training with changes that reflected more problem-oriented or problem-based approaches. At least one medical school implemented, in addition to the traditional programme, a graduate entry PBL program.⁴ The Afrikaans medium medical schools implemented mainly cosmetic changes.⁵ The University of Cape Town changed their programme to reflect a primary-

³ Personal communication, Staff member during Facilitator training session, April 2002
⁴ Personal communication, External examiner, University of the Witwatersrand, November 2006
⁵ Prof Nel, keynote address, HPCSA Conference, Bloemfontein 2002

care approach (Ncayiyana, 1999) but essentially retained most of the traditional structure. The University of the Witwatersrand on the other hand opted for a dual stream approach (i.e. one traditional and the other allowing only graduate entrants in a PBL stream). Strategically, the national leaders in health were under a lot of pressure to provide and produce doctors especially to care for the needs of the South African rural communities. The medical schools of the former Transkei and KwaZulu-Natal (who had the highest intake of Black medical students) were thus asked to increase their student intake by the Provincial Ministry of Health to meet the demands for health care in these provinces.

In terms of the assessment of undergraduate medical students' learning and coinciding with the establishment of revised curricula, the HPCSA recommended a change in assessment from strategies that focus mainly on factual knowledge and recall to approaches that engender problem-solving, professional competence, critical thinking and social values (HPCSA, 1999). Even in this regard, medical schools responded to the HPCSA's recommendations in a variety of ways. While most widened their repertoire of assessment strategies, others retained the tried and tested assessment methods (Walubo *et al.*, 2003). At the NRMSM, however, it was decided to undertake both assessment and curriculum review. The section below outlines how curriculum and assessment reform at the NRMSM came about in response to the HPCSA's mandate.

1.2.4 Curriculum Reform at the NRMSM

Aligned with the HPCSA's recommendation (1999) for medical lecturers to be trained in educational methodologies, I was appointed in July, 2000, to the Medical Educational Development Unit (MEDev) of the Medical school as an education consultant and staff developer. At the time of my appointment and six months prior to the implementation of *C2001*, *MEDev* consisted of a director, student academic developer, student counsellor and an administrative assistant. Upon joining *MEDev*, I joined the Steering group of the Curriculum Development Task Force (CDTF), which planned the coordination, and implementation of *C2001* at the school.

Apart from staff training in general educational and PBL methodology, my roles at the school have and still include being a year coordinator; serving as educationalist on teaching, learning and assessment committees, coordinating the assessment activities and evaluating components relating to teaching, learning and assessment in *C2001*. My perspective and knowledge of the curriculum are thus informed by my participatory role during these sessions as it related to the design, implementation and evaluation of the MBChB programme. (The details of the methodologies used, and the documents accessed for this case study, are more fully explained in **Chapter 4**).

Curriculum reform at the NRMSM was a prolonged process. It followed decades of student and staff dissatisfaction with the quality of students' learning and resulted from at least two investigations into the high exclusion

and failure rates that were common in the first three years of the traditional curriculum (Adams *et al.*, 1987; Bhagat, 1978). Reports from these commissions and research from the Medical Education Development unit (Olmesdahl, 1999) described not only the poor learning conditions at the school but also the increasingly overcrowded curriculum that was in use. Their recommendations for curriculum reform included a reduction in curricular content, increased recognition and reward for teaching, improving the educational qualifications of staff and the use of assessment practices with increased feedback to students to enhance learning (Adams *et al.*, 1987; Olmesdahl, 1999).

At the School, the CDTF explored and supported the idea of PBL as the instructional method to motivate students and to improve the relevance of their medical training in preparation for medicine as a professional career.⁶ As an instructional philosophy, PBL promised the acquisition of better-retained knowledge that would be integrated with allied disciplines and applicable in clinical contexts (Barrows, 1986, 1996). PBL's incorporation of active learning principles, the acquisition of retrievable and usable knowledge and the development of deep learning (Barrows, 1986; Barrows & Tamblyn 1980) for improved understanding, was believed to be the solution for the high failure and attrition rates that prevailed in the preclinical years (Bezuidenhout, 1990; Frame and Seneque, 1991). There were additional promises that students would develop clinical reasoning, problem-solving, independent learning and self-directed thinking skills while engaged in

⁶ Personal Communication with chairperson of the Curriculum Steering Committee, Sept 2000

collaborative environments. The environment were also to promote interpersonal and communication skills. The skills to be achieved seemed as the answer to issues highlighted in studies at the School (McLean *et al.*, 2006; Olmesdahl, 1999) and recommendations of the accrediting body, the HPCSA (1999).

A feasibility task group was established to assess the feasibility of implementing *C2001* at the School. They explored resource needs in terms of the additional staffing and physical requirements to implement *C2001*. The feasibility task team projected that additional medical staff would be needed to successfully deliver *C2001*. They also recommended upgrading existing school-based small group venues. The group highlighted that the projected costs for staffing might not be accurate due to poor departmental responses when this information had been sought. It was, however, concluded that *C2001* implementation was feasible and indeed desirable. The group also warned that the proposed increase in student admission, at the time, was to have more serious financial implications for the School than the curriculum reform.

Thus, in January 2001, *C2001* was introduced at the NRMSM with the primary objective of producing appropriately trained doctors to deal with the changing scope of medical care in South Africa. The new 5-year, student-centred programme greatly emphasises preventative care particularly in the light of life-threatening diseases related to HIV/AIDS and tuberculosis. *C2001* was initially divided into yearlong modules with each module comprising six

themes of approximately six-week duration. The modules were later divided into semesters of three themes each.

Learning in a theme typically begins with the analysis of a patient or clinical case in which approximately 10 students, assisted by a facilitator (non-expert tutor) in a small group setting, identify learning goals. A two-hour session is allocated for each tutorial/small group meeting and students leave these sessions armed with the goals that they identified under the guidance of their facilitator. The interdisciplinary learning goals relate to issues from the clinical case and may require students to research the anatomical position of an organ, the functioning or pathology thereof, the design or side-effects of drugs or ethical issues relating to procedures. The goals inform students' learning, as they require them to explore and understand core principles of the case. The learning goals may include additional issues identified by individual students depending on their needs and prior experiences. Students then research and explore the goals during the next seven days after which they reconvene for the second two-hour tutorial session for the conclusion of the case.

During the period of self-directed study, students engage with discipline experts in interactive large group sessions (similar to lectures) and undertake clinical and practical skill training sessions, which are coordinated by a year-coordinating office. These sessions occur in clinical or practical skill laboratories, lecture venues, community-based or hospital settings. During the intersession period, students search for and apply information gained to

resolve their individual and group learning goals. The students eventually conclude and resolve the case when they share their ideas and information at the second two-hour, small group tutorial.

1.2.5 Assessment reform at the NRMSM

Of particular relevance to this study are suggestions of educationists advising that students' learning in PBL is best assessed by means of objective, authentic, and contextual assessment tasks (Friedman Bed David, 1999; Savin Baden & Major, 2002). First, objective assessment tasks assume that all students would learn exactly the same content for which a single true answer exists. Objective assessments are usually constructed in the multiple choice, true false, short-answer format and they are good for testing factual recall. Objective tests can also be automated to facilitate computer-aided marking (Michigan State University's Teaching and Learning Centre, 2007).

Second, authentic assessment tasks support and encourage deep learning as students become self-directed and better prepared at identifying their own learning needs (Savin-Baden & Major, 2004). Authentic assessment tasks are often designed to closely match the desired performance of students are aligned to the educational philosophy of the curriculum (Broadfoot, 1995). As such, scholars recommend that assessment must occur in contexts that both simulate the practice environment and encourage ongoing learning. To ensure ongoing reflection and learning, students thus need appropriate feedback to become aware of what they know and do not know and how to

improve. To this end, Chickering and Gamson (1987) suggest that students must regularly be provided with opportunities to reflect on what they have learnt and on the topics still to be learnt. They must also be provided with opportunities to make judgments on their own competence. Informed by the principles of authentic assessment, including the need to improve feedback and support to inform and direct student learning, the progress examination (PE) was introduced at the NRMSM.

The PE, designed to assess students through the outcomes of the newly implemented *C2001*, is based on the principles of progress testing (PT) that originated at the University of Missouri (Kansas City) and the University of Limburg (Maastricht, Netherlands). These tests were developed independent of each other at the two medical schools where progress testing originated (Verwijnen *et al.*, 1982; Blake *et al.*, 1995, 1996;). The version on which the PE at the NRMSM is based originated from the concept of progress testing (PT) implemented since 1977 in the medical curriculum of the University of Maastricht (van der Vleuten, *et al.*, 1996; Harris, 2002). Described as a longitudinal testing approach (McHarg *et al.*, 2005), the PT is based on an educational rationale that supports desirable and deep learning of students in PBL curricula by ensuring that students learn for understanding rather than for the remembrance of unrelated facts.

1.3 The rationale of the PE

Research indicates that it is impossible to study for the PT (Albano *et al.*, 1996; Friedman Ben-David *et al.*, 2001) as each test samples the complete

domain of knowledge required of final year medical graduates. In this way, the PT reinforces the scope and depth of learning for students. The PT also rewards appropriate deep learning since it encourages meaning-making over rote-learning as students become motivated to read, understand and explore medical topics beyond the scope of their present academic level (van der Vleuten & Wijnen, 1996). This occurs because they are exposed to the same range and scope of questions at regular intervals (i.e. three times per year).

As is the case at Maastricht, the PE at the NRMSM is administered simultaneously to all registered medical students irrespective of their academic level of study. Each PT is compiled from questions that are randomly drawn from a large bank of objective true or false multiple-choice questions (MCQ) and cover the major areas of the medical curriculum. At Maastricht, members of staff monitor the increase in the students' collective and individual knowledge over the duration of the course per academic year while it is also possible to monitor students' progress per discipline or module. A norm-referenced pass mark is determined for each test and this pass mark is sometimes adjusted if the PT was deemed to be too difficult. In this way, the progress of each student is analysed and compared to the average (norm) for his/her class. The student receives individual, written feedback on his/her progress and areas of strength and weakness are identified for course constructors and students (McHarg *et al.*, 2005). Students are given time to compare the feedback that they receive with their understanding of the questions. During this time, students can also challenge answers (using relevant text to support their argument) with which they do

not agree. Appropriate steps are then taken to correct their understanding or to omit the test item if the question is considered unfair. After comparing the results of individual students with the pass mark, the student's progressive performance is rated as being more than satisfactory, satisfactory or less than satisfactory. At the University of Maastricht, where three of these PTs are written per academic year, a student is required to obtain a satisfactory pass on two or more to progress to the following academic level.

As with the University of Maastricht, the PE at the NRMSM was also adopted to measure the increase in knowledge of students in *C2001*. It was believed that the format of the PE would complement the collegial atmosphere developed in the small group setting as students would be less likely to withhold information from their group in a conducive and non-threatening learning environment (McLean & van Wyk, 2006). The PE consists of approximately 50 case scenarios of 200-250 multiple choice question statements (true/false format) requiring students to make decisions on whether statements that relate to the scenario are true or false. While the scenarios portray real-life medical situations and require that students make a choice, they are not, however, expected to justify or explain their choices.

In 2001, the score obtained by a student (average of three PEs) and their mark in the objective structured clinical examination (OSCE) was used to determine a student's progress to the following (2nd) year. Participation in other formative activities (i.e. self-assessment and tests at the end of 6-weekly themes) was voluntary. The facilitators' descriptive observations of

students' contributions and behaviour in the tutorial process additionally provided insight into students' affective development, ability to work as a member of a team, skills in performing independent research and ability to integrate their knowledge to resolve the weekly case.

Early in the programme, students reported having discovered that trying to study for the PE was futile and they actively participated in all learning activities that had been scheduled to support and structure their academic development and learning. Nearly 50% of the students in the 2001 cohort included 'mature' learners with partial or completed prior tertiary qualifications (e.g., a Bachelor of Science or Bachelor of Health Science). This may account for the cohort's exceptional performance during the 2001 implementation. The students also accepted and welcomed the PE and its feedback once they had understood the concept (McLean, 2001).

Analysis of the 2001 student results, however, revealed that while some students passed the PE, they scored poorly on items relating to the themes and the modules (i.e. content studied). In subsequent years, students also verbalised their increased tendency to guess answers. The fact that students eventually perceived the PE as an imposition and hurdle is illustrated when they refused to take the exam in their final year. They argued that it served no purpose in the final year as each clinical department used its own assessment strategies to determine competence in that discipline.

This non-compliant stance of the students created a problem for lecturers at the School. As in the case of the University of Maastricht it was believed that the testing format would support and develop deep and self-directed learning behaviour among students and that extensive formative feedback would help to identify individual student weaknesses to enable them to become more independent and self-directed. The implementation of *C2001*, however, coincided with the post-apartheid educational reform period in which the Department of Education favoured criterion rather than norm-referenced assessments. This necessitated the setting of a pass mark of 50% for all modules offered at UKZN. This requirement implied that students could not be failed on modular content for which they had not received instruction or be assessed summatively by an examination where the majority of the content was equivalent to a final year question paper. This imposition led to a series of alterations to the PE from 2002. The most significant of these was the assignment of an increased weighting of 80% for content from modules that students had already studied. A percentage remained allocated to modules not yet formally taught (20%).

The notion to increase the weighting of content directly relating to the modules, however, distracted from the philosophy of progress testing that essentially requires students to write the equivalent of a final year examination at every sitting of the PE. The priority of the faculty members to design and develop their own question bank led to the refusal of academic staff to release copies of the question papers for student feedback.⁷ Individual staff members were also reluctant to address students during

⁷ Personal communication with assessment contributors and theme heads, April 2002

feedback sessions due to the interdisciplinary nature of the PE. Students thus felt that they did not receive sufficient information to learn from their mistakes or to benefit from the PE.

A mandate in 2003 from the Department of Education and the University executive to semesterise and modularise the year-long modules of the Bachelor of Medicine and Bachelor of Surgery (MBChB) course reduced the number of PEs to be written in each academic year, from three per annum to one per semester. Year planners for the cohort can be compared in **Appendix J (I-II)**. Students' interpretation of semesterisation further implied that they were not to be tested on content not directly taught during the semester or modules preceding the PE. This was contradictory to the spiral nature of *C2001* where previous content needed to be expanded on in subsequent years. By 2005, students argued that they did not gain any new information from the PE and that it caused them undue pressure to undertake an additional examination (PE) in their final year. They perceived the PE in the final year as unnecessary because each of the six clinical departments had individual final year examinations that assessed students' theoretical and clinical knowledge and skills in that discipline. Concerned that the faculty may want to compare the knowledge of students who completed the six-year traditional exam with those who completed the five-year PBL exam, the leaders experienced a lot of pressure from the politicised student body, especially those in the traditional programme, who feared any form of comparison. The students eventually refused to undertake the examination. There thus appeared to be a mismatch between the instructional and

learning objectives advocated in PBL and the practice of the PE at the School.

In the light of research literature that suggests that the effectiveness of a curriculum is greatly influenced by the content and method of assessment, this study sought to examine whether the same educational principles that governed the design of *C2001* also informed decisions relating to the implementation and adaptation of the PE. The study focuses on the efficacy of the PE in the context of the newly implemented PBL curriculum at the NRMSM of the UKZN where I had served as staff developer and assessment-coordinator between 2000 and 2003. In particular, the study sought to examine the ways in which educational principles informed decision-making with respect to the curriculum and its choice of assessment tools for determining students' cognitive domain. In order to place the study and the modifications in the proper context, the rationale is described below.

1.3 RATIONALE FOR THE STUDY

This research is important for a number of reasons. First, documented success of the PE has predominantly been based on studies conducted in First World countries (Verwijnen *et al.*, 1982; Albano *et al.*, 1996; Blake *et al.*, 1996) and its use has not yet been researched in countries with students from diverse educational and cultural learning experiences such as ours. Secondly, research into assessment has been dominated by a psychometric tradition and there are currently calls for the use of broader, more educative perspectives and the incorporation of more diverse research methodologies

when investigating issues around assessment (van der Vleuten *et al.*, 2004; Gijbels *et al.*, 2005).

Thirdly, a number of South African health science faculties have initiated changes toward problem-oriented and PBL curricula, and questions and issues relating to the validity of the curricula and assessment can be anticipated from these faculties. The study will thus add to new knowledge, as it explores the adaptations to and effects of, the essentially formative PE at the institution in order to satisfy local needs for a summative assessment tool. It may also add a better understanding of why innovative educational strategies are so difficult to achieve in contexts such as the NRMSM.

Fourthly, qualitative studies supporting a contextual understanding of curricula and assessment have been relatively limited in medical education despite such studies having become more acceptable and accessible to researchers in the field (Mays & Pope, 2000; Malterud, 2001; Harris, 2002). There is, however, consensus that qualitative case studies have much to offer towards the understanding of the complexities of curriculum reform and assessment, especially in medical education where quantitative psychometric enquiries have dominated the research arena (van der Vleuten, 1996; Harris, 2002).

In the light of the above, the current qualitative study is based on the assumption that professional and pedagogical principles influenced the

adoption of the PBL curriculum and the PE at NRMSM. As such, the following questions were used to focus the investigation

1.4 THE RESEARCH QUESTIONS

The study was concerned primarily with stakeholders' understanding of the PE and its goals as well as their experiences of its implementation and its suitability for assessing students' cognitive abilities in the context of PBL.

This study addressed the following questions:

1. What educational principles influenced the adoption and implementation of the Progress Examination (PE) in the context of PBL at the NRMSM?
2. What are the stakeholders' understandings of the nature, principles and goals of the Progress Examination and its suitability for assessing students' cognitive learning in the context of PBL?
3. What are the experiences of stakeholders of the implementation of the Progress Examination (PE) and what factors shaped the implementation?

1.5 THE THEORETICAL LOCATION OF THE STUDY

The implementation of PBL is significant in medical education as it signals an attempt to make learning more meaningful to learners. The study is thus framed from a constructivist perspective that emphasises the role of social interaction in the development of meaning and understanding (Atherton, 2005). These curricula thus incorporate principles of adult learning

(Brookfield 1995; Knowles 1998), self-direction (Colliver, 2002) and life-long learning (Mifflin *et al.*, 2000; Stefani, 2004) and is premised on the notion that staff would support learners to become independent, deep learners (Biggs, 1994; Rushton, 2005). It is argued that staff would be keen to review their instructional philosophies and practice. These concepts are more fully explained in **Chapter 4**.

Specifically, the implementation of the PE can be seen as a proactive attempt to value and promote educative assessment where students should take greater responsibility for their development. Informed by the principles underlying PBL, the PE therefore encourages learners to set their own individual goals for progress and as such incorporates efforts to assess learners over the scope of the full undergraduate spectrum. By doing this, learners can monitor their progress towards the attainment of final goals but also play an active role in identifying their own strengths and weaknesses, and are able to take appropriate remedial steps. In this way, Cowan and Harding's (1986) model, which reflects the interplay between teaching, learning and assessment as amended by Stefani (2004), has informed the data collection and analysis in this study. For example, using the model, the study has sought to examine the conceptualisation of assessment as it locates the outcomes of the learning process at the center of the curriculum (i.e. with the learner) while simultaneously interrogating educational decisions relating to the learning process and curriculum.

Furthermore, developing appropriate assessment strategies should form a key part in the development of sustainable and effective curriculum reform (Fowell *et al.*, 1999, 2000). To aid this process, Fowell and colleagues (2000) suggest the use of a four-phased cyclical approach for the development of an effective system. As part of the evaluation phase, they suggest that educators should consider whether the system is congruent with the students' total learning experience, especially those learning outcomes that are not assessed. Feedback should also be viewed as part of the interactive components of teaching and learning which are central to pedagogy (Rushton, 2005). Despite the selected method, feedback must provide information about what the student knows or does not know, and provide direction for improvement (Hattie & Jaeger, 1998). Finally, to explain issues around the curriculum implementation process, I draw on Fullan's (1985) change theory for the framework to investigate the extent of the change.

1.6 METHODOLOGY

A qualitative, case study methodology was chosen to investigate the phenomenon under study (i.e. the social aspects of teaching, learning and assessment). It is believed that medical educators would learn from this experience if the phenomenon were better understood and explained from the interpretative paradigm. The chosen methodology accommodated my presence as participant observer in the setting, the use of purposive sampling and multiple research instruments (questionnaires, interviews, focus group, and document analysis) for data collection.

Data collection commenced in 2001 and occurred iteratively and serendipitously (Patton, 2001) throughout the period of engagement with key informants who played a role in the setting as medical educators, change agents or administrators. Initially, an exploratory questionnaire was administered to understand students' perceptions of the purpose and format of assessment at the School. During observations of the assessment working task team, I realised that medical educators had different views of the philosophy of the PE. This observation led to the adaptation of the sampling strategy to additionally gather information regarding the experiences and perceptions of the lecturers.

Therefore purposive sampling (Robson, 2002) was used to select staff who taught on the programme and who served on some of the committees during *C2001* design and implementation. The study used participative observation, interviews (individual and focus group) and questionnaires. Individual and focus group interviews were transcribed and individual participants and student-group representatives were given opportunities to comment during informal discussion sessions. Their comments were taken into account in the final analysis. The use of different methods of data collection tools helped to triangulate my findings. The UKZN and the Biomedical Ethics Committee at the NRMSM granted ethical clearance for the study (HSS/061/80A) and the curriculum evaluations (**R201/04**) (**Appendix A and B**), which allowed a more comprehensive view of student and staff perceptions over a prolonged period. The research methodology employed in this study is more fully described in **Chapter 5**.

1.7 LIMITATIONS OF THIS STUDY

The case study methodology as a study of singularity has been used to explore the perceptions of stakeholders in the study. It is, however, recognised that qualitative studies are rarely generalisable and that insights from this explorative, descriptive case would not predict success in other settings (Yin, 1984). It is important to note the bias of the researcher toward the curriculum change and in favour of formative feedback. Other limitations in the setting were the fact that substantial tensions developed between students in the 6th year traditional programme and the *C2001* cohort from whom the perceptions were collected. While it was planned to compare the exit knowledge of the PBL cohort with that of the traditional students by means of the PE, this did not occur due to objections raised by the students.

Despite the use of purposive sampling, most academic members of staff involved in the undergraduate curriculum and its assessment primarily taught in *C2001* and was keen lecturers. It was also difficult to gather the perceptions of lecturers who are jointly employed by the provincial Department of Health (DoH) and the university, as they are mainly hospital-based and seldom serve on decision-making committees at the School.

1.8 ORGANISATION OF THE THESIS

This study is concerned with how curriculum reform to PBL is introduced at the NRMSM after a traditional, didactic teaching curriculum has been offered for more than 50 years. It is especially concerned with how lecturers practice

and apply stated pedagogical goals and how these goals are articulated in the PE as an assessment instrument.

In the current chapter, I have provided an overview and background to the study, including the context and need for curriculum reform at international, national and local context. I have also provided an overview of *C2001* and the PE and introduced the students' concern and their dissatisfaction with the many adaptations to the assessment tool. I further provided the rationale for the study, the theoretical framework to be used to analyse the data and introduced the research questions that will guide the investigation.

In **Chapter 2**, I offer a critical synthesis of the literature on assessment implementation in PBL. I argue for a cognitive approach to studying curriculum and assessment. I also suggest an investigation into the reasons for, and the purposes served by, the assessment instruments in PBL settings. Hence, I review the literature on assessment in higher education and PBL schools, illustrating the misalignment between the aims of student-centered PBL curricula and the practice of assessment in PBL programmes. Moreover, based on this critical literature review, I argue that my research addresses a gap in the scholarship of how and why curriculum mismatches occur in medical curriculum reform and this case research might shed some light on factors that support or hinder further reform efforts.

In **Chapter 3**, I present a narrative-analytic account of the research setting, the curriculum and the assessment processes. For the case study report, I

provide a detailed description of the institutional context and the main themes that emanated from this exploration of the pedagogical principles that informed the curriculum and its assessment reform.

In **Chapter 4**, I provide an account of the theories that framed the data collection and analysis processes.

In **Chapter 5**, I describe the research design and methods employed in this study. I explain the difficulties encountered in obtaining written ethical clearance and I provide a narrative account of the data collection process and strategies. I conclude this chapter by giving an account of how I attended to issues of validity and trustworthiness in the case study of the NRMSM.

In **Chapter 6**, the findings from the study are presented in relation to the research questions.

In **Chapter 7**, the data is related to the theoretical work on curriculum change, assessment and learning to explain the processes that informed the decision-making in this case. Finally I present the significance of the study and outline the implications for policy, practice and research.

CHAPTER 2

LEARNING AND ASSESSMENT IN PROBLEM-BASED LEARNING CONTEXTS: A REVIEW OF THE LITERATURE

2.1 INTRODUCTION

The previous chapter introduced the study and examined the context and factors that are believed to have derailed the educative and formative purposes of the PE and the curriculum reform. This chapter also proffers that despite the learner-centered philosophy advocated by the implementation of PBL and the PE, educators did not seem to have fully understood, supported or applied the educative principles during the *C2001* and the PE implementation. This resulted in a mismatch between the aims and goals of the curriculum and the assessment of learners in *C2001*.

Literature and experience inform us that assessment drives learning through content, purpose or format (Newble & Jaeger 1983; van der Vleuten, 1996, Cohen Schotanus, 1999). To design an assessment plan that respects PBL principles, however, remains a challenge (Nendaz and Tekian, 1999). These principles include first, the validity and reliability of the instrument in assessing the outcome that it purports to assess. The second relates to the degree to which a test would yield the same results even when conducted by different examiners (Broadfoot, 1999; Schuwirth & van der Vleuten, 2006). The third principles relates to students' perceptions of fairness (see also Chapter 6 in this thesis). Van der Vleuten (2004) argues that it is nearly impossible to devise an instrument that is both reliable and valid and that has

minimal negative steering on students' learning. Thus, for the curriculum to appropriately steer learning, attention to how learning is structured, supported and assessed is important.

The previous chapter introduced the historical background that necessitated curriculum reform in medical education and the concerns of professional bodies about the ability of traditional, didactic programmes to prepare lifelong-learning and problem-solving skills in medical graduates (World Health Organisation, 1991; General Medical Council, 1993; World Health Organization, 1993; Walton, 1994; Fraser & Greenhalgh, 2001). For accrediting bodies, the need to reduce the factual burden and unnecessary detail in traditional programmes was central to the reform process (World Health Organisation, 1991; World Federation For Medical Education, 2003).

Medical education in Africa took a similar route that that of medical training in the USA and the UK. After having followed traditional, didactic curricula since the 1920s and coinciding with, and influenced by, global reform, three conferences on African soil [i.e. Abudja, Nigeria (1989); Yaoundé, Cameroon (1993) and Cape Town, South Africa (1995)] greatly steered curriculum reform in Africa. The declaration of the Cape Town gathering in 1995 challenged the restructuring of medical training in Africa by integrating basic and clinical training and adopting principles that focussed the teaching of core competencies. Moreover, the Declaration recommended that reformed curricula reflect socio-constructivist approaches that were patient-oriented, student-centered and community-based. In 1999, the Health Professions

Council of South Africa (HPCSA) also approved and endorsed those recommendations.

By the late 1990s the curriculum reform process had coincided with large scale restructuring of both the National Departments of Education (DoE) and Health (DoH) that were aimed at social restructuring in post-apartheid South Africa (South African Government, 1997; South African Department of Education, 2002; South African Ministry of Health, 2004). The process of social transformation by the Department of Health saw the previous, racially segregated health system change to a district health system. The restructuring, however, caused major uncertainties that resulted in many government employed doctors opting for private practice or emigration. This exodus of medically trained staff left training institutions and district hospitals with severe staff shortages and increased costs to equip new sites for training (Ncayiyana, 1999).

Nationally on the education front, the more profound change was the implementation of the National Qualifications Framework (NQF) (South African Qualifications Authority, 1998) that required HE institutions to re-design and register all educational programmes in an outcome-based-format. The NQF intended to improve the coordination and structuring of education and training from the previous fragmented and inequitable system (Baxen & Soudien, 1999) while the outcomes-based education (OBE) framework intended to shift educational practices towards more learner-centered philosophies by linking specified learning objectives with learner outcomes.

Premised on the notion of a core and extended curriculum, it also encapsulate principles of mastery learning, criterion-referencing and the use of educative assessment practices (Capper & Jamieson, 1993).

Thus, overwhelmed with reform in the education and health sectors and perceiving many similarities between OBE and PBL, most South African medical schools embarked on a process of curriculum reform to include student-centered PBL and problem-oriented learning. In 2001, the NRMSM implemented its new student-centered, PBL curriculum. In the remainder of this chapter, I review literature related to curriculum reform, PBL as a student learning philosophy and the assessment of learning.

First, the chapter reviews how curriculum reform had been managed in medical education. Second, it defines PBL and presents an overview of the pedagogical aims of assessment in PBL curricula. It then proceeds to review literature related to the nature and purposes of educative assessment in student-centered learning programmes. As such, it explores research literature dealing with alternative assessment strategies, including the PE, used in PBL settings. Finally, a description of PBL in medical education is provided. In essence, the chapter examines factors that could explain the difficulty of changing practice among medical lecturers despite professional and pedagogical initiatives to bring about change.

2.2 CHANGE IN MEDICAL EDUCATION

Calls for reform in medical education have been occurring throughout the world and with increasing frequency (Towle, 1998). Achieving large scale, coherent and sustainable reform has been difficult in any country (Cantor *et al.*, 1991). While much has been published on the nature of educational reform and strategies to achieve and understand medical reform (Chin & Benne, 1976; Schlesinger, 1979; Kotter & Levine, 1980; Moore, 1994; Bernstein *et al.*, 1995; Boelen, 1995; Gale & Grant, 1997; Mennin & Krackov, 1998; Regan-Smith, 1998; Sergiovanni, 1998; Trowler, 1998; Bascia & Hargreaves, 2000; Bland *et al.*, 2000; Ho *et al.*, 2001; MacFarlane *et al.*, 2002), authors such as Berg & Ostergren (1979) and Towle (1998) argue that reforms that challenge systems such as those of medical contexts often require political processes and considerable input from a variety of stakeholders.

Early publications of medical reform have mainly documented reform efforts and conditions in developed countries. To illustrate, as far back as in 1901, Osler (1901) already advocated the use of adult learning approaches for medical training in the United States of America. In the same country, Flexner (1910) reported his concerns regarding the quality of medical training resulting from a lack of standardised approaches during training. Under the leadership of W. C. Rappleye in 1932, the Association of American Medical Colleges (AAMC) commissioned yet another investigation into the status of undergraduate medical education (Rappleye, 1932) which together with the General Professional Education of the Physician's (GPEP) investigation of

1984, culminated in the formation of guidelines to reform physician training in the twenty-first century (Muller, 1984). The twenty-four published reports during the previous century in the USA generally kept reiterating similar problems and offered similar recommendations, which had mostly been disregarded (Christakis, 1995). Unsuccessful curriculum reform became so common to medical education that Regan-Smith (1998:505) described the phenomenon as “reform without change”.

Despite individual institutions having started curricular changes and accrediting bodies having mandated initiatives that were to keep medical education at the cutting edge of science and technology, Hoover (2005) reports that many facets of medical training remained unchanged for nearly half a century. Numerous reasons for resistance to reform had been noted. Greenberg (1994) related these to a lack of clear strategies for implementation of the reform. Bloom (1988), on the other hand, accredits the resistance of staff and lack of successful reform to the prevalence of research over teaching at most academic institutions. In the United Kingdom, the General Medical Council (1993) asserts that the persistent lack of successful curriculum reform stems from the diverse knowledge base of medical education, its historical development and the fact that successful implementation depends on the participation of quasi-autonomous departments (Towle, 1998).

The greatest challenge to reform in developing countries arises when trying to adapt the inherited Colonial style of medical education to suit local needs

and constraints (Bandaranayake, 1989). The difficulty of bringing about curricular change, especially in conventional medical schools, is also well documented as well as the futility of ad hoc changes (Greenberg, 1994).

To devise appropriate strategies to overcome resistance, Bloom (1988) recommends that change agents should try to understand stakeholders' resistance with reference to their function and motivation. From a study of four US medical schools, Bussigel and colleagues (1988) concluded that a single aspect is seldom the only factor to influence the success of a reform. They concluded that informal patterns of educational decision-making also greatly impact on success. Bussigel and colleagues (1988) further affirmed the importance for organisational factors to converge in support of an innovation and that attention be paid to the context and strategies used to ensure that planners have and use the power to adjust their plans when necessary (Bussigel *et al.*, 1988).

Barriers and resistance to change have been well researched. In New Mexico, Mennin and Kaufman (1989) identified a list of institutional barriers such as fearing the loss of control, unrealistic expectations for speedy reforms and a lack of faculty policies to support the reform. The Association of American Medical Colleges' 1992 report also identified factors that led to resistance. These include inertia to change, poor leadership, insufficient insight into programmes, resource constraints and the perception that the innovation was unlikely to result in improved practice. In the UK, a 26-school study by the General Medical Council (1993) identified ten barriers and ten

factors in support of curriculum reform. The supporting factors included the political goodwill of the dean, commitment by key individuals, recognition of student concerns, external pressures and participation by motivated lecturers. Cohen and colleagues' (1994) report of reform in six US medical schools identified similar factors to hinder change as those mentioned above. In Towle's (1998) view of reform in the UK, change seldom follows a rational path. An overall strategy devised during planning is often endorsed by authority figures and followed through to implementation. The lack of success of this process, in Towle's view, relates to the complexity of the reform, the lack of human interaction and a disregard of politics and motivation, which can cause major obstacles (Towle 1998).

Changes in organisations are often met with resistance (Kotter & Schlesinger, 1979). The ways in which people respond to change typically include the innovators, early adopters, late adopters and the laggards (Stocking, 1992). Innovators are the "brave" people who initiate and pull the reform. They are also important communicators of their ideas. The early adopters are respected opinion leaders who are open to new ideas while the early majority is the thoughtful, cautious people who are often more accepting of change than the average person. In the final categories are the late adopters who would only use new ideas when the majority had done so and the true skeptics or laggards who always stay behind.

In the context of curriculum change, Dharamsi (1996) found that medical lecturers generally struggle to change their fundamental views of teaching

and learning. With reference to leadership and decision-making, Delbecq & Gill's (1985) work with physicians led them to conclude that medical lecturers generally value leaders who ensure appropriate due process and who institute clearly perceived representative structures. Medical lecturers also value leaders who employ visible and logical processes for decision-making and who insist on and follow clear decision-making rules. Successful strategies to overcome resistance in this setting included education, communication, participation, support, mentoring; manipulation, agreement and implicit coercion (Kotter & Schlesinger, 1979). With PBL being widely implemented as the instructional methodology of choice, the next section introduces PBL and its philosophy.

2.3 PROBLEM BASED LEARNING

As a total approach to education, problem-based learning (PBL) considers both the content and the instructional process of a curriculum (Baig, 2006) and has impacted across subjects and disciplines in higher education (Gijbels *et al.*, 2005). Endorsed as an educational strategy by the WFME (World Federation for Medical Education, 1997) and the WHO (Kantrowitz *et al.*, 1987), PBL has become the pedagogy of choice in a number of medical and other professional training programmes (Sanson-Fisher & Lynagh, 2005). Its popularity has been ascribed to renewed interests to improve the quality of the adult learning experience (Coles, 1998) and to maximise educational learning environments (Dochy *et al.*, 1999; Segers *et al.*, 1999).

PBL has also been referred to as action learning, inquiry-based or experiential learning. In this context, the learning is organised around the investigation and resolution of authentic real-world problems (Torp, 2002). While descriptions of PBL emphasise the central position of the student in learning, PBL, however, lacks a universal definition of what it constitutes (Lueng, 2002). This ultimately led to many curricula being considered PBL despite the use of differing methods and emphasis on different aspects of learning (Davis & Harden, 1999).

Informed by research in educational psychology, PBL is based on the premise that students retain more and learn better when basic science content is embedded in clinical contexts and when students engage in social dialogue and opportunities for elaboration during learning (Kaufman, 2001). It has thus become the approach of choice to train students in skills such as clinical reasoning, problem solving and teamwork. From this, students are supposed to develop appropriate communication skills in an educational environment that sustains their interest in the study of medicine (Des Marchais *et al.*, 1992; Schmidt, 1993).

After three decades of PBL instruction at Maastricht, some signs of erosion have been reported that indicate the presence of a gap between practice and theory (Van der Hurk & Van Berkel, 2002). For example, evidence suggests that students' self-study time has dropped significantly and that they often skip steps during the tutorial process that were meant to help them to transform their learning. There is also evidence that students struggle to transfer knowledge

learnt in the learning situation to practical settings (Van der Hurk & Van Berkel, 2002). In addition, evidence also suggests that groups taught/facilitated by experts are less likely to engage in student-directed discussion (Silver & Wilkerson, 1991). In the same way, groups facilitated by non-experts were at risk of retaining errors and misconceptions if these were uncorrected (Patel *et al.*, 1991).

Other critiques of PBL include reports that dental students experience it as stressful and often too difficult (Barman, Jafaar and Ismail, 2006). These studies have also reported that students report not being interested in topics that they think will not be assessed.

2.3.1 Problem-Based Learning

Learning in PBL is mainly constructivist in nature. Jonassen (1994) characteristically describes constructivist environments as representing the complexity of the real world. This method encourages thoughtful reflection on experience and emphasizes authentic tasks in meaningful contexts rather than abstract instruction in educational context that disregard the relevance of training in appropriate professional practice settings. Constructivist-learning environments additionally support collaboration and knowledge construction through social negotiation (teamwork) rather than merely requiring learners to reproduce facts (Jonassen, 1994). This, Savin-Baden & Major (2004) argue, is reflected operationally when the students make appropriate decisions about what knowledge to pursue as learning goals. In

particular, the social constructivist view proposes learning as an active process in which learners construct new ideas and concepts based upon their current and past understanding. This view also holds that knowledge is shaped and evolves through participation within different communities of practice.

In PBL, the learners rely on their cognitive structures to select and transform information (Major & Palmer, 2001). A cognitive structure or mental model provides meaning and organisation to the learner's experience and allows the individual (while aided by a facilitator/tutor) to attain a level of understanding more advanced than the form in which the information had been provided. In this way PBL, as an instructional methodology, advances students' skills in collecting, evaluating and synthesising resources as they attempt to resolve a multi-faceted problem (Vygotsky *et al.*, 1962; Vygotsky, 1978; Bruner, 1986). As an instructional method, PBL further incorporates principles of active learning, the acquisition of retrievable and usable knowledge and the development of deep learning (Major & Palmer, 2001). In PBL, students work in small teams to explore a problem situation and through this exploration examine the gaps in their own knowledge and skills. This knowledge will further inform their future learning needs while they attempt to resolve or manage the situation with which they have been presented (Major & Palmer, 2001).

As an interactive, student-centred, adult learning approach, PBL thus promotes deep learning (Barrows & Tamblyn, 1980; Barrows, 1996, 2000;

Barrows & Kelson, 2006). It also provides authentic learning experiences to students that foster active learning, support knowledge construction, and naturally integrate learning with real-life whilst also providing an opportunity to integrate disciplines (Boud, 1985, 2000; Boud & Feletti, 1997). These concepts will be discussed in more detail in the **Chapter 4** on theoretical frameworks.

2.3.2 PBL in Medical Education

In medical education, various disciplines, particularly in the basic and clinical sciences, are integrated throughout the curriculum. This integration allows students to learn about normal structure and function while they simultaneously try to solve clinical problems that require them to apply the new knowledge. In this way, learning occurs in relevant context and builds on what students already know. This process, in theory, aids retention (Barrows & Tamblyn, 1980; Norman & Schmidt, 1993; Schmidt, 1993), adds interest (Albanese & Mitchell, 1993; Bligh, 1999) and increases students' motivation to learn (Norman & Schmidt, 1993).

Studies conducted in medical education have suggested that learning and teaching in PBL is more enjoyable for students and lecturers (Norman & Schmidt, 1992; Des Marchais, 1993; Finucane *et al.*, 1995; Vernon, 1995). The learning environment has also been found to be more stimulating and humane (Albanese & Mitchell 1993, Norman & Schmidt, 1993) and students' self-directed learning skills are enhanced and retained in supportive learning

environments (Barrows & Tamblyn, 1980; Norman & Schmidt, 1993; Vernon & Blake, 1993; Finucane *et al.*, 1995; Vernon 1995;).

The use of the case study to direct small groups and self-directed learning (SDL) are the fundamental and most identifiable characteristics of PBL curricula (Blumberg & Michael, 1991). During the PBL learning process, students are engaged as problem-solvers and identify the main problem and the conditions needed for a good solution. They pursue meaning and understanding to maximise their individual learning goals as self-directed learners. In support of the learning, educators function as problem-solving colleagues who model interest and enthusiasm for learning while providing guidance as cognitive coaches. Educators also function as the creators and protectors of the nurturing learning environment that should support open inquiry (Torp, 2002). With reference to PBL, the process starts with a real or paper presentation of a patient problem in a situation that reflects an authentic setting. Students then interrogate the problem in such a way that their reasoning abilities and knowledge application are challenged at a level appropriate to their learning. Secondly, students identify areas of learning that require attention and use these as a guide to direct their individual and group study. They then apply their skills and learning to the problem while they evaluate and reinforce their decisions through collaborative discussion. The learning that result while working on the problem is then finally summarised and integrated into students' existing knowledge and skills (Kaufman, 2003; Shin *et al.*, 1993).

Students mostly work in groups of approximately six, under the guidance of a discipline expert as tutor or a non-expert facilitator. At the NRMSM, a group of 10 students is assigned a facilitator (van Wyk & Madiba, 2006). The groups use the scenarios or cases as the basis from which to integrate theory with professional practice, which challenge students to think critically and analytically (Walton & Matthews, 1989). The 'teacher' in the PBL session facilitates the learning process by monitoring the progress of learners and asking questions to move students forward in the problem-solving process (Barrows & Tamblyn 1980; Health Professions Council of South Africa, 1999). In a typical small group session, students identify the main issues, share prior knowledge and hypothesise about possible causes and solutions. During this collaboration, students formulate individual and group learning goals that they explore and research. The students meet at a second session during the week where they report on their learning goals, share ideas and reach consensus on learning goals identified earlier.

PBL programmes thus focus on both the process and the product of knowledge acquisition; incorporate and advocate a change from the role of teacher to that of facilitator; and encompass a shift from teacher-led to student-driven learning and assessment (Boud, 1985). These developments are aligned with the philosophy of PBL that aims to develop self-direction in learners and promote a culture of active, life-long professional learning (Boud, 1985). There has also been convincing research evidence to suggest that PBL fosters self-directed learning skills (Barrows & Tamblyn 1980;

Norman & Schmidt, 1993) and that it could aid medical graduates to be life-long learners).

2.4.1 ASSESSMENT & LEARNING

Assessment and learning are inextricably linked (Blumberg & Michael, 1991; Shin *et al.*, 1993) as students' perceptions of the assessment requirements influence their approaches to future learning tasks (Donner & Bickley, 1990; Entwistle, 1991; Headrick *et al.*, 1994; Säljö, 1975; Struyven *et al.*, 2005). Effective learners not only have a realistic sense of their strengths and weakness, but knowledge of their own achievements help to direct their future learning in productive directions (Entwistle & Entwistle, 1992). Since assessment remains the single biggest influence on students' approach to learning (Marton & Säljö, 1997; Ramsden, 1997), it thus holds true that students' learning could be enhanced by an improved assessment system.

Students usually employ either a deep or surface approach to learning (Gibbs, 1992; Ramsden, 1997). These strategies are not static but constantly modified depending on the student's understanding of the context and their understanding of the nature and the demand of the learning task (Struyven *et al.*, 2005). Surface approaches describe an intention to complete the learning task with minimal effort or personal engagement (Biggs, 1996). This intention is often associated with routine and unreflective memorisation and procedural problem-solving results requiring a limited conceptual understanding of the learner (Entwistle and Ramsden, 1983; Biggs, 1987; Entwistle, 1991). Aligned with these learning strategies, Entwistle & Ramsden (1983) and

Entwistle & Tait (1990) found that those students who resorted to surface approaches for learning often preferred teaching and assessment procedures that promoted recall and memorisation.

Deep approaches, on the other hand, are used when learners wish to understand and actively comprehend concepts. This approach relates to high quality learning outcomes and a deep level of understanding (Entwistle & Ramsden, 1983; Trigwell & Prosser, 1991). Learners who engage in deep learning have been found to prefer intellectually challenging courses and assessment procedures that allow them to demonstrate their understanding of material (Entwistle *et al.*, 2001). Students also alter their learning strategies depending on their understanding of the context; nature and demands of the learning task (Struyven *et al.*, 2005). In this regard, it was noted that students sometimes use strategic approaches for learning. While this approach usually results from an intention to achieve the highest possible score, it was found that students nevertheless used well-organised, conscientious study methods and effective time management strategies to achieve good results (Trigwell & Prosser, 1991).

What factors do students regard as important for their learning? Irrespective of the approach to learning that they may follow, Entwistle & Tait (1995) found that students require detailed and sufficient feedback for the development of their academic skills. They viewed effective feedback as critical to strengthening their confidence and self-assessment skills and needed clear guidelines and expectations to plan and direct their learning.

They also preferred one-to-one tutorials and the use of logical assessment criteria by educators in order to improve their performance and learning (Drew, 2001).

Thus, if PBL evolved due to the need of graduates to efficiently solve the complex problems of modern society (Entwistle *et al.*, 2001; Gagne *et al.*, 1993), then its assessment cannot be achieved by the mere measuring of factual knowledge and recall (GMC, 1993; HPCSA, 1999). Assessment in PBL should also assist learners to identify their strengths and weaknesses in a safe learning environment that fosters reflective practices (Engel, 1997) that is consistent with learning (Poikela & Poikela, 1997) and most effective when directed towards clearly stated learning outcomes (Segers, 1997). In practice, this would imply that educators should have a clear list of outcomes and criteria for learners to demonstrate mastery in appropriate opportunities in the curriculum. Thus, this thesis is informed by the notion that assessment drives learning and that in order to be effective, PBL curricula will need to encompass appropriate assessment strategies. Assessment tools that contribute to the development and assessment of higher order learning outcomes (Grönlund, 2003) originated from a desire for learners to increase their responsibility and autonomy in learning (Nendaz & Tekian, 1999). Although the value of alternative strategies is recognised, they are relatively underutilised in higher education but slowly gaining ground in medical education (Walubo *et al.*, 2003).

In order to assess more appropriately in PBL, higher order knowledge and skills must be defined and incorporated into the instructional design along

with performance assessment (Savin-Baden & Major, 2004) that specifies short-term and long-term behaviours that are linked to the students' professional practice. Friedman Ben-David (1999) further asserts that the desire to demonstrate what graduates know and can do is common to most outcomes-based programmes. This is why a number of PBL schools have started to use Miller's (1990) pyramid as amended by Shumway and Harden (2003) to measure assessment outcomes. In conjunction with the specific higher order skill to be assessed, the tool suggests possible instruments to assess competencies that students should be able to demonstrate at each level. While clinical and practical assessments are both included in the assessment repertoire, they are conducted independent of the theory examinations at the NRMSM. This thesis is, however, only concerned with the efficacy of the PE for knowledge assessment at the School.

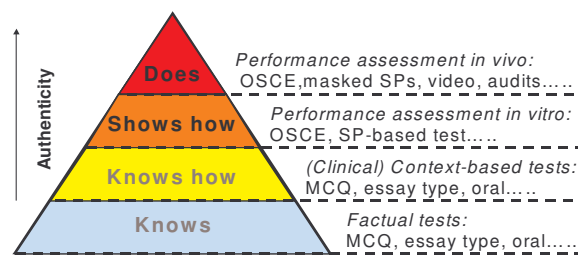


Figure 1: Miller's (1990) Pyramid of learning amended by Shumway and Harden (2003: 578)

With reference to the pyramid in Figure 1, Norman and colleagues (1985) assert that knowledge forms the base of most other outcomes to be achieved in medicine. They thus propose the use of the multiple choice question (MCQ) format as the best tool to a wide knowledge base. This sentiment is

however not always shared. Other authors (Birenbaum & Dochy, 1996; Friedman Ben-David, 1999; Verhoeven *et al.*, 2002) discourage the use of the MCQ format due to its inability to provide sufficient evidence of students' in situ performance.

Literature on teaching and learning reflects assessment as central to the students' learning experience (Brown & Knight, 1994) and therefore probably the single biggest influence on their approaches to learning (Gipps, 1992). In this regard, its influence in directing teaching and learning has long been demonstrated (Friedman Ben-David, 2000) and assessment's role in improving the quality of the students' learning experience has been debated since the 1990s (Delandshere, 2001, 2002).

The global and national trend to use student achievement for quality judgments about lecturers, programmes or institutions has emerged in recent years (Davis, 1998; Luckett & Sutherland, 2000; González Arnal & Burwood, 2003). In the South African context, it is also reflected by the inclusion and linking of criterion-based assessments to explicit learning outcomes on the NQF. This requires institutions to clearly specify assessment purpose statements and criteria to be used for evaluative and auditing purposes for each qualification (South African Qualifications Authority, 1998; South African Ministry of Education, 2002).

Irrespective of whether assessment is used mainly for teaching, learning or quality assurance, it has consistently been identified as the area where

curriculum policies and outcomes are most often misaligned. In the UK, Knight (2002:107) described student assessment as “the Achilles heel of quality”, while the USA based study by Rust & colleagues (2005) noticed the tendency to utilise assessment to improve educational programmes. A similar trend emerged in South Africa where the HEQC’s expressed the view for assessment practices serve as a key indicator to monitor teaching and learning (South African Ministry of Education, 2002). However, if assessment practices are to foster critical thinking and drive student learning in a positive, comprehensive manner then one needs to question the nature and scope of assessment strategies and practices to be used in constructivist, PBL contexts.

2.4.2 Assessment in PBL

The extent to which the PE at the NRMSM fulfils the requirement as a formative assessment tool and the manner in which it complements and facilitates learning in the context of *C2001* (PBL) is investigated in this thesis. Angelo (1995:7) defines assessment as “an ongoing process aimed at understanding and improving student learning”. The process involves setting explicit expectations and criteria and using a systematic method for gathering, analysing and interpreting evidence of students’ performance in relation to defined expectations. The trend to use assessment for quality assurance and evaluative purposes have detracted from its critical role in informing student learning and may be the reason why educators concentrate on summative assessment practices. The differentiation between the terms ‘assessment’ and ‘evaluation’ is, however, needed as both are commonly

used in educational literature. In this study 'assessment' refers to the use of systematic method to gather, analyse and interpret evidence of students' performance in relation to defined expectations while 'evaluation' refers to judgments regarding courses or course delivery. To illustrate, Rowntree (1987:4) defines assessment as an attempt to know another person and the quality of their learning when he defines assessment as,

...occurring whenever one person, in some form of interaction, direct or indirect, with another is conscious of obtaining and interpreting information about the other person.

Assessment practices in PBL should be fair and consistent with how students learn. Therefore, in PBL curricula, regular feedback must accompany informal and formative assessment practices (Macdonald & Savin-Baden, 2004). In the South African context, the HPCSA (1999) endorsed the change from the use of assessment strategies that focus on factual knowledge and recall to approaches that engender problem-solving, professional competence, critical thinking and social values. A valid assessment system should therefore evaluate students' problem-solving competencies in an environment that is congruent with the PBL approach. Assessment in PBL should also account for the organisation of the knowledge base and the students' problem-solving skills (Segers *et al.*, 2003). Literature exists that summarises the principles of good qualitative assessment (Murphy & McPherson, 1989). First, scholars and policy-makers believe that multiple measures should be used to assess higher order application of knowledge, attitudes and skills in the context of patient care (Friedman Ben-David, 2000;

Friedman Ben-David *et al.*, 2001; Savin-Baden, 2004; Schuwirth & van der Vleuten, 2004). Second, it is suggested that assessment be continuous and frequent (Regher, 2004) and that it should provide opportunities for learners to demonstrate mastery and competence while offering regular formative feedback (Grönlund, 2003; MacDonald, 2004). Third, assessment practices should focus less on factual recall and include more strategies for students to demonstrate capabilities in areas of self-reflection and meta-cognition (Savin-Baden, 2004).

Thus, to assess higher order application of knowledge, attitudes and skills in caring for patients, van der Vleuten and colleagues (2004) recommended that multiple measures and authentic assessment tools be used to gather evidence of competence. Activities such as student journals, activity logs, peer evaluations and personal reflections are recommended. Students could also be asked to evaluate case studies, write and defend definitions, or perform and present role-plays or cases to be evaluated by experts (Savin Baden & Major, 2004).

Guidelines require institutions to explicitly state the underlying premises and the institution's educational philosophy for student learning and assessment (Friedman Ben-David, 2002). Policies should also consider the learning environment, the conditions for learning and the ability of the institution to train lecturers as fair assessors (Schuwirth & van der Vleuten, 2004). These views imply an expanded and more educative use of assessment, which emphasises learning opportunities (Broadfoot, 1995).

This shift to use assessment to improve learning highlights the importance of formative assessment in education (Rushton, 2005) and the use of information gathered from formative assessment for improved student learning (Scriven, 1991). Summative assessment often refers to the point when assessment information is used to inform the final judgement on the student's performance (Taras, 2001). Taras remarks that assessment is hardly only used for formative purposes but that diagnostic or summative process often succeeds the formative phase. In contrast, formative assessment occurs when information and results obtained are used to for improve students' learning (Black & William, 1998b). As such, formative assessment methods in PBL should complement the goals of the curriculum (Segers *et al.*, 2003) and improve students' understanding, their skills and general educational development (Orsmond *et al.*, 1997).

PBL institutions do not always adhere to stated guidelines for assessment. In fact, most new PBL medical schools have been struggling with the assessment of student learning (MacDonald & Savin-Baden, 2004). Mennin & Kalshman's (1998) research of eight medical schools in the United States revealed that changes in assessment often lagged behind curricular changes. Their study also revealed that assessment reforms were more easily achieved if implemented during the first two years of curriculum reform.

Elliot's (1999) survey of assessment strategies used in PBL curricula in Canada, the UK and Australia revealed that assessment still predominantly served summative purposes, despite the use of a greater variety of instruments since the early 1990s. National regulations for using more formative assessment practices have generally been disregarded in countries where curricula had been reformed (General Medical Council, 1993; Nendaz & Tekian, 1999). A critical review of the literature in the USA also revealed that assessment practices seldom matched the philosophy of PBL (Nendaz & Tekian, 1999) and that schools lacked consistency, consensus and a uniform approach when applying general principles and recommendations of regulatory bodies. Schools in the study also reported difficulty in making formative practices an official part of the PBL curriculum. This was due to inertia of university policies while others cited a lack of resources as a reason for non-compliance.

Fowell and colleagues (1999) reported similar findings in a UK based-study while Walubo *et al.*, (2003) documented the influence of constraints in financial and personnel resources on the use and adherence to alternative assessment practices in African PBL settings. A study conducted in Canada by Des Marchais & Vu (1996) investigated whether student assessment fulfilled its intended goals. In an attempt to assess the reliability and validity of assessment instruments the authors compared the data from three classes (1991-1993) on three assessment instruments. The assessment formats included the multiple choice questions, short-answer questions (SAQs), and problem-analysis questions (PAQs). The PAQs consisted of PBL tutor rating

forms that assessed students' reasoning, communication and interaction skills and their autonomy, humanism and clinical skills. That study found the PAQs (written examinations) to have greater content validity in relation to the learning objectives of PBL. It further confirmed the necessity to monitor students' multiple skills of learning and applying complex higher-taxonomic-level content while monitoring and evaluating the program outcomes (Friedman Ben-David, 1999).

Despite the increased implementation of PBL, empirical studies have shown that the effect of the innovation on student learning has not always been demonstrated (Gijbels *et al.*, 2005). Some believe that the difficulty to evaluate the effect of PBL stems from its varied implementations (MacDonald & Savin-Baden, 2004) as schools greatly adapt the programmes depending on available resources, costs and number of students.

2.4.3 Authentic Assessment

Available literature suggests that PBL emerged out of a desire to improve the quality of students' learning (Gipps & Stobart, 2003; Ramsden, 2003). For this reason, it is widely believed that PBL curricula should simulate authentic learning (Linn *et al.*, 1991; Haertel & Wiley, 1993) and offer ample opportunities for students to interact socially. As discussed in an earlier section, authentic assessment tasks are those that closely match the desired tasks of practitioners (Broadfoot, 1995). Such assessment would therefore

occur in contexts that both simulate the practice environment and encourage ongoing learning.

This process is believed to aid the reflection and construction of new knowledge and to help students to build on what they already know (De Corte *et al.*, 1990; De Corte, 1996; Dochy *et al.*, 1999). To ensure the alignment between assessment and the instructional goals, Biggs (1999) and Rust *et al.*, (2005) suggest the use of constructivist assessment processes that link learning outcomes and learning approaches with assessment methods. A constructively aligned course can be achieved, but requires educators and students to have identified and to be aware of clear, explicit learning criteria and outcomes (Rust *et al.*, 2005).

Innovative curricula increasingly use competence and performance-based assessments in the clinical and simulated training settings (Regher, 2004). Despite the interchangeable use of terms such as competence, performance and authentic assessment, they denote different intentions by researchers. For example, Rethans and colleagues (2002) distinguish between competence and performance-based assessments by defining the first as a measure of what doctors can do in controlled representations of professional practice while assessed by a clinical teacher. The second is seen as providing evidence of what doctors do in professional practice while being assessed by a simulated or real patient.

Authentic measurements assess what students know and can do by using tasks similar to those encountered in the world outside schools (Eisner, 2002). Its value to medical education rests in the ability to measure not only factual information, but also the application of knowledge in solving clinical problems often encountered in patient care (Schwartz, Burgett, Blue, Donnelly, & Sloan, 1997).

The extent to which stakeholders believe that the PE in the current setting is an adequate measure of students' progress and ability to apply higher order skills is explored in this thesis. As discussed in **Chapter 1**, South-African medical education curriculum reform has, in the last few years, occurred in tandem with wider educational reform towards a more outcomes-based (OBE) system of education. The next section therefore considers the role of assessment in an OBE system.

2.4.4 Outcomes-Based Assessment

In an OBE system, the goals and methods of instruction are geared more towards the attainment of complex curricular objectives, including evidence that learners can manipulate information to solve new problems. For this reason, several guiding principles inform assessment practices in education in general and in medical education in particular. For Ivic (1992), the value of meta-cognition lies in its facilitation of learning when students reflect on the processes and the methods used to achieve learning during self-evaluative

activities. There is also an awareness to encourage students' thinking to advance deep and meaningful learning (Entwistle, 1993).

If assessment is thus to serve the students more effectively, one needs to explore the quality of the learning environment and the extent to which pedagogical principles of PBL are reflected in the assessment system (Segers, 1996). For this, lecturers need to focus their collective attention, examine their assumptions and create a shared academic culture to assure and improve the quality of learning in higher education and PBL settings (Stefani 2004). In addition, strategies that offer more appropriate feedback and learning opportunities for students are necessary (Des Marchais & Vu, 1996). An educational culture where assessment experiences offer valued learning experiences to students is thus required (Gipps and Stobard, 2003). As already described, progress testing is the approach advocated to support deep learning in PBL medical schools. At the NRMSM, the test had been adapted into an examination, known as the progress exam (PE). This thesis attempts to address the question of how efficient the PE is for the assessment of cognitive or deep student learning at the NRMSM. As such it hopes to ascertain the extent to which the PE has been significant in assessing outcomes of the curriculum such as life-long learning, problem-solving and critical thinking. A question that then follows is whether guidelines exist that can inform the choices and practices of medical educators in PBL assessment. The following section will discuss the PE in more detail with particular reference to its appropriateness for assessing higher order cognitive skills.

2.5 THE PROGRESS EXAMINATION

The progress examination (PE) at the NRMSM resembles the progress test (PT) of the University of Maastricht (Netherlands). A PT is an assessment tool that is administered at least three times during an academic year in order to measure students' progress relative to their previous test performance (Stefani, 2004; Verhoeven *et al.*, 2005). The test measures the students' incremental gains in knowledge as they progress through the curricular phases. The results can provide an overview of the students' knowledge in relation to the performance of their cohort. Ideally, the measurement of progress is not limited to incremental gains in knowledge but includes developing skills and competencies that require a clear definition of the end result and learning outcomes (van der Vleuten *et al.*, 1996).

A large data pool of test questions is needed to adequately supply assessment items for the quarterly repeats of the test. Schools are also encouraged to use a blueprint that ensures that tests are similar in form according to phase and learning objectives (Arnold & Willoughby, 1990; Verhoeven *et al.*, 1999; Verhoeven *et al.*, 2002). At schools offering progress testing, a dedicated, centrally organised committee ensures that core knowledge is assessed and that an equitable standard is maintained for each test. The committee also writes and reviews the bank of questions (Arnold & Willoughby, 1990).

Progress testing can be used for summative or formative purposes. Students, however, receive feedback even when the test served summative purposes (Friedman Ben-David *et al.*, 2001). The feedback is offered as individual student profiles that indicate the students' performance relative to that of their classmates (norm-referenced). The profiles can also be generated to compare the students' performance per discipline or relative to the students' previous performance.

According to test constructors, the major advantage of continuously assessing the content of the full curriculum is that it encourages learning and understanding as revising for a test is said to be nearly impossible (Verhoeven *et al.*, 2005). Proponents of progress testing stress its benefits in encouraging life-long and deep learning, its emphasis on functional knowledge and the rich feedback opportunities that it offers to students and faculty to inform teaching and learning (Albano *et al.*, 1996; Friedman Ben-David *et al.*, 2001; Verhoeven *et al.*, 2005).

Most medical schools have opted for the use of the multiple choice question (true/false) formats for its ability to sample widely on students' core knowledge (Friedman Ben-David *et al.*, 2001). The problem with this format, however, is that students are only required to indicate whether statements are true or false. The test thus fails to capture students' reasoning as they consider their answers. To overcome this deficiency some schools prefer to use progress testing in conjunction with other testing formats (Arnold & Willoughby, 1990). Guessing is an additional problem that had been

mentioned in this context. Some researchers advocate that one should try to restrict guessing by using the SAQs format (Friedman Ben-David *et al.*, 2001), others suggest an increase in the penalty assigned to incorrect answers (Verhoeven *et al.*, 1999).

The use of the multiple choice question formats, however, remains controversial. Some researchers argue that factual knowledge represents the basis for other medical competencies such as problem-solving and critical thinking (Mols & Crombag, 1989; Friedman Ben David *et al.*, 2001; Rademakers *et al.*, 2005). They thus consider it impossible to assess problem-solving independent of knowledge and so justify the continued use of the MCQ testing format in PBL.

On the other hand, researchers such as Barrows and Tamblyn (1980), West *et al.* (1985) and Neville and colleagues (1996) share the opinion that PBL cannot and should not be assessed by means of the multiple choice questions. They advocate the use of assessment strategies that are consistent with how student learning occurs in PBL. They argue that the multiple choice question formats rarely assess problem-solving and that data-driven questions might only assess a part of students' problem-solving or critical thinking skills (Glaser, 1984; Norman, 1988). Those opposed to multiple choice question testing believe that it penalises the broader thinking student who may see subtleties in questions that escaped question constructors. They also argue that the format lacks authenticity, as the options for scenarios do not always resemble the organised approach

necessary to resolve a particular patient problem (Neville, 1996). The multiple choice question formats is also widely believed to only measure lower taxonomic levels of knowledge, which would result in inappropriate learning (Perkins & Salomon, 1989). Multiple choice based assessment instruments is said to lack face validity and provide little evidence of students' success in clinical practice (Grönlund, 2003). A valid test requires the selection of an appropriate testing format to assess the competencies aimed for by test designers (Moss, 2001). This is especially evident when looking at the criticism levelled and experience with the PT in the Netherlands. Weaknesses evident in the Netherlands system stem from difficulties encountered in identifying core content (Mols and Crombag, 1989) restrictions imposed by central test development; screening of test items (Mols and Crombag, 1989; van der Vleuten *et al.*, 1996); and the challenges of trying to produce tests of similar difficulty (Wolleswinkel, 1989). For ease of marking and practicability the use of computer marking has restricted the students' responses to the multiple choice question formats (Case *et al.*, 1991; Driessen & van der Vleuten, 2000).

There are a number of important decisions to be taken by schools upon implementing progressive assessment strategies (Verhoeven *et al.*, 2005). These relate to the use of norm- or criterion-referencing, negative or number-right marking and the degree of weighting given to more recently covered outcomes (Muijtjens *et al.*, 1998). The test has been used and adapted in a number of contexts and for varied purposes since its 1980s implementation at the medical schools of the University of McMaster, Canada (Friedman

Ben-David *et al.*, 1987) and the UM, Netherlands (McHarg *et al.*, 2005). It has been used to compare the knowledge levels of international students for benchmarking purposes (McHarg *et al.*, 2005; Verhoeven *et al.*, 2005) and to define a core curriculum by focussing on the minimum competence needed by students for graduation (Blake *et al.*, 1994). Researchers also experimented with progress testing linked to free-text responses (Friedman Ben-David *et al.*, 2001) and short- answer responses (Verwijnen *et al.*, 1982). It is, however, important for the PE to remain true to its nature. In Mcharg and colleagues' (2005) view the progress test to continue to measure students' progress. To achieve this goal, it persistently has to include and assess content covered and passed by students in previous years. This was one of the most contested factors by the students at the NRMSM when modularisation was introduced. This is discussed in more detail in **Chapter 6**.

2.6 SUMMARY AND CONCLUSIONS

The literature reviewed in this chapter provides insight into several factors that facilitate and hinder successful curriculum reform in the medical education. Literature from developing countries indicates that successful reform depends mainly on the extent to which innovations can be adapted to meet local contexts. This adaptation must consider contextual factors such as resources, skill, and organisational culture as such factors play a critical role in the successful integration. Lecturers also need to understand, commit, and strive to incorporate the aims of PBL in their teaching practice.

Another important aspect gleaned from the literature, is the extent to which PBL implementation is informed by constructivist perspectives in teaching and learning. It requires attention to a variety of aspects including the effective use of the learning environment for social interaction and active exchange between lecturers and learners.

Designing appropriate assessment strategies should thus be central in developing a sustainable curriculum reform. Assessment for PBL should be designed and monitored appropriately (Shumway & Harden, 2003) since poorly conceived assessment programmes reinforce learning strategies that are antithetical to of PBL. These authors reiterate that a systems-based and integrated approach to assessment is needed where the reciprocal relationship between assessment and learning should determine the design of the system.

Designing a suitable system is also not a once off process. It would need continual maintenance, upkeep and review to develop a cyclical process of refining policy and practice to establish an effective system (Fowell and colleagues, 2000). Despite available guidelines and recommendations for assessment in PBL, literature seems to indicate that PBL schools struggle to adhere to stated guidelines. It was also difficult to compare PBL institutions because of the varied degrees and styles of PBL implementation.

Studies in developed countries have reported a lack in consistency, consensus and uniformity in how principles and recommendations have been adhered to in PBL settings. In addition, PBL schools struggle to incorporate formative assessment strategies in their programmes. Some ascribe this to inertia resulting from slow change in university policies while others cited a lack of resources as the main reason for the non-compliance with guidelines and recommendations. In their UK-based study, Fowell & Bligh (1999) reported similar findings while a study by Walubo *et al.* (2003) noted that PBL implementation in resource constraint African settings are severely constrained by financial and personnel constraints. Schools in developing countries also seem to find it challenging to adapt advances to local conditions.

Thus, the research questions I asked in this thesis are premised on the broad question: What are stakeholders' understandings of the PE and how have they experienced its implementation and its suitability for assessing students' cognitive abilities in the context of PBL? In particular, the study addressed the following questions:

1. What educational principles influenced the adoption and implementation of the Progress Examination (PE) in the context of PBL at the NRMSM?
2. What are the stakeholders' understandings of the nature, principles and goals of the Progress Examination and its suitability for assessing students' cognitive learning in the context of PBL?

3. What are the experiences of stakeholders of the implementation of the Progress Examination (PE) and the factors that shaped it?

This case study of the NRMSM is, however, the first to report adaptations when the number of examinations (PEs) per academic year had been reduced and when these favoured more recently studied content. At the NRMSM, where the PE was adapted so that students would score 80% of their mark from the content of the semester, it is believed that students' learning behaviour demonstrated surface and strategic learning which is contradictory to the aims of the curriculum. The extent to which students believed that they received sufficient feedback to improve their learning is another area that this thesis wishes to address. In addition, to what extent are medical educators, whose training has largely been outside the field of education, been prepared as assessors in PBL and outcomes-based contexts?

In the next chapter, I present a description and analysis of the setting and the curriculum of this study.

CHAPTER 3

THE RESEARCH SETTING

3.1 INTRODUCTION

This case study intended to investigate stakeholders' perceptions of the implementation and adaptation of the PE in the context of the problem-based curriculum at the NRMSM at the UKZN. This chapter aims to provide a description of the setting, educational programme and social conditions in which the curriculum change process was implemented.

The first part of this chapter presents a brief historical overview of the school and its position in the region to shed light on its educational decisions and practices as they relate to curriculum and assessment decisions. It introduces the complexity of the research setting in terms of the physical structure, staffing and the continued tensions of teaching and service commitments. The second part presents an overview of the governance and formal decision-making structures in relation to the undergraduate medical degree. The final part of the chapter provides the differences between the traditional and PBL curricula and reasons for the study.

3.1 HISTORICAL OVERVIEW

Medical education and training in South Africa started in 1912 at the University of Cape Town (UCT). Subsequent medical faculties were soon established at the universities of the Witwatersrand (Wits), Stellenbosch and the Orange Free State but these institutions were exclusively for White students and the medium of instruction at the three latter institutions

exclusively Afrikaans (Ncayiyana, 1999). Black students gained access to medical training, in token numbers, at the so-called 'open universities' of UCT and Wits but even this limited intake of Black students was opposed by apartheid legislation. In 1951, the exclusively White, University of Natal, in direct defiance of government policy, created a medical school exclusively for the training of Black students (Ncayiyana, 1999). The School enrolled its first cohort of 35 students in 1952, and soon acquired a distinguished academic reputation (Ncayiyana, 1999). The school is located adjacent to King Edward Hospital VIII (KEH VIII) in Durban, which served as main teaching and training facility for nearly five decades. For more than two decades and until the opening of the Medical University of South Africa (Medunsa) in 1976, the School served as the only medical training facility exclusively to train Black students⁸ (Noble, 1999). Medunsa, as a government institution for Blacks, however, bore the stigma of being an Apartheid institution (Ncayiyana, 1999).

The rise of the NRMSM was thus not without difficulty. Noble (1999) explains that the School's defiance of the Apartheid government's philosophy of providing substandard training for Black medical students created difficulties and tension with government, and within the School itself. Its location in a previously demarcated 'White' residential area added to the ongoing attempts of the apartheid government to relocate it to a more appropriate site that matched the separate training and accommodation policies of the time. The School became renowned for its politically sensitised student body that often voiced and demonstrated its discontent with the apartheid regime. It also

⁸ In the South African context "Black" refers to students of African Black, Indian & Coloured origin.

became known for producing the country's first Black medical graduates and academics, under less than optimal conditions and notwithstanding its controversial political history. Many of its graduates proceeded to occupy prominent positions in the post-apartheid government and academic institutions (UKZN Publicity Office, 1999).

The neglected state of the School's training hospital site [The King Edward KEH (VIII)] stemmed from being associated with providing medical care predominantly to the Black population during the apartheid era. The general state of the building and upkeep of the site were often in contradiction with the 'world class' quality of service provided by a well-respected teaching and training site. The hospital's condition was often publicly discussed as it highlighted the gross inequalities that prevailed in state-funded Black health care as compared with that offered to other racial groups or in the private health care sector at the time (UKZN Publicity Office, 1999).

To illustrate, one of the first female graduates can remember how a disused army barracks in Wentworth (an apartheid Coloured township) served as both the residential and lecture venues during the early years of the programme. She recalls numerous attempts of the apartheid government to separate students into racial groups. These attempts were increased after the University of Durban-Westville was established to educate Indian students. She believes that the previous government ignored the maintenance and upkeep of the School site to spite students and staff who

did not adhere to the Apartheid Nationalist philosophy and policies (Personal comm. April 2006).

For nearly five decades, and despite years of political harassment, inequitable state funding and a chronic lack of human resources, space, facilities and equipment, the Medical School established a national and international reputation for academic rigour and an unwavering commitment to the community it served (Noble, 1999). The significance of its reputation has been ascribed to the traditional, didactic methods used since the schools' inception (Naidoo, 1976). Before 2000, medical education at the School, like those offered in the rest of South Africa, followed a traditional system where three years of training in preclinical subjects were followed by three years of clinical education and practice mainly in large teaching hospitals (De Villiers & De Villiers, 1999). Those skeptical of the PBL reform process often cited the School's reputation and tradition of excellence, gained through the traditional programme, as justification for their resistance to curriculum reform. To illustrate, with reference to *C2001* implementation, staff often asked, "Why do we need to fix something that is not broken? I studied here and there is nothing wrong with me or my medical skills" (Dr M, Internal Medicine, Facilitator training session, April 2002).

Thus, influenced by the global trend in medical education reform (World Federation of Medical Education, 1998), the Health Professions Council of South Africa (HPSCA) (1999) has provided guidelines for the teaching and training of undergraduate students. They suggested that the curriculum

should include early clinical exposures and a multidisciplinary approach to health care. Also advocated were the emphasis on professional competence and the cultivation of specific social values such as sensitivity to cultural, racial, language, gender and religious differences in learners (HPCSA, 1999). In the South African setting, the HPCSA also advocated the use of 5-year problem-based learning training, which incorporated principles of student-centered and self-directed learning. Most of the eight medical schools in South Africa have embarked upon curriculum review processes to achieve these goals. While the NRMSM opted for a PBL curriculum and the former University of Transkei implemented a community-based curriculum (Meel, 2003), the Afrikaans medium medical schools implemented mainly cosmetic changes.⁹ The University of Cape Town changed their programme to reflect a primary-care approach (Ncayiyana, 1999) but essentially retained most of the traditional structure. Strategically, however, the Department of Health was under a lot of pressure to produce medics for the rural areas of South Africa. The medical schools of the former universities of the Transkei and Natal (who had the highest intake of Black medical students) were asked to increase their student input by the Provincial Ministry of Health to supply in the demand for medical doctors in these provinces.

3.2. SOCIO-POLITICAL CONTEXT

As described in **Chapter 1**, the planning and the implementation of *C2001* at the NRMSM coincided with a number of post-apartheid initiatives in education and health that posed major challenges for medical education

⁹ Prof Nel, keynote address, HPCSA conference Bloemfontein 2002

(Department of Education, 2002; Government Gazette, 1998; Karim, 2004b; South African Ministry of Health, 2004). In an attempt to produce more Black medical graduates following 1994, the number of students enrolled for medical training increased dramatically from 28% in 1994 to 60.3% in 2001 at the eight medical schools in the country (Karim, 2004a). With the restructuring and transformation in Further and Higher Education being considerably slower than in the general education and training phase, secondary schools were still reeling from decades of inequitable funding and staffing. This presented considerable challenges to tertiary institutions in terms of student selection. These and other inequalities placed considerable responsibility on tertiary institutions to ensure students became self-directed, adult learners (van Niekerk, 1999). These revised entrance criteria, along demographically representative lines, affected learner diversity, ethnicity and academic preparedness of students.

Concomitant with restructuring in higher education has been the adoption of the district health system in an effort to redistribute health care resources from better-resourced hospitals to poorer, often more rural primary health care facilities (South African Ministry of Health, 2004). In Ncayiyana's (1999:714) opinion,

the redistribution has been too quick and too deep, throwing academic hospitals into chaos and resulting in random, drastic and often crippling staff and service cuts.

The resulting excessive service loads and resource shortages have led to losses of personnel, which have negatively influenced academic faculties both in terms of teaching and research (Ncayiyana, 1999; Kent & Gibbs, 2004). At the NRMSM, the decommissioning of KEH (VIII) seriously affected the education and training of medical graduates and the faculty structure. This decision affected the placement of academic staff, which used to be within walking distance of their teaching sites and were now serving in peripheral hospitals in the wider Durban Functional Region (DFR). It also led to increased difficulties in timetabling and increased travel costs for staff and the faculty who then needed to transport students to the peripheral training sites.

During 2002-2004, the national Department of Education spearheaded the merging of Higher Educational institutions in an attempt to promote demographic, cultural and social integration. The merger of the School of Medicine (of the former University of Natal) with the faculty of Health Sciences (of the previous predominantly 'Indian' University of Durban-Westville) resulted in the incorporation of NRMSM into the Faculty of Health Sciences and accommodated other allied health professions. In some instances, some departments and staff (who had previously exclusively trained medical students), had been relocated and shared across campuses.

The merger displaced a great number of staff that formerly taught on the programme while the functions of the Medical Education Development unit became incorporated into SUME. The merger has seen at least some

members of staff now teaching and commuting between at least two of the five multi-campus sites and cross-campus collaboration and reliance on private practitioners for teaching became the norm. The NRMSM's operates from the University of KwaZulu-Natal's Umbilo road campus, but students are trained in many hospitals and clinics in the Ethekeini, greater Durban Functional region (DFR), Pietermaritzburg and some rural hospitals and clinics.

In view of the South African Government policy to "transform higher education as part of the broader process of South Africa's political, social and economic transition, to achieve equity" (Government Gazette, 1998:9), universities adjusted their student intake of Black students and devised policies to improve their success rate. These initiatives led to a larger and more diverse student body, a further lack of facilities for small group teaching in the initial years, the disillusionment of staff and the establishment of a prestigious research facility for medical scientists. A massive exodus of staff to the private sector occurred, which left a large number of academic vacancies at the School.

PBL implementation further proved to be resource-intensive requiring library facilities and small group teaching facilitators and venues. These requirements were not necessary for training in the traditional programme. Faculty facilitators, initially paid during the phasing in of the PBL programme, became disillusioned when the payment ended in 2004. Many faculty-based clinical facilitators argued that it was not feasible for them to commit

themselves to the four-hour sessions for a period of six weeks, especially as many had to travel long distances to get to the School thereby leaving their patients unattended or having to buy additional staff to keep their practices running. Members of staff overseeing the clinical years were also involved with the provision of health care services to hospitals in the greater DFR and as far as the Pietermaritzburg and Greytown areas, a distance of more 100 kilometers away.

Teaching in the clinical years, while mainly based on the apprenticeship model, still meant that students accompanied clinicians on hospital rounds. It became impossible for clinical staff and students to adhere to a PBL timetable since clinicians were also expected to continue with their clinical work while they engaged in bedside teaching. This resulted in only a few clinicians becoming available to act as facilitators, lecturers or assessors during the first four years of the programme. Predictions in the 1999 feasibility report, which proposed that staff would increasingly become available to teach in the PBL curriculum concurrent with the phasing out of the traditional curriculum, did thus not materialise. The lack of visible clinician input led to the perceptions that Medical Scientists were then the main lecturers involved in the training of the medical students. This perception created a lot of unease amongst the students, who pressurised the faculty leadership to ensure greater interaction and contact with clinical lecturers. The Dean was, however, hesitant to mandate increased teaching, as he believed that it would demand a change in the job descriptions of clinicians

who were familiar with teaching in the traditional programme. This issue will be revisited in Chapter 6.

3.3. STUDENTS

Using Apartheid racial categories, the School had admitted mainly African, Coloured and Indian students since its inception. The intake of White students was prevented by threats of subsidy losses in the early apartheid years and small numbers were admitted from 1995, after the country's first democratic elections. The current cohort of students is thus representative of the demographics of the province. The first year student intake more than doubled in the first ten years after the 1994 elections. The NRMSM still follows a quota system for student admission. The student population comprises 69% African, 19% Indian, 9% Coloured and 3% White, respectively.

Student intake was a critical factor since a feasibility study (1999) [**Appendix L (I)**] conducted by the Director of the Medical Education Unit (MEDev) and the Steering Group of the Curriculum Development Task Force (CDTF) recommended the capping of a 100 students per year to allow for the overlap of curricula. This was recommended as the PBL curriculum is one year shorter than the traditional curriculum, which would have resulted in a double final year class in 2005. The capping of the student numbers did, however, not materialise and the School had to cope with limited physical and human resources, and a double load of students. For example, in 1995 the number of first year students was 102 while it rose to 215 in 2005. The final year

class also doubled in size since both the traditional and the PBL curricula culminated at the same time.

3.4. STAFF

The NRMSM of the former University of Natal has merged with the schools of Faculty of Health Sciences of the former University of Durban Westville to form the College of Health Sciences. The NRMSM has about 304 permanent academic staff members and 228 permanent support staff members (June 2005). Members of staff with teaching interests are usually nominated by their colleagues to serve on the Undergraduate Committee (UG). The committee deals with issues relating to the Bachelor of Medicine and Bachelors of Surgery (MBChB) degrees offered to undergraduate students. These include issues of student recruitment, admissions, support, curriculum, teaching and learning, assessment and evaluation. The UG committee generally makes recommendations on these issues to the faculty board.

Not all the members of staff who teach on the MBChB programme are university employed. Up to 70% are employed by the provincial KwaZulu-Natal's Department of Health. Service conditions of these members differ greatly from other university employees. The provincial members of staff play a significant role in the training and supervision of students at the district hospitals. The training of students therefore requires a substantial degree of collaboration between the provincial hospital-based staff and the staff based at the school. Attempts to regulate and formalise a working agreement for

jointly appointed staff negotiated by the Faculty management and leaders in the Provincial department of Health, have not been successful.

The members of staff at the district hospitals have considerable service loads and do not serve on the faculty decision-making committees, which often leave them out of the decision-making loop. Coinciding with the implementation of *C2001*, a decision was taken for all members of staff to be trained and oriented in the principles of PBL. This decision was enforced for all new appointment staff to the school but could not be enforced for those on joint appointment conditions of service. Some voluntarily underwent the facilitator-training course but often did not use the skills to facilitate on the course.

Differences between University and Department of Health employees included the extent to which they could pursue their research interests, attend conferences, remission of fees for further studies and the option of faculty board membership. Prior to 1990, the decision-making powers resided mainly with the Heads of Departments who served on the Faculty Board. After 1990, the Faculty Board was re-constituted to a conflated board, allowing full time members of staff to participate in decision-making. These different conditions excluded many provincial government employees from decision-making at the School.

The HPCSA have strongly recommended that staff at medical schools should, in addition to clinical qualifications, also have educational qualifications (HPCSA, 1999). This was deemed necessary because of the poor pass rate of medical students and the complaints about the quality of teaching at many medical schools. Previously it was accepted that most staff at medical schools could teach, albeit without any teaching qualifications. At the time of data collection for the 2005 HPCSA accreditation audit, only 10 of the 304 full-time university employees had formal educational qualifications (HPCSA Accreditation report, 2005).

3.5 ORGANISATIONAL STRUCTURES

Prior to 2001, the NRMSM was organised into 33 departments, each with its own head. Each department retained autonomy over the content of their curricula, their teaching methods, the number of staff employed and the goals and format of their assessment. Staffing, especially in the clinical departments was the joint responsibility of the provincial KwaZulu-Natal Department of Health and the then University of Natal with most members of staff formally employed by the former for the services that they provided in the academic hospitals. Some staff members were also jointly appointed with a portion of their salary being paid by the university. Many staff members and departments, nevertheless, secured research grants and became internationally renowned for their contribution to academic research (UKZN, publicity office, 1999). The university received considerable accolades for these research profiles and increased the incentives for research (i.e. financial reward and academic promotion).

Functioning in the Medical Education Development unit (MEDev) entailed interacting with volunteers from the other departments of the faculty to construct the themes and assessments and also to provide staff training in support of PBL. During the first four years of *C2001* implementation, I served as an education consultant, staff developer, assessment coordinator and evaluator. From 2004, I was assigned to the evaluation function of SUME into which the Medical Education Development Unit was incorporated. Staff in the 'virtual school' was, apart from the facilitation and staff training, not directly responsible for the teaching and delivery of the MBChB programme. As the programme is now implemented, SUME currently employs about twenty full-time members of staff that coordinates the activities of the 5-year programme.

By 2005, after the merger with UDW, the six main clinical departments of the NRMSM became housed in the College of Health Sciences as schools. A number of previous departments merged into new units to form schools. These included the School of Surgical disciplines; Laboratory Medicine; Clinical Medicine; Family Medicine; Public Health and Undergraduate Medical Education (SUME). A 'virtual' School of Undergraduate Medical Education (SUME) coordinates the activities of students and staff in relation to the undergraduate MBChB programme. This means that academic members of the SUME contribute to the coordination of the undergraduate learning as well as staff development and training, but are not directly responsible for teaching on the MBChB programme. For *C2001* implementation, academics from various departments are jointly required to

participate in decisions on teaching and learning while co-constructing themes in an integrated, system-based interdisciplinary manner. A structure to administer and coordinate the activities of the undergraduate medical programme was planned but only institutionalised in 2003, despite the curriculum implementation of *C2001*. The School of Undergraduate Medical Education (SUME) serves mainly a coordinating function with a focus on educational activities for staff and faculty development, curriculum planning, evaluation and quality assurance.

The Department of Health of the province of KwaZulu-Natal is now responsible for almost 50% of the human resources budget and academics attached to the school spend nearly 80% of their time on service responsibilities in the provincial hospitals (Deans report, 2006 Strategic planning). While the medically qualified members of staff generally earn much higher salaries than other academics, the salaries are still much lower than their medical counterparts in private practice. This has resulted in many medically qualified academics being lured into private practice where conditions of service are much more favourable than in the public hospital setting (Karim A, 2004b). Due to the differing conditions of service of staff either on full-time university employment, joint appointment or totally provincial government employment with an option to consult in private practice, there are huge discrepancies in salaries between the different groups of employees. The significance of this factor in the study is that doctors, as professionals, have enjoyed a great degree of autonomy over their time and activities. Their training prepares them to a great extent to

make individual decisions and they often set up practice where they have sole control over their time and activities. Doctors who choose teaching at a medical school as a career are normally those who enjoy the interaction with students and who want to provide a service to their alma mater. However, such factors as the inequitable remuneration for research and patient care over teaching will make them reflect on their choices and might have led to the increased vacancies in various academic departments. The morale amongst the remaining workforce would then also have decreased as they often work for longer hours to manage the patients in their care, while in addition also sharing the teaching loads of their departments.

3.6 LEADERSHIP AND GOVERNANCE

The implementation of the integrated PBL programme required the establishment of a central structure to facilitate the coordination between various departments that now worked together to produce and present the 'themes'. Prior to the establishment of the School of Undergraduate Medical Education (SUME), the coordination function was assigned to an understaffed (three full-time members of staff) MEDev unit. While the director of the Unit spearheaded the feasibility study and the design of the programme, a university decision to enforce the retirement age at 60 for all members led to his retirement while *C2001* was only in the third year of implementation. He was further informed that his accumulated leave would be forfeited if not taken before retirement. This led to him taking long periods of leave during to *C2001* implementation.

The establishment of SUME did not alleviate the critical staff shortages, as most positions needed for the year coordinators, facilitators and assessors were filled by volunteering faculty and provincial government staff. While it was initially believed that administrative support staff would become available to the SUME, this did not materialise and most departments took on additional teaching loads in other teaching programmes or special research initiatives. The Dean (2001-2004) additionally believed that staff could not be compelled to teach in the PBL programme, as it would alter their job descriptions, implying that they had not been employed to facilitate. This stance further destabilised the implementation process as those who volunteered realised that other staff members were much less involved in the running of the programme and with little consequence. Despite the focus on the coordinating and largely administrative duties during the first five years while student and facilitator manuals, examinations and theme evaluations were prepared and administered by SUME, the NRMSM only made one permanent administrative support appointment in 2001 and another assistant became available from the Medical Science Department (2002). Since 2003, at least eight temporary administrative support staff members rotated through SUME. This made planning difficult, as new staff constantly needed training. In addition, one had to be sure of where documents and files were saved, which led to most academic staff performing most of the administrative duties themselves. The constant flow of the administrative staff was mainly due to the merger. In an effort to ensure greater integration of staff across the campuses of the university, staff declared in excess from other schools and campuses were to be integrated across various campuses so that the staff at

the NRMSM would become more representative of the black population. In 2008, this process remains incomplete. The constant flux of staff caused instability during the running of the programme as most administrative staff, appointed for only three months used the time to seek more permanent employment.

The Dean was appointed mid-way through the planning phase of *C2001*. In August 2001, the faculty appointed a Deputy Dean to lead the curriculum reform. The Deputy Dean left in January 2005 when he accepted employment elsewhere. The Dean showed great enthusiasm for the research initiatives of the faculty and secured funding for an excellent on site research facility. Similarly, he explored options to relocate the undergraduate teaching programme to alternative sites to free up space to house additional research units. In my opinion, this overt bias of the Dean emphasised the “Cinderella status” of teaching in the faculty. With promotion often linked to the size of research grants and research outputs, members of staff came to view teaching as the less respected and rewarded option. His comments often indicated his unease with the new philosophy of PBL and he failed to encourage greater clinician support for *C2001*. He often blamed those who conducted the feasibility study for not foreseeing the difficulties of implementation caused by the restructuring of the higher education sector and the Department of Health.¹⁰ This thesis asserts that his inability to motivate the members of staff to ensure that their creative energies were channeled in a positive direction, could have led to the situation where

¹⁰ Personal communication when the Dean addressed staff at SUME, Aug 2003

skeptical members of staff felt free to criticise the programme. Such behaviour eventually would have demoralised the students and staff who may have otherwise supported the reform.

The fact that the Dean only joined the School after the decision to implement the curriculum change had been taken, might also have contributed to his pessimism. The Deanship of this school is, however, a difficult position. Although a 5-year term has been specified for deanship, very few Deans have managed to serve for the full duration. During the past five decades, the School has had 15 deans with the average term of three years being served. The table below provides a summary of how often this position had changed at the school.

Table 1: Deans' tenures at the NRMSM

Dates	Tenure in years	Dean
1950-1952	2	Dr. A (Acting)
1952-1955	3	Prof. B
1955-1971	7	Prof. C
1974-1975	1	Prof. D
1976-1977	1	Prof. E
1978-1981	3	Prof. F
1982-1983	2	Prof. G
1984-1986	4	Prof. H

1987-1988	1	Prof. I
1989-1990	1	Prof. J
1990-1992	1	Prof. K
1993-1998	5	Prof. L (Acting)
1999-2000	2	Prof. M
2000-2004	4	Prof. N
2004-2006	1	Prof. O
2006-2008	2	Prof. P

The reason why it is necessary to reflect on the leadership is because lecturing staff often compared the current Dean to his predecessors who some believed to be more supportive of reform. With students at the school being very politically aware and expressive, recent deans are reputed for being too “soft and accommodating towards students”. (Dr S, Field notes following student curriculum conference, September 2004).

3.7. THE ACADEMIC PROGRAMME PRIOR TO 2001

The teaching programmes delivered by departments were well entrenched prior to *C2001* implementation. University publications from the 1970s and 1990s shows that very little structural changes had been made to the traditional programme since the inception of the School in the last 20 years. The main differences between these curricula were in terms of additions and the duration of the programme as new information became available and as the clinical knowledge base expanded.

Most members of staff started their teaching careers in the latter years of their medical training while they were registrars and consultants with little or no educational qualifications. They based their teaching methodologies on the ways in which they themselves had been taught. The teaching programme thus evolved slowly over time. According to Prof N (theme head, CDTF & Assessment group member), some members of staff were more interested in teaching than others. Rewards for teaching were not as public and prestigious as those for research. This was in part due to the fact that they did not always publish their educational research as extensively as the Scientists with whom they competed for promotion at the School (Personal communication, 17 September 2002).

Table 2: Curriculum Structure in 1976 (Naidoo, 1976)

<u>Preliminary year</u>	<u>Second Year</u>
English 1	Anatomy
Sociology 1	Physiology
Psychology 1	
History 1	
Botany	
Chemistry	
Physics and Zoology	
<u>First year</u>	<u>Third year</u>
Botany 1	Pathology and
Chemistry 1	Pharmacology
Physics 1	
Zoology 1	

	<u>Fourth, Fifth and Sixth years</u>
	Medicine,
	Obstetrics and Gynaecology,
	Paediatrics,
	Surgery,
	Social Preventative
	Family Medicine

Table 2 illustrates the structure of the Bachelor of Medicine and Bachelor of Surgery (MBChB) course offered during the first twenty-five years of the School's existence while **Table 3** below illustrates the structure of the curriculum offered just prior to the implementation of PBL curriculum.

Table 3: A representation of the structure of the Bachelor of Medicine and Bachelor of Surgery (MBChB) Degree in the traditional didactic curriculum (University of Natal) in the 1990s. (McLean, 1999)

<u>First year</u>	<u>Fourth year</u>
Medical Biology	Community Health 2
Chemistry 1	Chemical Pathology
Community Health 1	Forensic Medicine, Medical Law and Ethics
Introduction to Physiology	Medicine 1
Introduction to Anatomy	Surgery 1
Skills and concepts of Medical Studies	Obstetrics and Gynaecology 1
Emergency Care/Basic Ambulance course	Paediatrics 1
Computer course	Psychiatry 1
Zulu for Beginners	Family Medicine 1

<u>Second Year</u> Human Anatomy Physiology (Histology, Physiology and Biochemistry) Behavioural and Social Science 1	<u>Fifth Year</u> Medicine 2 Surgery 2 Obstetrics and Gynaecology 2 Paediatrics 2 Psychiatry 2 Family Medicine 2
<u>Third Year</u> Medical Microbiology Pharmacology Anatomical Pathology Behavioural and Social sciences 2 Introduction to Clinical Methods	<u>Sixth Year</u> Medicine 3 Surgery 3 Obstetrics and Gynaecology 3 Paediatrics 3 Psychiatry 3 Family Medicine 3

The traditional programme was entrenched in its comprehensive structure and detailed teacher centered approach. Topics were taught in accordance with the disease index of the Medical textbook, which gave students and staff great satisfaction, that the content was duly covered or taught to students. The weakness of the traditional programme was that it did not pay sufficient attention to whether students learnt but that the approach used assumed teaching to be synonymous with learning. The amount of detail and some of the topics covered were sometimes of limited relevance and value to the South African setting as some of the diseases were not common to South Africa or the KwaZulu-Natal region. The information explosion further saw efforts of staff to add more detail to an already overloaded curriculum, which made learning for understanding a near impossibility for students. Memorisation and rote learning thus became the strategy of choice as learners tried to cope with the increasing amount of detail. Traditional

teaching also entailed the teaching of students during clinical ward rounds. The teaching of clinical cases and diseases were also done in an opportunistic rather than systematic way as the lecturers had minimal control over the scope and incidence of diseases that patients would present with at the training hospital.

The integrated PBL curriculum uses a variety of real or paper-based patient problems as the starting point for learning. This ensures that common and relevant diseases are identified and included in clinical lessons. Previously, clinical lecturers enjoyed the closeness of being a feared subject expert that “put students on the spot” (Dr B, interview, May 2003) for their misconceptions. Clinical lecturers were also at peace with the fact that students matured over 2-3 years while exposed to subjects such as Biology, Chemistry, Anatomy and Physiology before being exposed to any clinical content.

A major shortcoming of the traditional system was that students became demotivated during the first three years of training as it showed little immediate relevance to the profession (Frame & Seneque, 1991; Olmesdahl & Manning, 1999). Linked to the technological and information explosion, the medical curricula became rather overcrowded as new content was added. Students, who struggled with learning faced exclusion from the school and many remaining unqualified, even after having accumulated substantial amounts in study expenses. Despite an increased intake of Black students into South African medical courses since 1994, the success rate and

throughput of this group remains relatively low due to the poor secondary schooling system that leaves them ill prepared for tertiary studies (Ncayiyana, 1999).

Furthermore, the changing disease profile of patients necessitated the training of appropriate students willing to serve rural communities (Mohlala, 1999). This means caring students needed training to treat and manage patients suffering from conditions specific to South Africa such as poverty-related diseases, chronic diseases of lifestyle, injuries and violence. There were also many other factors that needed consideration as training became too specialised and research-focused to address issues of primary care (Ncayiyana, 1999). These included a re-emergence of diseases such as cholera and malaria, poor health care infrastructures and antibiotic resistance that now culminates with increased mobility of large numbers of people.

3.8 THE INTRODUCTION OF CURRICULUM 2001 AND THE PROGRESS EXAMINATION

To address the shortcomings of traditional training as described above, an integrated PBL curriculum was implemented in 2001. The curriculum is characterised as student-centered, self-directed and patient-oriented. Horizontal and vertical integration is reflected in merged clinical and pre-clinical content of modules and themes (van Wyk & Madiba, 2006). As illustrated in Table 4, *C2001* differs from the traditional curriculum in the manner in which disciplinary content is integrated within themes of a five-year programme of study.

Apart from covering medical knowledge, the curriculum focuses on equipping students with learning and problem-solving skills to help them respond effectively to future challenges. Additional transferable skills formally included in the training programme included: computer literacy; language skills (English and isiZulu); teamwork; research; Basic Emergency Care; and HIV/AIDS counselling skills.

Table 4: Bachelor of Medicine and Bachelor of Surgery (MBChB) Degree in the PBL curriculum as implemented in the 2001. (Faculty Rulebook, 2001)

Year of Study	Themes	Assessment mode
1st	Diabetes Mellitus, Nutrition, Growth & Development	Progress Exam 1
	Infection & Inflammation, Reproductive Health 1, Trauma & Emergency	Progress Exam 2
	Practical basic science of medicine	OSPE 1
	Basic academic and clinical skills	OSCE 1
	Ambulance Course	Practical
3rd	Body in Motion 2, Hormonal Orchestra, Cell Dysfunction	Progress Exam 5
	Fever, Lifestyles, Reproductive Health 2	Progress Exam 6
	Practical: co-ordination, norms & aberrations	OSCE/OSPE 3
	Medicine, Family Medicine & Dermatology	Clinical Examination, OSCE, Case Reports, Continuous Assessments
	Surgery and Orthopaedics	Clinical Examination, OSCE, Case Reports, Continuous Assessments
	Paediatrics	Clinical Examination, OSCE, Case Reports, Continuous Assessments
	Elective 1 / 2 / 3	Report

4th	Sight & Sound, Abdominal Complaints & Jaundice, Higher Mental Function	Progress Exam 7
	Psychiatry, Dermatology, Haematology, Man, Environment & Health, Practice Management & Therapeutics	Progress Exam 8
	Practical aspects of perception & management	OSCE/OSPE 4
	Surgical Specialties & Anaesthetics	Clinical Examination, OSCE, Case Reports, Continuous Assessments
	Psychiatry & Internal Medicine	Clinical Examination, OSCE, Case Reports, Continuous Assessments
	Obstetrics & Gynaecology, Family Medicine & Paediatrics	Clinical Examination, OSCE, Case Reports, Continuous Assessments
	Elective 1 / 2 / 3	Report
5th	Medicine	Ward assessment (in block), Dermatology clinicals, Objective test, Short cases
	Surgery	Case presentations, Examinations, Differential diagnosis and management, Written OSCE
	Obstetrics & Gynaecology	Case presentations, Examinations, Differential diagnosis and management, Written OSCE/OSPE, Log Book, Continuous Assessment
	Paediatrics	Case presentations, Examinations, Differential diagnosis and management, Written OSCE
	Psychiatry	Long Case, Written case Vignettes, Viva
	Family Medicine	Seminar presentation, Short Answer Management Plan, Simulated Office oral, Viva, Logbook,

Assessment in the 'Traditional curriculum' was decided, implemented and reviewed predominantly at departmental level and each department exercised great autonomy in curricular decisions and those relating to the format, purpose and mode of assessments. Prior to the implementation of *C2001*, the multiple choice question (MCQ) and Objective Structured Clinical Examination (OSCE) formats were the most frequently used formats reported by 12 of the 14 undergraduate departments who completed a survey of the MEDev Unit (**Appendix H**) in 1999. The assessment format selected depended greatly on the nature of the content and the human resources available for assessment.

The implementation of the PBL curriculum necessitated the establishment of a central body to coordinate curriculum design and implementation. An assessment office was also established and faculty members were invited to serve on this committee to ensure that the learning objectives of *C2001* are met. While a resolution from Board required all facilitators on the programme to be trained, the same was not required of assessors and lecturers. They thus may not have had the same understanding of the pedagogical principles that the programme wanted to develop. The manner in which the progress examination had been implemented was also greatly determined by the student intake. With the student intake earmarked for 200, most of the faculty resources (small group meeting venues, computer workstations, space in the library) became stretched. Issues relating to the practicability of students' assessment became important. This became especially problematic when clinicians were tied to ever-increasing hospital commitments as the

Department of Health's social restructuring left those who did not opt for emigration or private practice with difficult choices at poorly resourced primary care training sites (Ncayiyana, 1999).

Members of staff in the provincial government's service were thus not free to attend meetings or to avail themselves for workshops or additional educational courses. This factor caused an over reliance on basic science lecturers who availed themselves in the early years of the programme. These were lecturers who primarily taught in the first three years of the traditional curriculum in disciplines such as Anatomy, Physiology and Pharmacology became more accepting of *C2001*. This might have left clinical lecturers alienated and not immediately exposed and engaged in the paradigm change required in *C2001*. In relation to how they viewed the change, these emotions would have affected their views of the programme and their subsequent interactions with the students.

In an attempt to meet the objectives of the programme and considering the educational principles underlying and influencing student learning in PBL, formative and summative assessment was introduced at the NRMSM. It was envisaged that the assessment in *C2001* needed to support and encourage the different types of learning expected from students in the programme. To achieve this end, it was decided to use assessment tools such as tests, assignments and presentations formatively and examinations in the form of the progress examination, the Objective Structured Practical Examination (OSPE) and the Objective Structured Clinical Examination (OSCE),

summatively. The theory component, however, received a 50% weighting in the calculation of a students' final mark while the other components jointly contribute towards the other 50%. These weightings are not static and the students are expected to demonstrate greater mastery of clinical skills from the 3rd academic year.

Both formative and summative assessments are used in the first three years. The assessment activities of the first three years are administered by academics in the coordinating body (i.e. SUME). The methods included the OSCE, OSPE and case-based written examinations. Assessments in the last two years are scheduled at the end of each clinical block and generally administered by staff of the clinical departments.

The PE was implemented to assess students in line with the outcomes of the newly implemented *C2001*. The format of assessment was developed to support desirable and deep learning among students in PBL by ensuring that they learn for understanding rather than to remember unrelated facts. Theoretically, the aim could be achieved as research indicated that it is impossible for students to study for such a comprehensive assessment such as the PE or PT (Albano, 1996; Friedman-Ben David, 2001). In this way, the format was designed to reinforce the scope and depth of learning by encouraging lifelong learning behaviours and the realisation that one does not ever know everything that there is to know on a given topic.

The original test, as described in **Chapter 1**, samples the complete domain of knowledge that final year medical students are expected to have mastered upon completion of their undergraduate studies. It is administered to all students registered in the course (irrespective of their year of study) at three intervals during the year. The increase in students' knowledge is subsequently mapped over the remaining five year period. The questions are drawn randomly from a large bank of objective multiple choice question (true/false) questions, which cover the major areas of basic, clinical, behavioural science and public health. The individual progress of each student is analysed over the duration of the course and each individual receives written feedback on his or her progress. The main aim of this form of testing is that students should improve their scores (knowledge base) on the test over the duration of curriculum, which would enable both the student and members of staff to monitor the students' progress (McHarg *et al.* 2005). This study aims to understand how staff and students understood and responded to *C2001* and the PE implementation at the NRMSM.

As in the case of the University of Maastricht, the progress examination at the NRMSM is administered simultaneously to all registered medical students irrespective of their academic level of study. Each PE could, however, not be compiled from questions randomly drawn from a large bank of objective multiple choice question as the PE was to be tailored to South African conditions. Members of staff were asked to submit appropriately formatted assessment items relating to major areas of the medical curriculum such as medical and clinical sciences and primary health care and their disciplines (in

the true/false format) to the assessment office. These items were to be refined and categorised and saved for the assessment bank.

As in the case of the University of Maastricht, the progress examination (PE) at the NRMSM was also adopted to measure the increase in knowledge of students in *C2001*. It was believed that the format of the PE would complement the collegial atmosphere in the small group when students volunteer information in the conducive and non-threatening environment (McLean & van Wyk, 2006). At the NRMSM, the PE consists of approximately 50 case scenarios of 200 to 250 multiple choice question statements (true/false format) requiring learners to make decisions on whether statements that relate to the scenario are true or false. While the scenarios might portray real-life medical situations requiring students to select a choice they, however, are not expected to justify or explain their choices.

Initially the pass marks, and students' progress to the following year, were calculated on an average of three progress examinations and the score obtained in the OSCE. Students were encouraged to participate in other formative activities (i.e. self-assessment and tests at the end of each 6-weekly theme) and the facilitators provided descriptive observations of the students' participation in the tutorial process.

Early in the programme, the students reportedly discovered that trying to study for the PE was futile and that they now actively participated in all learning activities. (Student RM, repeating year 1, Focus group, 21 February 2003). However, early analysis of the 2001 results revealed that while some students passed the PE, they scored poorly on content knowledge relating to the themes modules that preceded the exams. In subsequent years, students also verbalised their increased tendency to guess answers on items of the PE. The students eventually perceived the PE as an imposition and argued that it served no purpose as each clinical department used independent assessment strategies to determine their competence in each of the clinical rotations.

The students' stance created a problem for educators at the school. While there had been hopes that the testing format would support and develop deep and self-directed learning it was also perceived that the PE would help lecturers to optimise learning and feedback opportunities. The School, however, uniquely trapped by post-apartheid educational reform initiatives found itself having to implement criterion, rather than norm-referenced assessments. This requirement necessitated the setting of a pass mark of 50% for all modules offered at the UKZN. This excluded the assessment of modular content that had not yet been taught. Furthermore, the use of an instrument that focussed mainly on final year outcomes, irrespective of the academic year of study, was also difficult to explain to the South African educational accrediting body. The imposition led to a series of alterations to the PE from 2002 of which the most significant had been the assignment of

an increased weighting (80%) to content from modules that preceded the PE. A percentage remained allocated to modules not yet formally taught (20%).

The notion to increase the weighting of content directly relating to the module, however, distracted from the philosophy of Progress Testing that essentially requires students to write an equivalent of a final year examination at every sitting of the PE. The priority of the faculty to design and develop its own question bank led to the refusal of academic staff to release copies of the question papers for student feedback. Individual staff members were also reluctant to address the students during feedback sessions and only wanted to answer questions from their own disciplines.

In 2003, the National Department of Education and the university implemented a semesterised and modularised course by repackaging the previous yearlong Bachelor of Medicine and Bachelor of Surgery (MBChB) course. In the new course, the number of PEs was reduced from three per annum to one per semester. Students further interpreted the semesterised course to imply that they would not be assessed on content not directly taught during the semester (i.e. modules preceding the PE). This was contradictory to the basic principles of the PE that required students to be assessed on final, exit outcomes. When, in 2004, the clinical departments indicated their intention to retain the examination formats used in the traditional curriculum (which excluded the PE), students outright refused to take the PE. By 2005, the students argued that they did not gain any new insights from the PE and that it caused them undue pressure to sit for an

additional formative examination. The faculty leaders eventually faced a lot of pressure from the politicised student body on this issue. With the students refusing to take the examination there thus appeared to be a mismatch between the instructional and learning objectives advocated in PBL and the practice of assessment at the School.

In the light of the aims of *C2001*, as well as the research literature, which suggests that the effectiveness of a curriculum is greatly influenced by the content and method of assessment, this study thus sought to examine whether the same educational principles that governed the design of *C2001* also governed decisions relating to the implementation and adaptation to the PE. As such, the study focuses on the efficacy of the PE in the context of the newly implemented PBL curriculum at the NRMSM of the UKZN. In particular, the study sought to examine the ways in which educational principles informed decision-making with respect to the curriculum and its assessment process. It was concerned specifically with the way in which the PE had been implemented, understood, experienced and responded to by stakeholders (staff and students) in the setting.

3.9 CONCLUSION

In this chapter, I provided a description and historical overview of how medical education and training developed in South Africa in general and at the NRMSM in particular. The chapter describes the three distinct phases; prior to the 2001; from implementation of *C2001* until the merger with the College of Health Sciences; and the post-merger phase. The chapter

described the medical programme followed during these periods and the influences of the post apartheid reform on the delivery of the MBChB programme. The chapter also included a description of the site and stakeholders and highlighted issues of leadership and governance in the context of this setting. In the next chapter the methodologies used to conduct the study are discussed.

CHAPTER 4

UNDERSTANDING ASSESSMENT IN PROBLEM-BASED LEARNING:

CONCEPTUAL AND THEORETICAL FRAMEWORKS

4.1 INTRODUCTION

This study essentially questions the alignment between the instructional and educational philosophy of problem-based learning (PBL) and the strategies used to assess the knowledge of undergraduate medical students' learning at the NRMSM. In particular, the study focused on stakeholders' understandings of the progress examination (PE) and its goals, as well as their experiences of its implementation and the suitability of the PE for assessing students' cognitive learning in the context of PBL. In Chapter 2, the literature reviewed enlightened us to the status of assessment in PBL. It also highlighted the mismatch that exists between curriculum content and assessment practices despite the presence of guidelines for alternative assessment strategies. This chapter explores the theoretical and conceptual frameworks that have informed data collection and analysis in the study.

The study is located within a constructivist paradigm, which emphasises the role of social encounters for the development of meaning and understanding in educational settings (Atherton, 2005). In particular, this perspective privileges the principles of adult learning (Knowles, 1975, 1998; Brookfield, 1995) self-directed learning (Colliver, 2002), life-long learning (Mifflin *et al.*, 2000) and deep learning (Biggs, 1994; Rushton, 2005).

The second part of the chapter examines the theoretical frameworks that have informed data collection and analysis for this enquiry. Regarding curriculum change as a complex process that requires careful consideration, planning and continued monitoring for its success, this study draws on Fullan's (1985) educational change framework for its perspectives on educational reform and insights from Gale and Grant (1997) for its applicability to medical contexts. This was used to explain the complexity of achieving meaningful change of the processes that accompanied the 2001 curriculum reform (*C2001*) and the implementation of the PE at the NRMSM.

Thirdly, Cowan and Harding's (1986) model as amended by Stefani (2004), has informed the analysis in this study. This model considers the interplay between teaching, learning and assessment. It also advocates the central and educative role of assessment for student learning.

While the models discussed in this chapter have informed my thesis and the analysis and interpretation of the data, it is, however, essential to frame the educational paradigm within which teaching, learning and assessment is proposed. In order to understand how the mismatch between the aims and goals of *C2001* and the PE could have occurred, the first part of the chapter will offer a description of PBL within the framework of the constructivist epistemology.

4. 2 CONSTRUCTIVISM AND PROBLEM-BASED LEARNING

The broad theoretical perspective that informs this study is that of constructivism. This perspective essentially views all knowledge as constructed, under the assumption that it does not necessarily reflect any external realities but that it is contingent on convention, human perception, and social experience (Beaumie, 2001). Constructivism has received more explicit attention through the influential work of Jerome Bruner (1990) and its assumptions are inherent in the notion of learning through reflection on professional practice. Advocates of constructivist approaches suggest the inclusion and consideration of the knowledge and experiences of learners that would allow them to build and expand their knowledge base by connecting their existing knowledge to new learning (Beaumie, 2001). Supporters of learning in a constructivist approach recognise the limits of short-term memory, the value of providing students with many opportunities to connect prior knowledge to current learning and the need for spaced and guided practice. While cognitive constructivism essentially emphasise how the learner understands things, in terms of developmental stages and learning styles, social constructivism additionally propose the advancement of meaning and understanding through social encounters (Beaumie, 2001).

As such, PBL is rooted in social constructivism (von Glaserfeld, 1989), which views knowledge acquisition not as an entity for passive absorption but a process where thinking individuals actively build on, adds to or amend what they already know. Informed by these principles, students' learning in PBL acknowledges the influence of exploration, experience and active learning

(McBrien & Brandt, 1997). To maximise learning and simulate the professional environment, students are encouraged to think and explain their reasoning rather than memorise and recite facts. In addition, a curriculum informed by a social constructivist paradigm considers themes and concepts that emphasise relations between components rather than merely providing isolated information to learners (McBrien & Brandt, 1997). Such a curriculum firstly considers reality to be constructed through human activity (Beaumie, 2001). It acknowledges that members of a society collaborate to invent the properties of the world (Kukla, 2000). Reality in this paradigm cannot be discovered, nor does it exist prior to social interaction where meaning is made. Furthermore, knowledge is perceived as a human product, which is socially and culturally constructed (Prawat & Floden, 1994). Social constructivism emphasizes the importance of culture and context in understanding events in society and constructing knowledge based on this understanding (McMahon, 1997; Derry, 1999). According to this perspective, learning is viewed as a social process in which an individual creates meaning through his/her interactions with others and with the environment.

A major focus of social constructionism is thus to uncover the ways in which individuals and groups participate in meaning and knowledge creation in their perceived social reality. It involves looking at the ways social phenomena are created, institutionalised, and made into tradition by humans. Socially constructed reality is seen as an ongoing, dynamic process, and is created by people acting on their interpretations and their knowledge (Beaumie, 2001).

PBL, being steeped in a social constructivist paradigm, addresses four major aspects of Bruner's (1966) theory of instruction. The first relates to the creation of experiences and contexts that make the student willing and able to learn. Secondly, the information presented by experts should be structured and simplified to allow reflection on learning gaps, which the learner may want to address. Thirdly, the information should be sequenced for easy grasping by learners. Bruner's final condition relates to the nature and frequency of rewards and incentives offered in the learning process to aid learners on their journey to self-direction. Apart from initiating learning by means of real life PBL-cases, expert lecturers are still required to expand on new concepts to support learning and student development. For this supportive process, they need to draw on aspects of Bruner's theory of instruction. In addition, PBL encompasses principles of adult learning, experiential learning and self-directed learning. These concepts are discussed below to illuminate how they synergise during active learning.

4.2.1 The Theoretical Tenets of PBL and the PE as Pedagogy

Medical educators ascribe the emergence of PBL in medical education to renewed interests for improving the quality of the adult learning experience (Coles, 1998) and to maximise the educational learning environment (Segers *et al.*, 1999). As an approach to education, PBL considers both the curriculum and the instructional process (Baig *et al.*, 2006) and begins with the assumption that learning is an active, integrated and constructive process influenced by social and contextual factors (Barrows, 1986; Gijssels, 1996). While the content and structure of PBL courses may differ, the general goals

and learning objectives tend to be similar (Stanford Centre for teaching and learning, 2001). Thus, PBL can present uncertainty to both lecturers and learners who need to make the transitions from traditional ways of teaching and learning during times of curriculum reform. This thesis argues that these stakeholders need guidance, support and mentoring to successfully bridge this gap.

As mentioned in previous chapters, the term PBL, while also referred to as action learning, inquiry-based learning, experiential and problem-centered learning (Burgess, 1992), is a method of instruction that uses problems to start the learning process in a context where students can acquire both foundation knowledge and problem-solving skills (Banta *et al.*, 2001). These terms, subtle differences aside, all emphasise the central and active position of the learner in the processes of learning and understanding. For lecturers and curriculum constructors this requires a willingness to design activities that facilitate learning. Lecturers who may be unfamiliar with the instructional philosophy will show a commitment to engage and collaborate with knowledgeable peers while trying to understand the new concepts and their expected roles in the teaching and learning process. This willingness of lecturers to question their assumptions and practices would reflect a desire to develop a different understanding of the world and the process would result in a change in the teacher (Marton & Saljo, 1976a, 1976b). The beliefs of lecturers will also differ, depending on their knowledge, motivation and experiences.

There is, however, disagreement over the lack of a universal definition of what PBL constitutes (Lueng, 2002), with many curricula considered to be PBL, yet using different methods and emphasising different aspects of the learning process (Davis, 1998; Kaufman, 2001). Barrows (1986) suggests that PBL curricula are best evaluated in terms of their broad philosophy, which interrogates the type and utilisation of problems for learning; the choices of assessment; the degree of learner autonomy; and the way in which teaching and learning occurs.

The presence of this 'conceptual fog' (Maudsley, 1999) in terms of PBL has impacted on this study in a number of ways. First, a number of lecturers from the NRMSM had visited various PBL schools during the feasibility study period and the extent to which consensus was reached about the use and application PBL principles, such as self-direction, is one of the questions that this study explores. Second, the extent to which planning for assessment occurred and staff development activities prepared lecturers for their new roles is also explored. Available literature suggests that stakeholders in any change process need to fully understand and accept the concepts prior to its implementation and that a systematic plan of action/change is needed to diffuse these concepts through the organisation (Ho, 2000). This study is also informed by the assumption that it is essential for learners, especially from disadvantaged secondary schools, to be guided explicitly through criteria for improvement. Similarly, they need to be supported, developed and receive the necessary feedback from peers and lecturers to develop the capacity of self-assessment and self-direction as required in PBL contexts. In Finucane

and colleagues' (1998) opinion, innovative self-directed curricula such as PBL, provide a suitable academic environment to promote deep, holistic learning. To ensure a successful outcome, the context in which the principles are implemented, is thus important. In the section below, adult learning, a principle on which PBL is based is explored.

4.2.2 Adult Learning

Malcolm Knowles (1975), arguably the founder of adult learning, defines the concept 'androgogy' as the art and science of helping adults to learn. Knowles' theory centres around five assumptions about the adult learner. First, adult learning encompasses the notion that adults are driven to become independent and self-directed learners. Secondly, the theory acknowledges that adults possess prior life experiences on which to draw to aid learning. Thirdly, adults are prepared to engage in new social roles that ultimately increase their motivation to learn. Fourthly, adult learners want to apply new information soon after having learnt it. This practice in a problem-solving situation allows for a strategy to be followed when lecturers consider the instruction environment and the role of the learners. Finally, Knowles (1998) asserts that adults have internal motivational factors that ultimately influence their engagement in pursuing life-long learning activities. In particular, adult learning leads to changes in understanding. It helps them to think about things and the new insights results in transformational and transformative learning.

Transformative learning is associated with 'meaning making' or 'critical thinking', which is also related with constructivism. When embedded in adult education, it requires one to foster a learning environment of trust that facilitates the development of sensitive relationships among learners and lecturers (Taylor, 1998). The medical teacher should serve as a role model who displays a willingness to embrace life-long learning and change (Cranton, 1994). The desire of the Faculty Board to implement curriculum change assumed a readiness of lecturers to embrace reform and to support students in their professional and academic development towards becoming compassionate health care practitioners. The extent to which lecturers at the site embraced this desire for change is explored in this thesis.

In the context of PBL, the literature suggests that adult learning principles encourage learners to become more motivated to tackle problem-solving tasks when they understand the relevance of the tasks. The adults' motivation for learning also increase when they realise the relevance of the information gained and when they draw on prior lived experiences to solve complex life issues (Barrows, 1984; Knowles, 1984, 1998). Similarly, Merriam and Caffarella (1999) have emphasised that supporting students to become competent, independent learners require institutions to acknowledge students' prior lived experiences and the willingness of lecturers to guide them in critical reflection towards transformative learning. Transformational learning for students and staff entails a process where one learns in a meaningful way. It involves questioning one's own assumptions, beliefs and values and considering multiple points of view while seeking to verify one's

reasoning (Mezirow, 1981). The extent to which medical lecturers understand these concepts and meaningfully enable students to become self-directed and life-long learners is an issue that this thesis explores. But how is self-directed learning understood and what does it entail in PBL curricula?

4.2.2 Self-directed learning

Self-direction, as a concept of adult learning theory, refers to the way in which the learning environment allows learners to control their learning tasks (Kaufman, 2003). Self-direction is defined as a long-term outcome of PBL with students' progressively increasing their responsibility for learning, while the guidance from members of faculty is gradually reduced (Mifflin *et al.*, 1999).

Candy (1991) identified traits associated with self-direction as the learners' ability to be methodological, disciplined, logical, analytically collaborative, independent, curious, open, creative, motivated, persistent, confident, competent at learning and yet reflective and self-aware during the learning process. It is, however, argued that learners only develop these qualities when afforded opportunities to do so (Candy, 1991). For the development of these capabilities, they need the flexibility of student-centered curricula where they can practice questioning, critically appraise new information, identify their own knowledge and skill gaps and reflect critically on the personal learning processes and outcomes. They also need guidance from a cadre of informed, supportive medical lecturers who have the students' development and academic interest at heart. The educator's role and

behaviour is thus critical in developing self-direction in learners (Norman, 2004).

By drawing on the developmental perspective, Patel and colleagues (Patel & Dauphinee, 1984; Patel *et al.*, 1990) suggests that people pass through stages when they learn something new. Immature learners often have a 'dualistic' view of knowledge that results in the conceptualising of information as either right or wrong. Learners with such a conceptualisation normally expect an educator or teacher to tell them everything that they should know. For learners to move to the 'relativistic' stage, where they understand how the appropriateness of knowledge depends on the specificity of the situation in which knowledge are to be applied, require the guidance of informed and caring medical lecturers.

An additional issue accommodated by Patel's developmental view is the awareness of the learners' psychological, physical and emotional states and its influence on learners' success in learning. In this regard, Maslow (1970) proposed a hierarchy of needs that should be acknowledged in the design of holistic educational environments such as those aspired to by PBL lecturers. According to Maslow (1970), learners have certain needs, ranging from physiological to cognitive, that need to be fulfilled in order for effective learning to occur. Considering this hierarchy, it is therefore important that students' physical, psychological, social and emotional needs are considered and accommodated in the planning of enabling learning environments. Coles (1998) asserts that learners will have an enhanced chance at successfully

directing their own learning in a conducive and supportive learning environment when their holistic developmental needs are accommodated. Conversely, an environment that encourages competition or where learners are humiliated would seriously impair the quality of the learners' experience. Perry (1970, cited in Coles 1998), however, asserts that much of medical education and training reinforces the dualistic view of knowledge and that medical lecturers often find it extremely painful to mediate the shift from dualism and relativism to commitment. The extent to which medical lecturers, who may be lacking in formal educational training, are able to support students in becoming self-directed will also be explored. The experiences of the learners during the reform process will also provide insight to their perceptions of the PE and their resistance to the reform. In the section below, the principles of experiential learning as related to PBL is discussed.

4.2.3 Experiential learning

Kolb's (1984) experiential learning model informs adult learning theory by suggesting that learning occurs best when based on and acknowledging the learners' own experiences. It encompasses a process where learners construct new knowledge by comparing new information with what they already know (Barrows and Tamblyn, 1980). Effective learning allows learners to enhance their understanding and maximise their learning in new situations and requires that they reflect on their learning experiences (Kolb, 1984).

This notion of learning recognises the importance of the student's role in controlling and directing their own learning processes while necessitating the formation of a partnership between the learner and educator. Characteristically, self-directed learners would accept and share the responsibility for the planning and operation of their learning experiences with their lecturers and they would be keen to evaluate their own progress towards the attainment of stated and negotiated goals (Knowles, 1998). The implementation of the PE in the PBL context assumed that students would be encouraged towards taking greater responsibility in becoming self-directed learners. Lecturers would need to assume an increased role in providing guidance and support to help students to reflect on their strengths and weaknesses towards modifications in learning behaviour that characterises deep learners. This study will explore the extent to which lecturers and learners shared an understanding of the term self-direction. The expectations and experiences of stakeholders will also help me to understand the extent to which common meaning had been established and shared in the setting.

4.2.4 Deep learning

Deep and surface learning are approaches used by adult learners for studying. The terms originated from the research of Marton and Säljö (1976a; 1976b) and have been elaborated on by other researchers such as Entwistle (1981), Ramsden (1981; 1997); Ramsden *et al.* (1995), Biggs (1987) and Stobart (2008). Deep learning is characteristic of students driven by intrinsic motivation to engage in deeper understanding and meaning making. It results when learners are able to integrate information from different sources to

organise content into a coherent whole. Deep learners are able to relate their previous knowledge to new knowledge and can draw on theory to explain everyday experiences. Atherton (2005) asserts that learners may have a preference for either deep or surface learning, but that they are often able to draw on either approach depending on the nature of the learning task and their motivation for learning.

Learning in PBL is characteristically structured around authentic patient problems that encourage students to understand the concepts and the relationship between them. Considering the profound influence of assessment on students' learning, it is therefore essential that courses claiming to develop deep learning (such as *C2001*) adopt assessment procedures that allow students to demonstrate their deep understanding (Entwistle & Tait, 1995). Moreover, such courses must provide learners with sufficient support and feedback to learn from their mistakes. Feedback is an essential part of the interactive components of teaching and learning. Students view effective feedback as critical to develop confidence and skills for self-direction and self-assessment (Drew, 2001; Rushton, 2005). When assessment is used enhance learning, then feedback should provide students with information of both their current level of achievement as well as the direction that they need for improvement (Hattie & Jaeger, 1998).

It is additionally important that lecturers become aware of the interrelationship between assessment, curriculum and learning as the move to encourage formative assessment necessitates changes in both the

curriculum and pedagogy (Rushton, 2005). In this study, it is argued that changes in the pedagogy and curriculum also necessitated a reform of the assessment practices to align the assessment and the learning in *C2001*. It is also assumed that lecturers were aware of these interrelations and the expected changes in their roles at the start of the reform process. This study is thus premised on the belief that students' value of the PE would have been enhanced if they perceived the feedback on their learning as informative and supportive of their development towards becoming competent practitioners. The extent to which the PE was viewed as a tool to support deep learning is thus central to this investigation.

4.3 TEACHING, LEARNING AND ASSESSMENT

It is generally accepted that a teacher's approach to teaching reflects his/her conceptions of teaching and learning (Trigwell, 1995; Kember 1997; Prosser & Trigwell, 1997; Lueddeke, 2003; Prebble *et al.*, 2004). Teacher's conceptions range from reproductive, with teaching perceived as knowledge transmission, to transformative. Lecturers with transformative conceptions of teaching should foster conceptual change in learners. While it had been assumed that years of teaching experience led to lecturers having more transformative practices, evidence suggest that experience alone is not sufficient for lecturers to change their conceptions (Norton *et al.*, 2005). It is therefore imperative that institutions invest in and support their teaching faculty to improve their views of teaching and learning, their teaching practice and ultimately their interactions with learners.

Cowan & Harding's (1986) model, modified by Stefani (2004), has informed the analysis in this study for its consideration of the interplay between teaching, learning and assessment. This model advocates the central role of assessment for student learning. From this model, it can be argued that lecturers wishing to bring about lasting educational change and improved learning in their students will consider the impact of their instructional practices on the students' psychological and emotional development and learning. Since lecturers do not engage in this kind of professional decision-making without help, it is argued that they need to be guided through the process to become skilled in reflective practices (Schön, 1987, 1991).

Lecturers wishing to bring about lasting educational change and improved learning will consider the impact of their instructional practice on learners. In the case of the curriculum change to PBL at the NRMSM, lecturers whose practices reflect constructivist approaches to learning would be concerned with the quality of relationships that they have with learners (Torrance & Pryor, 1998). They would strive to understand the effect of the instructional process on the learner and will try activities that make learning easier (facilitate or scaffold). Not only will creative and caring lecturers forge collaborations with their colleagues to advance learning at the institution, but they will also adopt assessment strategies that support learning. Such strategies, which encompass dynamic, interactive and evolving processes, will allow student development. Lecturers wishing to facilitate learning would thus incorporate more formative assessment strategies and be morally compelled to aid learners to develop the ability for self-evaluation. Self-

evaluation, as mentioned previously, is an essential prerequisite of self-direction (Miflin *et al.*, 2000).

By remaining aware that lecturers' views of knowledge directly influence their beliefs and behaviours in the teaching and learning environment (Trigwell & Prosser, 1998) we can begin to understand that lecturers' conceptions will affect their interactions with students as well as their daily educational practice (Brunning *et al.*, 2004). Lecturers in a PBL curriculum should therefore ensure that information taught is relevant and assessed in relation to the learning context and they should make links between content and contexts explicit to learners. Lecturers thus have an increased responsibility to ensure that the instructional philosophy is reflected and aligned to their daily educational practices.

Lecturers intend to achieve congruence between their philosophies of teaching and learning will further ensure the creation of a conducive learning environment that support students' in developing deep learning strategies to improve their understanding of the subject matter. In the process of becoming a professional, students will acquire, under the lecturers' supervision, the necessary skills to sort and select relevant information and learn how to consider conclusions in relation to presented facts. In essence, lecturers should stimulate students to employ learning styles that develop meaning-making and application while undirected and reproduction-directed ways of learning should be discouraged (Vermunt & Verloop, 1999).

In recognising the complexity of teaching and learning, lecturers will consider the effect of their decisions and the whole curriculum on the learning of students (Ewell, 1997). Such holistic educational experiences, which PBL aspires to, are those that consider the students' cognitive and emotional preparedness as well as the learning environment (Stefani, 2004).

Where there is congruence between teaching and learning, the learning environment will allow students to develop skills in self-regulation and lecturers' efforts will be directed to support and scaffold students' holistic development. This process will essentially focus on greater student development rather than the mere acquisition and increase of knowledge. It will also include modelling professional behaviour that encourages learners to apply skills needed in their chosen profession (Kaufman, 2003).

Committed lecturers will also know that learner motivation plays a critical role in their academic success and development (Biggs, 1996). They will thus be keen to build confidence and motivate learners to face future learning challenges. Motivated and confident learners will have higher learning expectations and develop a keen interest in monitoring their own abilities and progress. For successful learning, feedback from an experienced mentor and concerned teacher would once again be crucial to enable learners to correct misconceptions in knowledge and understanding and to adjust their learning accordingly (Simpson, 2006).

Lecturers, as the central role players in assessing effective learning, will use appropriate assessment strategies and instruments that challenge learners to

use and apply the skills they developed during their training. Lecturers would thus be challenged to ascertain, by means of authentic assessment tasks, that students understand contextual factors for problem analysis and problem-solving (Baxter, 1994; Birenbaum & Dochy, 1996; Shavelson *et al.*, 1996). From this they would then provide students with opportunities to argue their ideas on the basis of various relevant perspectives in appropriate problem-analysis assessment tasks (Segers, 1996; 1997; Segers & Dochy, 2001).

The development appropriate assessment strategies, while being a time consuming process, remains essential for effective curriculum reform (Delanshere, 2001). For this reason, Fowell and colleagues (1999) advise lecturers to follow a four-stage cyclical approach (**Figure 3**) for the design and development of an effective assessment plan. At each stage, lecturers are required to answer questions to clarify the purpose and choices in respect to their chosen assessment strategy. The questions will assist them and their institutions to achieve a degree of congruency between educational philosophy and assessment practice.

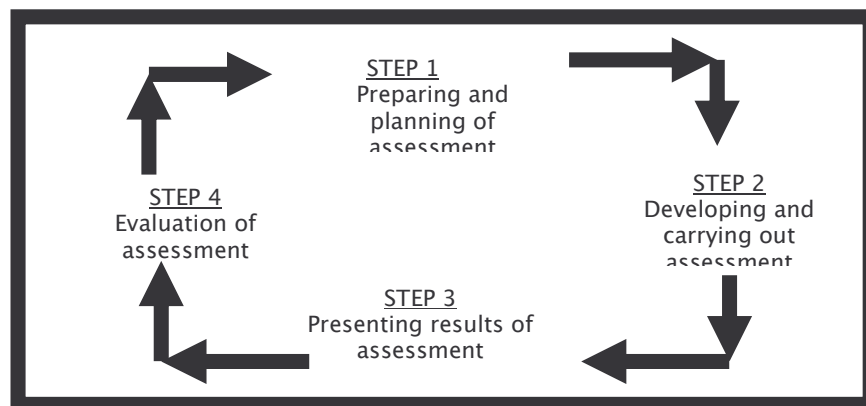


Figure 3. Diagram of the Assessment Cycle. (Fowell, Southgate and Bligh, 1999, p 276)

For example, at the first stage questions relate to the content that should be assessed. The questions also ask one to interrogate the reasons for the choice of assessment format and the most appropriate evidence that one need to acquire to proof the students' competence. At the second stage competencies and outcomes are highlighted and issues of weighting to components in an overall assessment system are addressed. These questions will inform the blue printing stage and could help members of staff to formulate a clear assessment policy.

At the third stage lecturers may wish to establish for whom the information gathered during the assessment encounter would be most valuable and how to use the information to improve instruction and/or learning. In the final stage the authors stress the importance of evaluating the assessment strategy or system. They recommend that lecturers check that the assessment system is congruent with the learners' total learning experience (Fowell *et al.*, 1999) and expectations. Would include and evaluation of the practices and policies and decisions on factors in the settings that may influence the effectiveness of the assessment strategy. Reflection at this stage may also inform staff development activities or lead to adjustment of the strategy and so initiate the new cycle of review. This framework is useful in the current study as it informs the analysis of the PE as an assessment tool and the decisions taken during the adoption of *C2001* to suit conditions at the NRMSM.

The manner in which the change to *C2001* was managed also needs consideration and is addressed in the section that follows.

4.4 A FRAMEWORK FOR CHANGE

This study is premised on the notion that curriculum change is a complex process that needs careful consideration, planning and continued monitoring for successful implementation. In order to understand and explain the complexity of achieving meaningful change during *C2001* implementation, I have drawn on the educational change framework of Fullan (1985, 1998) and its application to the medical education context (Gale and Grant, 1997). This theory provides an ordered, conceptual framework for the analyses and understanding of the tenuous relationship between policy and practice to make sense of stakeholders' perspectives of the change to PBL and the implementation of the PE as a new assessment strategy in the context of PBL.

In Fullan's (1999b) deep change theory, he proposes that it is possible to examine the quality of a reform by examining the relationship between its theory of education and its theory of (action) change. The theory of education refers primarily to the content, pedagogical assumptions, associated components and the moral purpose that is viewed as essential to the reform (Fullan, 1998, 1999b, 2003). The theory of action (change), on the other hand, involves the strategies to guide and support successful implementation of the educational innovation. Fullan (2003:53) argues that, "[you] cannot go deeply unless you create powerful new synergies between these two theories". Thus, to achieve meaningful and deep change, change agents need to pay attention to the theory of education and the theory of change (or action).

Theory of Change	<div> <div>Weak</div> <div>↑</div> <div>↓</div> <div>Strong</div> </div>	Theory of Education	
		Weak	Strong
		<div>↔</div>	
		<div>Superficial change</div> <div>2</div>	<div>Drift/Temporary</div> <div>3</div>
		<div>Change for sake of change</div> <div>4</div>	<div>Deep Change</div> <div>1</div>

Figure 2. Theories of education and theories of change (Fullan, 2003:53)

As illustrated in figure 2 above, Fullan’s framework recognises four main types of change scenarios. In two extreme scenarios, change can either present as deep and meaningful when the reform is characterised by both a strong theory of education and a strong theory of change (ideal). Alternatively, in the worst-case scenario, a reform will be *superficial* when both these theories (education and change) are weak. The quality of the reform can also be described as *temporary* or *showing drift* when the innovation has a strong theory of education but is accompanied by a weak strategy of action. There are also situations where change is embarked upon without due consideration of the educational theory. Such a reform will typically show characteristics of the innovation being implemented merely for the sake of change. This thesis posits that *C2001* review was based on a strong theory of education, but a weak plan of action to drive its implementation. The study aimed to investigate this issue.

To achieve deep change, the majority of the stakeholders should own the problem (reform) and be prepared and committed to work together to find suitable solutions (Fullan, 2003). Sustaining deep change needs the creative energies and ownership of the teaching force and its leaders to draw on when negotiating participation. This variety of stakeholders will include - amongst others - the leaders, change agents, the lecturers and the learners. These stakeholders should work collaboratively to demystify the problem by deliberating on reasons, implementation strategies and eventually share and agree to detailed plans regarding implementation and monitoring of the change (Gale & Grant, 1997; Fullan, 1999b).

A conducive, educational culture that supports deep change needs an environment where collaboration is supported and nurtured between top-down and bottom-up strategies (Fullan, 2003). Achieving deep change will strengthen the professional learning community (Fullan, 1993) where collaboration is sought and where new ideas are integrated with existing and effective strategies that are already working in the institution. Within such a community of practice, group members are free to share concerns and passions for the topic and show a sense of commitment towards continued personal and professional development. Such development should further their understanding and expertise and advance the success of the innovation (Wenger *et al.*, 2002; Fullan, 2003). In such an educational culture, lecturers would be guided by a moral purpose to pursue improvements that will better the lives of their students even when tasks appear complex and challenging (Fullan, 1993, 1999b, 2001, 2003). Achieving a moral purpose means

developing mutual empathy and relationships across diverse groups, which is a difficult but necessary task (Fullan, 1999b). It is, however, also the force that will see lecturers seeking appropriate knowledge and strategies to assist students in improving their learning, constructing new meanings, solving complex problems and working more easily in diverse teams. Lecturers themselves would adopt a proactive learning stance to face such a complex and changing world (Fullan, 1999b). This, Fullan (1999b) argues, is a necessary requirement to achieve greater and more dynamic coherence amongst lecturers.

In a deep, conducive educational culture, the quality of the relationships amongst the lecturers generally improves as they learn to collaborate across disciplinary boundaries. This collaboration both inside and outside the school requires profound assertive planning (Fullan, 1999b, 2003). This collaboration should infuse the willingness to invest effort, sacrifice and loyalty to the profession (Fullan, 2003). Having forged quality relationships under deep change conditions should lead to circumstances where collaborators should refuse to accept weak solutions but where they openly seek and debate sustainable resolutions.

Deep change is not without risks. Lecturers need institutional and collegial support to help them during phases of uncertainty. For lecturers, deep change involves acquiring new skills, capacity, behaviour, commitment, motivation, beliefs and understandings in relation to the reformed policy. This strategy for change should first and foremost cater for the pedagogical and

experiential gaps in lecturers' learning and understanding. It should also lead to capacity-building programmes for the development of appropriate strategies for staff and the organisation.

As learning does not take place in isolation, social constructivists argue that it is crucial to understand the social environment in which learning is to occur. With reference to lecturers, rather than learners, the nature of the social interaction with knowledgeable members of the society is also important (Knowles, 1975). Therefore, as the environment and social relationships among members of the organisation change, so the tasks of each individual will change too (Bredo, 1994; Gredler, 1997). A lack of social interaction with more knowledgeable others makes it impossible to acquire social meaning of important concepts and lecturers (as learners) will be ineffective in using new concepts and strategies appropriately. This thus relates to the current study that explores the quality of the interactions between students and lecturers in *C2001*.

As a result of deep change, lecturers' beliefs and conceptions of teaching and learning should change and manifest in new attitudes when they begin to see themselves as active agents of change instead of the victims complying with policy reforms (Fullan, 1993). Deep change thus requires a fundamental shift in the minds of stakeholders of their perceptions towards change (Fullan, 1999b). It should involve a process where they question and alter their underlying assumptions, goals, philosophies, skills, conceptions and

behaviour of teaching and learning (Fullan & Stiegelbauer, 1991). Consequently, this reflection should result in an altered educational culture of teaching and learning. After having agreed on the reasons for the change, lecturers will share a moral obligation to support students in their academic and professional development. They should consider the impact of pedagogical and professional decisions and behaviour as it relates to the students. They should engage and draw on their creative energies and ideas to support the reform (Fullan, 1999b). Commitment to deep change would also facilitate medical lecturers to embrace new roles and pursue challenges as and when they arise (Fullan, 1993). It is also important to remember that people cannot be forced, coerced or mandated to change or to develop new skills. This makes it even more imperative that they are supported as this will ensure personal and shared vision and skills development through practice over time (Fullan, 2003). For the NRMSM, the support would relate to the nature and type of organisation as well as the policy and strategies negotiated to support lecturers during change difficulties.

In this study, the deep change theory was used to explain the quality of change with reference to the curricular innovation at the NRMSM. It thus addressed the question that investigated the relevance and intention of the PE as a useful measure of student learning by illuminating the extent to which the tool fulfils the aim for which it had been planned and by exploring the conditions and theory of action prevalent during the implementation of the reform in the school.

In this section, I further advance the argument that schools considering curriculum reform should be viewed as "living systems" (Fullan, 1999b:12), requiring active change agents who are sensitive to individuals in the context and are able to develop relationships both within and outside of the institution. The success of living systems is that they consist of intricate, embedded internal and external interactions, which convert tacit knowledge to explicit meaning-making knowledge and exposes knowledge for sharing (Fullan, 1999b). Such a living system should also be engaged in developing a strong theory of education and a strong theory of change (Fullan 1999b, 2003) to guide the implementation of the innovation. Attention to the theory of action is needed if policymakers wish to understand the circumstances that support or hinder change and secondly the reasons why recommendations for change are embraced or ignored. It is especially necessary to remember the naive assumption of policy-makers that the adoption of new educational goals automatically alters lecturers' beliefs and behaviours. They also think that a change in policy results in uniform, meaningful and sustained modifications in practices. It is, however, well-known that the "road from theory to practice is often rocky" (Segers & Dochy, 2001:327) and therefore needs forums where staff can collaborate). Fora, such as the committees instituted to plan and support the *C2001* reform, could facilitate the sharing of ideas between leaders and lecturers to negotiate suitable solutions when faced with pressures during the reform.

In the absence of strong theories of education and action, change can also be temporary or unsustainable (Fullan, 2001). This type of change results when stakeholders experience a strong desire for change and where the

educational theory is only feebly supported. A characteristic of temporary change is that it is not sustained beyond the implementation phase due to challenging conditions and factors. Unsustainable change might also arise from the inability of the rationale to permeate fast enough through the organisation, causing only partial buy-in and support by stakeholders.

Change can also be described as superficial. This type of change occurs when a weak theory of change and a weak theory of education are attempted and where modifications are restricted to the surface features only such as mission statements and policy documents. This situation arises when a selected grouping of individuals drive the change and are the only ones fully informed of the phases and supportive of the need and educational philosophy of the innovation. Other stakeholders' lack of understanding of the need for, or adherence to, the underlying principles and rationale ensure that the response to the innovation may not be as enthusiastic or supportive (Fullan, 1991, 2001; McRel, 2000). The desired effect of the change may thus not be achieved and the status quo normally remains irrespective of the attempted innovation.

Change for the sake of change often results from environmental pressures, i.e. 'right thing to do at the time'. While this type of change could be labelled as mechanical, it is associated with a process whereby lecturers go through the routines of implementing the innovation without either understanding or committing to the deeper value orientations and belief systems of the reform. This reform follows an incremental process (Quinn, 1996) - small,

evolutionary steps being taken rather than huge transformative changes, which is often contradictory to what policy-makers envisage when they propose and plan for change.

Fullan & Miles (1992) suggest that reform often fails because of the poor fit between the innovation and the organisation in which the change is to be implemented (Fullan & Miles, 1992; Wallace & Pocklington, 2002). Fullan (1992) identifies a number of contextual factors, one being the role of the leader and lecturers, as some of the crucial contextual factors that influence the fit between the innovation and the organisation. The author also argues that most attempts at collective change in education seem to fail, leading to wasted time and effort, and diminished staff morale and overall disillusion in the learning community. Fullan (1992) asserts that a history of failure or success in terms of innovations attempted by the organisation is likely to have an impact on future attempts at implementing a new change. This, he explains, is due to the meanings that individuals carry from one experience to the next. Thus, stakeholders who had negative experiences with previous implementation attempts will tend to be more apathetic about the next change regardless of the merits of the new idea (Fullan, 1992). This theory may have some bearing on the current study where the schools' systems and sub-systems towards developing the capacity for change might have been affected by individuals' beliefs and experiences of previous attempts at reform such as the initiatives of the ERG (Faculty board, July 1993) and the recommendations of the Bhagdat commissions (1978).

According to Fullan (1992), the role played by the organisational leader is another significant factor of the context of change. Similarly research on innovation and school effectiveness suggests that the leader has a strong influence on the likelihood of successful change. For example, Berman & McLaughlin (1977) found that innovations with the support of the organisational leader are more likely to perform well. In such innovations, the actions of the leader serve to legitimate the change, support lecturers psychologically and facilitate the necessary resources. This is understandable given that the leader is the individual most likely to promote the development of shared goals, foster teamwork and implements monitoring mechanisms.

Emphasising the importance of leadership in the context of change, Jantzi & Leithwood (1996) argue that the global shift towards a redistribution of power and responsibility in educational institutions has led to the emergence of a new image of the ideal educational organisation. This image leaves the organisation presumably less in need of control and more in need of support and capacity development. The authors (1996) also argue that such organisational needs are more likely to be served by practices associated with effective leadership and proactive empowerment rather than with administration alone. This study asserts that the *C2001* implementation subcommittees had not been empowered to fully enforce the decisions that they were to make. Thus, the reform without the support of the leaders would have subdued the enthusiasm of staff towards the innovation.

Fullan (1992) views the role of the teacher as another important local factor in the context of change. Heystek & Lethoko (2001) further agree that lecturers' motivation to perform professionally is important if a culture of teaching and learning is to be enhanced. Depending on their previous experience, personality, and stage of career, some lecturers become self-actualised and are more likely to take action for implementing change than others (Fullan, 1992). Change entails learning something new, and interaction is the primary route for social learning. The need for collegiality, open communication, learning on the job, group success, trust and support cannot be over-emphasised. Working together has the potential of raising morale and enthusiasm, opening doors to experimentation and increasing self-worth (Cohen Schotanus, 1999).

To enable the school to become an institution of learning (rather than only a teaching institution) and one where capacity is developed requires a reallocation of resources and efforts. Medical lecturers' (faculty members) acceptance of the educational policy and their participation and commitment to educational reform is likely to be influenced by how well they were informed of the reasons and relevance of the suggested change, as well as, being given a mandate (overt or covert) by faculty leadership to accept and participate in the change process. In addition, their understanding and acceptance of the nature and purpose of the assessment would have determined their participation and experiences thereof. Thus to achieve success in implementing change requires that schools become 'learning-enriched' institutions (Rosenholtz, 1989).

4.5 CONCLUSION

In trying to understand the efficacy of the PE in the context of the curriculum change, and informed by the theoretical frameworks reviewed in this chapter, a number of key propositions about the process of change, the principles underlying PBL and the PE and the experiences of the stakeholders were developed. These tentative propositions (Bassey, 1999) were linked to the research questions that informed the study and might explain the difficulties experienced during *C2001* implementation. Data collected in the study was used to test these propositions.

First, the study investigated the nature of the alignment of the professional decisions and pedagogical principles that informed the curriculum and assessment decisions at the NRMSM. Based on the theory that positions assessment as central to learning (Cowan and Harding, 1986) and therefore also central to curriculum reform, the first proposition holds that change agents and curriculum drivers at the NRMSM based their decision for curriculum change on sound professional and pedagogical principles. These pedagogical principles would have been informed by their belief that assessment should enhance student development and that educators should support practices that aim to achieve this curricular goal.

The second research question interrogated the extent to, and manner in which, professional and pedagogical principles informed the implementation of the PE at NRMSM. As such, the second proposition suggested that despite evidence of a strong theory of education, the *C2001* and PE

implementation process lacked a theory of action (Fullan, 1998). It is proposed that a situation of curriculum 'drift' (Fullan, 1993) (which refers to a situation where the final reform did not meet the ideals of the proposed reform) might have resulted during the implementation of the PE at the NRMSM. It is thought that insufficient attention might have been paid to the organisational culture during the planning and implementation of *C2001* and the PE. This assertion is based on the notion that medical educators' (faculty members) acceptance of the educational policy and their participation and commitment to educational reform is likely to be influenced by how well they were informed of the reasons and relevance of the suggested change. Similarly, being given a mandate (overt or covert) by the faculty leadership to accept and participate in the change process significantly influences their reaction to the initiative. In addition, their understanding and acceptance of the nature and purpose of the assessment would have determined their participation and experiences.

The third research question investigated the perceptions of the stakeholders (staff and students) regarding the PE in the context of *C2001*. This thesis posits that the experiences of the educators and students would have been influenced by the nature and quality of support they received in the context of the curriculum change. This means that opportunities and forums would have been created for staff and students to become familiar with the new roles and expectancies associated with educational philosophy of the PBL curriculum and with that of the PE. These activities would have helped stakeholders to develop a common understanding of the principles of the reform. It would

possibly also have led to an acceptance of the responsibilities and the changes required in the repertoires of educators. Furthermore, the success of the policy implementation at the School depended on the quality and extent of the training and support that they receive in preparation for the policy implementation.

The propositions outlined above were tentative and were to be tested with the evidence from the study as well as by further evidence beyond the scope of the present investigation. In the next chapter, I report on the research design and methodology used to address the research questions.

CHAPTER 5

RESEARCH DESIGN AND METHODOLOGY

5.1 INTRODUCTION

This study investigated stakeholders' experiences of the implementation of the progress examination (PE) and its efficacy in assessing higher order cognitive skills as intended in the problem-based learning (PBL) Curriculum 2001 (*C2001*) at the Nelson Rolihlahla Mandela School of Medicine (NRMSM). The study examined the curriculum decision-making that coincided with the implementation and adaptation of the PE as an assessment tool in the context of the problem-based curriculum. In the previous chapter a number of key propositions were presented in an effort to understand the efficacy of the PE in the context of the curriculum change at the School.

Informed by the theoretical frameworks reviewed in **Chapter 4**, the propositions are linked to the research questions that informed the study. The research questions asked:

1. What educational principles influenced the adoption and implementation of the Progress Examination (PE) in the context of PBL at the NRMSM?
2. What are the stakeholders' understandings of the nature, principles and goals of the Progress Examination and its suitability for assessing students' cognitive learning in the context of PBL?

3. What are the experiences of stakeholders of the implementation of the Progress Examination (PE) and what factors shaped the implementation?

The literature suggests several contexts and approaches that could guide a research enterprise such as this. Our beliefs of knowledge and our nature of reality are, however, deeply interwoven and reflected in our representation of reality and the questions that we ask. Thus, considering the influence of our beliefs on the choice of research design, Yin (2003:10) advises researchers to interrogate their personal and philosophical orientations when trying to make sense of the world so as to establish a harmonious relationship between the purposes of the research, the paradigm of inquiry and the choices of research methods. Informed by the above, as well as the propositions, this chapter describes the research design and methodology I used to address the research questions in the study.

As this study was conducted in my own School, it was necessary to follow a systematic and self-conscious strategy of research design, data collection, interpretation and communication (Mays & Pope, 2000) to ensure both rigour and trustworthiness. A conscious effort was made to include sufficient data to allow others to judge whether the understanding and interpretations are adequately supported and justified. Thus, details of the setting (**Chapter 3**) are provided to allow others to compare the extent to which factors in this setting are similar to theirs. Therefore, conscious of the ways in which my views, assumptions and experience might have shaped the collected data, I

have included the propositions to be tested by the evidence. The rest of this chapter gives an account of the research design and the methodology used to conduct the study.

5.2 RESEARCH DESIGN

A foundational principle in undertaking this study was the notion of social construction of knowledge (Beaumie, 2001), which accommodates the belief that stakeholders' conceptions will inform their perceptions and eventually also their experiences of the PE and its ability to assess students' knowledge in *C2001*. Thus, governed by the desire to investigate how the multiple choice question (true/false) response format of the PE informed students' experience, I utilised a qualitative, case study design for research. Initially I embarked on the research believing that my observations could be confined to the students' experiences only, but early analysis and interactions with participants revealed that staff held different perceptions to those of students. Thus, the belief that all these views needed to be captured, described and interpreted for a holistic understanding of the implementation of *C2001* and the PE, led to the adaptation and expansion of the methodology to include the views of the different stakeholders (staff and students) in the setting.

This study, cast in a qualitative-interpretative frame, adheres to Bascia and Hargreaves' (2000) advice that the best way to investigate subjective experiences and thinking of participants is by means of an in-depth, contextually based, interpretative research design. Thus, the use of a

qualitative research design was an attempt to understand the participants' behaviour and experience in relation to their context.

As indicated in **Chapter 2**, qualitative inquiry into formative assessment practices in PBL is either limited or not well published (Fowell *et al.*, 1999; Nendaz & Tekian, 1999). In particular, research into the prevalence and use of formative assessment, which has been deemed essential for good practice in PBL, has also not been conducted nor reported (Fowell *et al.*, 1999). In addition, the majority of the studies in the field of student assessment have been conducted in the positivist and post-positivist traditions (Harris, 2002).

This predominance most probably relates to the disciplinary backgrounds of researchers in medical education, and the cultural embeddedness of medical education in biomedicine, with its almost exclusive value of the positivistic research tradition (Harris, 2002). The problem with this view lies in its belief of a single, unequivocal social reality or truth that is entirely independent of the researcher and of the research process, neglecting multiple perspectives of the world as created and constructed in the research process (Denzin, 1994). In the light of the above, this study adheres to a philosophy that wishes to represent a reality at a particular point of the School's existence rather than to attain an absolute truth (Mays & Pope, 2000).

Despite the cautionary note about qualitative research in medical education (e.g., by researchers whose work are well grounded in the psychometric tradition) (Colliver, 1999, 2002), there has been more vociferous calls to

expand the repertoire of qualitative methods in the field of medical education (Malterud, 2001; Harris, 2002; Savin-Baden & Major, 2004). This study wishes to address this shortcoming. My choice of research design was informed by the belief that the phenomenon under study (the social aspects of teaching, learning and assessment) would benefit if understood and explained from an interpretative paradigm, rather than a positivistic or scientific approach. While Harris (2002) believes that one method should not be viewed as superior, researchers should consider the circumstances when one approach might be more appropriate than another. Thus, located in an interpretative paradigm, this study recognises the role of communication and sharing of ideas in the meaning-making process. The qualitative case study methodology with its purposive sampling allows for the sharing of local experiences and the interrogation of theory and practice (Jacobsen *et al.*, 1997; Nierenberg, 1998 cited in MacFarlane *et al.*, 2002).

The prolonged nature of the study and my participative role as the researcher further offered a thorough understanding of the reform, the PE and the participants in their natural setting (Henning *et al.*, 2004). Such observation provided a direct account of the phenomena and the circumstances (Patton, 2001) and the flexible use of a variety of methods and strategies for data collection (Cohen *et al.*, 1997; Denzin & Lincoln, 2000), which could be gathered as rich descriptions. It further facilitated the triangulation of data sources to ensure rigor, legitimacy and trustworthiness of the study (Bassey, 1999).

5.2.1. Access and Ethical Approval

Access to the research setting was obtained by virtue of my status as an education consultant within the school, a position to which I was appointed in July 2000. In this position, I joined the Curriculum Steering Committee six months prior to the implementation of *C2001*. During the discussions of the Curriculum Steering Committee, and informed by my training in education, I became interested in the philosophy of the PE and applied to the Director of the Medical Education Development (MEDev) unit, the Deputy Dean and the Bioethics Committee of the School for permission to monitor its implementation. The Undergraduate Committee, the Director of MEDev and the Deputy Dean endorsed the study. During the first three years of *C2001* implementation, I served as an education consultant, assessment coordinator and evaluator.

I was granted access to the research setting and introduced to the stakeholders (students and staff) as education consultant and coordinator of the assessment procedures in 2001. I initially received approval for the study from the director of MEDev and the Deputy Dean. After the merger of the University of Natal with the former University of Durban-Westville I applied again for ethical approval from the merged University of KwaZulu-Natal. Approval was subsequently granted in August 2006 (**Appendix A**).

The question of ethics in qualitative case study research revolves around the integrity of the researcher as he/she functions as the primary instrument for data collection and analysis. While this has advantages, there are also

disadvantages. An unethical researcher, for example, might select from amongst the available data “virtually anything that s/he wishes to illustrate”, (Guba and Lincoln cited in Merriam, 1998:42). A major concern regarding this study stemmed from my status as an employee at the NRMSM, and conducting research in ‘my own backyard’, and as occupying the dual role of researcher and Assessment Coordinator during the first three years of *C2001* reform. Cognisant of the potentially influence of my role on data collection and to minimise research bias, I triangulated my perceptions against those held by key participants in the setting. As Assessment Coordinator (2001-2003) and later evaluator (2003-2005) of the implementation of the PBL curriculum, I could interact with students, staff and administrators *in situ*, which contributed to a relationship of trust with participants.

My interactions with staff stemmed from my appointment to the poorly human-resourced Medical Education Development (MEDev) unit in 2000. The unit had been formed in 2000 with only three full-time staff assigned to coordinate the implementation of *C2001*. Compared with other teaching and learning centres in medical faculties of South Africa, averaging between 5-8 members of staff,¹¹ this was an extremely modest size for the task at hand. It was envisaged that teaching and administrative staff would be integrated into the central body to coordinate the PBL curriculum as the traditional curriculum was being phased out. This, however, did not occur as departments were reluctant to release their administrators and many

¹¹ Personal communication, directors/academic staff of medical schools of the universities of Cape Town, former Transkei and the Free State, December 2002

academics became more involved in research endeavours that required assistance. Another limitation in the functioning of the department was the regulation that accompanied the university merger necessitating staff to retire at the age of 60. The director of the MEDev unit, assigned to oversee *C2001* implementation, was to retire in 2002. He was also told that accumulated leave would be forfeited and was advised to take his due leave.

Functioning in the MEDev unit entailed interacting with volunteers from the other departments of the faculty to construct the themes and plan assessment and also to provide staff training to support PBL. From 2004, I was assigned to the evaluation unit of the virtual School of Undergraduate Medical education (SUME) into which the MEDev unit was incorporated. Staff in the 'virtual school' was, apart from the facilitation and staff training, not directly responsible for the teaching and delivery of the MBChB programme. The current situation is however different. SUME currently employs about twenty full-time members of staff that coordinate the activities of the 5-year programme. The research setting was described in **Chapter 3**.

5.2.2. Case Study Methodology

As stated above, this study utilised a qualitative case study methodology. This facilitated the application of an inductive research strategy, which facilitates the building of concepts and theories (Bailey, 1991). Yin (1994:23) defines a case study as:

an empirical inquiry that investigates a contemporary phenomenon within a real-life context, when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used to increase validity and reveal diverse perspectives.

As such, I had very practical considerations in the selection of the unit of analysis for this study. As a new employee at the NRMSM and informed by my training in the field of education, I became interested in the reasons for the seeming failure of the implementation of PE in the PBL context. My position in the school made it convenient to undertake the study. Thus the units of analysis were those students who experienced the PE as the first cohort in 2001 and academic staff members of the curriculum and assessment decision-making committees (i.e. the Faculty board, Undergraduate committee (UG), Curriculum Development Task Force (CDTF) of the UG and the Assessment group of the CDTF).

Many writers have highlighted the benefits of the case study methodology for qualitative inquiry (Merriam, 1998; Edwards & Talbot, 1994; Mark, 1996). In this study, it provided a strategy for research that intended to understand

complex social phenomena in a specific educational setting. The methodology did not influence the behaviours of participants or the order of events and thereby ensured the investigation retained the holistic and meaningful characteristics of real-life events (Yin, 1984). This helped me, as researcher, to gain an in-depth understanding of the situation and the meaning for those involved (Bailey, 1991; Merriam, 1998).

The case study methodology also facilitated the development of educational theory that served to illuminate educational policy while it enhances educational practice (Bassey, 1999). This means that educational theories are often cited to justify curriculum decisions while these justifications are reflected in policy directives, this, does not guarantee practical application by educators in the setting. In this investigation the case study methodology was chosen to illuminate hidden dimensions of the setting that could explain this phenomenon. The use of the case study design further articulated well with the intention and purpose of the study, which was not to prove or disprove the effect of the progress examination in the setting, but to understand the alignment of purposes that the examination was to serve with reference to *C2001* while examining the process of reform. A final appealing feature of the methodology was its recognition of complexity and 'embeddedness' of social truths (Henning *et al.*, 2004). The triangulated method of data collection and analysis that I used enabled an exploration of the research problem and questions from a variety of perspectives.

Despite the value and insight offered by case study methodology, as stated above, its use in medical education remains limited (Lueng, 2002). It is thus anticipated that this study will contribute to addressing this deficiency in medical educational research, in particular. Furthermore, since the majority of studies in assessment in general, and the PE in particular, have been conducted from a psychometric, quantitative perspective – and with relative homogenous student populations – medical educators may benefit from qualitative insights into a setting such as the NRMSM where the student samples represent a variety of cultures and secondary schooling experiences.

There are, however, several limitations of using the case study design. One perceived limitation relates to the microscopic nature of the case and the subsequent application of the findings to other situations. From the other perspective, the case study investigates process rather than outcomes, context rather than specific variables, to enhance the understanding of a context (Simon 1980, cited in Bassey, 1999). There is thus no intention to generalise the findings to other settings or individuals in medical education. Case studies are generalisable to theoretical propositions (Yin, 1984). Their unique strength to deal with a variety of evidence (e.g. from documents, artefacts, interviews, questionnaires and observations) thus made the case study the most appropriate methodology for this investigation.

5.3 PARTICIPANT SELECTION

Based on the purpose of the research and the desire to create meaning from various perspectives, purposive rather than random sampling of participants was used. The sample, which included the first student cohort in *C2001* (n=197) and key informants from the academic staff (members of the various curriculum, assessment and Undergraduate Committees) (n=15) were selected for their ability to provide the most relevant views in terms of the research problem (Borg & Gall, 1989).

Initially, the selected data sample included only the student cohort but observations in the setting and early analysis revealed that staff might have had different expectations and experiences that would provide a more holistic interpretation. In addition, the sample from which perceptions were sought was extended to include staff (academic and administrative) who constructed assessment items for the PEs and who served on various curriculum decision-making bodies in the School.

The research question that interrogates the underlying pedagogical principles that informed curriculum and assessment reform at the School, assumed that educators had an understanding and conceptualisation of the outcomes and philosophy of PBL and believed that successful PBL implementation would be beneficial to the students. The design of the study recognised that making-meaning and reaching understandings are not instantaneous revelations but subject to change over time as educators engage in discussions around curriculum reform (Yin, 1984). The study was premised

on the assumption that opting for PBL at the NRMSM and having engaged in workshops facilitated by PBL experts, as well as an extensive curriculum debate processes would have enabled some understanding of PBL and the need for a different assessment process at the school. Thus, using purposive sampling, the staff selected had been exposed to the PBL workshops and later played a leading role in designing learning encounters in the theme-related activities in *C2001*.

5.3.1 Staff Sampling

The staff sample consisted of 11 academics (six males and five females). Three were Medical Scientists who specialised in subjects such as Physiology and who are not medically qualified while seven were clinicians (medical doctors assigned to hospitals). Two were administrators at the School with no teaching duties. Of this sample, five served on four or more of the main committees that dealt with the planning and implementation of *C2001* and its assessment. These included the Assessment Group; the Steering Group of the Curriculum Development Task force (CDTF), Undergraduate Committee and Faculty Board.

At the time of data collection, four members of staff sampled had formal educational qualifications such as higher degrees or diplomas in education or medical education in addition to their primary scientific or medical qualification. This is important, as it is a proposition in this thesis that medical lecturers needed educational workshops and sustained exposure to

education to bring about a conceptual shift in how they regard their roles in the training of students.

While the initial sample only included the Assessment and CDTF staff (n=8), this sample was later extended to gather data from theme heads from the first year (n=3). As the curriculum was phased in, this group of participants was further extended to include theme heads (n=2) from second and third year themes (n=2). These individuals were tasked with driving and coordinating a six-week long theme of learning (e.g. Nutrition). They ensured that the case of the week included interdisciplinary input and identified other members of staff to collaborate with for teaching and assessment of various aspects of the theme. It was, however, not possible to get the views of theme heads of the 4th year as the PBL format of the fourth year was changed after being offered only once (2004) to the 2001 student cohort. This was in response to requests from students and clinical staff to increase students' clinical exposure in the 4th academic year. In addition, the majority of theme heads in year four were not faculty-based and they spent most of their time at one of the training hospitals in the greater Durban functional region.

Table 5: Staff sample

Period of Reform	Gender	Administrator	Clinician	Medical Scientists	Associated with the UG curriculum or assessment committee & Theme Head	Total
2001	Male		4	2	All	6
	Female		2	3	Three of 5	5
2002	Male	2				2
	Female					
2003	Male		1		Both Theme heads	1

	Female			1		1
	Male		2		Both Theme heads	2
2004	Female					
	Male	No themes planned in this year				
2005	Female					
Total						17

This purposive sample of academics (n=15) and two administrators (**Table 5**) were thus selected for their regular interaction with decisions involving assessment (the PE) and curriculum issues. They were approached for their perspectives regarding the purposes, educational principles and process followed during *C2001* and PE planning and implementation. The views of two administrators who served as chairperson of the Undergraduate Committee and faculty representative at Senate were sought for the managerial view of the curriculum implementation and assessment review processes. Each of these key participants was interviewed for approximately 45min by use of a semi-structured interview (**Appendix C**). Several informal discussions also occurred during the period of data collection to explore, verify and confirm initial responses.

5.3.2 The Student Sample

Student participants included the first cohort in *C2001*, who had received extensive briefing on *C2001* philosophy during their orientation and at several points in their first year. They sat for the PE at three intervals during their first year and received some feedback on their progress. This cohort consisted of 194 students. Their experiences were followed over a five-year period, from their first year in 2001, until they graduated in 2005. This cohort was the most convenient and approachable data source for their experience with the PE.

The group had been divided into 20 smaller groups, each with its own representative with whom I met twice, every six weeks. These meetings called in my capacity as year coordinator and held at the Medical educational unit helped to gather students' perceptions regarding the quality of their learning and experiences in *C2001*. The focus groups provided rich input into their experiences.

Of the 194 students who participated in the project, 57 (29%) were 'mature students'. This means that they had completed a year or more of a tertiary qualification in Science or a related Health Science field before entering medical education. One hundred and five (105) students (54%) entered the medical school directly after completing Grade 12 (Matric). Thirty-two (32) students (17%) of the cohort were repeating year 1 after having failed in the traditional curriculum. While some students preferred to repeat the year in the traditional curriculum, others opted to enter the PBL curriculum and could be viewed as 'mature students' because they had completed a year in the programme. If these students were combined with the 'mature students', the percentage of mature students would increase to 46%.

5.4 DATA COLLECTION

Data collection commenced in 2001 and ended when the student cohort graduated in December 2005. The collection process occurred iteratively and 'serendipitously' (Patton, 2001) throughout the period of engagement with key informants, which enabled the collection of perceptions and experiences over a prolonged period. The prolonged period of interactions added to the

trustworthiness of the data. This study applied theory, data and methodology triangulation. Theory triangulation refers to the adoption of multiple perspectives to interpret a set of data and data triangulation refers to the use of a variety of data sources. Methodology triangulation refers to the use of multiple data collection methods.

To illustrate, as reported in **Chapter 4**, the theoretical framework for the study draws on different theories to collect and interpret data. These constructivist theories essentially emphasises the role of social encounters in the development of meaning and understandings in educational settings (Atherton, 2005). In particular, this perspective includes the principles of adult, deep and self-directed learning (Brookfield, 1995; Knowles, 1984; Miflin *et al.*, 2000; Stefani, 2004; Biggs, 1994; Rushton, 2005), and the nature and context of complex educational change (Fullan; 1985; Gale and Grant, 1997).

Data collection methods in the study included a combination of participant observations, documents analysis, semi-structured interviews, focus group discussions, and the administration of two questionnaires (**Appendices DI-DII**) to the cohort of students over the five-year period. In seeking to explain the efficacy of the PE and the impact of its implementation on students' learning behaviour, a qualitative case study approach was utilised. Specifically, three research questions were addressed. To answer the question, *what educational principles influenced the adoption and implementation of the progress examination in the context of PBL at the*

NRMSM? , I collected data through participant observations, semi- structured interviews and documents analysis.

5.4.1 Participative Observation

Wolcott (1994) defines observation as a process that employs an iterative process of asking, watching and reviewing. The observations were undertaken to understand stakeholders' experiences of and responses to curriculum reform and the implementation of the PE, and to be able to triangulate findings with their own responses. Observation is the art of noting a phenomenon. It consists of the researcher gathering impressions about a phenomenon, through all his/her relevant human faculties (Bogdan, 1982; Cohen, 2000; De Vos, 2005). Data was collected at meetings of the Assessment, Curriculum Steering Group, and Undergraduate Committees where I served as assessment coordinator and member. I observed the discussions around the curriculum and assessment process in general and the PE in particular. I was particularly interested in the purposes to be served by the PE and the experiences of the students and staff around the issues of the PE. As a participant observer and as educational advisor, it was fairly easy to participate in discussions. Most decisions were, however, majority decisions, which did not interfere with my researchers' or observers' role. In order to keep a record of my reflections, I used field notes to separate my role as a member of the various committees and my role as a researcher.

I conducted the observations. These were conducted despite awareness that a major criticism of this data collection method relates to the researchers own perceptions, which might be influenced by bias (Miles, 1994). Similarly, the

method is criticised for lack of reliability and generalisability due to the limitation of statistical analysis to confirm the observed patterns (Cohen, 1994). However, for this study I was informed by the school of thought that believes observations to be a credible method if conducted in a systematic way and repeated over varying conditions (Denzin, 1989). The observations were recorded and supported by field notes to capture and reflect my thoughts and processes. As a member of staff to the Medical Educational Development Unit (MEDev) my professional roles included serving as education consultant, faculty developer, assessment coordinator, evaluator and later also year coordinator. These multiple roles facilitated entry and access to discussions around C2001 implementation while it also challenged me ethically in relation to the extent to which I could participate in decision. The field notes as reflections were useful to anchor and acknowledge as the study unfolded. My perspective and knowledge of the curriculum are thus informed by my participatory role during these sessions as it related to the design, implementation and evaluation of the MBChB programme.

5.4.2 Document Analysis

In addition, data was gathered and triangulated by means of document analysis of meeting minutes of the Educational Review Committee (a committee that later evolved into the Curriculum Steering Group), Undergraduate Committee and the Faculty Board and the Assessment Group. Documents and records are defined as text that had been prepared to attest to some formal transaction or agreement (Lincoln & Guba, 1985). In addition, document analyses were also undertaken of the feasibility report

(2000) (**Appendix L**), faculty rules (2001-2005) (**Appendix E**), the quarterly (*Mednews*) medical school newsletter (**Appendix F**) and correspondence of the assessment group (**Appendix G**).

These documents provided insight into the curriculum and assessment-planning processes and the factors that had been considered to convince faculty of the change to PBL and the progression rules for students in *C2001*. The concerns of staff prior to the *C2001* implementation regarding the feasibility of PBL were also addressed in the quarterly newsletter.

Document analysis was chosen for its unobtrusive ability to aid interpretation since the analysis process did not affect the nature of the documents. Documents may reveal factors promoting and/or hindering curriculum reform. Through document analysis, the study sought to establish and triangulate educators' and change agents' perceptions about the way the curriculum was planned and the manner in which the implementation had been managed.

My selection of documents for review was informed by conversations with the Director of the Medical Education Unit (my line manager at the time), and engagements with members of the Curriculum Steering Group. Access to the student assessment records of the previous five years, when students studied in the traditional programme, was included to compare the pass rates of students in the PBL and traditional curricula.

Thus, to answer the question, *Did the pedagogical principles inform the implementation of the PE at NRMSM?*, the minutes of the Assessment Committee, Curriculum Steering Group, Undergraduate Committee and the Faculty Board meetings were analysed. The two most recent accreditation reports of the HPCSA were also analysed to compare whether the references made to the student assessments and pass rates (2001 report) had been addressed in the 2005 report. For the analysis of these documents, content that reflected the educational purpose and suitability of the PE for cognitive assessment in *C2001* was selected. References to the structure, format, marking procedure, recording, and reporting of the PE were also included. Evidence of staff and student involvement in the planning and implementation were also sought.

5.4.3 Semi-Structured Interviews

To address the question: *What are stakeholders' (academic staff and students) perceptions of the PE in the context of PBL?*, semi-structured interviews were conducted with 15 members of staff who served on the Assessment, Curriculum, Undergraduate Committees and the Faculty Board to ascertain their views and experiences regarding the assessment system at the NRMSM. The staff composition represented the decision-makers and theme heads who were supposed to have had the most intimate knowledge of the PE and who were to have interacted with students more frequently regarding academic achievement. One interview session of approximately 45-60min was conducted with each of the key participants in 2003, three years after PE implementation. The interviews were not audio- or video-

recorded and the responses were captured in field notes for analysis. Field notes were written and elaborated on and transcribed immediately after each session (**Appendices CII-III**). The interviews were conversational and interactive in an attempt to offer a non-threatening way to gather participant's perspectives. The semi-structured interview approach was used as it offered an engagement in a more conversational style while the open-ended questions could be explored that yielded in-depth information. This approach enabled the exploration of questions around beliefs and basic issues and it provided the flexibility to explore meaning, interpretation and nuances as it emerges without running the risk of the interview becoming an inquisition or intimidating to participants. In cases where I believed I had gained insufficient understanding of a particular participant's perspective, the prolonged engagement with the participants presented many opportunities for follow-up and additional probing. The data gathered from each interviewee were unique in terms of the individual's interaction in the research setting and was captured in Microsoft Word. These interviews were transcribed into NVivo for the analysis.

5.4.4 Questionnaires

The students' views of the *C2001* and the PE were captured at several instances during the period of engagement and by means of a variety of strategies. Many of these were opportunistic as student representatives were expected to have regular feedback meetings during the phasing in of *C2001*. To illustrate, to gather data about the students' experiences of the PE, I analysed the theme evaluation reports (**Appendix B**) of students'

experiences in the curriculum that were administered at the end of each 6-week theme over the first four years. Only the themes where students referred to assessment in general and to the PE were included in the analysis. In addition, two questionnaires were administered to students of the cohort. The first was attached to the theme evaluation in October 2001 (**Appendix DI**) and the second (**Appendix DII**) was administered to a representative sample (a third of the class, n=75) during their 4th year in July 2004. This sample reflected the demographics of the cohort in terms of racial groups, prior secondary experience and gender. Apart for eliciting students' perceptions, the purpose of the first questionnaire was to gather information on their understanding of the assessment system and the rules that governed their progress in *C2001*.

The purpose of second *questionnaire* was to confirm and triangulate students' perceptions on assessment issues and learning behaviour raised during the focus group discussions. Both questionnaires were self-administered. The questions were logically sequenced to deal with the areas of preparation for assessment, assessment instruments and students' perception of the fairness of the assessment instruments used in *C2001*. Respondents were verbally informed of the purpose of the questionnaires and received instructions for their completion. Both closed and open-ended questions were posed. The ordinal data was captured and scanned using the OpScan software program. Data gathered from the open-ended sections of the questionnaires were captured in Microsoft Word and analysed using NVivo.

5.4.5 Focus Group Interviews

A focus group interview is a systematic questioning of several individuals simultaneously (Fontana, 1994). The participants constitute a focus group in the sense that they bear something in common with the study's questions. Two focus group sessions of 60 minutes each were held for evaluation purposes with 18 group representatives in the students' second (2002) and third (2003) academic years. These discussions, which used a semi-structured interview format, explored issues relating to the experiences of stakeholders during the PE and curriculum implementation. Document analysis was conducted on aspects relating to assessment issues to better triangulate the students' perceptions of the PE with data gathered from the questionnaires.

5.5 DATA ANALYSIS

Different approaches to qualitative data analysis have been debated in the social sciences literature (Strauss, 1987; Silverman, 1993; Miles & Huberman, 1994). Guided by Mason's (1996) descriptions of the process, I employed mainly 'interpretive' and 'reflexive' data analysis. While the interpretive approach is centered predominantly on making sense of research participants' accounts to enable the researcher to understand their meaning, the reflexive approach focuses on the researcher's beliefs and contribution to the processes of data creation and analysis. Despite the interpretative approach being the focus of the study, Mason (1996) argues that qualitative practices should involve a combination of interpretative and reflexive approaches.

The lengthy period of data collection (2001 - 2005) generated a considerable amount of data. The data had to be managed (labelled, filed and stored) to be accessible for analysis. To facilitate this process, I conceptualised the data as belonging to three interconnected levels: raw, organised and analysed data. This notion of interconnected levels illustrates that interpretations and conclusions at the stage of analysis rest on choices made at the stage of organisation. In turn, the choices made at this stage were related to the ways in which the raw data had been captured. In addition, both the content and the structure of the raw data are intimately related to the researcher's *own ideas* or *pre-theories* about the topic of investigation prior to data collection. The raw data was generated from primary sources in the form of field notes, interview transcripts and from secondary sources such as texts of published and unpublished documents (i.e. rule books, feasibility report, minutes of meetings and student records). For the purpose of this study, data was stored and managed by means of the Microsoft Office software packages (Microsoft Word, Microsoft Excel, QSR NVivo).

Understanding of human behaviour emerged slowly and non-linearly or iteratively, which implied a constant back and forward movement. As in design and implementation, qualitative analysis typically follows an iterative path. Thus, the qualitative analysis process started in the field, continuing through and beyond the data collection phase, including numerous rounds of questioning, reflecting, rephrasing, analysing, theorising and verifying. Three processes occurred concurrently (i.e. data gathering, data coding and the construction of categories) to capture the characteristics of the data. The

simultaneous nature of this process enabled me to develop tentative categories and themes, which provided answers to the research questions (Merriam, 1998).

Qualitative analysis emphasises how data fits together as a whole, bringing together context and meaning. While many approaches exist, the most useful for my purposes was to use the research questions to group the data and then to look for similarities and differences in stakeholders' views or to analyse the texts to answer the question. The reading of substantive theory that framed the conceptual framework also informed the coding process into categories and themes.

It was thus important for me to first become familiar with the collected data. This was achieved by being immersed in the data, a phase when the text and field notes were read and re-read. As the reading proceeded, and with reference to the key questions, I became aware of emerging themes and these were roughly coded. The coding process involved describing aspects of the data in shorthand to allow retrieval in the future. The process involved following a system whereby specific aspects of the data with the same characteristic were given the same code (Merriam, 1998). The data gathered as text was coded using an open coding system. At the initial level, basic information such as time, place and the characteristic of the interviewee were recorded. At the second level, interpretive constructs were employed to look for patterns and themes. Field notes that reflected the researcher's thoughts, and speculations, were also kept for later use.

While NVivo software facilitated the process of coding, the choice of how to code a section of text in a specific way still rests with the researcher. The virtue of the software, apart from presenting an organised storing system, was that it allowed me to make notes as the process continued and facilitated searches for specific codes in different documents or sets of data. Upon its classification, the themes represented a reasonable researched set of reality and each theme was used as the basis of an argument in the discussion. In the final stage of data analysis, an overall interpretation of the study findings is presented, showing how thematic areas relate to one another. This stage explains how the network of concepts responds to the original study questions and what they mean beyond the specific context of this study. Within the broad categories, I analysed data further as briefly described below.

Firstly, there was the context or research setting code. In this category, I analysed information about the setting and the respondents. This included descriptive statistics about the respondents. Such information allowed the study to be placed in a larger context. Secondly, some data was categorised under perspectives held by respondents, including such issues as views on the curriculum and the PE, role perceptions, shared rules and norms, and concerns. Finally, a code I called 'emerging issues' was used to capture pertinent issues that seemed to emerge from and cut across all the other categories. This code contained data from which conclusions would be drawn.

5.6 TRUSTWORTHINESS

Reliability, which refers to the extent to which the research findings can be replicated under similar case conditions, is particularly difficult in social sciences because human behaviour is never static. The traditional notion of reliability is based on the assumption that there is a single reality and that a repeated study of the same phenomena will yield the same results (Merriam, 1998). Qualitative studies, however, are based on different assumptions about reality, and the level of abstraction and conceptualisation in interpretive case studies allows for the suggestion of relationships among variables or for the construction of new theory (Merriam, 1998). The aim of the researcher in qualitative studies is, however, to understand a particular phenomenon within a specific setting.

Validity refers to the researcher's interpretation of the data as a true reflection of the findings. Ratcliff (1983) in Merriam (1998:p201) refers to the researcher as the "translator and interpreter" since the "data does not speak for itself". The following strategies were used to ensure reliability and both internal and external validity in the study. Firstly, I declared and explained my biases, theory, assumptions and criteria for sample selection and the social context for data collection. Secondly, by using various data-gathering techniques (i.e. interviews, questionnaires and document analysis), I aimed to triangulate the data. Data was further gathered from various participants in the setting (i.e. students, administrative management team, participants of the Assessment- and Curriculum Steering groups and the Undergraduate

committee). Triangulation is the application and combination of several research methodologies in the study of the same phenomena (Lechner, 2001). Data collection was informed by a combination of theories, and included a variety of methods, empirical materials and participant viewpoints. This was meant to overcome the biases that often come with single method, single observer, and single theory studies (Bassey, 1999; Bland *et al.*, 2000). Thus, cognisant of the subjective nature and problems relating to my 'single observer' status and the limitations imposed on findings due to the validity of the perceptions of the observer (Lechner, 2001), I resorted to the use of triangulation to minimise the impact of researcher bias. As a final check for trustworthiness, I took heed of Patton's (2001:440) exhortation that all qualitative researchers have "an obligation to monitor and report their own analytical procedures and processes as fully and truthfully as possible". Triangulation of sources and data essentially allowed me to view the innovation and context from many angles, thereby obtaining a broader perspective.

5.7 LIMITATIONS OF THE STUDY

A qualitative case study design was used to explore the perceptions of stakeholders. While I acknowledge that qualitative studies are rarely generalisable and that insights from this explorative study would not be used to predict success in other settings, I also believe that some valuable lessons can be learnt from this single case and that others in similar contexts might apply these in their own work.

A second limitation of the study is linked to my dual role as a participant observer (I was both a researcher and a staff member in the school). As a staff member, and at the time of the study, one responsible for assessment in the school, my own bias towards the curriculum change and towards formative feedback might have clouded my researcher-judgement at times. To guard against this, I kept a reflective journal in which I constantly reflected on and checked these biases against the various sources of data I had at my disposal.

Other limitations of the study involved conditions in the research setting. For example, substantial tensions developed between students in the 6th year of the traditional programme and the cohort registered in the PBL curriculum (who were the participants in this study). While I had planned to compare the two groups' exit knowledge by having both write the PE at the end of their final year (2005), this did not occur as the leadership of the medical students' representative council (MSRC) objected to any research and comparison between the two cohorts.

Most of the active participants involved in the study and those regularly in contact with me as the researcher were involved in more than one aspect of either the decision-making process or the implementation of *C2001*. They were thus mostly committed to the curriculum reform process and were active 'change agents' as the more hesitant members of staff generally did not volunteer their services during the first three years. This may have affected the perceptions gathered from faculty members sampled as most of

them would have had agreed with the aims and goals for the curriculum. Students were also not blind to the innovation and may have used the discussions (interviews) to raise concerns about the implementation process in general. It was difficult to gather data from the students' final year as they were attached to various hospitals and instead, perceptions of the student representative body were sought. This might have led to a bias in relation to whose views got represented in this study. Triangulation of data collection methods and data sources somewhat addressed these shortcomings.

5.8 CONCLUSION

In this chapter, I have described the research design and methodology utilised in this study. The chapter locates the study in the qualitative research paradigm. As a naturalistic approach, qualitative research was appropriate because the study sought to examine stakeholders' understandings and experiences of, and responses to, curriculum and assessment reform at the NRMSM. The trustworthiness of this study lies in the use of mixed data sources and selected theoretical frameworks that provide coherence and integrity to the account.

Also consistent with the qualitative research approach, the chapter has given an account of how the data was analysed. In the next chapter, I present the findings to the research questions.

CHAPTER 6

FINDINGS AND DISCUSSION

6.1 INTRODUCTION

As described in the previous chapter, a qualitative case study was used to explore stakeholders' perceptions of the efficacy of the progress examination (PE) as an assessment tool in the context of problem-based learning (PBL) at the Nelson Rolihlahla Mandela School of Medicine (NRMSM). Data collection methods included a combination of participant observations, semi-structured interviews, focus group discussions and document and questionnaire analysis. The unit of analysis was the NRMSM with particular attention being paid to the 2001 cohort for the students' experiences with the PE. This cohort represented the first student intake into the PBL programme and had experienced most of the changes of the progress examination. Other key informants' whose views were sought included academic and administrative staff who were involved in decisions to modify the PE through their service on the assessment working group, curriculum steering group and the undergraduate committees.

As discussed in the preceding chapters, the investigation reported in this thesis was premised on my observation that a misalignment existed between the professional and pedagogical goals of the PBL curriculum (*C2001*) and the PE as a strategy adopted to assess cognitive learning at the school. To illustrate, the overall aim of *C2001* was the development of deep, life-long learning strategies among learners (Barrows, 1986; Barrows and Tamblyn, 1980; Rolfe and McPherson, 1995). In accordance with these principles, PBL

supporters advocate the design and implementation of true, contextual, real-life assessment tasks that closely meet the desired performance of practitioners in authentic contexts (Gipps, 1994; Savin-Baden & Major, 2004). Furthermore, the purpose of the implementation of *C2001* was to develop a new educational culture that would have promoted collaboration and learning amongst staff and students at the School. Within this setting, staff members were to model continuous learning practices and team work, and embrace new roles to promote individual and professional development of students into competent care-givers.

Yet, in spite of the curricular (PBL) and assessment (PE) interventions, my initial observations suggested that the PE was not suitable for assessing learning in the context of the PBL curriculum and that this method of assessment tended to contradict the curricular principles of PBL that essentially aim to promote critical thinking and problem-solving through social interactions. Reasons for this mismatch were numerous. There was resistance from educators to provide students with formative assessment information that would have enhanced skills such as self-direction and self-evaluation. Adaptations to the PE and the failure of instructors to deliver on promises of improved feedback to students eventually resulted in the students rejecting the PE and its role in guiding and supporting their learning and their refusing to sit for the examination.

This study is premised on the notion that the successful implementation of the PE in the context of PBL at the NRMSM would depend on stakeholders'

understanding, experiences of and responses to the curriculum and assessment transformation processes. It is also premised on the notion that a number of factors such as the context and history of curriculum change and the students' experiences of the innovation, the leadership, as well as support from academic staff in the various departments impacted on *C2001* and the PE implementation. To address the research questions, the study utilised theories of educational change and learning, and from this vantage point, posited that learning and collaboration among instructors, as well as between staff and students, are essential for deep and meaningful change. As such, specific pedagogical and professional principles would have informed the adoption of *C2001* and influenced the decisions that informed the choice and format of the PE as an assessment tool.

Thus, the study sought to analyse major stakeholders' (staff and the affected students) experiences of *C2001* and in particular, of the progress examination. Utilising a qualitative case study approach, the study addressed three research questions:

1. What educational principles influenced the adoption and implementation of the progress examination in the context of PBL at the NRMSM?
2. What were the stakeholders' understandings of the nature, principles and goals of the progress examination and its suitability for assessing students' cognitive learning in the context of PBL?
3. What were the experiences of stakeholders of the implementation of the progress examination and the factors that shaped it?

In this chapter, the findings from the study are presented and discussed in relation to these research questions.

6.2 EDUCATIONAL PRINCIPLES THAT INFORMED THE ADOPTION AND IMPLEMENTATION OF THE PE

To ascertain the pedagogical and professional principles that influenced the adoption and implementation of the PE at the NRMSM, data were collected using interviews with staff and analysis of documents. The analysed documents included minutes of meetings of the Faculty Board, Assessment Committee and the Curriculum Steering Group, as well as field notes from observations in the various teaching, learning and administrative activities and fora in the school. In addition, student rulebooks (2001-2005), and the accreditation reports to the Health Professions Council of South Africa (HPCSA) (2001/2005) were analysed.

What conditions led to the adoption of *C2001* and the PE? Findings from studies conducted during the days of the former University of Natal Medical School (before the merger with the University of Durban-Westville, Chapter 1) concluded that students experienced their first three years burdened by the intense factual overload and that this resulted in high failure rates and inappropriate student learning. In addition, a study by Frame and Seneque (1991) reported that students felt driven to inappropriate learning strategies (i.e. rote memorisation and factual recall) when burdened with an intense factual overload. It was reported that students were unable to apply clinical reasoning and problem-solving skills in the clinical context (Frame and Seneque, 1991; Olmesdahl and Manning, 1999). These studies suggested

that the use of the surface learning strategies hindered students' understanding, which is required for deep, meaningful learning. The authors concluded that the traditional curriculum did not prepare medical graduates to apply transferable skills such as self-direction, communication, leadership and teamwork, required for general clinical practice. A review of the curriculum was recommended. More importantly, a wider variety of assessment formats to aid learning and problem-solving during learning was suggested (Frame & Seneque, 1991).

Discussions regarding the poor academic performance of students led to an increased awareness of the teaching, learning and assessment practices at the NRMSM. While some innovative teaching practices followed, they were limited to specific departments. These initiatives caused students to compare the progress and quality of their learning experiences across departments. The discussions resulted in the establishment of the Medical Development unit to improve the overall quality of teaching and learning (Interview Prof L, Steering and Assessment Group member, April 2001). By July 1997, the Faculty Board resolved to form a Curriculum Development Task Force (CDTF) to reform the curriculum at the school.

It was, however, not the first time that curriculum reform had been considered. The potential for the curriculum to improve student learning had previously been recommended by at least two task teams (Bhaghat Commission, 1978; Adams *et al.*, 1987; Minutes of Faculty Board, 26 July 1993). A proposed date of implementation (January 1995) had also been set

on that occasion (Minutes of Faculty Board, 26 July 1993). In the view of Prof T, a former chairperson of the Undergraduate Committee, previous attempts at curriculum reform had been sparked by the South African Association for Medical Education (SAAME, Durban, 1985). He recalled how a 1990 meeting had resulted in the formation of an Educational Review Group (ERG) at the School.

The ERG was to explore and implement a student-centered curriculum that encompassed a holistic and community-orientated approach to medicine. The Group set out to design a core, integrated curriculum to develop self-direction in learners. At the time, the ERG stated that the educational aims would only be achieved if the faculty agreed to an implementation strategy. Their proposal suggested the integration of teaching, learning and assessment and the development of a learning context that facilitated problem-solving. They also proposed the inclusion of selective options to increase students' awareness of community needs, while they recommended that a staff development strategy should be employed to familiarise staff with the pedagogical goals to be achieved in *C2001* (Minutes of Faculty Board, 16 Sept 1991).

The ERG, however, had limited success in presenting a feasible plan to the Faculty. In Dr N's opinion, the failure to launch the curriculum resulted from the inability of the Acting Dean to champion change at the school (personal communication, Dr N, 10 July 2003).

Prof T asserted that:

...Although curriculum reform had been on the cards for long, the external and global environment to facilitate curriculum change only favoured reform in the mid 1990s. (Interview, 8 May 2002).

The ERG nevertheless became the forerunner for the work of the CDTF at the site. The CDTF highlighted the same principles that had been identified by the ERG many of the decisions of the ERG were used to guide the reform.

The Faculty Board agreed to the key educational aims of the ERG (16 September, 1991, Minutes of Faculty Board). A core curriculum that integrated content across the disciplines was once again being discussed. Members of the Board expressed a desire to develop students' motivation to ensure that they become independent learners, critical thinkers and able to engage in ongoing self-development and reflection. It was further envisaged that the curriculum would be responsive and adaptable to needs and changes in the community (16 September, 1991, Minutes of Faculty Board).

The curriculum reform coincided with the National Department of Education's initiative to bring about social transformation and the implementation of an outcomes-based curriculum in the schools (NQF, 1997). Both reforms emphasised curricula that placed the student at the centre of the learning process (Department of Education, 1997; The World Health Organisation, 1998).

Addressing the practicalities of improving teaching, learning and assessment at the School was not an easy process. Previous task teams encountered substantial difficulty when planning for change. As one member of the Steering and Assessment Committee commented:

Most attempts at curriculum reform stalled at the proposal phase when staff could not agree on a suitable model. (Minutes of Board meeting, 12 July 1993; Interview Prof L, Steering and Assessment Committee Group member, 6 April 2001).

There was overwhelming concern that the School's reputation of producing good clinicians nationally and internationally should continue. Staff also recognised the need for future graduates to embrace a philosophy of life-long learning to meet future challenges in medicine and medical technology (Minutes of Faculty Board, 18 July, 1994). As one member of staff reported:

At the School, a critical mass of change agents who were knowledgeable about PBL and others who joined the school after being exposed to PBL institutions overseas influenced the curriculum debates. (Interview Prof L, Steering and Assessment Group member, 6 April, 2001).

The concern regarding the quality of the student's learning at the site coincided with the global trends in medical education that favoured the development of life-long, self-directed learning skills over the dissemination of factual information as a learning strategy. One member of staff illustrated the support for the reform in the light of the massive changes that had been taking place in the country:

Paradigm shifts in all aspects of life, including the health services, demanded new ways of looking at health and disease (Dr M, Interview, 10 October 2002).

The choice and format of the curriculum were not debated for too long. According to one academic member of staff:

We thought PBL and OBE was the same thing in that both focused, and resulted in, improved student learning. With some of the colleagues having visited PBL schools, it became the natural way to go. (Interview Prof Q, Theme Head, 3 September 2002).

Once identifying the ideals of *C2001* and the PE, it was agreed that the new, integrated *C2001* curriculum should reflect and promote the philosophy that views learning at medical school as the first step to developing habits that foster life-long learning. The curriculum was also to be student-centered, self-directed and based on actual/authentic problems, while developing student motivation and life-long learning skills (Minutes of UG, 8 December, 1997, *Mednews* Jan–Mar, 1998). These goals were clearly stated in the documents I reviewed in this study.

It was, however, necessary to explore how stakeholders understood the aims and purposes of the PE and *C2001* and the suitability of the former as an assessment strategy in the context of PBL. The findings in response to this second research question are reported below.

6.3 STAKEHOLDERS' UNDERSTANDINGS OF THE PE AND ITS SUITABILITY FOR ASSESSING STUDENTS' COGNITIVE LEARNING

To ascertain what stakeholders understood regarding the nature, principles and goals of the progress examination and its suitability for assessing students' cognitive learning in the context of PBL, data included field notes from classroom observations and document analysis (Minutes of the Faculty Board, Assessment Group, ERG, CDTF and Undergraduate Committee). Notices to students and entries in the student rulebook (2001-2005) were also studied.

First, in a presentation to the Faculty Board to introduce the innovation and to highlight its ideals from the official/management perspective, the Director of the Medical Education Development Unit outlined the aims of assessment in general, the PE in particular to members of staff. He described the rationale for assessment as:

...seeking to examine the progress and growth of students in terms of the end goals of the curriculum [and stated that] the major aim of assessment in the new curriculum is to measure all cognitive levels and not only the lower order levels (Minutes of Faculty Board, 20 August 1999).

He assured Board members that this educational goal could be achieved by setting interpretative questions that were relevant to authentic, real-life medical cases that constituted the core curriculum at the NRMSM. In addition, the assessment format was to render test-directed 'swotting' or memorisation useless and by implication, encourage deep learning. He advocated the PE because it severed the direct relationship between the

specific course content of recently completed modules [themes] and the examination. Speaking as the Chairperson of the CDTF, he expressed the view that the PE was more suitable to engender long-term, functional knowledge and deep learning:

Students should not take a week or two before the event to 'cram' for the examination. In this way, the examination emphasises the acquisition of long-term and functional knowledge, reduces stress and removes much of the anxiety students experience around examinations. (Minutes of Faculty Board, 20 August 1999).

He assured Board members that:

while it [the PE] appears quite unusual, that it has a long and positive history in some institutions overseas. (Minutes of Faculty Board, 20 August 1999).

A further advantage of the PE was that it was to be data/case based which were to assess students' ability to understand, interpret and recognise the value of data in relation to each case. Members agreed that the use of the PE would be an improvement from the traditional examination process that tested isolated factual information. (Minutes of Faculty Board, 20 August 1999).

The Faculty Board also agreed that the multiple-choice format of the PE was more appropriate than the T/F format that was currently in use. An MCQ format would also allow the PE to be optically marked. This was an important consideration in the light of the anticipated increase in student admissions.

In the Director's presentation, he highlighted how students would benefit from the format by receiving the questions and answers and opportunity to query issues with subject experts after the completion of each PE. He reiterated that proponents of the PE believed computerised marking facilitated reporting and feedback to staff and students as:

...the results would be given to the students as progressive information as they proceeded from block to block.¹² It is also imagined that a School of Undergraduate Education would monitor the progress of the students as they passed through the curriculum and appropriate counselling should be made available to students if they experience problems. (Minutes of Faculty Board, 20 August 1999; Prof P, Interview 18 July 2001).

While this section of the dissertation highlights the ideals of the PE in *C2001*, the section below describes how planning and implementation of the PE proceeded at the NRMSM.

The PE was adopted because the members of the Steering Group of the CDTF and the Undergraduate committees thought it desirable for assessment in PBL to support student learning. The case-based scenarios were to reflect suitable patient cases relevant to the national and local context. Rather than buying an assessment bank of questions from elsewhere, members of staff decided to develop a question bank at the school to ensure greater alignment with the core curriculum (Minutes of CDTF, 22 May, 2000; Minutes of UG, 08 August, 2000).

¹² The term block was subsequently changed to module and eventually to theme in the context of *C2001*.

Some staff members wanted guarantees that students would actually consolidate and understand the content of completed modules. The Assessment Group was thus tasked with customising the PE at the School. The Group entertained the idea of dividing the PE into two parts to fulfil two different purposes: Part One was meant to gauge how students performed on completed modules, while Part Two would assess material yet to be covered, i.e. the final exit outcomes (Minutes of CDTF, 22 May 2000). The first part specified a number of questions from themes that students had already studied (Material Already Covered - MAC, material already studied), while the second NMAC part (i.e. Non-MAC, Material not yet covered) assessed content that had not yet been taught. As students progressed through the themes, it was envisaged that the amount of MAC from previous themes would increase incrementally in each PE. It was also envisaged that students would have covered 50% of the curriculum content by the end of their second year (Minutes of the UG, 18 May, 2000). During these discussions, it was envisaged that the notion of MAC and NMAC would only be applied during blueprinting and progress examination design.

The CDTF, to whom the Assessment Group reported, believed that the chosen model was suitable to assess students' cognitive knowledge as it still incorporated a component that assessed the final cognitive outcomes of the curriculum (Minutes of the CDTF, 8 May 2001). In addition, staff and students would have been able to monitor students' progress of the newly acquired material and gather data on how well students coped with specific curricular content. This version of the PE furthermore preserved and encouraged life-

long learning in that it rewarded students for reading beyond the scope of their completed modules (i.e. they could score in the NMAC section). It also reinforced the notion that students should revisit content and skills learnt in earlier modules and academic years, as it would be reassessed in future PEs.

Some members of the Faculty Board were skeptical of the international successes of PBL and voiced concern about the *C2001* reform (Minutes of Faculty Board, 20 August 1999). For example, at that time, reports were inconclusive on the proven benefits of PBL when scores had been compared for students in PBL and traditional tracks in the United States of America's licensing examinations (Albanese and Mitchell, 1993). The Faculty Board then resolved to allow staff the time and opportunity to become more familiar with PBL as an instructional methodology. CDTF members were tasked with the design and implementation of two pilot PBL modules and the organisation of a visit by a panel of PBL experts from the University of Maastricht in the Netherlands to conduct workshops at the School. Staff from the University of Maastricht also offered training courses to those interested in PBL and several members of staff attended some of these.

The CDTF was to spearhead and maintain the momentum for change. They developed, refined and implemented the plans for curriculum reform that originated from an early workgroup, the ERG in the early 1990s. The CDTF worked well during the initial phases and later elected a Steering Group to

organise the visit of the PBL experts in October 1999 (Minutes of CDTF, date April 1998). The experts presented workshops on module construction, case design and facilitation. It is, however, important to note that no staff development took place in terms of possible assessment strategies.

Following the workshops by the visiting experts, two pilot modules were planned for the latter part of 1998 and 1999. In addition, the first 'theme heads' volunteered from the workshop attendees. The theme heads were responsible for convening and leading the deliberations of the theme design group. They presented the structure and details to the Steering Group, made the final selection of assessment items and were expected to address students and facilitators on the aims of the theme and ensure that students were provided with feedback to inform their learning. Once the curriculum had been implemented, the theme head was expected to affect changes to the theme based on student evaluation.

During the planning phase, the CDTF co-opted new members and a newsletter, *Mednews*, was initiated to inform staff of developments as the innovation unfolded. The July 1998 issue informed Faculty of the weekly planning sessions and invited staff from various departments to engage with the Group to identify the core content of their departments. The editor also cautioned that the implementation date of January 2000 was at risk of postponement due to poor staff participation (*Mednews*, July 1998).

The Faculty Board eventually seconded members of staff to full-time work on the curriculum and funding was made available to relieve one full-time

member of staff from her service and teaching commitments. In other cases, secondment on a part-time basis was considered (Minutes of UG, 20 August, 1998) as members expressed concern that they would not be rewarded sufficiently if they were to suspend their research activities and the sacrifices made in terms of their personal development (Minutes of UG, 20 August 1998). Some thought that the majority of members of staff were indifferent to the curriculum reform, and as a result, implementation was postponed by a year (Dr K, Interview, 5 July 2001).

In Prof N's view, the pilot modules differed from the way in which the School subsequently offered modules/themes (Interview Prof N, Theme Head, CDTF & Assessment Group member, 17 September 2002). In the pilot modules, students and facilitators received a resource pack, which, unlike during the writing of this thesis, made students' independent research unnecessary. Another member of the CDTF and Assessment Committee, Dr K believed that, "*the pilot modules did more harm than good as people got a skewed idea of what PBL was*" (Interview, 5 July 2001). Positive responses were, however, forthcoming from Faculty members who observed and facilitated the pilot modules. One explained that he was:

...impressed by the student enthusiasm and pleasantly surprised. The merits of the system, even though still new, became evident. (Dr P, Interview, 9 October 2001).

In a report to the Faculty Board, the Director of the Medical Education Development Unit reiterated that a problem-based, integrated learning

curriculum could succeed if uniquely developed for the local (South African) environment. He, however, expressed concern that it was not possible to make major decisions regarding the curriculum without the participation and feedback of faculty members (Minutes of Faculty Board, 16 July 1998). The lack of Faculty participation was believed to have delayed a number of important decisions regarding resource allocations. To illustrate, six months prior to implementation of *C2001*, the faculty had still not resolved the accommodation of the small group tutorial sessions since current venues at the School were unsuitable. Eventually, 12 park homes (temporary small group venues) were hired and erected in the car park just prior to the start of the January 2001 academic year and used during the first two years before decisions were taken to refurbish previous laboratory spaces (field notes, 6 May 2004).

As indicated earlier, the workshops led by the team of PBL experts from the University of Maastricht did not address the issue of student assessment. In fact, no assessment expert accompanied the team to the NRMSM because the School could not afford the additional expense (Minutes of CDTF, 18 February 2000). The workshops were regarded as a confidence booster and, as Prof BM (a member of the CDTF, 27 March, 2003) remarked, it created a climate for 'buy-in' from some members of staff. It culminated in the design and implementation of two pilot modules, which were offered in 1998 and 1999.

Towards the end of 1999 and unrelated to the study at the time, the MEDev Unit conducted a survey to determine the assessment formats preferred by

the academic departments in the School. A total of 18 departments and sub-specialties responded to a questionnaire that explored the type and use of assessment instruments. The results indicated that both summative and formative assessments were used in the traditional programme and that an average of 10 different testing formats had been employed. The formats included vivas (oral examination), multiple choice questions, short answer questions, group projects, self- and peer-assessments, clinical assessment, case reports, seminar presentations, role playing, simulations and long essays (Minutes of CDTF, 4 December 1999).

With assessment not having been explored or considered during the 1999 PBL workshops at the School, the Steering Group consulted three other South African medical schools where similar curricula reforms had taken place to gain insight into their assessment processes (Minutes of the Assessment Committee, 8 March, 2001). Responses from these indicated that one had not changed from using traditional assessment methods while the second school employed a greater variety to complement the new learning philosophy. The third school continued with the use of the traditional, established assessment methods but also introduced the formative University of Maastricht progress test (True/False format) to compare their graduates internationally (e-mail communication, 20 April 2001; CDTF Minutes, 24 April 2001).

Members of the CDTF, several of whom had visited overseas medical schools where alternative assessment strategies had been used, contributed

to assessment discussions and decisions by explaining the strengths and weaknesses of various instruments and procedures at medical institutions such as Sherbrooke (Canada), Leinster (Glasgow), New Mexico (USA) and Maastricht (Netherlands) (Prof P, sabbatical report, 1999; Minutes of CDTF, 27 July 2000). They strongly favoured the inclusion of a number of strategies for decisions regarding the PE at the School. These included the desire to provide learners with more formative feedback to increase their motivation to learn and to engage learners in the use of deep-learning strategies.

Most faculty members did not, however, take part in these discussions about the PE or its suitability to assess students' cognitive learning. They were mainly involved with the proposed curriculum reform and the structural and functional restructuring required. In the section that follows, I report on how the PE had been adapted and used.

6.4 STAKEHOLDERS' EXPERIENCES OF THE PE IMPLEMENTATION

In trying to understand the experiences of the staff and students regarding the implementation of the PE and *C2001*, data were gathered using observations, interviews with staff, minutes of meetings, focus group discussions with students and qualitative data gathered from the open-ended section of the student questionnaire. These were triangulated with field notes of observations. In the section below, the findings from this research will be addressed first.

In 2001, three PE examinations were written, each comprising 250 (MCQ-true or false item response). The items that reflect the material already covered (MAC) were marked separately for formative purposes. The MAC from Themes 1 and 2 represented 15% of the PE1, while themes 1-4 represented 20% of the PE2 and themes 1-6 represented 25% of the third and supplementary PEs respectively. The MAC questions were scattered throughout the question paper and not identified for students. The pass mark for each of the three PEs was respectively set at 7.5%, 10% and 12.5%, according to the Faculty rule M4 (n)(d) ii requiring the pass mark to be 50% for each exam (Assessment Group Minutes, 5 April 2001, Communication with UG chairperson, 11 February 2002).

The PE was negatively marked with half a mark (0.5) deducted for every wrong answer offered by the student. Progression depended on a student's ability to obtain an average of 50% on each exam and a pass mark (50%) on the Objective Clinical Examination (OSCE) that assessed their clinical skills competence. A blueprint ensured that the content of each PE related to the themes that preceded the exam and that it progressively corresponded with the allocated coverage over a number of years (Minutes of Assessment Group meeting, 15 May 2001). The blueprint used in 2002 is illustrated in Table 4 below.

Table 4: Proportion of Progress Exam contributing to Material Already Covered (MAC) and NMAC components

Year	Progress Exam 1	Progress Exam 2	Progress Exam 3
Yr 1	2 themes (³⁰ / ₂₀₀ questions): 15%MAC:85%NMAC	4 themes (⁴⁰ / ₂₀₀ questions): 20%MAC:80%NMAC	6 themes (⁵⁰ / ₂₀₀ questions): 25%
Yr 2	8 themes (⁷⁰ / ₂₀₀ questions) 35%	10 themes (⁸⁴ / ₂₀₀ questions): 42%	12 themes (¹⁰⁰ / ₂₀₀ questions) 50%
Yr 3	14 themes (¹²⁰ / ₂₀₀ questions) 60%	16 themes (¹³⁴ / ₂₀₀ questions) 67%	18 themes (¹⁵⁰ / ₂₀₀ questions) 75%
Yr 4	20 themes (¹⁷⁰ / ₂₀₀ questions) 85%	22 themes (¹⁸⁴ / ₂₀₀ questions) 92%	24 themes (²⁰⁰ / ₂₀₀ questions) 100%
Yr 5	No Themes. Only MAC		

During deliberations on the marking of the scripts and the allocation of a pass mark, staff queried the proposed summative use of the PE at the School. Members were, however, informed that a set of rules for assessing students in *C2001* had already been submitted to the Faculty Board for approval and that modifications could only be made in subsequent years (Minutes of CDTF, 18 May 2000). Some Assessment Group members expressed concern over the exhaustive assessment of the first two themes and the difficulty that design teams would encounter in trying to produce novel questions to re-assess those themes in subsequent PEs. They also thought that a strategy was needed to ensure that assessment items only assessed the core content of each theme (Minutes of CDTF, 22 May 2000). Some members of the Assessment Group felt that the assessment options were limiting. One member expressed his concern:

I am concerned that we have reduced the summative assessments to four in Years 1-4 and types to but two (PT and OSCE). This at a time when educationalists are speaking of increasing both number and type in order to lower the stakes on each assessment and to cover a greater spread of learning objectives. (Dr D, Theme Head & member of Assessment Group, 16 April 2001)

Furthermore, staff experiences were seemingly tainted by factors that hindered the implementation of the PE and C2001. These factors are presented below.

6.4.1 Large Student Intake and Assessment Format

The first factor relates to the fact that due to the large student intake in 2001, staff felt obliged to mainly use the multiple choice question (true/false) format for student assessment in C2001. This format lent itself to computer-aided marking and some members of staff thought that it offered a more objective procedure for dealing with student assessment (Interview Dr FK, 29 May 2003). Amongst the members of the Assessment Group, some expressed concern at the predominance of the true/false MCQ format. They thought that other student response formats such as the short answer or essay questions should be used to assess and develop students' writing skills. One member's comment illustrates:

I am concerned that logistical considerations may sway us towards a small number of easily handled instruments, which may negate the educational benefits of what we are trying to inculcate. (Dr X, Assessment Group member, 5 April, 2001).

A member of the CDTF Steering Group suggested that alternative assessments such as reports and vivas should be used elsewhere in the curriculum, e.g. in isiZulu language assessment, history-taking and/or group projects to assess students' language skills sentence construction (Prof I, Minutes of CDTF, 5 April 2001). These alternatives (presentations, assignments and reports) had subsequently been incorporated into the HIV, selective modules and ambulance components (NRMSM Faculty Rule book, 2005).

The second factor that influenced the experiences of staff with the PE relates to the manner in which they experienced the planning and implementation of the PE. This is discussed in the section below.

6.4.2 Structural and Organisational Support

Several organisational and structural problems were identified during the early part of the PE implementation. First among these was the management of student examinations and marks. For example, according to the Head of Student Administration, the University's online student management and mark system was not geared to keep record of the students' PE scores. The system also lacked an averaging function to calculate the final student mark when students wrote three PEs. The Assessment Coordinator was thus requested to generate a single score for each student on PE (email, Head of Student Affairs, 10 September 2001). Accurate and official record-keeping was necessary to calculate students' final credit points on the programme

and the unwillingness to invest time and effort to upgrade the management system should have been viewed in a more serious light at the time.

A second problem was related to the fact that a semester system implemented after the merger of the then University of Natal and Durban-Westville into the current University of KwaZulu-Natal (see Chapter 1) required a restructuring of the course into self-contained units, each culminating in an end-of-module assessment. Some students understood the semester system to imply that work not formally taught during the semester would not be assessed. This perception jeopardised the way in which the spiral nature of *C2001* was to allow for reassessment of previously learnt material (Field notes, student curriculum conference, 19 September 2003).

Subsequently, a decision was taken by the UG Committee to host an assessment seminar with student representatives to address unresolved assessment issues. At this forum, students reiterated a request for all rules relating to assessment to be clearly stipulated prior to the date of the proposed assessment. They also criticised the Assessment Head for not responding to student queries, accusing him of a lack of interest (MSRC communication to Chairperson of Steering Group, 14 August 2003).

The third challenge related to staff shortages. For example, additional administrators to assist with *C2001* and assessment implementation at the MEDev unit were to become available as the traditional programme was phased out. Since the period of implementation coincided with the

restructuring of the provincial Department of Health and the provincial Department of Education's merger, many members of staff were, however, relocated to the newly established tertiary hospital that was not open to the student training at the time. The relocation of the offices of a number of members of staff impacted on their functioning. Many found it difficult to attend curriculum meetings and did not take time from their service commitments to travel to the School.

Again, with promises of administrative staff once the two universities had merged, the School of Undergraduate Medical Education (SUME) was constituted as the coordinating body for *C2001*. SUME was, however, not sufficiently funded to appoint permanent administrative assistants and only temporary (three to six months) positions were offered to the incumbents. The temporary status of the majority of the staff in the School caused a great deal of instability resulting in high staff turnover. The minutes of the May 2002 UG Committee reflect the Director's concern that staff assigned to the development and implementation of *C2001* (18 months post- implementation) were still mainly on temporary contracts. At a meeting of the Steering Group, it was also reported that designating tasks to administrative support staff was nearly impossible since all were employed on three-month contracts (Steering Group, 23 April, 2002). The Director thought:

It's inconceivable that an entire high profile, important faculty programme dealing with hundreds of students, should have such an insecure staff base. (Appendix I: Correspondence regarding faculty support, Email correspondence, 25 April 2002).

Furthermore, the Head of the Student Affairs office was on an extended period of sick leave for more than eight months during 2003 and the Faculty Manager retired in early 2003. In the absence of a functional Faculty student management system, SUME was called upon to maintain student records. This placed additional demands on the already over-stretched human resources especially since, resulting from the merger, administrative support members of staff were appointed only in temporary positions (i.e. periods of 3-6 months). In addition, in an effort to speed up transformation, the lowering of retirement to age 60 by the University, led to the resignation of the Chairman of the Steering Group during 2001. The Director of the Medical Education Development Unit functioned as Chairperson while his contract was extended for two years post-retirement. With the retirement of the Director by the end of 2002, the then Deputy Dean became increasingly involved with the running of the programme until the appointment of the new director in 2003. When the newly appointed Deputy Dean unexpectedly resigned from his position at least two acting Deputy Deans stepped in during the first five years of *C2001* implementation (Field notes, 26 July 2004).

By March 2004, the newly appointed Head of SUME suspended the regular meetings of the Steering Group due to a perceived lack of 'faculty buy-in'. This period also coincided with the ongoing provincial restructuring of the Department of Health and led to an increase in staff resignations due to unstable working conditions at UKZN. Remaining members of staff became overworked, shouldering greater teaching and service loads. In an effort to keep *C2001* afloat, the heads of clinical departments appealed to alumni,

private practitioners and staff assigned to hospitals in the greater Durban functional region to teach on the programme.

During this time, the Dean voiced repeated concerns about the capabilities of students in the PBL curriculum. He thought that more traditional, didactic teaching would provide the poorly prepared secondary students with better foundations in medicine. He voiced various proposals such as an increase in the duration of the programme, reduction of the PBL sessions and the introduction of more traditional lectures (Minutes of SUME Meeting, 21 May 2003). These options were not acceptable to students and the Dean was eventually removed from his office amidst strong student protest on issues that were unrelated to *C2001* (field notes, 12 December, 2005).

Students also became aware of the resource constraints. A student placed a notice on the online web communication system (WebCT) which facilitated communication between students and the organisers. He complained they had barely been receiving the answers to the self-assessment questions in time to prepare for the end-of-theme tests. He expressed concern that *“there are times when queries are not immediately addressed because the only curriculum organiser might be in a design meeting.”* He thought that more staff needed to be employed (Student MX, notice placed on WebCT, 12 September 2003).

Some members of staff such as Professor JR believed that radical changes were being made too quickly during the implementation of *C2001*. He thought

C2001 was labour-intensive and required additional human resources to succeed. He expressed reservations about the students' ability to cope and he voiced concern on behalf of members of his department who had heavy service loads. He thought that the disabling factors such as the lack of physical space and resources and the low level of staff and student skill were too much to overcome. He also thought that students' success in self-direction in *C2001* depended on the availability of all these resources. (Interview with Prof JR, 26 September 2001).

6.4.3. Staff participation and support for the PE

A third factor that seems to have impeded the successful implementation of *C2001* and the PE at the NRMSM involved the lack of faculty participation. This was also evident in the way in which staff responded to requests for contributions to the question bank (See Chapter 1 for a fuller discussion on the PE question bank). As the curriculum progressed into the second and third years, the MAC content from previous themes increased and more members of staff and theme leaders were approached for contributions. Despite having contributed clinical scenarios for the PEs, most staff did not attend the meetings where the assessment items were moderated and many did not share in discussions that highlighted criteria for setting good multiple-choice questions. They also seldom interacted with colleagues from other disciplines even though members of staff from the Family Medicine discipline were tasked with achieving some form of interdisciplinary integration on the PE. In some cases, contributors were skeptical of suggestions made at

meetings of the Assessment Group (field notes based on observations of assessment moderation meeting, 9 May 2002).

Despite regular requests and reminders from the Chairperson of the Steering Group to discipline heads for greater participation, few faculty members responded. Following a staff workshop in August 2004, the clinical departments of the final year disciplines decided not to amend the criteria, structure or format of the assessment tools used for assessment in final year. The use of the PE in the Family Medicine discipline was debated, but not agreed on. Family Medicine was the area most responsive to change and integration and the main goal of the MBChB programme at the School is to train competent family practitioners for the greatly underserved rural KwaZulu-Natal and general South African population.

It was eventually decided to schedule only one PE in the final year for formative purposes. The students, however, perceived no real benefit for taking the exam and rejected the idea, as they believed it would only add additional stress since each end of block examination still determined ultimate success (Personal communication, MRSC representative, 26 August 2004).

Prof BM explained that the perceived lack of clinical staff input stemmed from the increased student intake that had started in 1995. He explained that an agreement between the provincial Department of Health and the School leadership in the early 1990 was to limit the student intake to 100 in 2001, but

that new leadership in the provincial Department of Health and the University reneged on this agreement. In the light of the HIV/Aids epidemic and great demand for health professionals in the province, the new faculty leadership was coerced into accepting 200 students. In Professor BM's opinion:

The implementation process was too difficult since the student intake was too large. The University also did not come to the party as they promised people like you to assist in the transition. (Prof BM, interview, 27 March 2003).

He qualified the "people promised" as educationalists, administrators and support staff to the Faculty.

At a meeting of the Steering Group, debates ensued about a suitable place to locate a complete, personal portfolio for each student for progress and feedback purposes. A suggestion for theme heads to become more involved in assessments and the collation of marks was rejected since theme heads had not been told in advance of the additional requirements (Minutes of Steering Group, 23 April 2002). Theme heads, however, felt that their job description was in constant flux as the programme progressed, and they felt overwhelmed with challenges of the new responsibilities (Dr S, 19 March 2002). Some, especially clinical members of staff, noting the luke-warm stance of faculty leadership on faculty participation, abandoned the task in the second year of the programme.

6.4.4 Leadership

A fourth factor that impacted negatively on the implementation of *C2001* and the PE was the poor or lack of leadership in the School. To illustrate, my own

observations suggested that the Dean showed little interest in the *C2001* reform and that staff blamed him for not motivating them to buy into the innovation. He seldom attended the meetings of the Steering and Assessment Groups or the UG committee (field notes, 4 December, 2003). Instead, he often expressed the opinion that the curriculum was too costly to sustain and that the feasibility study had been inaccurate. On occasions when he was asked why he did not request Heads of Departments (HoDs) to allocate staff from their departments to facilitate or serve on the assessment committee, he argued that he was not at liberty to change the job descriptions of these clinical members of staff whom he thought were prepared to teach but not to participate in developing a new curriculum (Field notes, 4 December, 2003).

At a meeting on 21 May 2003, while addressing staff at the SUME tasked with central coordination of *C2001*, the Dean remarked that “the ship was sinking” and that “it should head for the nearest shore”. In response to this perceived crisis, he proposed a reduction in the PBL component of the programme (Minutes of SUME Meeting, 21 May 2003). With the Dean not supportive of *C2001*, the Chairperson of Steering Committee and the Deputy-Dean became the authority figures during the first three years of the *C2001* implementation until their respective retirement and resignation in 2002 and early 2004, respectively.

Following an Examination Board meeting at which a student representative questioned the marking criteria used during the final year examination, Dr P

(a third year Theme Head and clinician) thought that the leadership was too accommodating towards students and that *“they [students] are now dictating to us what they want... students had been allowed too much freedom.”*

Other members of staff thought that students had a false sense of accomplishment due to the way the PE had been implemented. At the time, Dr RT expressed concern that *“students are not sufficiently penalised for wrong answers, but that it would be difficult to enforce this rule in the current university climate.”* Other members of staff thought that students were given too much freedom and credit (Drs P& RT; field notes of exam board, 12 December 2003).

In 2001, following the release of the results of the first and second PEs, members of the assessment and curriculum groups expressed concern at the unprecedented high scores that many students achieved. When applying the rules strictly, some students were not obliged to take the final PE in order to pass the theoretical component of the year (Minutes of Steering Group, 18 September, 2001). Members of the group were disillusioned and thought that the PE had failed to distinguish between high and low achievers in the cohort (email correspondence, field notes with Mathematician Prof M, 18 October, 2001). A statistician was consulted to advise the Assessment Group on the use of a formula to aid the interpretation of the results. Due to the diversity of students in the programme, it was difficult to make decisions as either the matriculants or traditional young students (who mainly scored higher in the MAC) or the mature students (who scored higher on the NMAC) would have

benefited from any 'normalisation'. A decision was then taken not to adjust the marks, as the procedure had not been explained to students. Debates ensued on possible rule changes to be submitted to the Academic Board during 2002 to affect the processes of interpreting the results of the PE in 2003. This was decided as the academic year had proceeded too far to implement changes via the normal lengthy university procedures the 2002-academic year (Minutes of CDTF, 6 November, 2001).

After the writing of the final PE in 2001, the University Senate decided to inform students only of whether they had passed or failed on the exam. Marks obtained in the clinical examination (OSCE) were used to rank the students for positions in the class. Students who failed either the theoretical or the clinical component of the examination had to repeat both components the following year (Minutes of combined meeting of the UG, CDTF and Assessment Groups, 7 December 2001; Minutes of Assessment Group, 6 February 2002). Predictably, students were disappointed to find that their final result reflected the percentage obtained on the OSCE only and that a pass or fail was awarded for their achievements on the PE.

In 2002, under the guidance of the Senate representative, three substantial changes were made to the format and structure of the PE. The first saw the reduction of the number of test items in each PE from 250 to 200 to allow more reading time to the predominantly English second language cohort. The second introduced the concept of MAC and NMAC in the marking of the examination. The Faculty advisor recommended that the sections be

identified for students. The third change introduced a weighting of 70% to the MAC component and 30% to the NMAC section. The implementation of the weighting was to ensure that students kept abreast with the new content of *C2001* and revisited material from previous themes. This weighting further ensured that students wishing to achieve more than 70% had to read wider than the scope of their current modules. This was an important principle that was envisaged to reinforce life-long learning, especially since some students needed to maintain an average of 80% or more to secure a bursary. The year co-ordinator explained the changes to the student cohort in the following way:

In the model currently proposed, for the calculation for the first and second year level of students, the PE mark comprises two components: 70% = material already covered (MAC) and 30% = material that has not been covered (non-MAC) with the MAC increasing in each successive PE. (Student notice, 19 March 2002).

She clarified that it had become apparent during 2001 that at least a third of the class consisted of students with prior tertiary experience. While most passed the PE well, they had failed to achieve the expected outcomes in terms of the core material (i.e. material covered in completed themes). She believed that it would impact on their understanding in later themes and that the new rule would encourage students to see the importance and relevance of the core content. It also suggested that while the core was important, a student wishing to obtain a higher mark would need to read beyond the minimum expectation. The 30% was thus aimed at those students who wanted to supplement their marks and who wanted to test their knowledge gained through self-study and additional reading. The multiple choice question (T/F) formats, where five statements were linked to a scenario, were

used and negative marking (the deduction of 0.5) was applied to both sections. It was, however, decided that the score obtained on the NMAC section would not reduce the students' mark on the MAC section thereby protecting the major weighted component. While the adjustments were still clearly aligned with the pedagogical principles of *C2001*, the decision to separate the MAC achievement from the NMAC mark implied that students could guess in the NMAC section with impunity, a practice that some admittedly engaged in (Student NQ, field notes, 13 May 2003).

6.4.5 Decision-making

Linked to leadership, the fifth factor, which impacted negatively on the implementation of the innovation, was lack of confidence to make informed decisions in relation to the PE among staff members. To illustrate, some members of staff felt uncomfortable about their ability to make informed decisions on how the PE was to be used. A member of the assessment and Steering Group, Prof S, recalled his experiences and reasons for abandoning the Assessment Group during the planning phase.

I felt frustrated as I asked for an opportunity to interrogate an example of the Maastricht PT of which the Chairperson had a copy. It was never presented nor discussed (Prof S, Interview, 7 March 2003).

Other members of the Assessment Group felt that decisions regarding the use and format of the PE had already been taken and that their efforts at customising the exams were futile. Prof M explained his absence from the Steering Group around discussions of the PE by stating that he:

.... cannot recall attending any meetings regarding the planning for assessment or being informed about a suggested format I was

supposed to have been sorted out by the educationalists. (Prof M, Interview, 7 March 2003).

The Assessment Group functioned as a task team of the Steering Group, which in turn functioned as a task team of the Undergraduate Committee. Both groups were not recognised as formal committees of the Faculty Board and so their decisions could be overturned. Some of the task teams also appeared to work at cross-purposes. Some thought, *"It was easier to use an exam that was used elsewhere instead of reinventing another format."* (Interview Dr R, theme head, 8 September 2003), while others... *"did not have sufficient understanding of the big picture"* (Prof O, Member of UG, Interview, 26 June 2003).

There were also complaints about the way in which decisions were made. For example, Dr I expressed the opinion that:

Decisions are made for you and about you without including you in the process. This leads to mistrust, as there has not been any dialogue around some important considerations. (Dr I, 6 August 2003).

A member of the Assessment Group thought that she had been working at the 'coal face' and kept the process on track in the early years, but that her contribution had not been acknowledged or rewarded (Dr H, email, 19 February 2003). Prof L also wrote that she had volunteered to help with the coordination and that she had not anticipated having to 'beg' colleagues for their contributions to the assessment programme. She thought that unusual measures were expected of her, such as physically visiting with Heads of

Departments to obtain the work that had been taught during the year.

Another coordinator thought that:

...despite the lack of a clear formal agreement on the duties of the Theme Head... members rallied around to the best of their abilities under extremely difficult conditions. (Prof L, 13 June 2002)

Those who were relocated also expressed feelings of being undervalued. A member on the joint appointment agreement felt that the University and the School did not value the efforts and time of staff that performed teaching duties under difficult circumstances:

Members who had been moved from Joint Appointment posts to peripheral hospitals were treated poorly. Our emails at the university were just discontinued irrespective of the fact that we were still teaching on the programme. (Dr I, 6 August 2003).

Dr H, a member of staff who volunteered on the Assessment and Steering Committees, thought that co-operation between members of staff would not improve due to the vague guidelines and lack of policy directives given to members of staff. He thought it needed *“a negotiated and agreed upon policy regarding the provision of assessment items”*. He expressed concern regarding the quality of assessment items offered from some disciplines and thought that the faculty needed to appoint a team to oversee *C2001* assessment and that the Assessment Group should have representation at the UG committee. Dr S's views concur, as he became frustrated because the goal post of the requirements of theme leaders changed constantly. He did not want to provide students with feedback after the theme tests and said that he had not been aware of this requirement when he agreed to the

responsibility of Theme Head (Dr S, Theme Head, Interview, 19 March 2002).

Some members of staff thought that the uncertainty surrounding the programme caused unease. Others became disillusioned and resigned from the working groups due to personality clashes. Dr CD explained:

I eventually had to leave the group because I couldn't deal with the personalities. People would come to the meeting with set ideas, not listening to others or negotiating and bombard their way through. I could not work like that and had better things to do. (Dr CD, clinical representative, 11 April 2003)

The concerns and suggestions of the Assessment Working Group were reported to the Steering Group and the Director of the Medical Education Development Unit mediated between the groups. This mediation, however, rested on his presence at meetings, which could not be guaranteed in the long-term as he neared retirement and was forced to take his accumulated leave or have it forfeited (personal communication, Director the Medical Education Development Unit, May 2002). The Director, tasked with the implementation of *C2001*, eventually retired mid-way through the implementation process.

Findings suggest that staff felt overwhelmed by the large student intake and the lack of guidance on the use of the PE. In addition, the lack of faculty leadership, poor communication and mixed messages from the various committees and working groups failed to harness the energy that staff had at the start of the reform process. In this regard, the relocation of some to more

distant physical locations, high staff turnover and the effort to keep the School project on track seemed to have impacted on staff morale.

In the section below, findings are presented of how students experienced the PE and *C2001* implementation.

6.5.1 STUDENTS' EXPERIENCES OF THE PE AND *C2001*

To assess how students experienced the implementation of *C2001 generally and of the PE in particular*, data were obtained from observations, focus group discussions, student questionnaires, and document analysis of theme evaluations and the promotion statistics of the cohort.

First, it is important to note that during the first two years of *C2001* implementation, students mainly received verbal feedback on their progress. Their requests to retain the question papers were not accommodated as staff from clinical departments feared it would compromise the security of their question banks. They argued that the students had access to examples of end-of-theme question papers and model answers that were similar in format to the PE.

On their experiences of *C2001* and the PE, responses gathered during the focus group interviews indicate that their perceptions of the PE were mainly influenced by their experiences in *C2001*. Some students indicated that the transition to *C2001* and self-direction was rather difficult at first. Many became distraught because members of staff told them that PBL had not prepared them as well as their predecessors (who had studied in the

traditional curriculum) for a career in medicine. One student expressed it in the following way:

I had a lot of uncertainty, doubt and unanswered questions about this new curriculum but due to my experiences of Curriculum 2001, I have acquired skills of maturity, independence and the enthusiasm for learning and [I am] experiencing new things everyday. As a student who underwent the first year of the traditional curriculum in 2000, I can see the difference. (Student RM, repeating year 1, Focus group, 21 February 2003).

Other students doubted the success of *C2001* and their ability to show personal progress after being told by members of staff who opposed the reform that the curriculum was not preparing them adequately for future clinical practice. In this regard, a student reported having experienced:

...negative attitudes from senior students, negative attitudes of some Heads of Departments and Doctors in the wards and these [attitudes] makes one doubt oneself (JS, Field notes, Student group representative meeting, 15 August 2002).

Another student reflected that:

Much of my perceived shortcomings come from being told by clinicians that our knowledge is deficient to what doctors who qualified in the traditional programme or at other universities were expected to know. (Student no 54, data from open ended-section of student questionnaire, 6 August 2004)

Thus, data from focus group discussions and questionnaires suggest that most students generally held positive views towards the PE and the new curriculum. To illustrate, some thought that those who trained in the

traditional curriculum that was being phased out, were threatened by the presence of the PBL cohort.

Some students believed that while the ability to score more than a 100% on the PE might have added to a distorted idea of their abilities, the new curriculum was putting them at an advantage compared with their predecessors. Student XM explained:

As first year students, we are already attending the course on the medical school campus as opposed to previous years when first years were taught on the main campus. In addition, we have stethoscopes for clinical skills training; visit the hospitals for history-taking and observations, and we get more than 100% in the exams (which didn't make sense at first) and they... [Traditional students] think we are getting preferential treatment (Student XM, Focus group, 26 February 2003).

Similarly, on their experiences of the PE in particular, questionnaire data indicate that 50% of the cohort thought that the PE was useful and suitable to assess their cognitive learning. Reasons included the fact that the PE assisted them in monitoring their progress from year to year and it helped, as *"one needs to stay abreast with your work"* (Student no 37, data from open ended-section of student questionnaire, 6 August 2004)

Another student commented that the PE *"uses the spiral process, which forces one to revisit your previous work"* (Student no 24: Response from open ended-section of student questionnaire, 6 August 2004). Another student suggested that it was useful since:

...it is still exactly the way we were told in first year. I believe that my previous work is not neglected since we are expected to sit for the same examination as students in the junior years (Student no 17, Response from open ended-section of student questionnaire, 6 August 2004).

Another valued the PE because it encouraged understanding (as opposed to memorisation of facts). She claimed that she *“did not study just prior to exams any more since most of the information could not be found by just reading a book”*. Another thought the PE was *“too abstract and [that it was therefore] meaningless to study for and so it teaches me to try and understand concepts”* (TF& NN, Focus group, 21 February 2004).

Others, however, did not think that the PE was suitable for developing their cognitive skills, with one disgruntled student commenting that it:

...is based on how many facts a person knows but it does not reflect the quality of that [which] one knows (Student no 9, Response from open ended-section of student questionnaire, 6 August 2004).

Yet another student justified his perceptions by stating:

I'm only choosing/guessing answers, and... anyone could pass this examination (Student no 46, data from open ended-section of student questionnaire, 6 August 2004).

Comments thus reflect that some perceived the PE as just another multiple-choice examination based on cases. A few students also questioned the validity of the exam, with one stating that:

... the way we learn and the way we are tested are two different things as they [examiners] tend to concentrate on information that are less important than the core knowledge (KL, Focus group, 21 February 2004).

Others believed that PE did not improve their learning. For example, one thought that *'anyone could pass the exam as passing it (PE) did not show that one understood the work'*. (MZ, focus group, 21 February 2004).

Some responses suggested that students found the assessment tool and the assessment system unfair (observations notes from the Student Curriculum Conference, 14 August 2003). For example, Student KL complained that some statements were vague and failed to relate to the scenarios used as prompts in the exam questions, which made it difficult to commit to an answer. (KL, focus group, 21 February 2004).

Students also felt that the curriculum and the examinations had not been adequately deliberated. One student's comment captured this sentiment:

I also feel that the curriculum organisers should be at least be a year ahead with the planning of the curriculum (CS, Notice on WebCT, 24 April 2002).

The student requested more information on the structure and format of the assessment and thought it would alleviate anxiety, especially at examination times. To illustrate, the Chairman of the MSRC penned a letter to the Chairperson of the Assessment committee in which he stated that:

...the problem does not only lie with the format and structure of the exams, but also with the lack of leadership in the Assessment Committee. Exams are problematic in that it has not changed despite the transition of curriculum (Letter to Head of School, SUME from the MSRC Chairman, 14 August 2003).

Students thus had varied understandings of the PE with only a few believing that it helped them to monitor and engage in deep learning. Others thought that scenarios and statements were vague and thus encouraged guessing. Those who were dissatisfied with the PE thought that it did not serve a feedback purpose (as was originally planned). Some suggested that *“the PE should cover the taught material only”* and that *“multiple choice questions can never measure the amount of work that one has acquired.”* (LG, focus group, 21 February 2004). They added that assessment in the new curriculum was not adequate as

...there are not enough tests and T/F does not test knowledge or, more importantly, students’ understanding [of] topics. (Second-year student at student curriculum conference, 12 September, 2002).

A guiding principle of the implementation of the PE was that it would render test-directed swotting useless (See Chapter 1 for a full discussion). Data from this study suggest that this did not happen for this cohort. Despite comments from the majority of the class indicating that they could not prepare for the PE, most respondents to the questionnaire thought that they needed study leave prior to the PE. Despite some impressions of the PE as an ineffective assessment tool to assess the depth of their knowledge, some

students still preferred the multiple-choice question format to other formats.

One student's comment illustrates:

I do not know how to write short answer questions for assessments or how to prepare for essay assessments. (Student no 63, Student questionnaire, 6 August 2004).

Students also preferred the 70:30 weighting introduced for the MAC and NMAC components in 2002 because it conformed to the way in which they had received marks previously. They thought they stood a better chance to perform well with this weighting as *"it gives the students a chance to pass well and encourages one to read widely"* (ZM, focus group, 21 February 2004). Another explained that *"it is well structured and we can score on the material that we know"* (LX, focus group, 21 February 2004).

Some also linked their preference of the multiple-choice format to how the results would be viewed by outside stakeholders. For example, one commented that:

It makes sense to our sponsors and bursars as it was a bit outrageous that you could get more than 100%. (JS, field notes, student group representative meeting, 15 August 2002).

Thus, with students expressing mixed opinions on the ability of the PE to assess their cognitive knowledge, I turned to the examination results of the cohort to gauge their actual performance on the PE in the first five years (2001-2005). My assumption was that students' performance was an important indicator that influenced their perceptions of the PE.

6.5.2. Statistics of the cohort on the PE

As discussed in Chapter 3, 48% of the 2001 student cohort was mature students, i.e. they had completed or partially completed a tertiary qualification, in Science, Health Science or a related discipline. Examination results indicated that these mature students had ample prior knowledge and generally performed well on the PE, especially on the NMAC section that contained material not yet covered at the time of the examination. As discussed in the sections above, the students' good PE results caused a great deal of discomfort to some members of staff. To illustrate, by the end of 2001, the School's administrators voiced concern about the scores of more than 100% that students could achieve on the PE. They believed it positioned the NRMSM in an embarrassing light (personal communication with Director of the Medical Education Development Unit, 18 October 2001). Help was sought from a Mathematician to 'normalise' the marks and to represent it that would be familiar to outside stakeholders such as parents and bursars. It was, however, very difficult given the range of mature and younger traditional students in the cohort as an adjustment would have favoured either the mature or the new matriculants in the specific cohort (field notes of meeting with mathematician, 23 October 2001).

During this time, a university senate representative was assigned to mentor the School and a number of urgent meetings were called to decide on an acceptable way to publish the PE results. The Chairperson of the Assessment Committee eventually suggested that the OSCE proved to be a better discriminator between the high and low performing students of the

cohort. As discussed above, this led to the decision only publish a pass or fail result for the overall PE. This decision was, however, taken after the students had written the third PE of the year (Minutes of special exams meeting, 12 December 2001). As they were unaware of the developments, some expressed shock at the way in which the marks were packaged upon their return in January 2003 (Field notes, 6 February, 2003).

The students generally performed well on the PE. In 2001, only one student failed the first PE (May, 2001) while three failed the second (August, 2001). Everybody achieved the required 50% on the third PE (December 2001) and all the students in the cohort passed the average of the three PEs as was prescribed for passing the theoretical component in the faculty rules (Faculty rule book, 2001, M4).

Twelve students, however, failed to obtain the prescribed 50% pass mark in the clinical examination, i.e. OSCE component but they all obtained between 40-49% which qualified them for taking the supplementary exams (Minutes of assessment committee, 7 December 2001). A summary of the results is indicated in Table 6 below.

Table 6: Analysis of 2001- Student Results

Year	Weighting	No of students	Exam Dates	No of students who failed MAC	No of students who failed PE
2001	None Themes	194	May	Not used	None
			August		
			December		
2002	70 MAC: 30 NMAC Modules	185	May	34	13
			August	27	2
			December	4	3
2003	80 MAC:20 NMAC	171	May	1	
			August	9	
			November	0	
2004	None	169	June	1	1
			November	1	1
2005	No PE as each of the 6 clinical final year disciplines continued with the end of block assessment				

As indicated in the table, three progress examinations were written in each year of the first three years of *C2001* only. Several reasons account for this. In the first instance, due to the national Department of Education compelling institutions to introduce more flexible learning programmes, Universities were asked to modularise all tertiary education courses. Thus, during 2002, the themes in *C2001* were rearranged, first into modules and then (by 2004), they were packaged into two semesters, each culminating with a PE, i.e. two PEs per year. . The overall performance of the cohort indicates an attrition of about 13% over the first four years.

Students initially thought that it was rewarding to score more than a 100% for the PEs and for some, it led to an increased awareness of personal progress and the use of improved study methods. Staff, however, viewed the student results on the PE as confirmation of the tool's inability to differentiate between strong and weak candidates. From 2002, and coinciding with the introduction of the weighted sections, students started to request more time to prepare for each PE. The changes to the PE in the subsequent years and the lack of feedback further caused students to lose faith in the ultimate benefit of the PE and they thought that the School was engaged in an ill-constructed experiment (Field notes, student curriculum conference, September 2004). The next section reports on the factors that influenced the implementation of the PE in the context of *C2001*.

Findings in response to the research question pertaining to the factors that influenced the implementation of the PE indicate that students had varied experiences of the PE. While some thought it was useful because it required them to revisit prior topics, others claimed that they did just as well by guessing on the examination. Most students did not feel that the PE assessed their abilities at problem-solving or understanding. In fact, students preferred MCQ over short answer questions because they claimed not to be familiar with studying for the short answer format.

In addition, the PE had not been implemented as promised (with individual profiles and feedback), factors that could have detracted from any formative

value. The students' experiences of the PE were again closely linked to their experiences in *C2001* and their interactions with staff in the setting.

6.6 FACTORS THAT SHAPED THE IMPLEMENTATION OF THE PE AND *C2001*

A sub-section of the third research question explored the factors that shaped the implementation of the PE. Data sources included web communications from the student discussion forum, analysis of documents such as the minutes of meetings and the curriculum package, staff interviews and observations of interactions and discussions regarding the PE and *C2001*.

6.6.1 Students as self-directed learners

The implementation of *C2001* and the introduction of the PE were to support deep and self-directed learning in students. It was envisaged that knowledge of students' performance and areas of weakness would direct staff and students efforts in addressing identified shortcomings for future learning. During the first two years of *C2001* implementation, there was much confusion regarding self-direction amongst both staff and students. Staff had various interpretations of the extent to which they should provide guidance to students while the students were unfamiliar with the scope and depth to which they should conduct independent research. The situation was worse for those studying in English as a second language, especially those who matriculated from poorly-resourced secondary schools where lecturers often prepared notes for learners. Some members of staff thought that students should not receive any guidance (e.g. lectures or overview notes) because

they were supposed to ‘teach themselves’. This was very confusing to students and one student complained on WebCT that:

We are expected to pay fees without being taught and should only pay half because we have to teach ourselves! (Student MX, discussion forum on WebCT, 24 April 2002).

Some students also thought that the PE had not been valued. Following the prize-giving ceremony in 2002, a student expressed his dissatisfaction with the awarding of a top prize by stating that he felt as if he had been cheated in a way. He explained that he had higher percentages on the three PE examinations than the student to whom the prize had been awarded, who presumably had done better on the OSCE. He also thought that it would be difficult for him to share information with his peers in the tutorials if they were competing for the top prize. The competitiveness between graduates and selfish behaviour was some of the factors that the PE was to have alleviated. It was to instil a sense of individual mastery and an ethic of working towards their personal best. The awards were based on the final result of 2001 where the OSCE score was used as the main discriminator between students. It, however, entrenched the summative functions of assessment strategies at the School.

6.6.2 Staff beliefs

Data from interviews, minutes of meetings and observations of discussions revealed that the staff perceptions had a major impact on the implementation of the PE and *C2001*. Findings from this study suggest that not all members of staff embraced the idea of curriculum reform at the NRMSM. Some

believed that the issue had caused divisions within the School while others voiced concerns about the sub-standard quality of students accepted into the programme. They queried the students' ability to cope in programmes that expected a degree of self-study and self-direction and thought that the school was "*running the risk of lowering academic standards*" (Minutes of Faculty Board, 18 July 1994).

As mentioned previously, the major concern during the *C2001* reform stemmed from suggestions by change agents that it was possible to reduce the amount of content covered in each discipline to emphasise core content only. Some members of staff argued that the nature of their disciplines did not allow for the teaching of core content. In addition, they believed that students from poorly-resourced high schools needed additional material to be on par with their counterparts from better-resourced schools. The Dean voiced repeated concerns about the capabilities of the students in *C2001* and proposed the implementation of more traditional, didactic teaching to supplement *C2001*. Prof BM, a member of the Steering Group believed that:

...the Dean came half way through the process but he had to focus on the image of the Faculty in the wider context. (Prof BM, interview, 27 March 2003).

He thought that the Deputy Dean:

...did a good job, but it's sad that he [Deputy Dean] did not get the Dean's support and that we lost him to another medical school in the country. (Prof BM, interview, 27 March 2003).

The staff also questioned the School's ability to manage the process of curriculum integration and it became apparent that staff felt poorly prepared to engage in the pedagogical and professional decision tasks expected of them. Some thought that their disciplinary content did not allow for the use of the true/false assessment format. Others opposed the idea of reducing the teaching of their disciplinary content to reflect core material only. By February, 2000, approximately a year prior to the implementation, the Steering Group had produced a document detailing the themes of the first four years (Curriculum Package, 20 February 2000). While the document detailed the core components for each module, assessment was still to be discussed. The document, nevertheless, suggested the PE for student assessment and proposed a set of rules to govern the implementation thereof. These were presented and accepted by the Faculty Board by June 2000, six months prior to *C2001* implementation (Curriculum package, 20 February 2002).

While attempting to secure Faculty input for assessment decisions (function, format, and norm vs. criterion referencing), a staff development workshop was arranged. The Director of the MEDev Unit reported that details could not be discussed because participants were mainly novice lecturers who lacked a basic understanding of assessment terminology (Minutes of CDTF, 9 June 2001). Instead, staff at the workshop expressed their reservations about students' ability to succeed at self-direction. They doubted their own ability to cope with PBL and thought that *C2001* required even more independent work than what could be expected of poorly prepared students. For example, Dr B thought that students' success in PBL depended on the quality of their prior

educational experiences and the extent to which it had prepared them for self-directed learning:

I do not even understand what this PBL is about. Can we really expect any degree of independent work from the students? (Interview, Dr B, 16 July 2001).

Seven years prior to the implementation, another member of staff expressed a similar view. PBL was too complex for him to understand and he questioned students' ability and the suitability of the philosophy in the context of such a resource-poor, Third World environment such as the NRMSM (Minute of 263th meeting of Faculty Board, 5 July 1994).

To illustrate, some believed that the assessment system did not sufficiently separate the students according to their abilities. Dr ND thought that "*sub-standard students were sifted more efficiently*" from medicine in First World medical schools (Interview, Dr ND, 17 July 2001). He feared that the School's obligation to admit under-prepared students would lead to a lowering of the quality of teaching. He did, however, agree that the School should become aligned with modern international and South African educational trends (Dr ND, Interview 17 July 2001).

There were also those who were proud of the School's achievements during the traditional programme and thought that they only required guidance on how to proceed. In Dr P's opinion,

...We were passionate that we were preparing excellent clinicians at the School. We were just not adequately equipping them with skills for the 21st century. Considering that it had taken five decades for the

faculty to consider curriculum reform, clarity was needed on how to proceed. (Dr P, Interview, 9 October 2001)

Members of staff were also skeptical of the Faculty's abilities and the availability of resources to organise such a major undertaking. Prof AS explained:

The implementation process required a level of educational insight and administrative complexity and considerable administrative integration to design and deliver the different components in the multiple case presentations. I am doubtful of our ability to deliver that. (Prof AS, 25 July 2002).

While some staff participants thought that the implementation was premature, others (mainly Steering Group members), thought that the time was right for the change. To illustrate, a member of the CDTF declared “...*the faculty had buy-in and momentum and that it made sense to implement*” (Dr CD, Interview, 11 April 2003). There were also those who volunteered with the coordination of assessment items but who had experienced difficulty in the absence of an assessment office with this function. (Prof L, email to the Chair, Steering Group, 13 June 2002).

A further factor that impacted on and shaped the adoption of the PE and *C2001* related to the fact that students were to be treated as adult and self-directed learners. Attendance of lectures in *C2001* was thus not compulsory. This became an issue for some members of staff who measured their success in terms of students' attendance at the teaching sessions. Some thought that the decision had not been interrogated and that students were

allowed too much freedom to do as they pleased. Dr JJ expressed these sentiments:

How would they [students] know what is important if I do not tell them or if they are not compelled to attend... [the lecture]. (Dr JJ, field notes of workshop to orientate to PBL, 5 February 2004).

Some lecturers were concerned that students may not attend after they had made efforts to prepare the lecture content. In terms of the PE and the establishment of the question bank, a few members of staff thought that the students were an untapped resource that could be drawn upon to submit questions on themes. To tap into this resource, a Theme Head suggested that the students would have been exposed to a number of cases by the end of the first year and that one should allow groups of students to compile case scenarios that could be added to the assessment bank. The idea to use students to expand the question bank was, however, not supported by the rest of the staff.

Finally, some members of staff did not believe that *C2001* or the PE could succeed. Dr MG's response, in particular, illustrates this:

I do not think that this programme will work. When I was a student, we were told that we needed to attend all classes and registers were kept. We worked our fingers to the bone. We had Anatomy spotters all the time. These students do not know enough and they want to get away with knowing even less. How can anyone expect of me to say that some structures in the body are more important than others. They will not have the luxury of a week to go and research their anatomy when presented with a surgical emergency. (Dr MG, field notes of workshop to orientate staff to PBL, 5 February 2004).

This section presents the factors that shaped the implementation of the PE. First, students believed that they did not receive sufficient direction from lecturers on the scope and depth required for study in PBL. They also thought that the aims of PE was not been adhered to as staff refused to provide feedback. In addition, students thought that the PE became just a paper exercise that only marginally influenced summative decisions at the School.

Staff resisted the idea of designing a core curriculum and thought that students should be compelled to attend lectures. Even the Dean was sceptical of PBL. He thought it was costly and failed to allocate human and financial resources to support its implementation. He also did not secure or promote faculty participation in C2001 and the PE.

6.7 CONCLUSION

This chapter presented findings from the study that addressed the question of a possible misalignment between the aims of *C2001* and the way in which the PE had been implemented. The first research question was: *What educational principles influenced the adoption and implementation of the progress examination in the context of PBL at the NRMSM?* In response to this question findings indicate that the School had sound reasons to embark on curriculum and assessment review. These included:

- Agreement amongst staff and the acting faculty leadership to consider curriculum reform.

- A genuine intention to improve the learning experience of learners at the school and to equip them with life-long learning skills.
- A favourable post-apartheid climate for reform and a growing international trend towards the modernisation of medical curricula.

The second research question asked *what stakeholders' understandings of the nature, principles and goals of the progress examination and its suitability for assessing students' cognitive learning in the context of PBL were.*

Findings indicate that students expected individual and group feedback to inform them of their strengths and weaknesses while members of staff of the CDTF thought that the PE would develop deep learning strategies in students. CDTF members also believed that the PE could be tailored to the needs of the School. Lecturers especially those on joint appointment were sceptical of PBL and needed time to familiarise themselves with the educational philosophy. In addition, assessment was not planned for while members of staff were hesitant to participate in educational decision-making processes.

The third research question explored *the experiences of stakeholders of the PE and the factors that shaped its implementation.* Students had varied experiences of the PE and *C2001* which included beliefs that the PE encouraged understanding rather than rote learning and that it influenced their learning positively. Others, however, thought that the PE failed to assess their understanding and problem solving abilities and they claimed to be performing equally well by guessing on the PEs. Students thought that

changes were being made too frequently to the PE. They also thought that the PE had not been implemented as promised and that it did not serve any formative value in *C2001*. Members of staff felt restricted in the use of assessment options that were amenable to computer-assisted marking and thought that their experiences of the PE could not be isolated from their experiences with *C2001*.

The following enabling factors shaped the implementation of the PE. These included the political drive from students to see an improvement in their learning, the initial presence of a small group of change agents to champion the cause and the culture of renewal and transformation in South Africa that encompassed national curriculum reform in schools.

Limiting factors, however, included the lack of orientation and training for staff, the rapid turnover in change leaders, disinterest from faculty leadership and a lack of resources, the restructuring of health resources, poor organisational support and poor planning for implementation. Furthermore, the leadership did not address the voice of sceptics who demoralised students by eroding their self-esteem. Perceptions of severe staff shortages could have added to the view that the PE had evolved into a cumbersome commodity that tested the skill of members of staff rather than deep learning and understanding of students.

The study sought to examine the extent to and ways in which there was a misalignment between the professional and pedagogical goals of the PBL

curriculum (*C2001*) and the PE as a strategy adopted to assess cognitive learning at the school. From these findings, there appears to have been a mismatch between the aims advocated by *C2001* and the PE and the way in which the curriculum was implemented and practiced at the School. The findings will be discussed in relation to the theories offered in Chapter 4 (learning and assessment of students). The next chapter seeks to explain the misalignment between the curriculum reform introduced at the NRMSM (*C2001*) and the assessment approach/tool (the PE), and identifies the implications for curriculum reform at the School and in medical education, as well as for future research.

CHAPTER 7

IS THE PROGRESS EXAMINATION A SUITABLE TOOL FOR ASSESSING PROBLEM-BASED LEARNING IN MEDICAL EDUCATION? DISCUSSION AND IMPLICATIONS

7.1 INTRODUCTION

This study sought to examine stakeholders' (staff and students) experiences of the implementation of the progress examination (PE) and its efficacy as a tool for assessing problem-based learning (PBL) in the undergraduate programme at the Nelson Rolihlahla Mandela School of Medicine (NRMSM). Using a case study methodology to address the research questions, the study was embedded in the social constructivist paradigm that emphasises the role of social encounters for making meaning of educational settings (Atherton, 2005). This perspective includes principles of adult, deep and self-directed learning (Biggs, 1994; Brookfield, 1995b; Miflin *et al.*, 2005; Stefani, 2004). As discussed in the preceding chapters, the study was premised on the perception of a possible misalignment between the pedagogical aims of *Curriculum 2001 (C2001)*, a *PBL programme*, and the PE to assess the cognitive domain in the programme. As such, the study examined the curriculum decision-making that informed the implementation and adaptation of the PE as an assessment tool in the context of *C2001* at the NRMSM.

As indicated in Chapter 2, qualitative inquiry into and publication on, formative assessment in PBL has been limited (Fowell *et al.*, 1999; Nendaz & Tekian, 1999). In particular, there has been a dearth of research into the use of formative assessment practices to promote learning in PBL settings

(Fowell *et al.*, 1999). In addition, much of the research into student assessment in medical education is consistently reported from a positivist tradition (Harris, 2002) and often fails to consider the social and cultural context of teaching and learning.

This study was informed by Fullan's (1991, 1999) theory of educational change, Boud and Middleton's (2003) notion of lecturers' communities of practice and the social constructivist theory (Atherton, 2005). In particular, the social constructivist perspective privileges the principles of adult learning (Knowles, 1984; Brookfield, 1995a), self-directed learning (Colliver, 2002), lifelong learning (Miflin *et al.*, 2000) and deep learning (Biggs, 1994; Rushton, 2005). From these theories, this thesis posited first that change agents and curriculum drivers at the NRMSM based their decisions for curriculum and assessment reform on sound professional and pedagogical principles to enhance student development and improve teaching practices at the site.

As evidenced in the previous chapter, findings suggest, however, that staff members did not share a coherent understanding of the purpose and format of the PE and that a common understanding was limited only to Steering Group members who essentially drove the reform. There was thus a mismatch between the principles of the PE as advocated in *C2001* and the understanding and experiences of stakeholders. Evidence of a strong theory of education was further only present during the initial stages of the reform and did not diffuse after the retirement or relocation of key change agents. Furthermore, while there was some understanding of a theory of education

and educational principles that informed the need for curriculum reform, implementers of *C2001* at the NRMSM lacked a strong theory of action (Fullan, 1998). In addition, the findings suggest that curriculum reform was only superficially achieved (Fullan, 1993), resulting in the perception that the innovation failed to meet the ideals proposed at the outset. Secondly, this study posited that staff and students' understandings and acceptance of the nature and purpose of the PE would have influenced their participation and experiences of its effectiveness and that the nature and quality of the institutional support would have influenced their views of the reform. Thus, informed by the above, the study used a case study approach to investigate the appropriateness of the PE as a tool for assessing students' knowledge in the context of the PBL curriculum at the NRMSM.

In this concluding chapter, I revisit the data gleaned from the case by identifying the main themes that emerged from the findings. I juxtapose my findings against the knowledge base on curriculum change in education in general, and medical education in particular, and critically analyse the findings in the light of the theoretical positions outlined in Chapter 4. I then illustrate how this study extends and advances our understanding of what is currently known about reform in medical education contexts. I also discuss the implications of the findings for curriculum policy and practice at the School and identify additional research questions that have emanated from this study.

7.2 SUMMARY OF THE MAIN FINDINGS

During the process of curriculum reform at the NRMSM, it was envisaged that the PE would be a suitable assessment instrument to develop and enhance deep, meaningful learning in the context of *C2001* among undergraduate medical students. This was to be achieved through multiple sittings of the PE and the continuous assessment of the final curricular outcomes at every sitting of the examination (Verhoeven *et al.*, 2005). Findings from the study, however, suggest that the PE, as it was implemented at the NRMSM, was not a suitable tool to assess students' cognitive learning in the context of PBL in *C2001*. Instead, after several adaptations over the years, to meet short-term needs, it eventually became another summative examination with the major weighting assigned to content most recently covered in the programme. The original philosophy of the PE as an assessment tool that assessed students against the exit outcomes was lost as it was modified to suit the immediate needs. These adaptations left stakeholders, especially students, disillusioned about the possible educative purposes of the PE. The section below summarises the findings responding to each of the three research questions.

The first research question asked: *What educational principles influenced the adoption and implementation of the PE in the context of PBL at the NRMSM?*

Findings from the study suggest that clear professional and pedagogical principles informed the curriculum and assessment reform processes at the School. From the documents studied, it was envisaged that the implementation of *C2001* would integrate teaching and learning. As an

assessment tool, the PE was advocated to facilitate students' problem-solving skills on content of the *core curriculum* that reflected the local situation. This was to be achieved through the use of clinical case scenarios that simulated authentic problem solving (Banta *et al.*, 2001) at multiple sittings of the examination. The multiple sittings were to ensure that students were not assessed on a single assessment opportunity but that their progress would be informed by multiple assessment opportunities. By continuously assessing the final year outcomes, the PE was to promote life-long learning among the learners, reminding them of the ultimate goals to which they needed to aspire. Upon writing each PE, students were to have received feedback on their personal progress to aid them in self-reflection. With feedback widely recognised as the single most powerful influence on students' learning (Hattie, 1987), the feedback received on each PE was to have informed students of their strengths and weaknesses and helped to direct their energies in future learning tasks (Hattie & Jeager, 1998). Through the regular assessment of the final exit-outcomes, it was also believed that students would be directed towards the use of deep learning strategies and clinical application rather than using strategies associated with short-term memorisation and recall. In fact, the use of short-term recall and memorisation strategies were exactly the type of learning behaviour that the PE reputedly would prevent.

The study sought to examine the manner in and extent to which students and staff understood these principles and their significance in the teaching and learning environment. As such, the second research question asked: *What*

were stakeholders' understandings of the nature, principles and goals of the progress examination and its suitability for assessing students' cognitive learning in the context of PBL? Data collected from participant observations, interviews and minutes of meetings indicated that individual staff perceptions varied widely, depending on their degree of participation in the reform process. The perceptions of staff were also influenced by how they had experienced the early implementation of *C2001*. To this end, members of the Curriculum Development Task Force (CDTF) expressed a shared understanding that the PE, through the acquisition of long-term and functional knowledge, would reduce stress and anxiety that students traditionally experienced. They also believed that the formative nature of the PE, through its use in terms of feedback, would support remediation in student learning and that the PE's emphasis on exit outcomes would have encouraged understanding and meaning-making in clinical context.

The staff, of which the majority served both the University and the provincial Department of Health (i.e. joint appointments) generally, had less understanding of the aims of the PE than those who were full time employees of the University. Many were not sure why *C2001* had been implemented and complained that it was too time-consuming, and as a result, refused to serve on the assessment structures of the School. Many of these members of staff thought that it was difficult to identify core content in their disciplines and expressed feeling restricted by having to design assessment questions in the format of the PE (i.e. a scenario linked to the true/false MCQs). Many

simply refused to attend assessment meetings and often submitted questions of poor quality to the assessment group.

Students expected to be advised of the criteria for success on the PE prior to sitting for the examination. They requested and expected copies of the question papers on many occasions and monitored their individual progress eagerly. They were told that educationalists at the Medical Education Development Unit would have monitored their progress and wanted to be informed by members of staff on how their results compared with others in the cohort (i.e. as satisfactory or unsatisfactory). They also anticipated appropriate academic support and counseling from the School, depending on the outcome of their PE results, and outcome that had not been met.

The third research question asked: *Following the implementation, what were stakeholders' experiences of the PE and what factors shaped its implementation?* Students' perceptions of the PE were influenced by their experiences in *C2001*. Some described the learning environment as hostile and unsupportive. Some *C2001* students felt belittled, embarrassed and victimised by negative comments of some members of staff towards the "new programme". Not all the students appreciated being constantly compared with those who studied in the traditional curriculum by members of staff. Some students, having entered the programme from mainly teacher-centred secondary schools, reported initial difficulty in adjusting to learning in *C2001*. They, however, thought that they could see the benefits of PBL and the PE for the future. Some members of staff thought that the tool was ineffective in

discriminating between high- and poor-performing students and that they generally performed too well on the PE. Others believed that students were not adequately penalised for guessing on the examination and that the adaptations to the PE had been detrimental to its formative function.

Findings from the study also suggest that as the other major stakeholders in the School, on the one hand, students viewed *C2001* and in particular, the PE as a positive intervention in their learning in medical education. For example, they thought that the PE was an effective tool for assessing their learning and believed that the spiral nature of the exam encouraged them to revisit work studied in previous years. Their responses suggested that they believed the examination helped others “to monitor their progress” and helped them to stay up-to-date with the work. On the other hand, while the majority of the cohort expressed a preference for the (T/F) format of the PE over written assessment formats, believing that it required less examination preparation from them, others were skeptical of the PE’s effectiveness for assessing their understanding. In general, the students thought that the PE was easy to pass and that they could guess some answers during the examination.

With regard to their participation in curriculum decision-making during the implementation of the innovation, the majority of staff viewed assessment decisions in *C2001* as the domain of educationalists. They often expressed feelings of insecurity and a lack of competence regarding their role in the assessment decision-making process. For example, members of the

Assessment Group felt marginalised and believed that some members of the more formally recognised Undergraduate Committee disregarded their recommendations in terms of the adjustments made to the PE.

A sub-section of the third research question was: *What factors shaped the implementation and modifications to the PE?* Findings from the study suggest that several factors, both internal and external to the NRMSM, influenced the initial implementation and subsequent modifications to the PE. The workshops offered by the PBL experts did not address the issue of student assessment. Assessment in general was also not considered during the pilot modules that had been tested prior to *C2001* implementation.

Other internal factors included the ongoing and *ad hoc* changes to *C2001* reform in response to issues arising. Many of the adaptations to both *C2001* and the PE reflected ‘stop-gap’ changes that were not based on a coherent evaluation programme (Fowell *et al.*, 1999). *C2001* also received poor organisational and leadership support. It further coincided with semesterisation at the university, which placed serious restrictions on the duration of the academic year and the format and number of assessments that were practicable during each semester. Staff thought that changes to *C2001* took place without sufficient consultation and viewed the establishment of the SUME as a mechanism to control their time and academic activities. They complained of a lack of faculty leadership while CDTF members believed that their efforts in driving the reform were not valued.

Furthermore, the School, after being asked to increase its intake of students to address political transformation, felt burdened by the large student cohort that severely challenged human and physical faculty resources. This restricted the assessment options to formats that were open to computer-aided marking. The increased student intake also brought about greater diversity in the student population with nearly 50% of the cohort entering as non-traditional “mature” students who were skilled at exerting political pressure to get what they wanted in terms of the teaching and learning arrangements, including assessment. External factors, such as the restructuring of the Ministries and provincial Department of Health and Department of Education also impacted significantly on the stakeholders’ experiences of *C2001* and the PE. For example, most members of staff, especially those on joint appointment (employed by the university and the provincial Department of Health), felt overwhelmed by uncertainties that these external factors as well as the internal reform processes brought to their daily realities. Many opted for private practice, leaving academic and clinical departments severely short-staffed.

The section below discusses the findings and explains some of the reasons for the PE failing to be an effective tool for assessing learning in the context of a PBL curriculum.

7.3 EXPLAINING THE FAILURE OF THE PE AT THE NRMSM

Based on findings from data presented in Chapter 6, several issues emerge. During complex curriculum reform and without appropriate institutional support and guidance, medical lecturers were unable to shift their

understanding and practice of teaching and learning to engender more transformative educational practices. Some openly resisted changing from a teacher-centered to a student-centered philosophy and practice. This negatively impacted on the success of the PE and *C2001* in a number of ways. The first problem stems from the failure of the curriculum developers and its leadership to consider assessment as an integral component of the reform process. The format and purpose of the PE at the NRMSM was neither addressed during the preparatory workshops, nor was it considered during the pilot modules that preceded *C2001* implementation. Related to this oversight, was the deficient educational understanding that some members of staff had of the goals of the PE. In this regard, Fullan's (1990) advice holds true that even well intended reforms can fail if stakeholders fail to see the relationship between the reason for the innovation and its purpose at the school.

First, informed by the theoretical frameworks discussed in Chapter 4, this study was premised on the notion that good understandings of the curriculum reform among the stakeholders (medical students and staff) at the NRMSM would lead to its effective implementation and improved teaching and learning. Findings from the study suggest that the stakeholders had varied and often inadequate understandings of the nature and purpose of the PE in the context of PBL at the school. These understandings further influenced their behaviour and relationships with their colleagues and students. In addition, and despite the proclaimed student-centered approach of *C2001*, some members of staff also questioned the educational value of formative

feedback that the PE warranted. In the absence of an agreed and coherent assessment policy, many members of staff refused to serve on the new committees and failed to address students on feedback. Others only provided superficial explanations for assessment decisions. From these actions, it became clear that they did not consider the students' needs or the educational impact of their actions on students' learning. In fact the actions of staff failed to demonstrate a willingness to encourage students in life-long learning or to embrace practices that would have impacted on their own professional development as lecturers (Cranton, 1994).

Staff also preferred to protect the confidentiality of their assessment question banks. In this way, they did not harness the opportunities for learning that the PE offered and failed to maximise the learning that would have been best when based on the experiences of the learners (Kolb, 1984). If the PE had been used as planned, the computer-aided analyses of the results would have informed stakeholders of students' misconceptions and highlighted areas for improvement. The incorporation of a feedback system would also have helped to develop a culture of learning where staff regularly interacted with learners and where the environment would have encouraged learners to develop their skills of self-assessment (McMahon, 1997; Derry, 1999).

Findings also suggest that staff members did not believe in the ability of many of the students to direct their own learning or to be independent in learning. There was no trusting environment in which students could interact with their more knowledgeable lecturers to demonstrate more transformative

conceptions of learning (Torrance and Pryor, 1998). Instead, *C2001* students complained of the “hostile learning” environment and the staff’s criticism of *C2001*. Some students became demotivated by the constant negative comments relating to their ability and reluctant to share their concerns or to expose their misconceptions in the presence of lecturing staff.

Students did not receive opportunities to use their knowledge in relation to newly acquired information (McBrien, 1997) and failed to interrogate the gaps in their knowledge because they feared exposing their ignorance. The lack of these learning opportunities possibly hindered students from developing into confident graduates who could use medical terminology appropriately to phrase questions and who were skilled in self-reflection and self-assessment (Rushton, 2005). This thesis therefore, argues that the failure to create a trusting learning environment thus inhibited learning in the programme in that it became difficult to gauge the extent of the support that students required to succeed at learning (Taylor, 1998).

With regard to staff members’ beliefs, and partly due to the appointment of an Assessment Head who did not have any educational qualifications, were the seemingly annual, *ad hoc* adaptations made to the PE during the first few years of implementation. These adaptations followed in response to issues that became evident as the first cohort moved through. The seemingly *ad hoc* adaptations further reinforced the students’ perceptions of being ‘guinea pigs’ in a programme that had not been thoroughly planned. While the PE had been implemented in its original format (assessing outcomes in the students’

first year), the concepts of MAC and NMAC which refer to the content previously covered and content not yet covered were introduced in 2002 with a weighting of 70:30 allocated to each of the MAC and NMAC components respectively. The NMAC component that represented the final curricular outcomes was further reduced and received a weighting of 20% in 2003.

Coinciding with semesterisation in the new, merged university, the number of PEs was reduced from three to two per year (*i.e.* one per semester) in 2004. Students also complained that questions did not always assess what they had learnt and they thought that a final mark that included a NMAC component disadvantaged those who competed with students from the allied health and pure sciences for bursaries and other forms of financial assistance and incentives. Thus, this thesis argues that the failure of the PE to focus on core and exit outcomes hampered the desired alignment between the taught, learnt and assessed areas of the curriculum (Gipps & Stobart, 2003) and between the PE and the PBL curriculum. In fact, the adaptations to the PE failed to consider what McHarg and colleagues (2005) identified as one of the most critical features to retain for the PE to stay true to its function (*i.e.* assessing students' progress). To effectively assess progress, is the authors' argument, the PE should persistently include and assess content covered and passed by students in previous years (McHarg *et al.*, 2005). Contrary to these principles, at the NRMSM, various factors, including the militant student body exerted strong pressure for the PE to assess only content covered during the semester that preceded the examination (to the exclusion of the previous years' content).

Furthermore, the reduction in the number of PEs in a year prevented the School from demonstrating students' progress (McHarg *et al.*, 2005). The increased emphasis on the summative function of the PEs and its scheduling at the end of semester resulted in most students, except those who failed, not receiving feedback. Students became increasingly critical of the formative influence of the PE and eventually refused to be assessed on NMAC content altogether. This finding affirms the argue of Miller and Parlett (1974) regarding the sensitivity of students to cues and rewards in relation to assessment and their ability to alter their learning behaviour depending on the assessment requirements (Marton & Säljö, 1997; Ramsden, 1997).

By 2005, the clinical departments were faced with a double load of final year students and preferred the 'tried and tested' end-of-block examinations that had been used in the traditional curriculum. Each of the six clinical end-of-block examinations assessed students' knowledge and competency only in the specified disciplinary content and little integration or interdisciplinary collaboration occurred. By August 2004, the students, fearing the constant comparisons between the PBL and the traditional cohorts, refused to sit for the PE as it had not been incorporated as part of the assessment plan of their final academic year. Again, departments argued that they failed to plan for the eventuality of the double cohort in the final year class in 2005 and that they were not able to assess learning in ways other than computer-aided marking due to the large student numbers.

In summary, as a tool, the PE thus failed to assess students' cognitive knowledge in the context of a PBL curriculum at the School. Reasons for this failure included poor and inadequate understandings and acceptance of *C2001* and the PE among staff, a lack of a common understanding of self-directed learning for students, lack of opportunities for collaboration and failure to achieve deep learning and meaningful reform. In the section below, four possible explanations are offered for the failure of the PE in this context.

7.3.1 Varied and inadequate understanding of *C2001* and the PE

As evidenced by data from the study reported in this thesis, a possible reason for the failure of the PE at NRMSM relates to the academic staff members' insufficient understandings of the philosophy and purpose of the in the context of PBL. This is premised on the notion that the educator's role is critical in the development of self-direction in students (Norman, 2004). Students need the flexibility of a trusting, learning environment to practice critical questioning and thinking and guidance in appraising new information (Patel *et al.*, 1990). The thesis argues that in the light of the diverse student cohort at the NRMSM, guidance from informed teacher experts would have supported students in building confidence in applying problem-solving techniques and practices in groups to new encounters. Furthermore, receiving immediate feedback from these experts would also have helped learners psychologically to trust their instincts when applying the newly acquired skills (Patel *et al.*, 1990).

As reported in Chapter 6, staff at the school did not receive any substantial training on PBL and in particular, on the PE and were not oriented on the expectations that accompanied the implementation of the PE. Consequently, despite statements that the *C2001* aimed to inculcate student-centered approaches, the staff operated seemingly oblivious to the educational impact of the PE on teaching and learning. The mismatch between the aims of *C2001* and the PE further became evident, as students' expectations for increased interaction with discipline experts in a conducive social learning environment did not occur. This process of social interaction is necessary to provide students with individual feedback regarding their strengths and weaknesses and opportunities for reflection on gaps in their knowledge. Learning in such an environment could potentially stimulate students' interest in their progress which could lead to increased sense of responsibility for their learning (Knowles, 1986). To achieve and inculcate self-direction in the students was after all one of the aims of *C2001* and the PE was viewed as a vehicle for achieving this.

Failing to consider and plan for assessment as part of *C2001* reform further led to the School's omission to diffuse the concept throughout the Organisation. Rogers (2003) defines diffusion as a special kind of communication around a new idea and can bring about a kind of social change. For the successful diffusion of the PE at the NRMSM, a number of cyclical information exchange processes would have been needed between change agents and stakeholders. These did not occur and expectations of some members of staff for the PE to differentiate between high and poor

performers were thus not verbalised or addressed until after implementation. The lack of planning also became apparent in the incoherent strategies employed when the school faced problems such as the impact of having mature and matric students in the same cohort. Many members of staff did not actively support the formative function of the PE and became disillusioned when the results in response to the summative use of the PE did not satisfy their needs. Instead of evaluating the effects of the assessment strategy and reflecting on its use as advocated by Fowell and colleagues (1999), adaptations were made in a piece-meal way that failed to consider the effects of the changes on the coherence of the assessment strategy and *C2001*.

Since teaching experience alone does not develop more transformative conceptions among lecturers (Norton *et al.*, 2005), it is vital that institutions wishing to pursue transformative educational practices, provide appropriate training and institutional support to its academic staff. This is especially needed for institutions that regard academic growth towards becoming effective lecturers as a developmental process (Higgs & McAllister, 2007). For example, the failure of the school to provide training in the development and use of the PE as an assessment tool also led to a situation where most members of staff were not skilled in the construction of effective higher-order assessment scenarios. This impacted on staff members' confidence in assessment-item-construction with many claiming that the content of their disciplines was unsuited to the assessment format of the PE. As a coping mechanism, some simply submitted items without linking the data to the

statements and, in the process, the PE lost face validity or its authenticity. The limited understanding, orientation and insecurities about their ability to assess using the new format resulted in reluctance from members of staff to participate in assessment activities and failure to serve on the Assessment Group.

The lack of understanding of the intention of the PE amongst members of staff impacted negatively on their behaviour, practices and relationships with their colleagues and students. Literature reviewed in Chapter 2 suggests that assessment can inform learning if considered integral to the curriculum and the reform (Fowell *et al.*, 1999; Shepard, 2000). Also noted, is the importance of reflecting on the effects of an assessment strategy on the learning behaviour of students (Cowan & Harding, 1986) and the interplay between these factors on learning (Race, 1996). Staff did not believe that feedback on assessment would provide students with opportunities to reflect on their learning or that the practice would ultimately enhance students' motivation to learn. They thus lacked the fundamental pedagogical understanding of the reasons for feedback.

In addition, the professional practice of staff did not reflect a caring nature or the desire to consider the impact of their attitudes and teaching styles on students' learning (Race, 1996). Instead, while the implementation of *C2001* should have been viewed as a significant paradigm shift towards a student-centered approach, the practices of staff remained firmly rooted in a positivistic, teacher-centered paradigm. Due to poor planning and

management, the NRMSM also discontinued orientation and induction of staff into the philosophy and purpose of the innovation. The decision to discontinue the Medical Education Development Unit where staff could collaborate and share their challenges was further detrimental to the knowledge base and experiences of lecturers at the site.

Aligned with the negative beliefs of staff regarding *C2001* were patterns of behaviour that indicated a poor understanding of pedagogical terms used such as student-centeredness and self-direction. The behaviour of staff can be understood and explained if one views their beliefs as the basis from which they engaged in curriculum decisions (Cheung and Ng, 2000). Their beliefs about students' inability to engage in independent learning and the reminders to *C2001* students about their lack of knowledge and competence could be explained if we acknowledge that staff's attitudes largely reflected reproductive conceptions of learning (Murray & Macdonald, 1997; Vermunt & Verloop, 1999). Staff essentially viewed their role in teaching as transmitting information and learning as an accumulation of information (Rothman, 1992; Kember 1997). Their misguided beliefs of the PE and its purposes are also consistent with the reproductive conception of teaching and learning. The adaptations to the PE thus reflected a view consistent with their view of teaching (i.e. to measure the amount of information accumulated by students) and had a debilitating effect on their own ability to practice transformative conceptions of teaching and learning. Under these circumstances, it was also unlikely that these staff members would develop

higher-order learning skills among the students they were charged with teaching.

7.3.2 Failing to create opportunities for collaboration among staff

According to Wenger and colleagues (2002), a community of practice is necessary where people share an interest and pursue common activities to build relationships and engage in discussions where they learn from one another. Collaboration and team approaches are important during periods of curriculum reform as it encourage dialogue and aids inclusive decision-making (Duderstadt, 2000). In the context of C2001, such a community would have enhanced the understanding of the reform and contributed to the effective implementation. The established community would also have led to improved teaching and learning at the NRMSM. For example, good clinical patient cases for assessment were often deliberated at meetings of the Assessment Group but some lecturers resisted serving on this working group while others, due to service commitments and understaffed departments, seldom attended workshops that could have helped to improve their skills.

First-hand encounters in such a community where assessment cases are constructed could have contributed to the development of appropriate skills and helped lecturers to experience and understand the dynamics of collaborative learning. Instead, staff at the School worked mainly from traditional disciplinary orientations and was largely unfamiliar and uncomfortable with interdisciplinary collaborations. Mennin and Krackov (1998) partially attribute the lack of collaboration and resistance of medical

lecturers to participate in interdisciplinary teams as resulting from inexperience and unfamiliarity. In their study of curriculum drift at an American school, Robins and colleagues (2000) noted the same trend in response to curriculum reform.

This thesis posits that the formation of a learning community would have helped staff to share the collective responsibility for the reform. Since members of learning communities are both students and practitioners, staff would have been better positioned to appraise the advancements of the School towards the success of the reform. An additional advantage would have been that learning, even though it might have started in a formal structure such as the CDTF, would not have been limited only to members of that group. Instead, staff would have shared their experiences and tools to overcome challenges even across disciplinary boundaries (Wenger *et al.*, 2002).

The lack of a professional learning community at the NRMSM entrenched behaviours where staff in departments isolated themselves and only contributed to the programme when called upon by their line managers or the Dean. The central organisation of the programme and the establishment of the SUME was a factor that divided staff, and many clinical academic members of staff perceived the coordinating function of educationalists in SUME as having authority over their time and autonomy. This experience is at odds with literature that suggests an increased likelihood of success where

the innovation is centralised for planning, coordination and funding (Bland *et al.*, 2000).

The power of autonomy and need for independence over working conditions and hours is a factor also highlighted by Gale and Grant (1997) in their study of factors that challenged successful reforms. Those authors noted the priority of clinicians towards self-determination and the tendency to withdraw their participation and support in circumstances that tested their independent mode of operation. At the NRMSM, the poor learning culture manifested in a lack of enthusiasm amongst the lecturers and it prevented them from developing their own knowledge, skills and strategies to improve students' learning. Except for the small group tutorial setting where relationships between students and PBL tutors improved (McLean *et al.*, 2006), other spin-offs of a conducive learning culture such as improved collegiality, increased interdisciplinary collaboration and improved teacher-student relationships did not develop. In fact, students, already intimidated by the new educational environment, started to doubt themselves and their ability to be successful on the course.

7.3.3 Failing to develop self-directed learning among students

As an assessment strategy, the PE also failed to enhance students' cognitive learning and to develop independent and self-directed ability among the students. This is not surprising as not all students are capable of independent work at the outset of a tertiary qualification (O'Hanlon *et al.*, 1995; Greening, 1998). In fact, most students, irrespective of prior educational background,

need a period of adjustment to PBL (Alessio, 2004; Greening, 1998; Miflin *et al.*, 2000). For students to become self-actualised, intrinsically driven and competent professionals require a consideration of their physical, physiological, emotional and psychological needs (Maslow, 1970). This thesis argues that it would be difficult for students with poor self-esteem to develop into self-assured mature students unless they are actively guided towards the use of appropriate skills for deep and self directed learning (Quinlan, 2000). Furthermore, if we believe, as Knowles (1988) suggests, that students need a positive self-concept to develop independence and self-direction, then it is essential that learners develop these competencies in an environment that encourages interaction and dialogue and one that is free from judgment, a situation that was lacking at the NRMSM during the implementation of *C2001* and the PE. Inappropriate support or failure to support students invariably results in the widening of the gap between students from diverse secondary schooling experiences and those with prior educational disadvantage would be even more hesitant to express their misconceptions in non-supportive learning environments.

7.3.4 Failing to achieve deep learning and meaningful reform

For curriculum reform to be meaningful and deep, it has to draw on strategies that are both strong in a theory of education and in a theory of action. Fullan (1999; 2003) advocates that good educational ideas that hope to bring about reform must include sufficient and detailed plans of action that consider the context in which the reform is to succeed. Such contextual factors include the organisation's readiness to learn, the local capacity to drive and sustain

change and the various local contextual challenges that the reform are likely to encounter.

At the NRMSM, the purpose, format and rationale of the PE was only well understood by a relatively small section of the teaching staff who served on the steering group. This group met fortnightly to discuss and plan the *C2001* reform. Despite the introduction of a newsletter to keep staff informed of the progress made during the planning stages, there was little communication regarding the PE. Especially with reference to the PE, change leaders became preoccupied with implementing the PBL programme while discussions were not entertained to demystify the concepts and ideals of the PE.

In this regard, the thesis argues that the oversight had a major impact on the participation of staff since different stakeholders most likely had different views of the PE and its proposed functioning at the site. Findings also suggest that conflicting ideas were not discussed in a collegial manner. To illustrate, some members of the assessment group expressed feeling devalued and disregarded when those who served on the formal UG committee had overturned decisions taken by the assessment group. They opted not to participate any further in the reform. Others also noticed disinterest and non-participation of staff, which could have been avoided if stakeholders were respectfully made aware of why and how they were likely to disagree (Fullan, 2003)

For curriculum reform to be understood as contextually beneficial and meaningful, it has to be valued and supported both structurally and institutionally. While *C2001* and the PE were underpinned by a strong theory of education and initially well supported, the theory of action was not as well designed, communicated or executed. There are also indications that staff at the school suffered low morale and lacked commitment to work towards suitable solutions when faced with challenges. A possible explanation could be the fact that creative energies were needed both from staff and the faculty leadership to sustain the reform. In the case of the PE and *C2001*, members of staff also verbalised not being valued or supported by decisions of the faculty leadership. To illustrate, those who had been seconded to drive the reform were not nurtured or rewarded to keep abreast with developments and research in the departments from which they came. Support of individual change agents could have sparked a strengthening in the learning community (Fullan, 1993) if others noticed the positive spin-offs. Instead, it seemed as if only a minority shouldered the responsibility of the reform with little incentive for others to join. It is also obvious that the majority of lecturers at the School did not share a moral purpose to better the lives of the students (Fullan, 2003). Instead of adopting a proactive learning stance to find sustainable solutions or to improve their professional understanding and competencies, they refused to invest time or effort in teaching. Perhaps due to the lack of training and orientation and to overcome uncertainty, many had left for private practice and only some remained with huge service loads.

Wenger (2002) cautioned that new information diffuses easily in learning communities where the organisation is characterised by great autonomy, sufficient practitioner's orientation and a crossing of boundaries. A possible explanation for the failure to diffuse the ideals of the PE may have been the perceptions of staff that believed that their time and effort was not valued or was overturned by more formal structures. Senge (1990) affirms that change diffuses when stakeholders hold a shared view of the future that they seek to create. Such a shared vision is believed to encourage experimentation and creativity and it spreads through the organisation due to reinforcing processes. Senge (1990:227) asserts, *"the vision grows as people talk"*. Such a process includes discussions that add clarity to the theory of action and allows enthusiasts to share successes and concerns. It also supports the change as commitment from some stakeholders motivates others and where late adopters become familiar enough to join the ideals of the reform.

In terms of improved teaching and learning, it is clear that the implementation of *C2001* and the PE had little impact on developing deep learning among students who seemed to prefer the multiple-choice question format due to its ability to allow them to guess some answers. In addition, the reform did not improve teaching practices at the site. Students also did not experience the learning environment as conducive and instead of an increased motivation to learn, expressed fears of being victimised and belittled by staff and traditional students. With the formative component of the PE having been eroded, students ultimately did not believe that the PE would be of any benefit in directing and influencing their learning. Instead, the PE became viewed as an

additional hurdle to overcome. With students consistently adapting their learning to achieve only the highest possible marks, they admitted to guessing and the use of surface and strategic learning strategies to achieve this goal. These learning strategies were totally contradictory to the aims and philosophy of *C2001* and the PE.

The staff's lack of ownership of the new programme was often cited as a reason for their poor participation. It is argued, however, that, given the nature and context of the joint appointments of those who served both the provincial Department of Health and the UKZN, staff expected more guidance on how to manage and adapt to the reform. With the leadership in crisis, these aspects were not addressed prior to or during the implementation of the reform. Instead, claims by the Dean that the innovation was more costly than had been estimated, demoralised the drivers of the reform. The Dean's suggestions to "head for the nearest shore with the sinking ship" i.e. return to the traditional programme after having progressed only halfway through the PBL programme, probably prevented late adopters from investing and committing to the reform. The retirement of the Director jeopardised the leadership and further coincided with the low morale of the staff and the lack of support from the faculty leadership.

A possible explanation for the superficial nature of the reform may rest in what Fullan (1988) describes as a planning problem. It was difficult to plan for the collective effect of the external influences on the setting. While these factors (health and education reform and restructuring) could have been

planned for individually, their collective impact exacerbated an already difficult period for the NRMSM. In this regard, it was difficult for planners and decision-makers to foresee the complexity under which the reform had to be implemented.

Thus, based on the evidence presented above and in the previous chapter, this thesis argues that there was a mismatch between the intention of *C2001* and the PE and the way in which the PE had been implemented at the NRMSM. While there was a good theory of education and an understanding of the pedagogical reasons for the adoption of the PE as an assessment strategy, the necessary theory of action was lacking. Staff failed to embrace and support the reform process while the institution failed to provide sustainable leadership and guidance for staff to change their conceptions of teaching, learning and assessment in *C2001*. In Fullan's (1999) view, the intentions of the innovation matter little if its quality or appropriateness is not duly considered. With reference to this study, it means that the potential of the PE was thus missed as its appropriateness and aims in the context of *C2001* was neither deliberated nor supported.

7.4. IMPLICATIONS FOR PRACTICE

The successful implementation of innovations such as the PE in the context of *C2001* necessitates the consideration of approaches such as a faculty-wide system to ensure its implementation and coordination. There were many new roles and expectations for staff to become skilled in an unfamiliar paradigm. Strong and effective leadership was needed to ensure the success

of reform. In the light of the findings and explanations, several implications for practice emerge.

It is essential for organisations to support their members and to try new ideas without fear of retribution, especially when first attempts are not as successful as planned (Bland *et al.*, 2000). This thesis also posits that practices can only be amended once appropriate policies become implemented to affect and sustain the reform. The dean, generally accredited as the leader best suited and most influential to change the organisational culture, should therefore take the lead in creating a supportive climate for reform (Deal & Petersen, 1994). S/he should also make a concerted effort to involve staff at the grassroots level to secure broad-based buy-in, especially where the institution had been subjected to frequent changes in leadership, as was the case at NRMSM.

Specifically, stable leadership is important for successful reform but this was not a reality for the School. To sustain reform involves long-term planning and requires proactive leadership. It is therefore important to plan for succession (Louis & Miles, 1990) and to actively groom new leaders (Bland *et al.*, 2000). The leaders should also plan for the implementation dip by providing professional assistance to staff to monitor and adapt the reform (Eastwood & Louis, 1992) to local challenges. Bland and colleagues (2000) stress the importance for primary leaders to remain identifiable and committed throughout the implementation process. At the NRMSM, the lack of political support from faculty leaders resulted in severe human and

financial constraints that impeded the implementation and the success of the PE. While the late appointments and poor commitment of the Dean and his Deputy could partly explain the situation, it should not excuse leaders from being accountable for processes that transpire during their term of office.

Therefore, the school could use an electronic portfolio system or website to specify and communicate Faculty goals and priorities to potential Deans and Deputy Deans. Such a system would greatly help to inform applicants of the goals and initiatives that they would be expected to implement. Such a system may also help to ensure that leaders are accountable when they communicate progress on the attainment of goals (Eckel *et al.*, 2001).

Secondly, given the complex nature of reform, the prior educational experience of staff and varying confidence of entering students in the setting, it is important that the institution drives and supports the development of all stakeholders. To ensure alignment and a common understanding of institutional values, Murdoch-Eaton (2005) suggests that institutions specify the generic outcomes (transferable skills) that learners are expected to achieve. Greater dialogue between stakeholders would be required to facilitate greater standardisation and a common understanding of concepts with subjective interpretations. The stakeholders would ultimately have to come to an agreement on indicators that would signify successful achievement of outcomes. Such dialogue would probably be valuable to ensure faculties buy-in if stakeholders can agree on appropriate processes to follow and standard practices for remediation.

Morahan and colleagues (2002) attested to the value of a central coordinating office to improve staff participation. This finding is, however, contrary to the finding at the NRMSM where the central coordinating office was viewed with suspicion and thought to be a ploy to control staff's activities. The value of central coordination in Morahan *et al.*'s (2002) view was to be achieved through strategies that aided transparency and ultimate agreement to principles and processes to achieve institutional goals. A central evaluations office, such as the initiative attempted at the school (van Wyk, 2006), would also greatly facilitate the monitoring of quality assurance aspects of the reform. Having defined institutional priorities, the logic model could be used to measure, apart from satisfaction rates (Kirkpatrick, 1994), improved learning, performance or transfer in terms of teaching and learning against clear short and long-term indicators (Otto *et al.*, 2006). Regular reviews may certainly improve the culture of learning and the accountability of staff.

Thirdly, staff development is widely recognised as one of the most critical elements to successful curriculum reform (Bland *et al.*, 2000; Murray & Savin-Baden, 2000). The new roles expected of medical lecturers in PBL are numerous and include not only their medical expertise, but also competence as assessors, curriculum evaluators, learning facilitators and course organisers (Harden & Crosby, 2000). Having acknowledged a need for medical lecturers to be educationally qualified, the School should have incorporated a policy for doctors to become skilled educators, a requirement which is increasingly being recommended by accrediting bodies (GMC, 1999,

HPCSA, 2004). In addition, if the School viewed its lecturers as an important asset, leaders would have allocated more resources (time, money and effort) to the professional development of the staff. This type of investment is especially important if they were to become effective and compassionate lecturers tasked with “the training and education of quality medical practitioners to improve health care delivery in the future” (World Health Organisation, 1988). To increase the status and practice of teaching, the School could have collaborated with the Department of Education to offer flexible training options for doctors wishing to improve their educational qualifications. It should also have offered career paths for those wishing to pursue teaching as a profession as this could have led to an improved understanding of educational principles and practices of staff.

The change to PBL, therefore, requires the incorporation of an active staff development programme to complement curriculum reform. Evidence suggests that resource-poor institutions can achieve real savings by retraining their academic members of staff in the various roles expected of medical lecturers in PBL (Wingard *et al.*, 2004). With the requirements of graduates to perform and operate both independently and in a self-directed manner, as the ultimate aim of education and *C2001*, students will have to demonstrate mastery in skills such as analysis, problem-solving and critical questioning (Reynolds, 1997). They may also have to be assessed on these reasoning and thinking skills rather than through tools that allow for the selection of options from a multiple choice question list. Since lecturers need assistance as assessors, they will have to be mentored and trained by

discipline leaders or staff developers in these competencies. It is, however, imperative that lecturers become proficient in the use of assessor skills if they are to be effective role models for the learners.

A suitable staff development programme would thus go a long way to create a conscious awareness of the educational theories, assumptions and values that lecturers need for daily practice. Strategies such as workshops and seminars could also be used to enable members of the various committees to come to a shared and common understanding of values and expectations in terms of the teaching paradigm. A structured, institutionally focused series of workshops could also greatly promote reflection on teaching practice, and identify lecturers in need of training, mentoring or refresher programmes. A comprehensive programme would also have the potential to change the learning culture at the School and support lecturers towards transforming their consciousness (Grundy, 1987).

As mentioned earlier, more visible commitment from faculty and departmental leaders would ensure open and frank discussion on strategies to address problems anticipated by stakeholders. Collaboration between top-down and bottom-up strategies could also have created an enabling learning environment and improved collaboration within the organisation (Fullan, 1993). Resulting from a collaborative culture, limiting factors would then merely be viewed as solvable challenges to stakeholders. If stakeholders view challenges differently, then they would also be more eager to contribute their creative energies to finding successful solutions to implementation and

teething problems. Functions such as the coordination of assessment and Theme Head duties required educators to dedicate additional time from their busy schedules. The faculty that rewards teaching appropriately, such as an incentive that contributes towards conference fees, would surely have been welcomed by many during the initial and most challenging stages of the reform. A policy to reward and recognise staff for teaching contributions (including assessment) was, however, not immediately considered at the NRMSM and nearly derailed the implementation of *C2001* in its entirety (McLean & van Wyk, 2006). It is, however, essential for an institution that expects its teaching staff to transform their thinking, attitudes and behaviour to play a more active role in supporting and developing these competencies (van Wyk *et al.*, 2007).

Fourthly, adult-learning principles require a willingness from lecturers to accept new and often unfamiliar educational roles. Many lecturers, however, lacked exposure to formal educational literature and appropriate experiences and needed institutional support to meet these expectations. In this context, this study agrees with Hargreaves (1997) that teaching involves giving of oneself in an emotional experience of caring and forming relationships with students. This function was unfamiliar to staff. The practice of assigning a mentor to support lecturers emotionally (Hargreaves, 1997) would have provided guidance and support when they tried innovative strategies for unforeseen challenges.

For such a programme to be successful, policies would need to be in place to mandate each teacher to become familiar with the instructional philosophy. At a practicable level, lecturers would need to be assigned to knowledgeable or confident co-mentors or discipline experts in an environment that encourages inter professional sharing. The co-mentoring model would have promoted an equal sharing of ideas and aided the formation of a strong professional network. Educationalists could help to monitor and sustain such educational initiatives through professional interactions and training videos of critical incidences that sustain a culture of learning amongst members the staff.

Fifthly, this study and others have shown that students start their higher education experiences with varied ability in knowledge, self-directedness and transferable skills. It is thus necessary to identify their deficiencies accurately to provide appropriate academic, financial, psychological or emotional support. A practice to assess students' knowledge and skills upon admission would have helped to identify the nature, scope and depth of assistance that students require for success on the course. The faculty has started, although in a limited capacity, to assess the communication (English and isiZulu) and computer literacy skills of first-year students and to provide formal assistance and hands-on experience to students during patient encounters and hospital visits. Students' transferable skills, knowledge and self-directedness upon entry to *C2001* have, however, not been measured consistently. It would also help to evaluate students' knowledge and skills upon entry and at critical points in subsequent years to support teaching and learning at the NRMSM.

It would help students in becoming more effective at self-assessment, and feedback to staff could inform improvements of the curriculum and the student academic support programme. Such a policy is certainly necessary considering that these are stated outcomes of *C2001*.

PBL aims to improve the quality of the adult learning experience and to maximise the learning environment. Student-centred philosophies, while recognising the value of knowledge as the foundation for medicine, are primarily concerned with processes to verify that students can apply the knowledge appropriately (Friedman Ben-David, 2000).

7.5 IMPLICATIONS FOR RESEARCH

Changing a curriculum is a complex and multi-faceted organisational undertaking. While this study essentially set out to investigate the alignment between the goals of the assessment strategy that was to further the aims of *C2001*, it also highlighted how the structural and personal orientation of lecturers played a major role in the way the innovation was perceived. It was not possible to explore all the dimensions and factors that influenced the failure of the *C2001* generally and the PE in particular.

Considering the worldwide trend towards global requirements for doctors to be trained lecturers, there are a number of key questions that I would have liked to explore in greater detail and that would make for worthwhile research enquiries later. First, given the complexity and diversity of the students in the programme, one would want to understand the impact of secondary

schooling on learning in medical education and particularly in the context of PBL. Such a study could address the question: To what extent and in what ways does secondary education, and in particular, secondary school context influence students' performance in medical education?

Second, consider the lack of training in assessment in the context of PBL, justifies a study that examines staffs understandings of the links among teaching, learning and assessing. In a context such as that prevailing at the NRMSM, whether staff development activities would contribute to successful intervention and alter the beliefs and practices of staff towards more supportive practices such as mentoring and student feedback, also warrants further exploration.

Third, the ways in which medical educators, who trained in traditional curricula, understand, accept and embrace their role as facilitators of learning and assessors in PBL contexts needs further research. In particular, it would be informative to explore the nature and scope of the support required by staff to effectively teach in PBL curricular contexts.

7.6 SIGNIFICANCE OF THE STUDY

On the basis of the research evidence presented in this thesis, particularly the reform and implementation processes and experiences of the stakeholders at the NRMSM, I present five concluding arguments or explanations for why the PE is not a suitable assessment tool in a PBL context (e.g., *C2001*). The first explanation is evidenced from the fact that,

while staff at the school demonstrated a good understanding of the principles of the PE in the context of C2001, they failed to accept and embrace their new roles within C2001, and the fact that the majority of them did not demonstrate. To illustrate, the reluctance and/or failure of staff to provide continuous and developmental feedback to students about students' learning suggests that staff understandings did not include transformative conceptions of teaching and learning. Literature reviewed in this thesis (Savin-Baden & Major, 2004) suggests that lecturers who engage in transformative practices must display a willingness to guide learning by posing thoughtful questions. Informed by Bland and colleagues' (2000) notion of the effect of internal networking on the operations of an organization, this thesis posits that staff's interactions with learners and peers could offer multiple perspectives to an issue or problem, and this in turn, could contribute to improved understandings and deep learning in the classroom (Mezirow, 1981). Within such a social setting, both teacher and student would be led through the process of reflective practice to question their assumptions, beliefs and values but this did not occur at the School. Thus, the failure of staff to understand this conception of teaching and learning, and their role therein, contributed to the failure of the PE at the NRMSM.

Secondly, findings from this study suggest that the lack of effective, visible and stable leadership negatively impacted on the success of the PE at the school. For example, stakeholders' views were that the Dean did not support C2001 and that he also did not provide sufficient resources for its successful and sustained implementation. In Mennin and Krackov's (1998) view,

effective and strong leadership is essential for successful and sustained reform. As indicated in Chapter 3, Deans and Deputy Deans at the NRMSM seldom served the full 5-year term of office. The unplanned resignations and suspensions caused further anxiety in the already unstable organisational environment. The instability in leadership, coupled with the increasingly politically-aware student population (especially since 1994) greatly affected the quality of relationships between staff and students and impacted on the mediation and conflict management skills required from faculty leadership. As established from previous studies, the Dean of a Medical School remains the leader most suited and influential to bringing about a change in the organisational culture and to work towards sustaining reform (Cohen et al., 1994; Mennin & Krackov, 1998). This can, however, only happen if the Dean is fully aware of the faculty's priorities and supportive of the outcomes of the reform. S/he has to stay informed of appropriate educational developments and ensure that he support the principles that enables the organisation to grow. S/he should also delegate appropriate power to those competent and able to positively affect the reform (Fullan, 1999). An effective leader should also allocate appropriate and adequate resources, incorporate appropriate rewards, and provide assertive and proactive governance and possess the ability to coerce professional expertise (Bland et al., 2000).

The mandatory retirement age of 60 of critical change agents also influenced staff instability/mobility. To illustrate, the Director, who had been tasked with the implementation of *C2001*, resigned before seeing it through, and with no plans for succession, it was difficult to effectively fill the gap It is thus

imperative for schools to align leadership and appropriate resources – both human and physical – to allow implementation and evaluation of the outcomes of the reform.

Thirdly, curriculum development activities during the planning of *C2001* at the NRMSM did not include assessment: How students' problem-based learning was to be assessed. This is contrary to advice recommending that assessment is fundamental in curriculum reform (Cowan and Harding, 1986; Fowell *et al.*, 1999) and integral to curriculum design (Broadfoot, 1999; Gipps, 1999; Driesen, 2000; Schuwirth, 2006). Workshops and skills development had also not been planned for in the pilot programmes and no training was offered prior to the implementation of the PE. Staff's flawed understandings of the PE within PBL became obvious in the adaptations and modifications made to the tool, and the skewed ideas of feedback, which saw a major disregard for the formative aspect and purpose of the PE. Findings from this study have highlighted the importance of viewing assessment as a pivotal aspect of teaching and learning and the value of integrating assessment and curriculum reform throughout all the iterative phases of planning, implementation, evaluation and review.

Fourthly, in spite of a strong, collective theory of education that informed the initial desire for curriculum reform and for the introduction of PBL at the NRMSM, evidence suggests that multiple and complex forces, both internal and external to the School, impaired the successful implementation of the PE. While many factors influenced the changes to the PE, some of these

were beyond the control of the local curriculum and faculty developers. These unforeseen factors, such as the semesterisation and the Department of Education and Department of Health's transformation processes, however, had serious repercussions for the potential formative use of the PE. To address this, active and broad-based participation between stakeholders was needed to secure agreements for much clearer and detailed plans of action that sustained efforts at reform (Gale and Grant, 1997). In relation to Fullan's (1991) theory of change, the change to the PE can thus best be regarded as superficial and unsustainable (Fullan 1991; Fullan, 2001). The aims remained restricted to a few policy documents (Fullan, 1999, 2001; McRel, 2000), while the daily practices of teaching, learning and assessment showed little improved practice. This is contrary to the deep and self-directed learning that students were meant to have achieved. In addition, the passion for learning that the PE brought did not motivate staff to engage in individual or interdisciplinary collaboration.

Finally, in explaining the findings, I argue that medical educators at the juncture of curriculum reform needed extensive institutional support and professional development to come to terms with the uncertainties of the reform. This thesis posits that staff will only develop a sense of moral and professional obligation to change their practices once they reflect on and confront their own beliefs and commit to amend these to benefit the student. The institution did not prepare or develop its lecturers to embrace principles of lifelong learning or to become facilitators of learning. Staff then failed to provide a trusting environment for learning and failed to support learners in

becoming independent and self-directed in their learning. Plans for the reform should therefore have included more concrete strategies and action plans and sufficient detail of the processes to follow to ensure systemic, faculty-wide buy-in by stakeholders. Furthermore, as the literature suggests and as evidence from the study illustrates, an institution faced with reform should therefore provide support, visible leadership and incentives to its staff to challenge the underlying beliefs that govern their educational decisions.

The main significance of this study lies in the methodology. This study used a qualitative research approach to investigate assessment in medical education, a field that has for too long been dominated by a quantitative research tradition. Studies of the PE in particular, had been conducted in First World countries using research strategies dominated by a strong quantitative, psychometric tradition. In this qualitative study, the PE became the vehicle for a broader, more comprehensive examination into issues of alignment between assessment and learning in a PBL curriculum. The qualitative approach provided a much fuller description of the context and peculiarities of the setting.

Thus, this qualitative study has provided greater insight into the situational context and stakeholders' responses to the factors (both internal and external to the immediate setting) that coincided with the reform. The study provided the contextual reality of why progressive curriculum reform fails in resource-impoveryished settings. I demonstrated that progressive curricular reform aimed at greater learner autonomy and improved learning behaviour can

potentially fail if lecturers do not support these student-centred philosophies. This stems from medical lecturers' lack of educational orientation and training, which may have contributed to their resistance to change. In contrast to existing views that an overly detailed and prescriptive curriculum limits lecturers' decision-making and participation, findings from this study suggest, on the one hand, a need for a greater consultative approach, and on the other, agreement to detailed plans for medical lecturers to commit to a strategy of reform (Gale and Grant, 1999; Bland *et al.*, 2000). This case study has also offered a deeper understanding into the complexity of factors (e.g. human and financial resource constraints) specific to developing countries and diverse and varied prior educational and cultural learning experiences of students that present major challenges to reform. The study also presents practical and policy implications for researchers in similar conditions to address some of these challenges.

Finally, the study documented the adaptations to the PE in relation to *C2001* and its effects on students' learning. It might thus offer a useful learning experience for other schools with similar constraints and contexts. For example, previous studies of the PE had assumed relatively similar, prior educational preparedness of tertiary students. Issues of student diversity have, however, become more pronounced in the post-apartheid South African education arena. With our research site greatly mirroring the challenges confronting tertiary institutions in the larger South African society, insights from this study highlight the degree to which higher education institutions should prepare and provide culturally sensitive staff, develop

appropriate curricula and provide academic support to contribute to the creation of a more just and equitable society. The lessons learnt might also be of global interest, considering the rising numbers of political refugees and international students who now contribute to global diversity, where these issues may challenge conventional educational systems, curricula and the beliefs of the teaching staff. This case thus heeds change managers to consider wider political and societal factors when planning and implementing reforms. In the South African setting, the heightened politicized student body and efforts at democratizing the higher education sector might have added to the demise of the learning culture. It possibly also caused curriculum and assessment to be viewed as political topics to be controlled by either students or staff.

7.7 CONCLUSION

The main research question that this study addressed was: whether or not the PE was a suitable assessment tool to assess students' cognitive knowledge in the PBL context of *C2001*. Findings from this study suggest that the essentially formative nature and purpose of the PE had not been explored. It also became clear that the fate of the tool became a secondary issue to constant and complex change as experienced by stakeholders in the setting. Thus, the findings have significant implications for how change is managed in view of external political decisions on the life of the organization (the school).

The study also illustrates how the outside social context influences conditions in an organization such as the NRMSM in ways that significantly determine the fate of an educational innovation such as the adoption of PBL and the PE. For example, the volatile political context of the country at the time of the introduction of PBL (2001) as well as the highly politicised student body coinciding with the introduction of an essentially foreign educational innovation presented huge challenges for the implementation process.

From these unforeseen developments I draw a few lessons to be heeded by potential innovators. Informed by Rogers' (1983) theory of the diffusion of innovation, foremost would be the need to engage and educate members of staff from as early as possible about all aspects of the proposed change. Early debate would be useful as it would encourage a climate where staff can negotiate meaning, agree and support each other especially when they are expected to transform their thinking in response to complex and controversial change.

Second, staff in the organization (school) need to agree on a suitable development programme with activities to create, advance and sustain awareness of progressive innovative educational ideas. Decisions should be made on how such a programme could be used in a coherent way to educate all lecturers and when and how to frame the policies and practices for successful implementation.

Faculty leaders (management) are expected to lead by example through thoughtful plans and appropriate resourcing of the innovation. To create an enabling organisational climate, they need to reward and support appropriate professional behaviour. A proper change management plan would need to be devised to ensure that leaders become strategically placed to advance the understanding of the change, to ensure that cordial relationships become established and to further a supportive system. These factors are important to achieve and maintain the delicate internal consistency needed between the educational philosophy, design and the curriculum in action (Zizimat & Miflin, 2003). The roles, responsibilities and degree of interaction required between lecturers and learners should be communicated and initially even monitored to identify and address non-compliant behaviour.

While I acknowledge that innovations and ideas that worked elsewhere may not be appropriate for implementation in all contexts, this thesis posits that in the case of PBL, it is important to debate and decide on the educational principles that would be suitable to strive for in a student centered curriculum. Evaluations of the impact of educational impact of these innovations should also be conducted to inform ongoing review.

Lastly, the cultural sensitivities at the NRMSM have tended to complicate the implementation of PBL and PE since their inception. First, while *C2001* aimed to promote social values and cultural tolerance, it was implemented against the backdrop of a setting where staff and students were continually confronted with issues such as the student quotas, which restrict entry on the

basis of race. These practices might be better understood if explained in the context of the School's mission to provide mainly black physicians to serve the underserved population of KwaZulu-Natal.

Second, a significant number of students came from schools which did not adequately prepare them for study at university, partly due to their different cultural, language or religious settings. This may impact on how differences of opinion are perceived and settled. Issues such as shy or non-participative behaviour highlighted in the tutorial process may thus stem from difficulty by students to express themselves in a secondary language while others have also noted that assertive responses and direct eye-contact with elders could be perceived as culturally inappropriate in some settings. It may thus be necessary to appoint cultural monitors to a setting such as ours or train staff and students in skills that foster tolerance and acceptance of different cultures. It may also be that the awareness raised with regard to cultural diversity during the brief orientation programme, may be insufficient to have a lasting effect. This is probable because the orientation period is often perceived to be of lesser educational importance by students. These perceptions will, however, need to be evaluated.

As discussed in Chapters 1 and 5, there were several limitations to the study. Key amongst these was my dual role as a researcher in my own backyard. As a participant observer in the setting I often struggled to manage the multiple roles that accompanied my functioning. The multiple methods of data collection I used, however, helped to ease this complexity. Another factor

related to the tedious process of sifting through and making sense of the incredible amount of rich, qualitative data that I collected during the six years of the study.

This study was, however, critical in sharpening my skills as a reflective practitioner. Although my research focused on a particular context of the Nelson R. Mandela School of Medicine in Durban, I believe it offers some broad lessons in the context of global medical education reform. Finally, in the context of the current review of the approach to education and training of medical students in South Africa, it is even more imperative to align our assessment and curricular goals.

My journey as the daughter of a teacher exposed me to the administrative realities of the profession from an early age. After graduating as a science educator from the University of the Western Cape, I embarked upon a career of Science education but soon realised my calling for educating adults. It was only after my appointment to the NRMSM that I started really reflecting on best practices and strategies to bring about lasting change.

Through this study I became aware of the complexities and unique diversity of the School and the medical training sector and the professional and moral codes that sway daily practices. Being a participant researcher in this uniquely diverse setting has also led to me being better prepared, capable and confident to undertake independent research in the educational

landscape. Resulting from being ‘embedded’ in the setting, I was especially challenged and humbled at trying to portray the rich descriptions of the case.

As I am contemplating this conclusion, some members of staff have already embarked on another cycle of curriculum review. The feasibility of PBL and how to “Africanise” the instructional methodology to suit Third World needs and budgetary constraints remain at the forefront of the debate. I also know that the predicament of my School is not a unique phenomenon and that medical educators especially those on the African continent are facing similar challenges. Although it would not be possible to import and apply lessons from this case in a ‘lock, stock and barrel’ fashion, this study has tried to elucidate the factors that affect curriculum reform in developing countries. I am thankful for the enriching interactions and lived experiences that I shared with students and colleagues during this journey.

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APPENDICES

Appendix A

2006-08-14



UNIVERSITY OF
KWAZULU-NATAL

RESEARCH OFFICE (GOBAN MBEKI CENTRE)
WESTVILLE CAMPUS
TELEPHONE NO.: 031 – 2603587
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8 AUGUST 2006

MRS. J VAN WYK (951056590)
UNDERGRADUATE MEDICAL EDUCATION

Dear Mrs. van Wyk

ETHICAL CLEARANCE APPROVAL NUMBER : HSS/06180A

I wish to confirm that ethical clearance has been granted for the following project:

"Assessing problem based learning in Medical Education: A case study of the Nelson R Mandela School of Medicine"

Yours faithfully


.....
MS. PHUMELELE XIMBA
RESEARCH OFFICE

PS: The following general condition is applicable to all projects that have been granted ethical clearance:

THE RELEVANT AUTHORITIES SHOULD BE CONTACTED IN ORDER TO OBTAIN THE NECESSARY APPROVAL SHOULD THE RESEARCH INVOLVE UTILIZATION OF SPACE AND/OR FACILITIES AT OTHER INSTITUTIONS/ORGANISATIONS. WHERE QUESTIONNAIRES ARE USED IN THE PROJECT, THE RESEARCHER SHOULD ENSURE THAT THE QUESTIONNAIRE INCLUDES A SECTION AT THE END WHICH SHOULD BE COMPLETED BY THE PARTICIPANT (PRIOR TO THE COMPLETION OF THE QUESTIONNAIRE) INDICATING THAT HE/SHE WAS INFORMED OF THE NATURE AND PURPOSE OF THE PROJECT AND THAT THE INFORMATION GIVEN WILL BE KEPT CONFIDENTIAL.

cc. Faculty Research Office (Derek Buchler)
cc. Supervisor (Prof. R Moletsane, Prof. McLean)

Appendix B



20 October 2004

Mrs J van Wyk
SUME
Nelson R Mandela School of Medicine


Dear Mrs van Wyk

PROTOCOL : Theme evaluation for PBL -- Curriculum review -- J M van Wyk, SUME.
Ref.: R201/04

The Research Ethics Committee considered the abovementioned application and the protocol was approved by expedited review on 20 October 2004. This approval is valid for one year from this date. To ensure continuous approval, an application for recertification should be submitted a couple of months before the expiry date.

A full sitting of the Research Ethics Committee will be advised of this decision when next it meets on 9 November 2004.

Yours sincerely



PROFESSOR A DHAJ
Chair : Research Ethics Committee

Nelson R Mandela School of Medicine, Faculty of Health Sciences,
Head: Bioethics, Medical Law and Research Ethics

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Appendix C

Semi-structured interviews (members of staff) to elicit their responses to the following issues.

1. How did the C2001 reform come about at the NRMSM?
2. What were the reasons why C2001 was introduced?
3. Who represented your department during the deliberations?
4. Who were the curriculum drivers during the initial stage?
5. How did the faculty ensure that staff from all departments voiced their opinion?
6. What forms of assessment do you/your department prefer?
7. When did the faculty decide to implement the PE?
8. What is your understanding of the PE?
9. Why was a decision taken to use the PE for knowledge assessment?
10. What experience did faculty members have with the PE (overseas workshop or local training?)
11. What form of training were offered and how often
12. Did you attend any training for C2001 orientation
13. To what extent were the students' view considered during C2001 reform?
14. Who was the Dean (acting) during the main stages of the reform?
15. What was the position of the faculty leadership during each stage?
(planning piloting and implementation stages)
16. To what extent do you understand the philosophy of the PE?
17. How are you involved in student assessment in C2001?
18. What do you think are the strengths/weaknesses of the PE
19. Do you think that students are equally prepared for tertiary studies?

20. If not, in what way are they better or lesser prepared?
21. Do you think that students should keep their question papers upon completion of a PE (If not why not. / IF yes, why).
22. Would you be prepared to address individual students or the class for purposes of feedback? (If not why not. / IF yes, why).
23. What in your opinion could be the reason why students are performing so well on the PE?
24. What difficulties do you foresee in implementing the PE at the NRMSM
25. How should the student mark be reflected on the PE?

Appendix C (II)

Interview with Prof L, Wednesday, 10 March 2004

Main Building

Interviewer: How did you become involved in the curriculum steering group?

Prof L: I enrolled for the Educational Masters a while ago and it sparked the interests in curriculum and what we were doing here... I think I was co-opted to the Steering group in 1996 or 7.

Interviewer: Why was it a good time to think about curriculum reform?

Prof L: I do not think that there was something specific about the time. During that year the first year curriculum on main campus also underwent changes.

Interviewer: Who were the main members of staff involved in the reform?

Prof L: Prof K had visited PBL schools e.g., New Mexico, Suez and Prof S visited a number of others. People like I and O were also passionate about teaching in their departments and gravitated towards common goals.

FG also joined the faculty and he was passionate about PBL. In the same way there was J H who always tried new things in his discipline and basically sustained the momentum for change throughout. DM, now at (other Medical School), MA and some of us actually presented at the PBL conference held in 1996.

Interviewer: How did the programme change?

Prof L: In 1996 a changed curriculum structure was offered to first year students in the Medicine programme. Initially they had to study Biology, Physics, Chemistry and another Science subject on Main campus.

The change involved the implementation of the Basic Ambulance course, History of Medicine, Medical Terminology, Medical Biology, Introduction into Physics and Anatomy and also Computer and Zulu courses. Students also had more community contact via the departments of Community Health's TB module.

Interviewer: Why were all the changes made?

Prof L: That year (1996) was the first year that White students were enrolled at the Medical School. Initially were only enrolled 3% White students, 7% Coloured, 17% Indians, 69% Blacks students. I think the country and the education system were starting introduce the post- apartheid reforms. For the medical school that had not enrolled White students, it was a change.

Interviewer: Why and how did the school decide to implement PBL?

You know, I'm not sure. I can recall KL running OBE and SAQA workshops around 1997 & '98. She was from the quality unit and they made staff aware of Outcomes-Based Education. Most medical schools abroad were also implementing PBL and I do not think that anybody thought that OBE was different to PBL. The proposal was accepted at

board and circulated in the (MedNews Newsletter, 1997). The faculty saw a need for a Medical Education Unit to become establish to implement the new programme.

Interviewer: How did the faculty plan for the unit?

The first director of this unit was prof Loening (1993). When he retired it was headed for a short period by Prof Simjee (1995) who did it on a part- time basis but it was clear that it would require full time staff. In March 1997/8 Prof JH took over the director ship of the unit.

A number of staff members were involved with the CVS module that was a pilot of the PBL format. It differed from what we do currently with respect to the handing of a resource pack to students and facilitators. The TB module (offered by Com Health) was also a trial to pilot this way of learning.

Interviewer: How did the faculty prepare for the demands of the first year?

Members from Maastricht presented a workshop covering skills in facilitation, case design, writing assessments. Participants (about 15 to 18 to this workshop were selected (By whom) to head each theme in the first and second years. The workshop was offered in Oct 1999

As incentives these faculty members had their registration fees paid for to the Ottawa in Africa conference. Sue, Dorothy, Saras and I think Ted attended.

Interviewer: How did the faculty decide to implement the Progress examination?

Prof L: Some members of staff like, A, B and C had visited PBL schools where the PE had been in place. We needed to decide on how to use it in our context... B thought it was doable and did a lot of homework to understand to test.

Interviewer: How involved were the members of staff in the decisions to implement the Progress examination?

It has always been difficult to get joint appointment staff from their clinics. They were not very interested and some were to join once a decision had been taken.

Appendix C (III)

Interview with BM, 21 May 2004

Medical School , Main building

Interviewer: How involved were you in the assessment decisions of the New Curriculum?

I was involved up to the Blue print and template stages. I left (withdrew to complete my PhD around 1999 when a lot of buy in from the different departments came. People like Bobat and Bagratee was bought over after the Maastricht workshop (Oct 1999).

What is your opinion on the implementation of C2001?

I feel that the implementation of the Curriculum 2001 was rushed. People were passionate that a we were preparing excellent clinicians, that we were not adequately equipping them with skills for the 21st century. Our Dean at the time Jimmy van Delllen use to come in from time to time and encourage the group to keep going.

I was always the one who wanted proper structure, and insisted on the formation of the policy document. (I let you have copy of this) But we thought that our PBL programme will be unique and that we would draw on the best available of other existing programme and tailor it to our needs. We did not want a segmented programme. This was when people felt why waste time. We have faculty buy in and momentum and need to implement.

Why do you think we are not getting the support of the staff members?

I think it was a year too early for the following reasons. The student intake was too large University did not totally come to the party and deliver on what was promised (People like you, Educationalist, new posts support staff, lack of communication, common vision. I think the Dean came halfway through the process, but he had to focus on the image of the medical school in the wider context. I think Prof M did a good job, and it is sad that we lost him to Pretoria.

When Walter Loening was still here we pilot a PBL model (CVS/TB) that did more harm than good. People got a skewed idea of what PBL was.

I eventually had to leave the group because I couldn't deal with the personalities. People would come to the meeting with set idea, no listening or negotiating and bombard their way through. I could not work like that and had better things to do.

To what extend did the planning of the theme and the assessments go together?

I cannot give you the answer to that. I am not aware that we had decided on a specific assessment format and I had many other things to concentrate on then

Do you have any idea why the Faculty opted for the Maastricht PE?

A lot of buy-in came after the Workshop presented by the Maastricht team. People probably thought it was easier to use an exam that was used elsewhere instead of

reinventing another format. I cannot recall attending any meetings on assessment or being informed about a suggested format.

Why did the CDTF decide to opt for the PBL?

Well most of the staff here had no educational experience. I thought the PBL was OBE. We had help from the educational tertiary division, before the Quality promotion unit came to being. I think many people are anxious about the programme now. Initially I was concerned because I thought we had lost (departmental) control, but now after the last (exam) board meeting, I realized that there is nothing left to loose.

Appendix D (I)

Assessment -Quest 44-56



A. Facilitator Evaluation: Module 1.5

Group number: _____

Please answer each of the following statements by choosing either A, B, C, D or E, depending on how you feel about it. Once you have completed this, please transpose your choices to the computer sheet provided.

A-Strongly agree B-Agree C-Not sure D-Disagree E-Strongly disagree

With regard to the facilitator, please respond to the following statements.

1. The facilitator was generally punctual.	A	B	C	D	E
2. He/she appeared enthusiastic with regard to the small groups and PBL process.	A	B	C	D	E
3. The facilitator did not dominate the group discussion.	A	B	C	D	E
4. The facilitator created a supportive group climate/atmosphere.	A	B	C	D	E
5. He/she showed concern with the progress of individuals in the group.	A	B	C	D	E
6. The facilitator seemed to be well informed about the PBL process.	A	B	C	D	E
7. He/she encouraged involvement of individual members in the small group process.	A	B	C	D	E
8. The facilitator kept the group focussed on the task.	A	B	C	D	E
9. The facilitator stimulated a careful analysis of the problem/case.	A	B	C	D	E
10. He/she summarised and restated the problem as we proceeded through the case.	A	B	C	D	E
11. He/she stimulated the generation of specific learning issues useful for self-study.	A	B	C	D	E
12. He/she stimulated extensive reporting on information collected during self-study.	A	B	C	D	E
13. The facilitator encouraged us to reflect on and evaluate how well the group was functioning as a team.	A	B	C	D	E
14. The facilitator addressed group problems when they arose.	A	B	C	D	E
15. The facilitator had an understanding of the subject matter in the module.	A	B	C	D	E
16. The facilitator assisted us in distinguishing main issues from minor issues.	A	B	C	D	E
17. He/she used his/her expert knowledge to direct discussion.	A	B	C	D	E
18. The facilitator contributed to a better understanding of the subject matter by explaining concepts.	A	B	C	D	E
19. The facilitator gave the impression of being motivated.	A	B	C	D	E
20. He/she showed interest in our learning activities during the module.	A	B	C	D	E
21. The facilitator showed commitment with respect to group functioning.	A	B	C	D	E
22. Group members seemed to become dependant on the facilitator's guidance.	A	B	C	D	E
23. The facilitator supported interaction between the group members.	A	B	C	D	E
24. The facilitator's interaction helped me achieve my learning goals.	A	B	C	D	E
25. The facilitator aroused my interest in the subject matter of this module.	A	B	C	D	E
26. The facilitator appeared to have a clear understanding of the goals/objectives of this module.	A	B	C	D	E

Rating scale for tutor evaluation, adapted from Dolmans (1994).

In terms of your professional development and personal learning, use the scale A-E to indicate the usefulness of the learning experiences listed below.
A = excellent, B = good, C=satisfactory, D barely useful and E = poor

Rate the visits to:

27. Family Planning clinic	A	B	C	D	E
28. Antenatal ward	A	B	C	D	E
29. Labour ward & nursery	A	B	C	D	E
30. Practical arrangements & timetabling	A	B	C	D	E
31. Please elaborate					

**Student questionnaire
Information sheet**

You have been selected as a possible participant in this study because you have been a student of the first cohort of Problem based learners of the Nelson R. Mandela School of Medicine, University of Kwa-Zulu-Natal. This survey (about 3 pages) will not provide any direct benefits to you and it will not harm you or embarrass you. This is an anonymous questionnaire and no attempt will be made to identify participants. The results of this survey will be made available to the Faculty Committees (Undergraduate and Board). In addition, it is intended to present the results of this survey at professional conferences and to publish the results. In all cases, the results will be reported in such a way that no particular information can be linked with you.

You can choose whether to participate in this study or not. If you volunteer to participate in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study.

If you have any questions or concerns about the research, please feel free to contact Mrs. Jacqueline van Wyk, Head of Evaluation, School of Undergraduate Medical Education, Nelson R. Mandela School of Medicine, University of Kwa-Zulu Natal (tel:031 2604336; Fax 031 2604492 or email vanwykj2@ukzn.ac.za)

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty.

Please take a few minutes to complete this survey. The purpose of this questionnaire to elicit the perceptions of medical students towards the Progress Examination of the faculty. This is a research project of the evaluator and we value your cooperation in this regard.

Use a tick where appropriate to indicate your answer in the block of your choice.

Biographical Information

1. Year of study: _____ 2. Race: African ☐ White ☐ Coloured ☐ Indian ☐
3. Home language: English ☐ Afrikaans ☐ African languages ☐
4. Type of high school attended: Private ☐ Public (Rural ☐ / Township ☐ / Urban ☐) Model C ☐
5. Which questioning format do you think gives the best reflection of what you have learnt?
(e.g. MCQ True/False; Oral; Essays)
-

Please explain

Progress examination (PE)

6. What is your understanding of the concept of the PE?

-
7. How do you think this will help you Yes ☐ No ☐

8. In your opinion does the PE as used at the faculty match your understanding of what the PE should be about? Yes ☐ No ☐

Explain _____

-
9. Do you prepare for the PE? Yes ☐ No ☐

10. If yes, what material do you use in your preparation?

11. How many days prior to exams do you start your preparation?
- ☐ 1-5 ☐ 10-15
☐ 5-10 ☐ more than 15 days in advance

12. How many hours per day?
- ☐ 1-2 ☐ 5-6
☐ 3-4 ☐ more than 6 hours per day

13. Use a scale of 1-5 with "1" being the least stressful and "5" being the most to rank the extent to which each of the exam formats below stresses you. Circle the number that indicates your stress level for the method.

- | | |
|-------------------------|------------------------------|
| A) 1: 2: 3: 4:5 ETT's | B) 1: 2: 3: 4:5 OSCE |
| C) 1: 2: 3: 4:5 OSPE | D) 1: 2: 3: 4:5 Clin. Skills |
| Assessments/Block Exams | |
| E) 1: 2: 3: 4:5 PE's. | |

f) Explain why you rated any of the above as a "5"

14. Which of the exam strategies mentioned above stresses you the least? **A : B: C:**
D: E

15. Explain why

16. Do you feel that the PE tests all the knowledge and understanding you have acquired since first year? Yes ☐ No ☐

Explain your answer

17. Do you think that the marks you achieved in previous PE's reflected your knowledge and understanding of the Material already covered in the themes? Yes ☐ No ☐

18. Do you think that the PE is the best method of assessing students in the PBL curriculum? Yes ☐ No ☐

19. Explain

20. Do you need study leave before writing the PE?

Yes ☐ No ☐

Why?

21. How would you like to see the PE improve at the Nelson R. Mandela School of Medicine?

22. You have experienced various formats of PE (no separation between MAC and Non Mac; 80:20; 70 30) Which do you prefer?

23. Please explain the reason for your choice.

24. Do you have any other comments that you wish to make?

Thank you for your time.

Appendix E

NEW CURRICULUM

RULE CHANGES

2002

RULE CHANGES

Examinations M4 (new)

The timing and the format of the examination shall be determined by the Board of the Faculty on the recommendations of the Head of the School of Undergraduate Education having due regard to the requirements laid down by the Health Professions Council of South Africa.

(a) **Summative Assessment:**

In general, such examinations shall be:

- (i) Progress Examinations, undertaken three times a year in all five years.
- (ii) An Objective Structured Clinical Examination (OSCE) in years 1-4.
- (iii) The satisfactory completion of the Elective modules.
- (iv) Clinical Module examinations in each of the 6 clinical disciplines in Year 5.

(b) **Formative Assessment:**

In Years 1-4 such assessment shall include:

- (i) end of theme assessments; and
- (ii) facilitator appraisal of student progress.

The satisfactory performance and completion of elective modules and any other additional modules within years 1-4 will be monitored and addressed by the School of Undergraduate Education.

(c) **Promotion:**

Candidates in year 1- 4 of the programme shall be promoted to the next year of study only after having:

- (i) passed the three Progress Examinations for that year (*refer to explanatory note below*)
- (ii) passed the Objective Structured Clinical Examination (OSCE) for that year
- (iii) passed the Basic Emergency Care Practitioners module by the end of year 2
- (iv) satisfactorily completed the elective modules (in the case of years 2, 3 and 4).

Candidates in year 5 of the programme shall be required to pass:

- (i) the three Progress Examinations for that year, and
- (ii) each of the six (6) discipline-based Clinical Modules described in the programme.

Explanation

Year 1 & 2

(a) **Summative assessment:**

Assessment that determines whether a candidate may advance to the next year of the programme. It is used to certify mastery of a specific set of objectives. It consists of

- (i) an Objective Structured Clinical Examination (OSCE), which is a multi-station examination assessing different aspects of clinical medicine, clinical skills and procedures, history-taking and communication, laboratory investigations and practical issues, and
- (ii) Progress Examinations are examinations written by candidates at all levels of the programme, which sample the full domain of knowledge that a medical graduate should master.

The Progress Examination (PE) mark is a composite score derived from the material already covered (MAC) and material not already covered (MNAC). The entire examination will have negative marking.

1 **MAC 0-50:** The MAC will be expressed as a percentage.

1.1 **MAC 0-50:** If the mark of the MAC is 0 to 50% for the MAC, then this mark is carried over unchanged to the PE mark.

- 1.2 A candidate whose mark for the MAC exceeds more than 50% will receive the maximum of 50 against this part of the mark and the remainder will be dealt with as in 2.
 - 2 **MAC 51-70:** The remaining 50% for the MAC (cf 1.2. above) is converted to a mark out of 20. Thus, a candidate who obtains 73% for the MAC, will have 50 carried over to the PE mark and the remaining 23% converted by applying to it a constant factor (20/50) [i.e. $20/50 \times 23 = 9.2$]. The mark thus obtained is then added to the original 50 already obtained to give a MAC mark for the PE of 59.2.
 - 3 **MNAC 71-100:** To derive the MNAC mark, the three highest raw scores of MNAC will be averaged to obtain the highest reference raw score, which when converted will be equivalent to 28.5 of 30 (i.e. 95%). The highest converted mark for MNAC will be 28.5 and not 30. The lowest will be zero. A negative score of the MNAC will be converted to zero. Thus, if the three highest raw MNAC scores are 103, 97 and 94, then the average of the three scores $[(103+97+94)/3 = 98]$, will constitute the highest reference mark, which when converted, is equivalent to 28.5. The 3 highest marks will be assigned a mark of 28.5 each. The conversion factor that will be applied to the individual candidate's raw MNAC score will be $28.5/98$. A candidate who has an MNAC score of Z will get a converted MNAC mark of $(Z \times 28.5/98)$. This converted MNAC mark will then be added to the MAC mark to give the candidate's total Progress Examination mark.
- b) **Formative assessments:**
These are aimed at providing feedback to the candidate to enable him/her to monitor his/her progress. It is in the interests of a candidate that he/she undertakes all 6 End-of-Theme assessments.

Supplementary Examination M5 (new)

- (a) Years 1 to 4
 - (i) Supplementary Examinations in the Progress Examinations, the OSCE, or both will be granted to qualifying candidates who fail to meet the promotion criteria in any of one year of study,
 - (ii) Unsatisfactory completion of the elective block in any one year of study will require a repeat of that elective in December/January.
- (b) Supplementary examinations will be granted for the Basic Emergency Care Practitioners' Course in Year 1 or 2.
- (c) Year 5
 - (i) A supplementary Progress Examination may be granted should a candidate fail the PE.
 - (ii) A candidate who fails discipline-based clinical assessment(s) shall repeat the clinical module(s) failed.

Promotion and Refusal of re-admission M6 (new)

The pass mark for an OSCE or Progress Examination is 50%.

- (a) Candidates in year 1 to 4 of the programme shall not be promoted to the next year of study unless they fulfil all of the following criteria:
 - (i) obtain an average of 50% for the 3 Progress Examinations for that year of study,
 - (ii) pass the OSCE,
 - (iii) pass the third Progress Examination.
- (b) The OSCE and the Progress Examinations will be considered separately.
- (c) A candidate in year 1 of the programme who fails the Basic Emergency Care Practitioners' module may be allowed to proceed to the second year of study and to write it at the end of the second year of the programme. Should the candidate fail this module again at the end of year 2, the student will have to repeat the second year of the programme.
- (d) A candidate in year 5 of the programme shall be required to pass the Progress Examination, as in (a)(i) above, and each of the 6 discipline-based clinical assessments to qualify for the Degree.
- (e) A candidate who fails the OSCE with a mark of less than 40%, and who obtains an average mark of less than 50% for the 3 Progress Examinations, will not be granted a Supplementary

Examination. Such a candidate shall repeat the year including all components of the Summative assessment.

- (f) A candidate who passes the OSCE but fails the Progress Examination and has to repeat the year is required to obtain, during the repeat year, an average mark of not less than 50% in the components of the OSCE up to the last Progress Examination.
- (g) A candidate who passes the Progress Examination but fails the OSCE and has to repeat the year is required to obtain a mark of 50% in any 4 of the 6 End-of-Theme tests.
- (h) A candidate who fails the OSCE with a mark of 40-48% will be granted a supplementary OSCE. A candidate who obtains a mark less than 40% for the OSCE will not be granted a supplementary OSCE and will repeat the year.
- (i) A candidate who passes the OSCE but fails the Progress Examination with an average mark of 40 to 48%, will be given a supplementary Progress Examination.
- (j) A candidate who passes the OSCE and fails the 3rd Progress Examination with a mark of 40-48% shall be given a supplementary Progress Examination.
- (k) A candidate in Year 1 to 4 who fails a particular year of study for the second time shall be refused readmission except on the instruction of Senate.
- (l) A candidate in Year 5 of study who fails to obtain credit for any Clinical Module shall be required to repeat the relevant Clinical Module.
- (m) A candidate who has written one or more supplementary examinations, shall fail the year if
 - (i) the supplementary OSCE is failed or
 - (ii) both the third Progress Examination and the supplementary Progress Examination are failed or
 - (iii) the average mark of the three highest scored (of the four) Progress Examinations, including the supplementary PE, is less than 50%.
- (n) Candidates who, on health grounds or grounds of substance abuse, are deemed impaired and unable to continue their studies after due consideration and assessment by an *ad hoc* committee of the Board, shall have their registration suspended or be refused re-admission

This rule change M7 (new) is proposed to apply for the current year 1 candidates and subsequent cohorts only and not for those in year 2 in 2002.

Award of Degree Cum Laude (new) M7

The degrees of Bachelor of Medicine and Bachelor of Surgery will be awarded *cum laude* if a candidate obtains 210 points and *summa cum laude* if a candidate obtains 240 out of 300 points to be allocated according to the following formula.

The points apply to a mark of 75-80%. A candidate who obtains 70-74% shall earn 2/3 of the points as indicated and a candidate whose mark exceeds 80% shall earn 4/3 of the points indicated.

1st Year: 4 points for Basic Emergency Care Practitioners' module	4
2nd Year: 4 points per examination (3 x Progress + OSCE) + 4 points for Electives	20
3rd Year: 8 points per examination (3 x Progress + OSCE) + 8 points for Electives	40
4th Year: 12 points per examination (3 x Progress + OSCE) + 8 points for Electives	56
5th Year: 20 points per examination (3 x Progress + 6 clinical modules)	180
Total	300

Table: Cum laude points

	70-74% (2/3 of the points)	75-79% (3/3 of the points)	80%+ (1 1/3 of the points)
Year 1			
3 Progress Examinations	0	0	0
OSCE	0	0	0
Ambulance % Basic Emergency Care Practitioners' course	2β	4	5α
Subtotal	2β	4	5α
Year 2			
3 Progress Exams (4 points per PE)	8	12	16
OSCE (4 points)	2β	4	5α
Elective/Selective Module (4 points)	2β	4	5α
Subtotal	13	20	26β
Year 3			
3 Progress Exams (8 points per PE)	16	24	32
OSCE (8 points)	5α	8	10β
Elective/Selective Module (8 points)	5α	8	10β
Subtotal	26β	40	53α
Year 4			
3 Progress Exams (12 points per PE)	24	36	48
OSCE (12 points)	8	12	16
Elective/Selective Module (8 points)	5α	8	10β
Subtotal	37α	56	74β
Year 5			
Progress Exams (20 points per PE)	40	60	80
6 x Discipline-based Clinical Module Exams (20 points per exam)	80	120	160
Subtotal	120	180	240
Total Cumulative points	188	300	400

Duly Performed (DP) Requirements M8 (*new*)

Duly Performed requirements in Curriculum 2001 are attendance at 80% of small group meetings, skills training sessions, and programmed visits to various health care facilities. Failure to achieve these requirements will result in a student being barred from writing the next summative examination (Progress Examinations and/or Objective Structured Clinical Examination – OSCE).

Candidates who are unable to attend any of the above meetings for reasons of ill-health need to present a medical certificate, within one week of their absence, to the Head of the School of Undergraduate Education (SUE). If they are unable to attend such a meeting for any other reason, a written explanation has to be presented to the Head of SUE within three days of their absence.

EXPLANATORY NOTES FOR RULE CHANGES TO THE NEW CURRICULUM

The approach to the learning methods of the New Curriculum approved by Senate is that of student-centred, self-directed approach based on problems discussed in small group meetings. The topics are integrated both horizontally (across disciplines in the same year of study) and vertically (across disciplines at different years of study).

The New Curriculum adopts a holistic nature of the educational programme and its goal is producing clinically skilled and competent graduates with a caring attitude. Assessments for the New Curriculum are thus concerned with the progressive development of the candidate's knowledge, skills and attitudes. The learning method and assessments are, in addition, aimed at facilitating the development of lifelong learning skills. In years 1-4, the syllabus is organised into 6 themes of 6 weeks each per year of study. The themes are integrated. At the end of each theme an End-of-Theme test is written. These tests are for the individual student's assessment of his/her progress and not for the purpose of promotion.

Students are promoted on the results of their Summative Assessments. These consist primarily of
(i) Objective Structured Clinical Examinations (OSCE) and
(ii) Progress Examinations (PE).

In the assessment, a balance is sought between measuring the performance of the student on the material already covered in the teaching process and encouraging the student to read more widely and not succumb to the syndrome of "swotting for the examination only".

OSCE: This examination assesses the candidate's competency in clinical skills as well as his/her ability to carry out procedures.

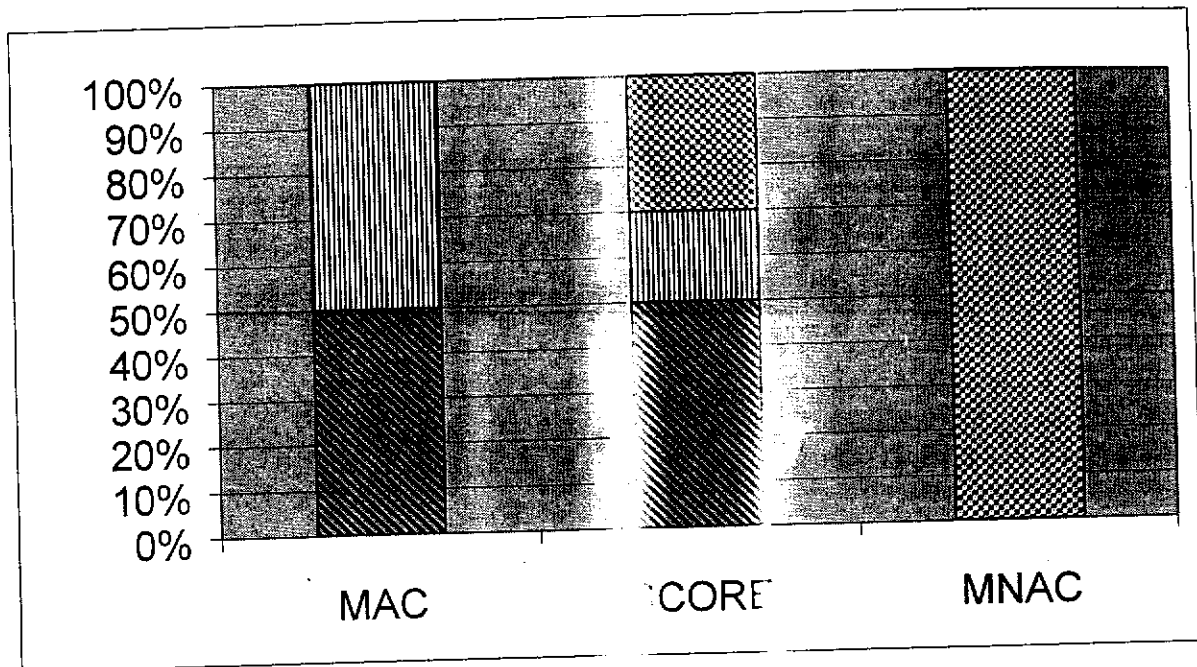
PE: There are 3 PEs in any year of the programme. The philosophy of the PE is to assess the candidate's progress towards attaining the knowledge expected of a graduate of this Medical School. PE aims at acknowledging and rewarding the candidate's additional effort and knowledge gained beyond what he/she has been taught. Each is therefore composed of a range of questions that samples the full domain of knowledge that a medical graduate should master. Each PE in years 1-4 will therefore consist of themes or parts of themes that have been covered in the syllabus at that level in the programme (i.e. material already covered - MAC) and the themes or parts thereof that have not yet been covered in the syllabus at that stage (material not already covered - MNAC).

Differential weighting of MAC and MNAC had to be introduced. Thus, candidates in years 1-4 will write the same PE. However, their assessments will differ according to their levels in the programme. In addition, the domain of MAC in the third PE in any level of the programme will include those of the 1st and the 2nd PEs at that level, as well as those covered at lower level(s).

By the time the candidate enters year 5 of the programme, there should be no MNAC.

NB: the MAC versus MNAC weighting proposed in the rule changes applies for candidates in levels 1 and 2 of the programme. The details of the weighting for the years 3 and 4 will follow.

PROGRESS TEST SCALING



MAC = MATERIAL ALREADY COVERED
SCORE = NEW DERIVED PROGRESS EXAMINATION COMPOSITE MARK
MNAC = MATERIAL NOT ALREADY COVERED

The Progress Examination (PE) mark is a composite score derived from the **material already covered (MAC)** and the **material not already covered (MNAC)**. The MAC constitutes a total of 70% (50% + 20%) and the MNAC constitutes 30% of the PE mark.

The effect of applying a conversion factor to the additional percentage points of MAC obtained in excess of 50, is as follows:

95-100	=	20%	70-74	=	10%
90-94	=	18%	65-69	=	8%
85-89	=	16%	60-64	=	6%
80-84	=	14%	55-59	=	4%
75-79	=	12%	50-54	=	2%

20 August 2002

◆UN Faculty of Medicine Curriculum Newsletter◆

Volume 1

Jan-Mar 1998

Newsletter of the Proceedings of the Faculty Curriculum Task Force

Keeping Faculty Informed

At a recent Curriculum Task Force meeting, it was decided that a quarterly newsletter be circulated to Faculty to keep members abreast with regard to curriculum development. Yours truly was asked ever so sweetly to serve as Editor of this newsletter. It is my intention to summarise the proceedings of the Curriculum Task Force during the 3 months between which newsletters are published. You are free to comment on anything printed in this newsletter (including the format!). Please send your comments or "Letters to the Editor" to me in **Physiology**. Your letters, comments or queries will be forwarded to the relevant party for consideration and the response will be published in the next issue.

FOR STARTERS: Not being creative, I could not think of an appropriate name for the newsletter (*Operation: Curriculum Reform* is about the best I could do!). So, there is R25.00 for the best suggestion of a name for this newsletter, and a further R25.00 for designing a simple logo with which the Curriculum Task Force can identify. Send your creations to me by the end of February 1998. The judges' decisions are final, and no legal wranglings will be entered into.



The Curriculum Task Force

During mid-1997, interested parties in the Faculty were invited to become participants in discussions regarding a new medical curriculum for the Faculty, in the light of the requirements of the National Qualifications Framework (NQF). Since August last year, about 26-30 Faculty members have met on a fortnightly basis (under the able chair of Prof F Güldner, *Anatomy*) to informally discuss issues pertaining to possible curriculum innovations. Several members thought long and hard about what the new curriculum should comprise. Their models were presented to the Task Force and the merits and shortcomings evaluated. Among the presenters were Dr EC Naidu (*Anatomy*), Dr PJ Olmesdahl (*Physiology*), Professor A Simjee (*Medicine*), Dr A Matthews (*Physics*) and Professor H Vawda (*Anatomy*). By the end of 1997, a document of the general principles governing the development of a new

curriculum had emerged, thanks largely to Peter Olmesdahl and Fritz Güldner for summarising almost 5 months of discussion.

Briefly, the document describes the principles, structure and content of the new curriculum:

GUIDELINES: NEW CURRICULUM

A. Principles

1. Medicine is a holistic art and science, dealing with a patient in terms of body, mind and spirit, who is an integral member of a family and of society, and whose human and ethical rights should be recognised.
2. Preventative medicine and the promotion of public health must be included.
3. Doctor-patient and doctor-community relationships, personal and professional development, professional values and ethics, the health care system and economics will be included, where appropriate.
4. Life-long and student-centred learning will be promoted.

B. Structure

1. Modular and of a generic nature (as far as is possible)
2. High (e.g. through electives of interest) and low (e.g. through remedial/revision modules) achievers must be accommodated.

Guidelines, continued.....

3. Electives to be incorporated to allow for flexibility in career choice and personal learning interests.
4. Use to be made of local practitioners. Students will then become apprentices in private practice.

C. Content

1. Students need to develop generic skills such as communication and the ability to access information. They must be able to analyse and apply the information, and develop problem-solving skills as well as practical (clinical) skills.
2. Content to be determined and be responsive to community needs and must be internationally acceptable.
3. Integration, real-life clinical exposure is a necessity.
4. A pass in conversational Zulu is required.
5. Factual overload reduced - Core curriculum plus optional knowledge.

D. General

1. Modified Faculty administrative structures to be introduced.
2. Staff training programmes appropriate for new curriculum.
3. Executive Committee overseeing course details.
4. Executive Committees dealing with Admissions, Programme Evaluation, Assessment, Implementation.
5. Regular newsletter or bulletin.
6. NQF/SAQA requirements met.

Issues not yet resolved (open for discussion !)

A number of issues have been discussed by the Curriculum Task

Force, but have not been resolved, and require further consideration and additional input (from Faculty members !)

1. MBChB + concurrent diploma or degree ?

For many years, several Faculty members have been perturbed that after 5 years, a student can be excluded from the Faculty without any credit for the time/studies completed. Several issues are involved in this scenario:

- * Should such a student have been admitted in the first instance (questionable admissions criteria)?
- * If such a student was admitted, surely there should have been appropriate support/remedial mechanisms in place?
- * Should such a student be given *something on paper* for his/her efforts?

While the Task Force did not discuss these questions *per se*, members did discuss the feasibility of a 2 year diploma or a 3 year degree in Medical Science running concurrently with the MBChB degree. Such a course/programme must be a worthy and marketable qualification that would allow graduates to enter into the fields of medical research, medical marketing and other related medical, paramedical or pharmaceutical fields. Considerable market research was necessary to establish the need for such a qualification. The medical curriculum would be designed such that those exiting at this early point would have the appropriate skills. In terms of the NQF, provision is made for a 1 year certificate, a 2 year diploma or a degree within a programme.

2. MBChB - post-graduate or undergraduate degree ?

As one can well imagine, this was one of the more contentious issues, and consensus could not be reached. I got the feeling, however, that the majority did not advocate a prior degree, mainly because of time constraints. A 3 year undergraduate degree + 4 yr post-graduate medicine would be counter-productive in the current socio-economic climate.

3. MBChB - 5 or 6 years ?

Most Task Force members agreed that if the curriculum was correctly structured and the appropriate content covered, the present degree can be reduced to 5 years. This would make the University of Natal degree more cost-effective.

4. New curriculum - disease-based, system-based, community-based, case-based, pre-clinical and clinical or integrated, PBL ?

Another area of heated discussion. It was apparent, however, that some individuals had difficulty in imagining how their discipline could be integrated with others, such that the present departments *per se* no longer exist, and departmental time becomes Faculty time. *Certainly an education for the educators !*

5. Selection and Assessment Criteria

The Task Force recognised that curriculum reform will have far-reaching implications for selection criteria and assessment methods. To date, however, these issues have not been discussed, but it was agreed that smaller

smaller subcommittees be established (2 or 3 individuals, perhaps) to investigate selection, assessment and programme evaluation specifically.

Recent publications on curriculum and medical education issues

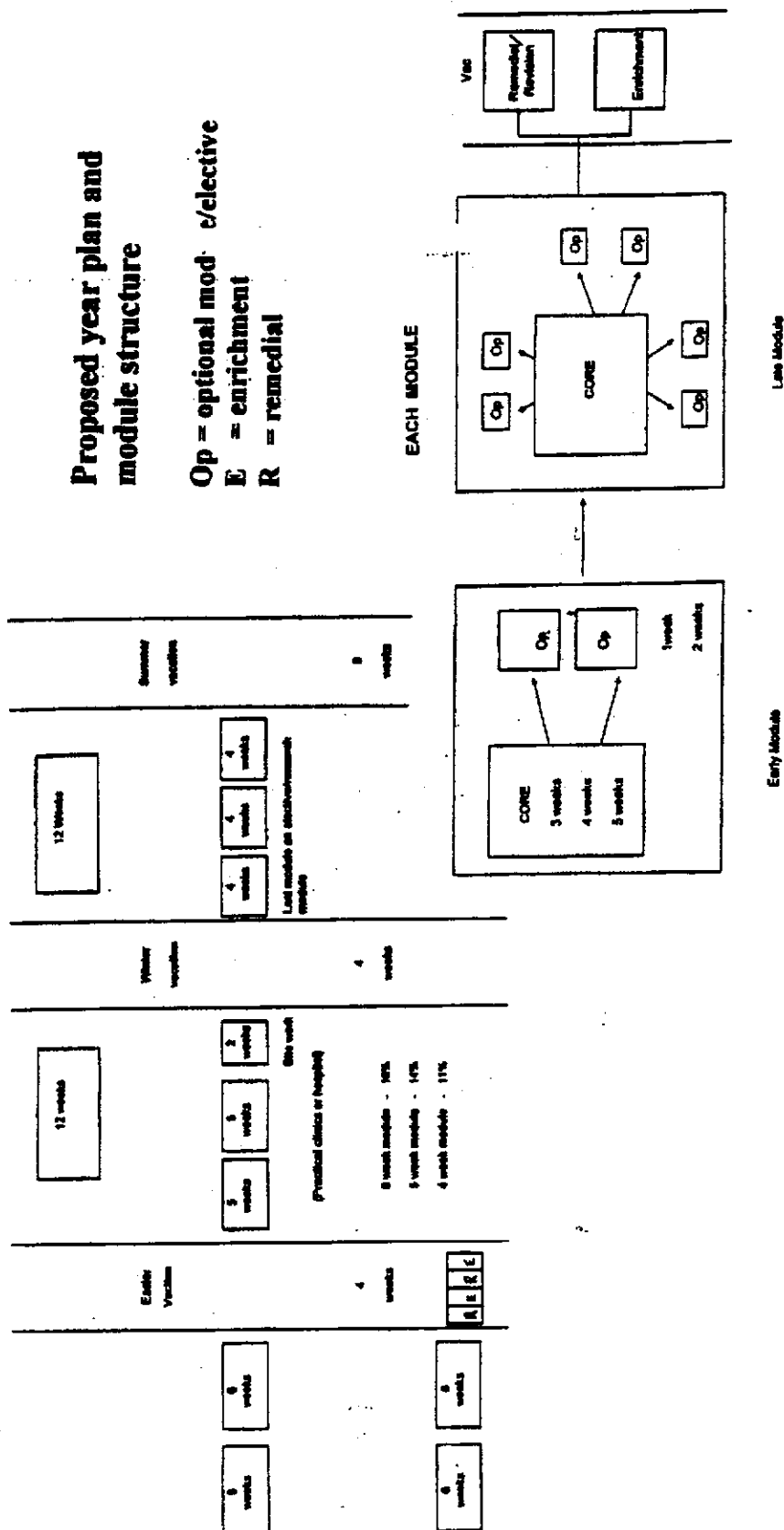
The Medical Faculty library subscribes to *Medical Education* and *Medical Teacher*, two journals which publish quality articles on medical and health science education.

Recent articles that may be of interest include:

- *Harrison A. 1997. Incorporating human subject research experience early in the medical curriculum. *Medical Teacher* 19 (3): 212-216.
- *Niemi PM. 1997. Medical students' professional identity: self-reflection during preclinical years. *Medical Education* 31: 408-415
- *Allen S. et al. 1997. Tailored Response Test: a new approach to teaching in medical education. *Medical Teacher* 19 (3): 194-199.
- *Dolmans DHJM et al. 1997. Seven principles of effective case design for a problem-based curriculum. *Medical Teacher* 19 (3): 185-189.
- *Wahlström, Sandén I and Hammar M. 1997. Multiprofessional education in the medical curriculum. *Medical Education* 31: 425-429.

Proposed year plan and module structure

Op = optional module/elective
E = enrichment
R = remedial



Appendix G (I)

From:

To:

Date:

3/20/02 3:10PM

Subject:

Re: scaling of the 30% MNAC

Dear colleagues,

has accurately captured the discussions of the assessment committee. We need to understand the implications. These include :

- we accept that the 70% mark for the MAC (material already covered) remains intact and any further change is upward. The person who performs extremely well on MAC will not be penalised by attempting questions from MNAC (material not already covered);
- The 70% is made up of the raw mark for those achieving below 50%; and for those scoring between 50 and 100% the excess over 50 will be multiplied by 0.4 and added to the 50. To get 70/70 for the MAC the student will have received 100% on the MAC. There will be a score that will reflect the better performers. The main pit fall is that it will advantage the borderline students. (esp 45 - 50%)
- the maximum that could be obtained on the MNAC is 95% i.e. 28.5 marks out of 30.
- negative marks in the MNAC will be counted as Zero.
- the rationale for using the average of the top 3 marks is to have a reasonable conversion factor. This will not allow the person who does very well (through prior knowledge or by chance) and who a very high outlier mark to cause the conversion factor to severely reduce the whole class mark.
- the top 3 students automatically are allocated the top mark of 95% (28.5/30)

If we achieve consensus on this this will address some of the problems that were raised at board. The 70/30 split is implementable.

Thanks

>>>

03/20/02 11:56AM >>>

Dear All

Please find enclosed the procees for the scaling to the 30% of MNAC.

SCALING TO 30% OF MATERIAL NOT ALREADY COVERED!

STEP 1.

TAKE AVERAGE OF TOP 3 MARKS

ie. RAW SCORE (R_s) = $AVG(M1 + M2 + M3)$

STEP 2.

OBTAIN A CONVERSION FACTOR (C_f) USING THE RAW SCORE (R_s).

$$C_f = 28.5/R_s$$

STEP 4.

MULTIPLY ALL OTHER MARKS BY THE CONVERSION FACTOR (C_f).

How do we handle all the marks?

1. The three highest marks are all allocated 95% or 28.5 (28.5 = 95% of 30). Therefore the highest mark for MNAC will always be 28.5.
2. All other marks will be multiplied by the conversion factor (C_f)
Once the marks have been converted they will then be added onto the MAC mark.
3. If there is a negative mark then it will be taken as zero(0). That is, a negative mark for the MNAC will not decrease the MAC mark.

Dr

In re: the vexed question of expressing students' scores on the Progress Tests:
Trying to clarify the issues in my own mind. {Subsequent thoughts in curly brackets.}

We are asked to express the scores in different ways for different purposes - currently 3 that we're aware of.

1. For summative [and formative!] purposes within the Faculty

Since we know the proportion of material in each Test that is relevant to the modules already covered, the pass score is 50% of that proportion expressed as a % of the total score for that Test. e.g. 1st PT [after 2 modules] includes 10% arising from those modules therefore students scoring \geq 5% overall will pass; 2nd PT will include, say, 15% material [from 1st 4 modules] and the pass score will be 7.5%.

[Norm-referencing the pass score [e.g. year cohort mean minus 1 standard deviation] seems unjustifiable in terms of educational, attitudinal and fairness principles.

- It guarantees that set proportions of the cohort always must pass and fail, however brilliant or poor a particular cohort may be.
- It negates the system of co-operation that PBL is attempting to inculcate - people may be less inclined to share information if they know that their own success in the PT depends on their relative position in the cohort rather than whether they have met the basic requirements.
- In the case of objections to pass/fail decisions, a norm-referenced decision is more difficult to defend than one which is criterion-referenced.]

2 For the use of bursary and scholarship funders

The point was made that a score of, say, 14.5% does not appear impressive despite its being the top score in that year cohort. In competition with students in faculties which express marks conventionally out of a maximum of 100%, our students might be handicapped. The idea of expressing scores in terms of their centiles within the year cohort was proposed - e.g. the student with 14.5% would be described as being above the 95th centile, say. [This is essentially norm-referencing and thus educationally a Bad Thing - but the funders seem to work on a competitive basis(? - is this actually so?).]

[TS: Expressing scores as a percentage of the expected score [e.g. in the 1st PT, 14.5% would be expressed as 145%] might also incur problems of incredulity but, with explanation, might be more acceptable.]

2 For purposes of awarding academic recognition

The easiest way of calculating academic honours would be to use student's percentage score of expected core knowledge - i.e. their score on those questions arising from the modules already covered. These questions are identifiable in each PT and a separate score could be generated for that section. This would give a conventional spread over a 0 - 100% range, which could without effort be divided into 1st, 2nd, 3rd classes.

[TS: As already revealed by processing the 1st PT in these different ways, this way of scoring does not necessarily favour the brighter students who have grasped not only the core material but have read more widely and are therefore(?) able to score on material beyond the expected. Do we want to reward those students for their wider grasp or do we want to emphasise that excellence lies in a firm mastery of the core?]

Thinking further, we are generating scores 2 & 3 for constituencies operating under a previous system while we are moving into a different mind-set.

- 2 and 3 are still competitive; we are encouraging a co-operative way of working with which 2 & 3 no longer sit easily. Perhaps it should be emphasised that 2 & 3 are temporary(?) expedients to bridge the gap.
- The point has been made that the number and type of assessment instruments needs to be extended so that the reliance on individual instruments is reduced and also a wider range of educational outcomes can be addressed. The more diverse our assessment instruments, the less likely that scores will be easily quantifiable for the purposes of 2 and 3 above. [e.g. Anyone who has been wrestling with quantifying skills assessments will already have realised how difficult that is.]
- I think that we are in the interim of moving towards the inclusion of more subjective assessments and at the same time trying to tease out of those binary value judgements [Satisfactory / Unsatisfactory] their constituent elements to make them more objective - although not necessarily more numerically quantifiable. This seems to be a general trend; concentrating on fitness for purpose / satisfactory performance according to explicit criteria, rather than on numerical scores which allow one to gain a pass despite being unable to grasp a small but vital step.]

Does this help????? Bat these ideas around a bit. This may be rather important!!!!

Appendix G (II)

Explanations for the Progress Exam : The Progress Examination (PE)

Date 19/03/02

This examination, which tests the full domain of knowledge expected at the exit level of the MBChB degree, is written three times during the year by all students in the programme. Students should therefore be aware that not only should their marks increase each year (i.e. they progress towards the final outcomes as the content of each theme is covered), but that the material covered in earlier themes is still important for the understanding of later themes (i.e. the curriculum is a spiral one), and will continue to be assessed. This type of examination would also reward the students with prior learning experience, particularly in the sciences and the health sciences. Rewarding prior learning is one of the strategic initiatives of the University. Since the philosophy of *Curriculum 2001* is to promote life-long learning amongst students, and hopefully amongst graduates in their professional careers, the organisers believe that by exposing students to clinical medicine from the outset, they will be encouraged to read more widely than the 'core' (minimum requirements).

In the model currently proposed for the calculation of marks for the 1st and 2nd year level of the 2002 cohort of students (and for the 2nd year students of the 2001 intake), the PE mark comprises 2 components: 70% = material already covered (MAC) and 30% = material that has not been covered (non-MAC), with the MAC increasing with each successive PE.

From our experiences during 2001, where at least one-third of the students had some prior experience in tertiary studies, it became apparent that although some students passed the PE (and often very well), they were not achieving what was expected in terms of the "core" material (i.e. that covered in the preceding themes). This would impact on their understanding of the content of later themes. The 70:30 split was therefore decided upon for the following reasons:

1. The 70% for the MAC (which is considered to be 'core' material, which students need to know) will encourage students to see the importance of the need to master this material, which forms the foundations for subsequent themes in later years. While the core is important, the most a student who does the bare minimum can hope to achieve is 70%. If the student wishes for a higher mark, he/she will need to read beyond the minimum expectations.
2. The 30% non-MAC will also allow two groups of students to supplement their mark in the PE.
 - First, the student with prior experience in the science/health science disciplines will be able to score extra marks in this section.
 - Secondly, students who have read more widely for each of their themes will be rewarded with extra marks for their enthusiasm and diligence. As mentioned previously, the organisers believe that students need to realise that they will rarely know all there is to know about a disease as the knowledge base around a subject/discipline will continue to increase as research progresses in that field. It is therefore in their patients' interest that they keep up to date with the research in their fields of expertise or interest. Inculcating this philosophy therefore starts in the first year of the curriculum.

Appendix H

ASSESSMENT DATABASE

Institution: University of Natal, Faculty of Medicine	Department/Discipline: Radiology	Level (circle): Undergraduate/ postgraduate
Course Title and year of study:	School: Clin Science	Year implemented: 1999
Programme (e.g. MBChB, Diploma in...): MMed (Rad) + FC Rad (Part 1, 2)	Name of qualification (if different from programme): Fellow (Medic Radiology)	Number of students: 22
Contact Person: Prof Con	e-mail: con@gwsc.med.und.ac.za	Tel: 2604301 Fax: 2604408

Method of Assessment (e.g. MCQ, essay, viva): MCQ, short questions
How is it implemented? (e.g. paper-based; computer-based, laboratory, etc.): Paper
What outcomes does it assess?: <ol style="list-style-type: none"> 1. Knowledge of radiological principles 2. Application of radiology to clinical practice

Perceived strengths of this assessment?:

1. Mel's a good discriminator
2. Essay give the examine an idea
of the candidate thought processes

Perceived weaknesses of this assessment?:

What, if any, are the unintended consequences of this type of assessment?:

Key readings (if appropriate):

Appendix I (i)

5

UNIVERSITY OF NATAL

DURBAN CAMPUS



Faculty of Medicine
Medical Educational Development

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25th April 2002.

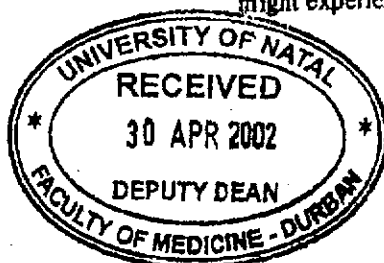
The Deputy Dean,
Prof
Mpala House
Nelson R Mandela School of Medicine.

Dear

Re: Matters arising at CDTF Meeting 23rd April 2002 and other issues.

A number of matters arose at the CDTF Steering Group meeting on Tuesday 23rd April 2002 and in discussions in MEDev.

1. Difficulties were expressed regarding theme design especially the difficulty of getting staff to commit to acting as leaders of the design group or even acting as members of the groups. A suggestion was made that departmental HOD's be reminded that funds had been set aside to recruit sessional appointees who would be able to take over the work load of those who volunteer to work on theme construction.
It was suggested that a letter from you reminding HOD's of this option might be timely and might assist in securing volunteers. This is becoming especially important as Themes in years 3 and 4 will be much more clinically based and thus there will be a greater need for clinicians to become involved in their design.
2. Regarding the Electives that start in 5 weeks time. It was suggested that you as Chair of the Undergraduate Committee invite those who have taken on the 3 leadership roles for each element of the Elective (Research, Community and GP exposure) to give a sort revue of what is going on in each area with the aim of informing the Undergraduate Committee members of the enormity of the task and thus building some support for these persons in the job they are doing. This would also act to develop a sense of ownership amongst members of the Undergraduate Committee of the process going on around them. The Electives programme is really very involved and demands on the Faculty will be great. (Professors _____ and _____ Dr _____ and Dr _____ who is the overall co-ordinator).
3. It was felt that the Faculty (Yourself or the Dean) should write to the HPCSA alerting/reminding them of the increase in size of the cohort of graduating students in 2005 and the need for many more internship posts in 2006 as a consequence. This largely to forestall any placement problems our students might experience after completion of their studies.



4. The issue of staff posts. All staff members presently working in curriculum development and implementation are on temporary contract posts except Dr [redacted] who has a permanent post in [redacted] but who is also only temporarily here in MEDev. Dr [redacted] is here only until mid June when his Sabbatical leave terminates. Four contract posts expire at the end of 2002 one in mid 2003, another at end 2003 and the other is on a "Blue form" 3-month basis!

This clearly is a very unsatisfactory arrangement considering the nature of the work being undertaken. It is quite understandable that these staff, especially the more senior members, should be looking for some permanence in their careers and therefore might be exercising their minds in this regard. It really would be very difficult to continue with programme implementation should we lose some or many of these staff.

My request thus is that you use your influence and work towards the establishment of permanent posts that will assure the continued development and implementation of Curriculum 2001. It seems to me inconceivable that an entire high profile, important faculty programme, dealing with hundreds of students, should have such an insecure staff base! We really cannot expect much forward planning or ownership of the programme unless this problem is resolved.

5. Examination venues. The group writing Progress examinations is now around 380 students and next year will increase again. There is no adequate venue at Medical School that can handle this number of students and as consequence we use a venue at upper campus. An official request from the faculty to the examinations officer at upper campus needs to be made that they include the writing of the 3 Faculty Progress examinations in their planning of venue usage in the future. This request should include an indication of probable student numbers from year to year.
6. MEDev staff will be running some short workshops shortly on Theme Design, Requirements of the Large Group Resource Sessions (LGRS) and The nature of the Assessment items needed for Curriculum 2001. We would appreciate some strong advertising from your office.

If there is anything that I can do to assist in achieving any of the above I would be pleased to oblige but I do believe ultimately it should come from you as Deputy Dean.

Best regards,

Prof

1 STUDENTS REPEATING FIRST AND SECOND YEAR IN 2003

Lengthy discussion took place on the exact requirements for students repeating first and second year in 2003, within the context of the rules in place.

1.1 Progress Examinations

It was **NOTED** that the IT system captured the exact mark obtained in each of the three progress examination during the year. No provision currently existed in the ITS for the average mark of the three progress examinations. Current rules stipulated that the condition for passing progress examinations were a minimum mark of 50% for the 3rd progress examination and a minimum average mark for the three progress examinations of 50%. Once the three progress examinations were averaged (with a pass being a minimum of 50%), and the third progress examination was passed (>50%), a condoned pass would be awarded on any failed progress examination. Student Affairs would alter the "Fail" symbol to "Condoned Pass".

It was **AGREED** that a repeating student would be required to register for all three progress examinations (on an extended DP basis), whether or not he/she had previously obtained a credit, but would not be required to write them if he/she obtained 50% in any four of the six end-of-theme assessments. Failing this, the student would be required to re-write the progress examinations.

It was **FURTHER NOTED** that it was to the benefit of the student to go through the entire system again as the examination was integrated.

1.2 Supplementary Examinations

The scope of material already covered (MAC) for the supplementary examination for progress examinations was to be the same as that of the third progress examination, irrespective of which examination during the year had resulted in the granting of a supplementary examination.

1.3 Aegrotats

Agreed: The calculation of an average mark of the progress examinations for a student with one aegrotat would be the average of the aegrotat and the two written progress examinations. With two aegrotats, it would be necessary to average the marks of both the supplementary and the one examination during the year (i.e. divided by 2 instead of 3).

1.4 OSCE

It was **NOTED** that it was essential for students to retain their clinical skills as the new skills might be in place as the curriculum evolved in 2003.

It was **agreed** that a repeat student who had passed the OSCE in 2002 would be required to obtain an average of at least 50% in the OSCE in 2003 in order to be exempt from writing the OSCE examination. Fee remission should be in place.

Ms Bond would give the names of students repeating the OSCE to Ms van Wyk.

Dr would discuss the calculation of the MAC and MNAC with Professor outside the meeting.

1.5 **Basic Emergency Care Practitioners' module**

If the Basic Emergency Care Practitioners' module and Ambulance Course was failed in the first year, it could be carried into the 2nd year. Discussion would need to take place in the future on what should happen if it was failed in the 2nd year.

It was **AGREED** that because the Faculty's emergency care course was run by a private company, it would be possible for a student who had failed this to pay privately to undertake the course on a full time basis for a short period of time provided the course was completed before registration. A pass from a recognised college would be acceptable.

2 **ELECTIVES**

The query was raised as to why credit points and values were not the same for electives. Professor Hellberg indicated that students in later years were expected to complete a more intensive elective. The credit points awarded and notional study hours involved should be borne in mind when marking allocation to electives in the different years of study.

3 **AREAS FOR FURTHER CONSIDERATION**

It was the opinion of the Committee that a workshop should be held in 2003 to reconsider various aspects of the rules. All concerned parties should be invited to the workshop, including, *inter alia*, Student Fees, ITS, student representatives.

The MSRC was asked to ensure that representatives of students currently in the new curriculum attend the workshop.

Members were asked to give prior thought to the following areas:

- Linkage of the three progress examinations into one module.
- Consideration of the necessity for repeating students to register for all progress examinations.
- Provision of supplementary examinations for the first two progress examinations.
- How to handle the case of a student who has three aegrotats.
- The necessity for a repeat student to register for all three progress examinations.
- Procedure for handling a student who, in the repeat year, fails any component he had passed in 2002.
- Procedure for a student who fails the Basic Emergency Care Practitioners' module in the second year.
- Change of M5 (c) new "A candidate in year 1 of the programme who fails the Basic Emergency Care Practitioner's module end of year 2, the student will have to repeat the second year of the programme" to "... .. shall repeat the Basic Emergency Care Practitioner's module and shall not proceed to the next year of study until this module is passed."

- Change of rule M5 (i) new "A candidate who has not been promoted will repeat the year by attending all the components of the Summative assessments for that year of study" to "....will repeat the year and will register for all three progress examinations and the OSCE"
- The possibility of structuring a single module (being 48 credits) with the *proviso* that the third one shall be passed.

It was stressed that members of the Undergraduate Committee who were absent from the meeting should apply themselves diligently to the discussed resolutions and recommendations of the meeting.

Members

CHAIRMAN

DATE {cmc: 12.12.02}

Additional problems with respect to fee remissions, library privileges, appropriate parking facilities, facilitator inputs to curriculum 2001 and increased numbers of students have aggravated the situation.

- ii) The Dean and Deputy Dean addressed 5 private sector forums over this period with limited success.

The above is to a certain extent dependent on financial resources from the University or province. Despite numerous memoranda and representation to UPRC, ARAC and SRAC in the former University of Natal as well as to the provincial Department of Health, there was minimal respite. This must be seen across a backdrop where the medical school was cross subsidising other faculties over the '52%' threshold and the province was receiving a substantive conditional grant for health professional training. [see attached paper on 'Equity and Medical Education']

CURRENT ISSUES

1. Context

The Medical school operates under the frameworks of the Education and Health Departments. Research support comes from the Medical Research Council (a separate statutory entity). There has been substantive transformation processes in both sectors, as well as, in research support that impacted substantively on the medical school. The medical school doubled its intake, took on new programs (Bio-Medical Science, Public Health etc) and is phasing out the old curriculum within a resource constrained framework and restructuring.

2. Administration

The current administrative systems to support Curriculum 2001 need substantive inputs. Small group facilitation, time-tabling, booking venues, organising transport, assessment and support systems needed considerable 'logistics' planning and operations.

3. Other Medical Schools

5 of the 8 medical schools have remained on the 6-year program (albeit re-tooled) with 1 having additional modifications (Wits has a clinical 4 year MD program which began in 2003 and takes students from a prior undergraduate 3 year degree program). Free State and Transkei have fewer students with a good infrastructure in a limited geographic area for service delivery with fewer hospitals and health facilities.

4. International experiences with curriculum reform

The bulk of the inputs to curriculum reform in Durban came from the Maastricht model. Resource support in medical schools such as McMaster, Newcastle, New Mexico etc are very

different from Durban. The health systems and educational backgrounds of the students entering medical schools are different. Thus, while the Problem Based Learning (PNL) curriculum (curriculum 2001) is of tremendous benefit to medicine locally and internationally, the objective conditions of the environment cannot sustain it.

CONCLUSION

This paper summarises the inputs leading up to Curriculum 2001, the current issues facing its implementation after 3.5 years and the need for modification. Curriculum reform is important and the medical school must be applauded for taking these bold steps. However within constrained environments, caution is needed.

Thus a 'hybrid' model with 'foundation' sciences (anatomy, physiology, epidemiology, pathology, social sciences and bioethics + others) with PBL and clinical 'case' models may allow for sustained faculty private sector involvement.

Annexure 1

EQUITY AND MEDICAL EDUCATION IN SOUTH AFRICA

Nelson R Mandela School of Medicine, University of KwaZulu-Natal)

Executive Summary

Medical education has been affected by historical imbalances, which persist till today. Up to the mid-1970's, there were 5 medical schools for Whites and 1 for Blacks with a further 2 Black medical schools coming into being in the 1980's. The funding of medical schools is inextricably linked to the funding of provincial health departments. The current situation of per capita expenditure on health in the different provinces has worsened the historical divide. Additional factors that have deepened inequity include:

1. infrastructure
2. cross-subsidies from other programmes and funding agencies (Medical Research Council, NHLS, NCOH/MBOD, Ministry/Department of Defence)
3. economies of scale (training of all health professionals)

Funding Sources

Funding of medical schools is via the provincial Departments of Health, from the Department of Education through the subsidy formula for higher education and to a minimal extent from student fees. Given the increasing divide between resources and need, most medical schools have begun innovative revenue generating projects (contract research, university – private partnerships, donor support, etc).

All medical schools are governed by joint agreements with their respective provincial Department of Health. These agreements vary from province to province but are important as they set the framework for funding, provision of infrastructure and support for research.

Most recurrent medical school expenditure is on personnel while the health care infrastructure is provided by the provincial administration.

Disparities in per capita Public Sector Funding (MTEF years 03/04 to 05/06)¹

	03/04	04/05	05/06
<u>Eastern Cape</u>	769	841	906
Free State	1049	1138	1201
Gauteng	1668	1758	1800
KZN	1006	1069	1105
Western Cape	1377	1425	1457

¹ Intergovernmental Fiscal Review 2003, National Treasury, RSA. Pg 77 Table 5.3

Gauteng and W. Cape have vastly higher expenditure relative to the E. Cape, Free State and KZN. While Gauteng and the Western Cape provinces may be diverting more resources to the Health Sector, additional flows of funds through the 'conditional grants' mechanism from the National Department of Health are a factor. This disparity is worsened by the current workload distribution as shown by the population per practitioner ratio.

It is assumed that most medical specialists in the public sector are associated with a medical school. Thus direct comparisons are possible amongst the medical schools when assessing the population / medical specialist ratio.

Population / Practitioner ratio in the Public Sector (February 2003)²

	Population/ Doctor	Population/ Specialist	Population/ Dentist	Population/ Nurse
Eastern Cape	8825	47529	190117	1278
Free State	422	11342	71491	786
Gauteng	273	3398	25458	606
KZN	4362	15641	145607	901
Western Cape	2979	2746	28074	796

In reality, this translates to a medical specialist in KZN having a workload 4½ times that of a specialist in Gauteng and 5½ times that of a specialist in the W. Cape. This is in addition to the teaching and research workload of that academic. E. Cape and Free State have greater disparities. Given that the other health professionals in KZN, E.Cape and Free State have similar unequal distributions as compared to the W. Cape and Gauteng, the overall support to the provincial health care system, as well as to health professional education, leaves much to be desired.

Infrastructure

The infrastructure backlog is also a case in point both with respect to medical school buildings as well as the health care infrastructure. While some progress is being made using the Hospital Revitalisation funded program, there are still vast disparities in the capital infrastructure (mainly hospital and clinic sites) associated with the various medical schools.

Cross subsidization through the public health care system has realised infrastructural and collateral benefits to some medical schools. The examples include:

1. the NHLS and Wits University
2. the NCOH / MBOD and Wits University
3. the MRC and Pretoria and Stellenbosch Universities
4. the old Groote Schuur hospital and UCT
5. Department of Defence and Pretoria University

² Intergovernmental Fiscal Review 2003, National Treasury, RSA. Pg 79 Table S.6

Major sponsorships through private networks have assisted some of the medical schools.

The Medical Research Council has funded many units/centre at the historically White medical schools. [See Annexure 2 for the current status of such units]. The linkages with the MRC in KwaZulu need to be strengthened.

Economies of Scale

The UKZN will, to a certain extent, do away with a "stand alone" medical school. Economies of scale with other health professional training programmes will realize the following benefits:

1. maximum use of basic and applied science facilities
2. increased FTE's with greater subsidy
3. enhanced research and learning collaboration
4. rational use of teaching platforms and collateral benefits with respect to transport, lecture rooms, library and other resources.

Personnel Matters

There are major differences amongst the provinces / medical schools with respect to conditions of service. The differences include:

1. Overtime payment
2. Retirement age
3. Private work
4. Numbers of posts (academic and support)

Conclusion

The widespread discrepancies due to:

1. historical and current funding patterns
2. infrastructure
3. cross-subsidies
4. economies of scale

have lead to grossly distorted inputs to medical education.

The above have created further imbalances as it relates to research outputs, ability to attract and support postgraduate students (especially in the basic and applied sciences) and revenue from SAPSE accredited publications. Indeed, were it not for the dedication of the academic and support staff in the historically Black medical schools, these institutions would have long collapsed with major consequences for the public health system as well as the future of health professional education. The situation within the health care system is further aggravated by the HIV/AIDS epidemic especially in a province such as KwaZulu-Natal.

Appendix I (iii)



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15th May 2002.

The Dean
Nelson R Mandela School of Medicine

Dear

Re: MEDev, SUE and

As head of MEDev I am most concerned about a pattern that is emerging regarding this position and the *de facto* expectation, when it suits, that MEDev should be organising and implementing the new curriculum, i.e. acting as SUE, and at other times, again when it suits, MEDev is MEDev and should not get itself involved in decisions regarding undergraduate medical education that are the preserve of SUE.

Some days ago an advert was sent to me regarding the position of Assistant exams Officer. This was the first I had heard about this position except for a suggestion in this regard made almost a year ago when suggestions regarding SUE were made in the Archer document. MEDev presently organises, runs and sees to the marking of all tests and examinations done by students in the new curriculum and yet we are not even consulted!

Yesterday a general advert appeared for an Education Manager in the Faculty of Health Sciences on the University wide message system. Again I have no idea what this is about. Head of Medical Educational Development and I know nothing about it?

When you met the Steering Committee in March we discussed the issue of the permanence of the post for [redacted] who has had her temporary appointment renewed 7 times and has been in the post nearly 2 years (MEDev [redacted]). You indicated that I go ahead and make necessary arrangements to finalise this situation as there should be no problem in making the appointment permanent. I wrote to you requesting that the issue be resolved in terms of a "credentials committee meeting". In spite of this an advert for the job has been sent out today!

The last information I had regarding an acting head for MEDev was your message that you were okay with my suggestion to appoint [redacted], but that [redacted] (Undergraduate Committee Chairperson) would need to concur. Then the information released at the Board and not even 'noted' to the Undergraduate Committee. I don't have a problem with the decision of the Executive but why could the Committee and I not be informed about it?

I am totally unaware of the plans you referred to, at Board, of the undergraduate students using Dookies as a venue for their small group meetings. Months ago, after I pointed out to an architect from FMG who suggested this, the very real dangers

involved in moving around 400 students backwards and forwards across Umbilo Road at least twice a week and probably more often, I thought the idea had been shelved. MEDev is the only unit organising and involved with small group venues for the new curriculum and we know nothing about this and are not even consulted?

The peculiar comments from a member of the Executive () regarding SUE and MEDev are of concern. What is the perception of the Executive regarding the implementation of the new curriculum? Do they really believe that SUE exists and could run the undergraduate programme? I, and I am sure the rest of MEDev staff, would welcome such a situation so that we could actually get on with tasks appropriate to our job descriptions.

Your constant reference to others, () on a number of issues when you are aware that the Undergraduate programme is being run by the Steering Committee of the CDTF under the Chairpersonship of and myself? Vice Chairperson is of concern. The Assessment Committee is in fact a subgroup of the Steering Committee that in turn is answerable to the Undergraduate Committee. Is there some agenda aimed at sidelining the CDTF and Steering Committee?

Comments like those from at the Board meeting, as you well know, are just not true, a real slap in the face for those who have voluntarily spent hours and hours on the new curriculum and are highly damaging to the general perception of the new programme and to staff moral. To suggest that it is "inferior" is to malign and insult senior colleagues who have appropriate educational experience, training and qualifications. As the programme is already approaching the 3rd year of implementation I would have expected very strongest support and confirmation from yourself as Dean to the commitment of the Faculty to Curriculum 2001 and its development.

I have e-mail and letters to administration dealing with various issues related to the undergraduate programme that remain unacknowledged or to which responses are not received.

New appointments in administration and elsewhere are made and funds appear to be available for renovation etc. elsewhere (painting of buildings soon to be demolished) but funds for staff and simple tidying up related to the undergraduate programme I am told are unavailable. Even the students, our ultimate consumers, have made comments in this regard! One can then only wonder what the central business of this faculty really is!

The announcement that the Deputy Dean should now be more involved with the undergraduate programme is something that the Steering Committee has been pressing for since his appointment and their expectation, in terms of the job description, that 80% of the incumbent's time would be devoted to the undergraduate medical programme. To date this has not happened because of the very onerous workload that he has. The fact that this will now eventually happen is in fact wonderful.

A small group of Faculty have voluntarily worked since June 1997 on the new curriculum. They have done this and continued to do it in the face of the Faculty

administration reneging on specific promises of financial support. Some of those have since died and others moved on and still the issue does not reach finality. Excuses on why original promises made should not be honoured are constantly produced. Is it any wonder that people are disgruntled and don't come on board?

Well before the introduction of the new curriculum the Steering Committee began pushing for the establishment of SUME/SUE as it was quite clear that MEDev did not have the resources to undertake such a massive function. However, largely through a process of default, MEDev has had to take on the responsibility of acting as the implementation arm of the Steering Committee. All the functions related to the implementation of the new undergraduate programme traditionally dealt with by departments are now organised, and in most cases done, by MEDev and its staff. (While the Curriculum Organiser and her assistant are supposed to be employed by the Faculty through SUE the reality is that there is no SUE and they and MEDev work as a team).

While you do of course have every right to lead as you see fit and I probably don't need to be informed on these issues and probably others too, I would have expected that such consultation would have a positive outcome on staff moral. You talked of "push" and "pull" issues. Quite clearly these are pretty strong "push" messages.

I really believe that if the intention is for the new programme to succeed and students are to get the best deal, there needs to be a lot more transparency and support from yourself and the administration for undergraduate medical learning and those committed to this end.

Yours sincerely

Appendix I (IV)

CURRICULUM REFORM IN THE NELSON R. MANDELA SCHOOL OF MEDICINE , June 2004¹

BACKGROUND

The inputs to curriculum reform in medical education has been around since the 19th century and was given impetus by the Flexner report in the USA. In South Africa, inputs from progressive health organizations (NAMDA) in the early 1980's led to substantive changes towards

- community oriented / based education
- early clinical exposure
- problem based learning approaches
- team learning experiences

The medical school began on a process of reform of the curriculum in the mid-90's with a "Curriculum Development Task Force" (CDTF) – implementation of the new program was planned for 1999 but subsequently delayed till 2001. The newly appointed Deputy Dean oversaw the implementation of Curriculum 2001, together with the Undergraduate Committee, the School for Undergraduate Medical Education and the CDTF. Infrastructural and other support was provided from the Dean's office.

The rule changes were assisted by Profs Hellberg and van den Berg with inputs from Ms Luckett on quality assurance. During 2002, the HPCSA accredited the undergraduate program and supported the changes underway in Curriculum 2001. The HPCSA is due to visit the medical school in 2005 for another accreditation visit. Various internal processes (UG committee, faculty Board, Senate and Council) were followed along with inputs to the registrar's office (Ms Ireland) to facilitate the external process with the CHE, SAQA and HPCSA.

CURRENT EVALUATION OF CURRICULUM 2001

Evaluation of the program has been ongoing with inputs at multiple levels (UG Committee, Executive Committee and Board); the students had a curriculum conference in 2003. Evaluation is done on the following criteria: inputs, process and outcomes.

Inputs

Content

Academic content has been restructured substantially with the 5-year integrated programme. The notional hours of instruction was 210 hours in the 6-year program and 204 hours in a 5-year program (with loss of vacation time and extension of the academic year). Medical Science inputs need to be strengthened (programs are underway to do this).

¹ This paper is a s a result of my observations since 2000. It should not be seen as a critique of curriculum reform but rather to consider issues that can enhance curriculum reform.

Infrastructure

While appropriate planning had taken place with the content, there was a paucity of planning for infrastructural support. This was compounded by the increased number of students (a policy decision taken in the late 1990s by the university authorities without due inputs by the faculty). These were:

- a) the doubling of the intake of medical students; an increase in service offerings to B.Med Science, Nursing and Public Health students; an increase in registrar and postgraduate medical science programs. There had not been concurrent increase in the physical facilities. Emergency interventions were made in 2000 to add seating capacity in lecture rooms. In late 2000, prefab "Parker" homes were brought in and re-tooled to provide small group venues (a necessary component) for curriculum 2001.
- b) Further infrastructural changes took place in the Skills Laboratory, the student LAN, student support services and residences during 2001/2002.
- c) These infrastructural backlogs in the medical school as well as in the health facilities including problems with the 'carrying capacity' of hospitals for clinical exposures led to substantial complaints from students and staff.

Personnel

- a) The personnel changes in this period (1996, 2000, 2004) were not substantive and led to decreased morale. [This must be seen against a backdrop of profound restructuring of the provincial health system with downgrading of certain hospitals, commissioning new ones or parts of a service, the maturing HIV/AIDS epidemic and increase in trauma. The medical school has a "footprint" across 11 hospitals in Durban (Inkosi Albert Luthuli Central Hospital, King Edward VIII, Addington, Mahatma Gandhi, RK Khan, Prince Mshiyeni, Clairwood, King George V, McCords, St. Aidans, Wentworth) and 5 in Pietermaritzburg (Greys, Northdale, Edendale, Fort Napier and Townhill) apart from the district and rural health facilities].
- b) Further issues on differing conditions of service (between public service and university and across provinces). They are:
 - i) pensionable age
 - ii) overtime payments
 - iii) academic privileges
- c) Private Sector Involvement
 - i) The medical school would not function effectively without private sector support. Given the substantive restructuring of the public and private sectors, as well as, changes to the curriculum, some private practitioners have opted out of the system whilst it has been near impossible to recruit others despite meetings with the guilds, the Forum for Equity and Excellence etc..

Appendix I (V)

6 May 2002

Professor [REDACTED]

Head: Undergraduate School of medicine

Cc: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

The rule changes that existed at the time of our registration in 2001 seemed to be in keeping with the new thinking in education. The proposed rule changes, however, create the impression that the previous rules on assessment were flawed and a more "acceptable" method needed to be found. Consequently, an elaborate and complicated method of "scaling down" marks has been presented. We believe that in our arguments presented below, we will show that the proposed new method disadvantages students (even if there is only one such student). We are further of the opinion that no assessment method is credible if it has the effect of favouring one student over another or if one student's marks determines that of another.

Additionally, you will note our examples and explanations hereunder are rather complicated, which gives an indication of the complicated nature of the proposed assessment methods.

A. MATERIAL ALREADY COVERED COMPONENT (MAC)

1. No explanation has been rendered in respect of why it was decided that the first 50% would be retained and the balance of the 20% scaled down.
2. We would accept that graded questions (levels 1, 2, 3, 4, 5) need to be awarded marks proportionately. However, **in the objective type questions posed in the PE there does not seem to be any distinction in the levels of questions.** Consequently, we cannot see which questions would cause the student to retain the 50% and which of the easier questions between 51 and 70% would need to be scaled down.
3. If the questions were graded, the new rules would not distinguish whether the student obtained 50% in difficult or easier questions. A student would therefore be severely disadvantaged if he were to obtain the 51-70% mark in the more difficult sections of the PE as he would be automatically scaled down.

B. MATERIAL NOT ALREADY COVERED COMPONENT (MNAC)

1. We presume that the pegging of the marks to 28,5% in this section made use of statistical and mathematical models. It seems that the presumption of the statistician is that no student will ever be able to score 100% (30%). We find it difficult to understand how this presumption could be made. Surely, a possibility does exist, no matter how small or remote that possibility may be.
2. This is a section in which a student shows that he has gone the "extra mile". Despite this fact, the proposed rules penalise the student by 1,5% for having gone that "extra mile". This, in our humble opinion, is tremendously demotivating and is a disincentive to perform at higher than expected levels.
3. We find it difficult to understand why the marks of an entire class are dependant on the average of the three highest marks. We have explored

several scenarios hereunder and have arrived at seemingly disadvantaged marks for students.

4. Eg.1: The higher the average of the three scores, the less the class benefits.
– $(103+97+94) / 3 = 98$. A student obtaining 90 marks in MNAC will achieve $(90 \times 28.5) / 98 = 26.17\%$. However if the three scores are 120, 115 and 113, the average would be 116, resulting in the score of 90 marks achieving $(90 \times 28.5) / 116 = 22.11\%$. This is pitting the student with 90 marks against the student who has above average ability. We consider this to be unfair.

Eg.2 : If the 3 highest scores are 105 , 35 , 33, all three would attain 28.5%. Would it be fair to the student who achieved 105 marks? Consider also the student with a score of 32. This student would only be awarded 15.8%, yet the 3rd highest, which is just one extra mark, receives 12.7% more! Can this be justified considering the difference of 72 marks between the highest and third highest scores?

Eg.3 : If the class colluded to answer only 10 MNAC questions and if all three obtained 10 marks each, the reference raw score would be 10 giving each of them 28.5%. A score of 8 would then be awarded 22.8% ie. $(8 \times 28.5) / 10$. Ironically, the fewer questions answered, the greater the possibility of attaining more marks!

The above three examples indicate that statistical and mathematical models can be used to manipulate any situation (whether it is ethical or not is not the question here). All that is required is collusion by the entire class to answer only 10 or even fewer MNAC questions, which they are 100% sure are correct and everyone in the class will have 28,5% for this section.

We therefore humbly question the reason for this compromise of academic quality.

It may be argued that only a few students may be affected by examples 1 and 2. We do not believe that any individual student should be disadvantaged to accommodate difficult situations that the faculty finds itself in as a result of the implementation of the new curriculum or to satisfy persons or organizations that have little knowledge of the workings of the this curriculum.

C. CONCLUDING COMMENTS

1. It is rather sad that we have to be concerned with assessment issues at this stage of our studies. We appreciate the considerable effort that has gone into producing the new curriculum. However, we perceive that no thought has been given to the scoring of assessments. Consequently, the proposed rule changes impact negatively on our studies.
2. Any rule must be understood and accepted by both students and the University community as being fair and educationally sound. We find it unacceptable that the University creates rules to satisfy bursars (as we have been informed) at the expense of students. We believe that such situations compromise the academic status of the Nelson R. Mandela School of Medicine as such assessment formulae can easily be manipulated by students. We are not sure whether the scoring of assessments in this way would be internationally acceptable. We therefore fear for the validity of our degree and our future.
3. There are **other** problems that we have identified with the proposed rule changes. However, our main concern at this point is the progress exam.

4. We need to be informed before the forthcoming progress test on what marking system will be employed and whether MNAC and MAC will be differentiated, as this will determine how we answer the MNAC component
5. We will be glad to explain or elaborate on the above as well as put forward for debate a possible compromise **solution** should we be called upon to do so.

We thank you for taking the time to read this representation.

Yours sincerely

[REDACTED]

[REDACTED]

Appendix I (VI)

MSRC PROPOSAL ON CURRICULUM ISSUES 2004

1. Introduction

Subsequent to the 2004 Curriculum review conference, the faculty as a whole was able to arrive at a more comprehensive approach to the manner in which the curriculum is to be developed. This was facilitated by the simple fact that both the students and academics were able to tackle jointly the challenges of curriculum development.

Firstly, as a matter of principle, the curriculum in creation and implementation must be entirely owned by every single department in the Faculty and not be seen as a SUME project. Intrinsic to the debate of ownership, is the notion of decision-making around curriculum content and the individual departmental autonomy to dictate precisely what it is that they would like to teach and examine. SUME must therefore correctly assume the role of coordinating the different information which comes from the different departments but more importantly, SUME must not interfere (or alternate) the material which has been contributed by the different department, SUME must merely consolidate.

Secondly, our understanding was that the initial change in the curriculum was informed by the necessity to improve identifiable inadequacies within the traditional curriculum; amongst these was the taxonomical approach in training which undermined the interrelation between and amongst the different disciplines. However, any improvement ought to have been done in a manner that, while facilitating a healthy change, sustains the good practices and components of the traditional curriculum and project them into² the new curriculum.

Lastly, but fundamentally paramount, while we welcome the proposed change of returning to the 6-year programme, we must remain continuously cognisant of the fact that there are students who are currently within this new curriculum which will soon be changed and hence, whatever inadequacies which necessitated the conversion to a 6-year programme should be addressed for the pipeline students.

2. Basic sciences and themes

In dealing with basic sciences, our approach will be underpinned by one important principle; a class -by- class approach.

This takes into cognisance that the gaps experienced by students in different classes are not necessarily the same and the time remaining to fill in these gaps is not the same, we therefore, need to respond to the inadequacies as experienced by the students in a particular year and not employ an umbrella approach.

See appendix A.

4. Facilitation

According to last year's conference, there was a resolution that facilitators be medics or clinicians and in this year's conference also resolved that the resolution was to stand unchanged. A request to have consultation time for the new curriculum students was made by students. A concern raised was that some facilitators are not interested in the job of facilitation and it impacts negatively on students.

Central to this debate is the issue of ownership of the curriculum, which must not only with SUME but must be equally shared with individual departments. Using that as the point of departure, academic staff and registrars must be able to participate in facilitation, the same way as they are the people responsible for tutoring in the old curriculum.

An extreme alternative is to consider the possibility of using final year students.

Private sector must also be approached.

5. Clinical Methods

There is a need for increased clinical exposure. To achieve this objective, all departments and relevant tutors must be encouraged to own the programme and therefore, the teaching of students to ensure their maximal involvement and subsequently, better delivery.

Skills lab cannot be assumed to be an adequate replacement for the ward experience. Competency in performing a procedure in a dummy is not

equivalent to clerking Mrs Gumede, and another critical debate that came out of the conference was the necessity to be conversant with isiZulu. The curriculum must be able to provide more concrete, examinable Zulu lessons and also discourage non-Zulu students from requiring the translation services of their Zulu -speaking counterpart.

While we will not bring ourselves to the cumbersome task of conducting an extensive comparison between the old and the new curriculum regarding clinical exposure, it is a known fact that students in the traditional curriculum remain highly privileged when it comes to this issue. For instance, for a 3rd year student in the NC, a 12-week block of Surgery is only composed of 4hrs per week of time spent in hospital while the same 12-week block of Surgery for a 4th year student in the traditional curriculum is composed of 36hrs per week of time spent in the hospital, however both these individuals will be in the same graduate year.

We are therefore convinced that if it was possible to compress the 4th year programme in such a manner that it avails full 3 days spent in the hospital, a similar scenario must be implemented for the 3rd years from 2005 onwards.

6. Assessments

First and foremost, all rules relating to assessments are to be clearly stipulated in the rule book and all new assessment methods/tools to go through the relevant structures (Undergrad and Faculty board).

a) PE

- 5th year – there shall be no Progress Examination in the final year.
- Other years – relevance and the rationale behind the PE must be assessed and necessary amendments must be instituted.

b) Semesterization

A basic, yet correct, understanding of the structure of the New Curriculum can be defined as consisting of two modules per year from year 1 to year 4, and generally, each module is composed of three themes.

Therefore what we currently refer to as PE1, for example, should be a module exam, in which case, should consist only of the material

covered in the three themes which make up that particular module. Subsequently what we currently refer to PE2, should be a module exam, in which case, should consist only of the material covered in the three themes which make up that particular module.

Therefore the exam for module 2 cannot include material covered in module 1, because module 1 is an entity on its own according to University rules, and we should correctly refer to module 1 and 2 as prerequisite modules for module 3 and 4 which will be done in the following year (rule GR3).

3 PE.
Sup. not
necessary

This also means that the supplementary exam for module 1 must be composed only of material covered in the themes which constitute this module, and hence the supplementary exam for module 1 cannot be the same as that of module 2.

However, for logical administrative purposes, module 1, 3, 5, 7 must only be offered in the first semester and modules 2, 4, 6, 8 must only be offered in the second semester, moreover the first semester modules must be ^{pre}co-requisite for the second semester modules in their respective years.

3. Sub

Above and beyond everything else, this therefore suggests that the concept of Progress exams as we know them is nullified because it attempts to impose an annual approach on the semesterized framework which then creates a lot of confusion.

c) Assessment committee

The MSRC has received numerous concerns from the students regarding the staff at assessments. In addition, the MSRC has also experienced challenges when dealing with this office and particularly, the head of this committee. This is a hurdle that needs to be dealt with and with immediate effect to ensure that the problems that students in general have been confronted.

Request
Criteria

d) ETT papers

Students are clear on this, the trend of letting them keep ETTs papers must continue and we are grateful that we have been listened to in this regard.

1. Proposed approach to 2005 1st year

Year	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6
1 st	Nutrition (4 weeks) ¹	Digestion and Absorption	Growth & development	Endocrinology	Infection & Inflamm	Trauma & Emergency
2 nd	Cardioresp ²	Diabetes	People & Bugs	CNS ³	Body in motion I	???Clinical medicine ⁴
3 rd	Body in motion II	Urogenital Disorders	Cell dysfunction	Fever	Reproductive Health I & II ⁵	Liver lectures ⁶
4 th	Sight & sound	Abdominal complaints & Jaundice	Higher mental function	Nuts and bolts	Dermatology and Haematology	Lifestyle & Man, health and environ

2. Proposed approach to years 2, 3 and 4 for 2005 and 3rd year in 2006.

Taking into consideration that no logical reshuffling can take place in these classes in 2005, the only possible option for creating additional time for basic sciences is through an extensive tutoring programme. To carry out this programme would necessitate that some tutorials are conducted on Saturday mornings somewhat similar in the same format that the traditional curriculum 2nd year students would come for supervised dissection sessions on Saturdays.

- * ¹ 2 weeks to be reserved for Approach to basic sciences and focus on the basic sciences relating to the GIT
- ² 8 week module (1st 2 weeks focusing on basic sciences and the 6 weeks to follow the normal routine)
- ³ 8 week module (1st 2 weeks focusing on basic sciences and the 6 weeks to follow the normal routine)
- ⁴ 2 week clinical medicine block spent entirely in the hospital
- ⁵ 10 week module
- ⁶ 2 weeks – to be done at the beginning of the year to anticipate mainly the Surgery block and to respond to the current setup in which case one only interacts with Abdominal complaints & Jaundice in 4th year after spending 12 weeks of Surgery the previous year.

3. Proposed approach to 2006 4th year

Recognising the fact that electives have currently taken an integrated approach such that each elective done consists of the 3 components (i.e. Family Medicine, Community based and research) which used to be stand-alone entities, we are thus convinced that electives should only be done up to 3rd years, so that time that would have normally used for electives in 4th year is re-directed towards basic sciences and clinicals.

Appendix J (I)

1st Year Time Table 2001

1st Term – 22nd January to 11th May 2001

DATE	DETAIL
22 nd January to 26 th January 2001	Orientation
29 th January to 16 th March 2001	Module 1.1 Introduction/ Diabetes Mellitus
19 th March to 4 th May 2001	Module 1.2 Nutrition
13 th April to 22 nd April 2001	Easter Vacation
7 th May to 11 th May 2001	Enrichment Module
12 th May 2001 (Saturday)	Progress Examination

2nd Term - 14th May to 24th August 2001

DATE	DETAIL
14 th May to 22 nd June 2001	Module 1.3 Growth and Development
16 th July to 24 th August 2001	Module 1.4 Infection/Inflammation
23 rd June to 15 th July 2001	Mid-Year, July Vacation
15 th August 2001 (Saturday)	Progress Examination

3rd Term 27th August to 16th November 2001

DATE	DETAIL
27 th August to 5 th October 2001	Module 1.5 Reproductive Health
8 th October to 16 th November 2001	Module 1.6 Trauma and Emergency Care
17 th November 2001 (Saturday)	Progress Examination
20th to 23rd November 2001	Objective Structured Clinical Examination
24 th November 2001	Year-end Vacation Starts

Appendix J (II)

3rd YEAR TIMETABLE – 2003

1st Term: 14th January 2003 to 6th May 2003

Registration 14th January 2003
Orientation 14th January 2003

Theme 3.1 Body in Motion 2 15th January 2003 – 26th February 2003
Small Group sessions (NB: See Note 1 below)
Wednesdays 1st session 15/1; 22/1; 29/1; 5/2; 12/2; 19/2
Wednesday s 2nd session 22/1; 29/1; 5/2; 12/2; 19/2; 26/2

Theme 3.2 Hormonal Orchestra 13th March 2003 – 30th April 2003
1st session (Thursday 8h30-10h30) 13/3; Wed 19/3; 26/3; 2/4; 9/4; 23/4
Wednesday s 2nd session 19/3; 26/3; 2/4; 9/4; 23/4; 30/4

Electives: 27th February to 12th March 2003

Easter Vacation: 12th April to 21st April 2003

Progress Examination: Saturday, 10th May 2003

2nd Term: 30th April 2003 to 3rd September 2003

Theme 3.3 Cell Dysfunction 30th April 2003 – 18th June 2003
Wednesdays 1st session 30/4; 7/5; 15/5 (8h30-10h30); 21/5; 28/5; 4/6
Wednesday s 2nd session 7/5; Tuesday, 13/5 (14h00-16h00); 21/5; 28/5; 4/6; 11/6

Theme 3.4 Fever 23rd July 2003 – 3rd September 2003
Wednesdays 1st session 23/7; 30/7; 6/8; 13/8; 20/8; 27/8
Wednesday s 2nd session 30/7; 6/8; 13/8; 20/8; 27/8; Tuesday 2/9 (14h00-16h00)

Electives: 9th July to 22nd July 2003

Mid-Year, July Vacation: 19th June 2003 to 8th July 2003

3rd Term: 3rd September 2003 to 28th November 2003

Theme 3.5 Life Styles 3rd September 2003 – 15th October 2003
Wednesdays 1st session Thurs(8h30-10h30) 4/9; 10/9; 17/9; 25/9; 1/10; 8/10
Wednesday s 2nd session 10/9; 17/9; 25/9; 1/10; 8/10; 15/10

Theme 3.6 Reproductive Health 15th October 2003 – 28th November 2003
Wednesdays 1st session 15/10; 22/10; 29/10; 5/11; 12/11; 19/11
Wednesday s 2nd session 22/10; 29/10; 5/11; 12/11; 19/11;
Tues (14h00-16h00) 25/11

Progress Examination: Saturday, 23rd August 2003 & Saturday, 22nd November 2003

Objective Structured Clinical Examination: 27th & 28th November 2003

End of Year Vacation starts 29th November 2003



S A P

Student Assessment Project

Progress Test December 2000

Maastricht University

S A P

Faculty of Medicine

S A P

S A P

CATEGORY 1 - RESPIRATORY SYSTEM

The release of leucotrienes from bronchial mastocytes can lead to a change in the permeability of alveolar capillaries. This is:

1. a reduction in permeability.

An allergic reaction is accompanied by the formation of various substances from arachidonic acid. One of these arachidonic acid metabolites is:

2. thromboplastin.

Inspiratory stridor can be caused by, for example, a laryngomalacia or a congenital struma. One occurs more frequently with newborns. This is:

3. laryngomalacia

Allergic reactions can be classified into various types. A type III allergic reaction (along with other types or on its own) occurs, for example, in the case of:

4. extrinsic allergic alveolitis.

We can distinguish the Maxillary sinus and the sphenoid sinus. One of these sinuses drains onto the meatus nasi medius. This is:

5. the sinus maxillaris.

Hypoventilation usually alters the pH of the blood. When this happens it results in:

6. an increase in pH.

One can identify metabolic and respiratory alkalosis. If, in the case of alkalosis, the "base excess" is raised, this would be referred to as:

7. metabolic alkalosis.

One can differentiate between the cytomegalovirus and the Epstein-Barr virus. One of these two is considered to be a important factor for the development of a nasopharyngeal carcinoma. This virus is:

8. the cytomegalovirus.



PROGRESS EXAMINATION 2

DATE: AUGUST 2003

TIME: 3H

INSTRUCTIONS TO CANDIDATES

- 1 Shade your Student number and Surname and Initials in the blocks provided on computer answer sheet. Write your name on the answer sheet.
- 2 Indicate your year of study, e.g. "3" on the top left-hand corner of your MCQ answer sheet.
- 3 Answer True (A), False (B) or I don't know (C) to the statements.
- 4 Negative marking (-0.5) will be applied and a '0' will be allocated for the 'I don't know' option.
- 5 The number of MAC questions are as follows:
 - First year = 30 statements,
 - Second year = 80 statements and
 - Third years = 130 statements.
- 6 The remaining statements are non-MAC.
- 7 All question papers should be returned to the invigilators with the answer sheet.

David, a 16-year old Type 1 diabetic, decided to play squash on Sunday morning. After the first game, he felt faint. A blood sugar test revealed his blood glucose level to be 1.5 mmol/l.

1. David did not take his insulin as required F
2. He probably missed breakfast T
3. Sugar given in the form of a sweet or sweet drink, is indicated for David T
4. After treatment, recovery from hypoglycaemia takes several hours F
5. David is at risk of permanent brain damage if not treated urgently T

Nothando and her friends have just returned from a lunch consisting of a hamburger and potato chips (French fries) with tomato sauce. This was followed by dessert of ice cream and canned peaches.

6. The potato chips would test positive for the presence of lipids T
7. The presence of alanine can be demonstrated using the Biuret test F
8. Benedict's reagent and ice-cream heated together will turn from blue to red/orange T
9. Reducing sugars will stain negatively with Benedict's reagent F
10. Complex carbohydrates will turn iodine to a dark purple/brown colour T

8-year old Thulani has macrocephaly since birth. He has an unsteady gait and poor balance. A CT scan of his head shows marked dilatation of all the ventricles.

11. Thulani's head circumference will lie between the 50th – 97th centile for his age when plotted on the appropriate growth chart F
12. The 3rd ventricle is connected to the lateral ventricles by the corpus callosum F
13. Thulani's poor balance is due to pressure effects on the cerebellum caused by the dilated 4th ventricle T
14. Thulani's macrocephaly is due to congenital hydrocephalus T
15. The choroid plexus produces less than 5% of circulating cerebrospinal fluid (CSF) F

Fathima is 2 years old and has Down's syndrome. She cannot stand without support but can crawl. Her mother also complains that when Fathima is upset, she (the mother) finds it difficult to console her.

16. Down's syndrome is an X-linked inherited disorder F
17. Fathima's gross motor skills are appropriate for a 1-year old child F
18. Fathima is displaying a difficult temperament which interferes with bonding T
19. A 2-year old should be able to search for and find an object that has been moved while it is out of sight (invisible displacement) T
20. An early intervention programme will allow normal psychomotor development F

12-year old Tilly is taken to the family doctor, complaining of a cough, sore throat, and a "runny nose". The family doctor diagnoses an upper respiratory tract infection (URTI).

21. The most likely cause of Tilly's URTI is a streptococcal infection F
22. She most likely acquired the infection by droplet spread from a classmate with a similar problem T
23. Rigors and myalgia are common manifestations of an URTI F
24. Antibiotics are an essential part of Tilly's treatment F
25. Complications of an URTI include otitis media T

2-year old Sipho lives with his extended family of 8 persons in Inanda. He presents to the local clinic with coughing for 2 months and loss of weight. A diagnosis of pulmonary tuberculosis (PTB) is made after examination and investigations.

26. An adult family member with PTB most likely infected Sipho T
27. You would expect Sipho's chest X-ray to show upper lobe cavitation F
28. Sipho's infection could spread to the liver and the meninges via the lymphatic system F
29. Sipho's infection could have been prevented by a BCG vaccination F
30. Sipho's tuberculosis can be treated successfully by a protocol using 3 drugs given over 6 months T

End of MAC for First Years

Mary, a 14-year-old scholar, presents to her GP suspecting that she may be pregnant. Her GP confirms that she is eight weeks pregnant. Mary requests a termination of pregnancy (TOP), as she cannot cope with a pregnancy at this stage of her life.

31. TOP can be performed on a patient of any age (T)
32. Mary will require parental consent for the procedure (F)
33. The GP can refuse to refer her for TOP (F)
34. A combination of medical and surgical means can be used for TOP at this gestation (T)

Sibusiso Khumalo is 20 years old. He is brought in to casualty with a deformity of his left lower leg and an overlying laceration within which a fragment of bone can be seen. He was the driver of a car that was involved in a collision. His pulse rate is 115 beats per minute, blood pressure 95/70 mmHg and respiratory rate 18 breaths per minute. His Glasgow Coma Score is 15. His speech is slurred and he appears to have difficulty in concentrating on your questions. The SAPS is in attendance, requesting a specimen for blood alcohol estimation.

35. His mental state indicates that he is drunk F [May be due to shock]
36. His cardiovascular status may be due to alcohol ingestion T [Alcohol is a vasodilator]
37. Since your patient is able to talk, your first intervention should be commencement of intravenous infusions and control of bleeding from the wound. T [Airway and Breathing OK; Circulation comes]
38. During your secondary survey, you should carefully examine the patient for other causes of hypotension. T [Possibility of multiple injuries]
39. The patient has the right to refuse giving a specimen for blood alcohol estimation (T)

Wiseman Zungu's height is 170 cm. His blood pressure measured with a cuff around his upper arm is 120/80 mmHg when standing.

40. The blood pressure in his head is approximately 23 mmHg T
41. The blood pressure in his feet is approximately 200 mmHg higher F approx. 110 mmHg higher
42. The pressure in his vena cava adjacent to his right atrium is 5–8 cmH₂O T
43. Return of blood from his feet to his heart is dependent upon the squeezing action of his leg muscles on the veins running through them T
44. The presence of valves in veins assists in returning blood to the heart T

With permission and counselling, you perform an HIV ELISA antibody test on 8-month old Michael who presents with recurrent pneumonia. The result is positive. Michael's mother asks you about the significance of this result.

- | | |
|---|-------|
| 70. Michael is definitely infected with the virus | False |
| 71. An HIV antigen test is required to confirm the diagnosis of an HIV infection | False |
| 72. An HIV RNA PCR will determine the HIV viral load in Michael's case | True |
| 73. HIV culture will be mandatory to confirm the diagnosis of HIV infection | False |
| 74. HIV DNA PCR will help confirm the diagnosis of HIV disease | True |
| 75. The ELISA result is an indirect indication of HIV infection in Michael's mother | TRUE |

7-year old Sibongile presents with hepatomegaly and pain in the right upper quadrant. The ultrasound picture confirms a mass in her liver.

- | | |
|---|--------|
| 76. Tuberculosis is the most common cause of a granuloma in the liver | True |
| 77. An <i>Ascaris</i> worm bolus may appear as a mass in the liver | False |
| 78. An amoebic liver abscess presents with point tenderness | True |
| 79. A bacterial liver abscess is commonly due to <i>Staphylococcus aureus</i> or <i>E. coli</i> | True |
| 80. There is a possibility of a malignant tumour in her liver | (True) |

End of MAC for Second Year students

Mr Dowling, aged 79, has a large frontal lobe tumour. Features, which are consistent with a lesion at this site, include:

- | | |
|---|-----|
| 81. ipsilateral face, arm or leg weakness | (F) |
| 82. personality change | (T) |
| 83. receptive aphasia | (F) |
| 84. homonymous hemianopia | (F) |
| 85. dementia | (T) |
| 86. perseveration | (T) |
| 87. difficulty in planning tasks | (T) |

12-year old Raksha Devi Moodley goes to the local primary health care clinic with her parents complaining of a severe headache and fever. On examination, the doctor elicits neck stiffness. There is no evidence of papilloedema.

- | | |
|---|-----|
| 88. Neck stiffness from meningeal irritation will impair lateral neck movements | (F) |
| 89. This child should have a CT scan prior to the lumbar puncture | (F) |
| 90. A subarachnoid haemorrhage is the most likely cause | (F) |
| 91. A Gram stain of the CSF will satisfactorily demonstrate cryptococci | (F) |
| 92. Absence of papilloedema excludes raised intracranial pressure | (F) |

Mrs Wilson, aged 65, consults her GP because of long-standing pain in her knees that has worsened over the last 2 years. She also has morning stiffness lasting 20 minutes. She has had 3 falls in the past 6 months and describes a sensation of 'giving way' of her knee. The doctor examines her and notes that her body mass index is 32.

- | | |
|--|-------|
| 93. The presence and duration of morning stiffness in this lady is compatible with the diagnosis of osteoarthritis | True |
| 94. An X-ray of the knees will show the presence of large erosions | False |
| 95. Weight loss would lead to loss of muscle and will worsen the instability and joint pain | False |
| 96. Quadriceps muscle strengthening exercises improve the stability of the knee joint | True |

- | | |
|--|-------|
| 116. The low phosphate is related to chronic antacid usage | True |
| 117. The GP need not pursue a diagnosis of diabetic ketoacidosis | False |
| 118. The patient has a renal tubular defect causing phosphate loss | True |

Mr Lucky Ngcobo, a 24-year old casual labourer, presents to the local clinic with a history of an inability to work properly without becoming tired. This has occurred over the past three months. He also states that he has put on weight around his abdomen and needed to purchase larger pants. He has developed a cough and notices that he has a drooping left eyelid. The young attending doctor examines the patient and observes a plethoric appearance, truncal obesity and has a left Horner's syndrome. The doctor concludes that

- | | |
|---|-------|
| 119. the patient has cushing's syndrome as opposed to cushing's disease | true |
| 120. the patient does not need to have a blood sugar estimation as an investigation | false |
| 121. the patient has hypotension | false |
| 122. the pituitary fossa, in this patient, appears normal on an x-ray of the skull | true |
| 123. the patient should be investigated for small cell carcinoma of the lung | true |

A 50-year old woman complains of itching and oozing affecting the skin of the nipple. This has been present for 6 months. On examination, there is erythema of the nipple, which has the appearance of eczema.

- | | |
|--|---|
| 124. This patient has features consistent with Paget's disease of the nipple | T |
| 125. This is a dermatological condition that should be treated with steroids | F |
| 126. An underlying breast duct adenocarcinoma must be excluded as the changes in the skin of the nipple may represent intraepithelial spread of the tumour | T |
| 127. Biopsy of the nipple is not indicated as it is cosmetically disturbing for the patient | F |
| 128. Mammography is indicated in this patient | T |

Mr Klopper has been smoking heavily for 30 years. He complains of a chronic cough, dyspnoea and right-sided chest pain with occasional haemoptysis. The chest X-ray shows a mass at the apex of the right lung as well as enlarged hilar lymph nodes. On examination, he has right-sided miosis, ptosis and anhidrosis.

- | | |
|---|---|
| 129. Mr Klopper has unilateral Horner's syndrome as a result of sympathetic trunk destruction by a carcinoma of the lung | T |
| 130. Additional complications of a carcinoma in this region would include erosion of the upper ribs and damage to the brachial plexus | T |

End of MAC for Third Year students

A 35-year old P2G3 from the E. Cape presents to the antenatal clinic. On examination, the symphysis fundal height measurement is greater than her calculated period of gestation. She is 33 weeks by dates.

- | | |
|--|-----|
| 131. Naegle's law is used to calculate the period of gestation. | (T) |
| 132. A "large for dates" abdomen is associated with polyhydramnios | (T) |
| 133. It is important to exclude syphilis in this patient | (T) |
| 134. The screening test for syphilis is the rapid plasma reagin | (T) |
| 135. An X-ray of the abdomen is an essential investigation in this patient | (F) |
| 136. Tetanus toxoid is indicated | (T) |

An 18-year old sexually active patient presents with a vaginal discharge. She is afebrile and has no other symptoms. She is treated with metronidazole.

- 137. *Trichomonas vaginalis* (*T. vaginalis*) is likely to be causing her discharge (T)
- 138. Metronidazole is used to treat *T. vaginalis* infection (T)
- 139. An ultrasound examination is essential in the diagnosis. (F)
- 140. A "Pap" smear is not warranted. (F)
- 141. Patients prescribed metronidazole should be advised to avoid alcohol (T)
- 142. The partner of this patient should be treated as well (T)
- 143. Her parents must be informed of her sexual behaviour because she is a minor (F) (FM)

A 5-year old boy presents with swelling of the body and oliguria of 2 days duration. He has impetigo and a diagnosis of acute post-streptococcal glomerulonephritis is made. The electrolyte results show $K^+ = 7.1$ mmol/l (normal = 3.5 – 5.5). In this patient,

- 144. there is a risk of ventricular fibrillation T
- 145. the ECG shows peaked P waves F
- 146. intravenous glucose given with soluble insulin is a treatment option T
- 147. there will be impaired concentrating ability in the renal tubules F
- 148. serum cholesterol will be elevated F

A 5-month baby girl presents with diarrhoea and generalised oedema. She weighs 5.4 kg and is otherwise well. She is exclusively breast-fed. Blood results show: Total protein 33 g/l (60-80); albumin 17g/dl (32-50); globulin 16 g/l.

- 149. Pan-hypoproteinaemia is present T
- 150. The most likely diagnosis is kwashiorkor F
- 151. Protein-losing enteropathy is present T
- 152. Lymphopenia is often present T
- 153. HIV infection is very likely F
- 154. Iron deficiency anaemia is a common finding in this category of patient (T) (FM)

A middle-aged male presents with a 1-week history of non-bilious vomiting. This is accompanied by epigastric pain that is relieved by antacids. On examination, he is dehydrated and has a tachycardia.

- 155. An ECG is not an essential investigation for the above symptoms (F)

Resuscitation of the above patient is commenced and biochemical investigations are ordered. An upper gastrointestinal endoscopy reveals an ulcer in the duodenum. The presence of *Helicobacter pylori* is confirmed.

- 156. The ulcer must be biopsied to exclude a cancer F
- 157. He has a metabolic alkalosis T
- 158. He is hyperkalaemic F
- 159. Normal (0.9%) saline must form part of the fluid resuscitation T
- 160. A proton pump inhibitor, amoxicillin and clarithromycin are indicated to treat the ulcer T

An elderly male presents with difficulty in swallowing solids and liquids for 6 months. He is emaciated and has a hoarse voice. Lymph nodes are palpated in the left supraclavicular fossa. A barium swallow reveals a stricture in the upper thoracic oesophagus. Bronchoscopy shows splaying of the carina and a tracheo-oesophageal fistula. An oesophagoscopy reveals a malignant lesion in the upper thoracic oesophagus which is biopsied.

- | | |
|---|---|
| 161. The patient has dysphagia | T |
| 162. He has infiltration of the recurrent laryngeal nerve | T |
| 163. A squamous cell carcinoma is most likely | T |
| 164. The tumour is resectable | F |
| 165. A celestin® tube is indicated to facilitate swallowing | F |
| 166. Informed consent is not necessary before performing the barium swallow (F) FM) | |

Mr G Coombs, aged 73, visits his family practitioner because he is feeling depressed. On examination, the doctor finds evidence of cog wheel rigidity, bradykinesia and a pill rolling tremor.

- | | |
|--|-------|
| 167. These signs are manifestations of a depressive disorder | False |
| 168. The anatomical site of pathology is the thalamus | False |
| 169. Huntington's disease is a possible differential diagnosis | False |
| 170. These signs may be due to antipsychotic drug administration | True |
| 171. A dopaminergic agent is indicated for Mr Coombs | True |
| 172. Mr Coombs' condition is likely to be familial | (F) |

The police bring 19-year old Blessing Molone to the Casualty Department at Addington Hospital. He wants to kill his neighbour whom he believes is an alien from outer space and thus represents a threat to the human race.

- | | |
|--|-------|
| 173. Psychotherapy is the treatment of choice | False |
| 174. An urgent CAT scan is indicated | False |
| 175. Blessing may refuse admission to hospital as the Constitution of South Africa guarantees the right of freedom of choice | False |
| 176. The differential diagnosis includes cocaine intoxication | True |
| 177. A novel antipsychotic is the treatment of choice | True |
| 178. Blessing's parents must be informed of the need for admission | (T)FM |

A 60-year old patient presents with weakness of the ankle followed by weakness of the left leg, the left arm, right arm and the right leg over a period of 6 months. Examination reveals spasticity in the upper and lower limbs with depressed biceps reflexes bilaterally and increased reflexes for all other sites. Abdominal reflexes were absent.

- | | |
|---|-------|
| 179. The correct investigation is a MRI of the brain and cervical spine | False |
| 180. The correct investigation is a MRI of the neck and thoracic spine | False |
| 181. A lumbar MRI is irrelevant | True |
| 182. The most common cause is cervical spinal stenosis at C5/6 | True |
| 183. A syrinx involving the cervical spine is the likely cause | False |
| 184. Aspirin therapy is necessary in this patient | (F) |

A middle-aged male has been diagnosed as having HIV infection. He presents with neurological signs and a diagnosis of AIDS dementia complex is considered. In the AIDS dementia complex,

- | | | |
|------|--|--------|
| 185. | dysphasia is an early feature | False |
| 186. | memory disturbance is prominent | True |
| 187. | the viral load is low | False |
| 188. | the CD4 count is usually over 500/ml | False |
| 189. | psychomotor slowing is a prominent feature | True |
| 190. | a lumbar puncture is necessary to exclude a meningo-encephalitis | (T) FM |

A 40-year old Black patient from the Transkei complains of pain in the right upper quadrant of the abdomen and pyrexia for 2 weeks. There is no history of diarrhea, blood per rectum or alcohol abuse. Physical examination reveals an ill man who is pyrexial (temperature 38.6 °C) but not jaundiced. The liver is enlarged 5 cm below the subcostal margin in the mid-clavicular line and is tender to palpation. An ultrasound study reveals a hypoechoic lesion in the left lobe of the liver close to the diaphragm.

- | | | |
|------|--|-------|
| 191. | Alpha -fetoprotein is likely to be positive | False |
| 192. | Trophozoites of <i>Entamoeba histolytica</i> are likely to be present in the stool | False |
| 193. | Aspiration of the hypoechoic lesion is indicated | True |
| 194. | Clindamycin and gentamycin are the antibiotics of choice | False |
| 195. | A persistent hypoechoic lesion 4 months after appropriate treatment is an indication for a further course of therapy | False |

A middle-aged female presents with headache, fever and neck stiffness. A lumbar puncture is performed. In the interpretation of the CSF findings,

- | | | |
|------|---|-----|
| 196. | the protein level is greater than 1 g/l in tuberculous meningitis | (T) |
| 197. | the protein level is normal or low in pseudotumour cerebri | (T) |
| 198. | red cells are frequently present in Herpes simplex encephalitis | (T) |
| 199. | the glucose level is very low in cysticercal meningitis | (T) |
| 200. | a polymorphonuclear leucocyte predominance is noted in cytomegalovirus radiculopathy in AIDS patients | (T) |

End of Question paper

Appendix L (I)

FEASIBILITY STUDY REPORT

Feasibility Study Task Group

Professor AE Simjee (Medicine) Chairman
Dr C Daniel (Anaesthetics) Vice-Chairman
Professor M Adhikari (Paediatrics and Child Health)
Dr V Chrystal (Anatomical Pathology)
Professor FH Guldner (Human Anatomy)
Professor PJ Olmesdahl (Medical Education Development)
Dr U Pillay (Medical Education Development)
Dr E Royeppen (General Surgery)

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PART 1

INTRODUCTION

A new curriculum for medical students has been mooted for many years with at least two abortive attempts to develop and implement it.

In July 1997, on the initiative of the Board of the Faculty of Medicine, a Curriculum Development Task Force (CDTF) was formed.

Five members of this CDTF were nominated to the Curriculum Development Steering Committee and tasked to start and guide the process of developing the new Curriculum 2001 for medical students.

This group has been meeting for discussions, decisions and action three times a week and the process has been taken a long way.

AIM

The aim of this study was to assess the feasibility of implementing the new Curriculum 2001 for Medical students, in terms of human and financial resources and facilities for teaching.

THE NEW CURRICULUM

The new curriculum encompasses the following principles: -

- an holistic approach to health with emphasis on prevention of ill-health and maintenance of good health
- developing a sensitive and understanding relationship between doctor and patient
- awareness of the ethical issues surrounding medical diagnosis and treatment

1. Syllabus: -

Has been shortened from 6 to 5 years without losing essential core content. The topics are integrated both vertically and horizontally.

2. Process: -

The learning method is one of a student centred, self-directed learning (SDL) approach based on problems discussed in small group meetings.

3. The Curriculum: -

Was planned in 5 stages.

- | | |
|---------|--|
| Stage 1 | Development of the Core Curriculum - this was developed from the combination of Heads of Departments suggested core content list and the "Essential Drug List and Standard Treatment Guidelines (1998)" and was undertaken by the Steering committee of the CDTF. |
| Stage 2 | Module Matrix - which shows the distribution of the core curriculum subjects over the 4 years into 6 modules of 6 weeks each. |
| Stage 3 | Writing the Blueprints - which contain the Aims and Objectives of the module. |

- Stage 4 **Module Design** - developed the themes, topics and educational formats of the topic for each module.
- Stage 5 **Module Book** - records all the detail activities pertaining to that module.

Stages 2, 3, 4 - was done at weekly meetings of the CDTF members working in small groups.

Stage 5 is being undertaken by CDTF members working in 6 planning groups with one member designated as the head of the group.

4. **THE APPOINTMENT OF THE FEASIBILITY GROUP**

At a special Board meeting on 13 August Professor Güldner and Olmesdahl presented proposals for the new curriculum.

The Board voted on the proposal that *"This Board approves the curriculum structure for implementation in 2001, as outlined in the presentation, circulated on the Lan and distributed widely"* and *"that a task group be appointed to examine the feasibility and cost for implementation. As far as possible all concerns would be addressed"*.

A task group consisting of members of the Steering committee and two co-opted members, namely Dr C. Daniel and Dr E. Royeppen was formed to undertake the study. Professor Simjee was nominated chairperson and Dr Daniel the vice-chairperson of the task group.

At a meeting of the Board Executive, held on the 28 September, Professor Simjee presented an outline of the proposed feasibility study. Professor Bawa was present.

Professor Simjee outlined the proposed areas to be covered by the study, namely, human and financial resources, equipment, and facilities. He also advised that the task group will consider other points of concern raised by some of the members of the Board, i.e. students ability to cope with the curriculum, perceived lack of basic sciences, and the question of whether the new curriculum would be labour intensive.

Literature review supports student's ability to cope with the SDL methods, and studies from Australia indicated that the demand on the teaching staff is no different in the two curricula.

Basic science has been incorporated in all the modules in context of the problem being studied.

5. **LITERATURE REVIEW**

- 5.1. Connolly & Seneque (1999) used a multi-dimensional methodology to evaluate the TB module in its first year of inception. The results showed that the group social interaction was highly successful. However, the emphasis on group participation might have overshadowed the enquiry process leading to superficial discussions of problems.

- 5.2. McGill (1998) in a preliminary research report on the TB module found that over 90% of the students wrote, in a qualitative survey, that they had enjoyed the experience of small group learning. By the completion of the course, students felt that there had been a 74% increase in their confidence to apply skills clinically and solve problems in the context of TB.

With regard to interpersonal skills learnt during the course the students felt that their ability to relate to peers had increased by 72% and that this was one of the strengths of the course. There thus appeared to be a general consensus amongst the students that inter-active or group learning was an effective learning tool.

A survey of the facilitator opinions showed that the students were able to achieve their learning objectives and that the morale of the group was high.

- 5.3. Appalasamy *et al*, (1999), in a preliminary report evaluated the TB module introduced in 1996 and showed that 51% of the students preferred SDL to traditional methods. Ninety - ninety five% expressed positive statements about group work.

Interestingly, students with English as their home language expressed less positive attitudes towards SDL than those whose for whom English was not their home language.

The mean examination mark for the TB module test (61%) was higher than those of two other tests in the first year i.e Community health 50%, 58%, and Physiology 60%.

The TB Module assessment marks in addition showed a distinctive distribution of marks and a negative skew. Improved performance was particularly noticeable for students who obtained poor marks in the traditionally taught courses.

- 5.4. Olmesdahl (1999) in his study on the perceptions of two year cohorts of students in respect of the meaningfulness of the CVS module, assessed on a course valuing inventory consisting of 4 scales showed the following: -

Course value	Course to be perceived a valuable and rewarding learning experience
Cognitive domain	Better able to conceptualise problems and achieved a deeper understanding of the field and a clearer and more integrated notion of the subject matter
Affective domain	Perceptions that the module had a positive impact on personal growth
Behavioural domain	Module helped develop new ways of learning and that students took more responsibility for their learning

- 5.5. Sefton *et al* (1997) in a study estimating staff time and resources before changing from a traditional to a problem based curriculum concluded that in the steady state, the demands on staff for scheduled teaching would be no greater than in the traditional curriculum.

Appendix L (II)

University of KwaZulu-Natal

POLICY DOCUMENT¹

Modules: Size, Credits and Notional Study Hours

1. PURPOSE OF THIS DOCUMENT

As the new Schools embark upon the process of academic planning and detailed curriculum development, we need to have common definitions and nomenclature. It is important to have simple definitions of elements of the curriculum that will be easily understood by users. In addition, to enable students to take modules across faculties, we need to have a uniform structure across the University in respect of module size, notional study hours and credit value.

This document sets out the definitions of terms commonly encountered in relation to curriculum, a coding system for the identification of modules, and the size of modules (in terms of credits and notional study hours) that the Executive has approved for use in the University of KwaZulu-Natal (UKZN).

In developing common curricula and in planning and designing new modules, and in creating a common database, the definitions and modular system outlined below should be followed.

2. IMPORTANT DEFINITIONS

The following definitions are based on South African Qualifications Authority (SAQA) and National Qualification Framework (NQF) policy and guideline documents. Where the official definitions are over-lengthy and open to varied interpretation, they have been abbreviated and a position taken as to how they should be understood and applied in UKZN.

- **Programme:** a structured set of modules in an area of specialization leading to a qualification such that 50 per cent of the modules at each level are prescribed by the programme. A programme's curriculum is set down in a 'programme template'.
- **Module:** a separate course of study for which credits are obtained.

Modules shall be designated **by level**, as being at level 0, usually taken in an access programme at the University, level 1 (or 100), level 2 (or 200), level 3 (or 300), level 4 (or 400 for final year engineering etc.), levels 5 and 6 (or 500 and 600 for architecture & medical curricula), level 7 (or 700 for honours) or levels 8 and 9 (or 800 and 900), the last normally taken during postgraduate studies.

The level of modules is set at the appropriate academic level depending on the complexity of the material and not on the level of the student, i.e. if a student does a third year module as a masters student the module carries a level 300 code and not a level 800 code.

¹ This policy arises from a workshop of the Interim Executive Deans and the Pro Vice-Chancellor (Planning) held on 21 February, 2004. The principles were approved for recommendation to the Executive Management Committee by the Academic Affairs Executive Committee on March 11, 2004. A document outlining the policy as set out herein was drawn up by Professor P Zacharias and approved by the Executive Management Committee on 18 March 2004.

The same course of study cannot be pegged at two different academic levels.

Modules are further classified within a specific curriculum as:

- **Capstone:** a module in which the content and assessment tests the learner's integration of the learning outcomes of the programme;
 - **Core:** a module specific to the learning outcomes of the programme;
 - **Elective:** a free-choice module related to the learning outcomes of the programme; and
 - **Foundational²:** a module upon which further knowledge is built.
- **Notional study hours (NSH):** the learning time it is envisaged an average learner would take to meet the *defined outcomes* of the module, *entering with the correct level of assumed knowledge and skills*.

Calculation of NSH takes into account all the academic activities that a student undertakes, including contact hours of various types, self study, revision and assessment.

Notional study hours are the units in terms of which credit values are assigned to modules.

- **Credit:** the value assigned to ten (10) notional study hours of learning and assessment.

It is critical to understand that the calculation of credits on the basis of notional study hours is *student focused* and *not based on contact time*. Therefore:

- There can be no simple formula that equates credit value to number of lectures or contact time;
- Staff must ensure that their expectations of what it would take the 'average student' to complete successfully are realistic.

Note: For post-graduate students higher levels of output are expected and the credit value associated with modules and qualifications at this level is only a guide. Further, the NQF is not settled in terms of the duration and credit value of masters and doctoral qualifications.

3. SIZE OF MODULES

The national definition of the minimum size of a full academic load is 120 credits per year (2 by 15 week semesters at 40 hours per week). Both the former universities chose to make the minimum 128 credits to make a neat binary system possible. However, a modular policy was not uniformly applied and a mixed system prevails. In the new institution it is essential to have a common size for modules to facilitate timetabling and to articulate curricula across faculties.

Based on the highest commonality between the two previous systems, the following policy will apply:

- The minimum number of credits for a full academic load will continue to be 128 credits per year.
- Modules will have a credit value of 16 (160 NSH) and 8 (80 NSH) credits.
- Any deviation from this will have to be motivated through Senate.
(e.g. If it were necessary for Accounting or Engineering to introduce a 24 credit module to meet the requirements of professional bodies, this would be possible with the approval of Senate. However this 24 credit module would need to be balanced with an 8 credit module at the same level to retain the 8 and 16 credit system).

² In SAQA and CHE documents the term "fundamental" appears. The term "foundational" should be used as a synonym for, and in preference to, "fundamental".

4. UNIFORM CLASSIFICATION SYSTEM FOR MODULES

We need to introduce a uniform classification system across the University.

Both the former institutions' systems of codes for identifying modules have flaws. In the current systems we have a seven character alpha-numeric code and are running out of unique options. As combinations run out, both systems have resorted to more than one code for the same entity (discipline). There has been a proliferation of codes caused by the re-coding of modules for minor editorial changes. In addition the current systems have been inconsistently applied and have become confusing, resulting in errors in data capture and communication.

In keeping with the principle of single disciplines across all campuses irrespective of sites of delivery, the new system must be able to uniquely identify disciplines. The identification code for each module should be unique (as required for HEMIS reporting and audits). The classification system should be meaningful and have a degree of 'intelligence' built into it. Codes should be easy to understand, so improving their value in communication. They should be intelligible to staff and students as well as those outside of the University.

Based on these considerations, the Executive has approved the following unitary system for implementation.

The classification and coding system has two components – an identification component and a description component.

4.1 IDENTIFICATION CODES

Any one module can **ONLY have a single unique identification code**.

To identify modules there will be a uniform **9 character** code system of acronyms for disciplines and numerals, as follows:

- 4 alpha for DISCIPLINE, e.g. GRAS = Grassland Science
- 3 numeric, e.g. 211, to denote a module's
 - Level, e.g. 2 for level 200
 - Sub discipline if needed, e.g. 1 = plant identification
 - Edition or version.

The third digit will indicate the number of times a module has been significantly revised or updated while still retaining its basic purpose, e.g. To introduce students to plant names.
- 1 Alpha for CAMPUS (Edgewood, Howard College, Medical School, Pietermaritzburg, Westville)
- 1 Alpha-numeric for SEMESTER (1, 2, Both, Choice (offered in either semester), Vacation, Year).

e.g. MATH722P2, ENGL110WB, etc.

4.2 DESCRIPTION COMPONENT

The coding system will also **describe** a module in terms of:

- Notional study hours spent on the various types of academic activity;
- Duration of the module;
- Credit points assigned to the module;
- Title.

NSH and Identification Codes for Academic Activities

So as to communicate the type of learning activities staff and students are engaged in, and to indicate the time required of the student to successfully complete the module, each module will be described in terms of the NSH apportioned to each academic activity (consistent with the number of credits assigned to the module). In assigning NSH all academic activities that *the student undertakes* must be taken into account.

All times are *in hours* and the following sub-classification of activities applies:

- Lectures (L);
- Tutorials (T);
- Practicals and field trips (P);
- Seminars (S);
- Own (self) study, resource-based learning and assignments (H);
- Revision (R);
- Internships and field placements (F);
- Problem-based Groups (G); and
- Assessment the student undertakes (A).

Duration of the Module and Credits

In order to complete the coding system identifying the notional study hours apportioned to the individual module we add:

- the duration of the module (in weeks) (W);
- the credit points assigned to the module (C) (consistent with 3 above).

Title

The descriptive title should be no more than 45 characters (an ITS system requirement) and must describe the contents of the module, i.e. Accounts 1 or Chemistry III are not permitted.

Some examples of module codes as they would appear in Faculty Handbooks are:

- **GRAS211P1 - Introduction to Range Management**
(18L-0T-18P-0S-30H-11R-0F-0G-3A-13W-8C)
- **GRAS791PB - Grassland Science Seminar**
(0L-0T-0P-1S-79H-0R-0F-0G-0A-13W-8C)
- **ACCN312WV - Forensic Accounting practice**
(18L-18T-50P-20S-110H-20R-0F-0G-4A-13W-24C)
- **HYDR793PY - Investigating the Tugela Basin**
(0L-0T-0P-1S-639H-0R-0F-0G-0A-26W-64C)
- **ELAW910HY - Doctor of Philosophy in Environmental Law**
(0L-0T-0P-0S-1280H-0R-0F-0G-0A-26W-128C).

5. POLICY IMPLEMENTATION

The implementation of this policy is largely a technical matter and needs to be handled programmatically by the Division of Management Information and the ITS Project Office as far as is possible. In order to ensure consistency and accuracy module identification codes will be assigned centrally by the Division of Management Information, and not in Faculty Offices.

The choice of acronyms needs to be done efficiently in consultation with the disciplines. Once decided, the codes identifying disciplines should be used throughout all the systems (Finance (FAS), Human

Resources (PAS) and Student (ITS)). Many of these acronyms already exist in the vocabulary of staff and students and these should be retained where possible.

In addition, in merging the two ITS databases we need to minimise tinkering and retain the 'old' information - as far as is consistent with the intention of this policy - to build a fresh and identifiable but uniform module coding system for the University of KwaZulu-Natal.

23 April 2004