THE ROLE OF LEADERSHIP IN CREATING EXCELLENCE IN A DIAGNOSTIC RADIOGRAPHY PROGRAMME THROUGH CURRICULUM RESTRUCTURING

by

Antoinette Mabatho Thulo

Submitted in partial fulfilment of the requirements for the degree of

Master of Education (Maximising Potential)

in the

Department of Curriculum Studies

Faculty of Education

University of Pretoria

October 2005

Supervisor: Prof. W.J. Fraser

DECLARATION

I hereby declare that this dissertation is my own work and that all the sources that I used or quoted have been indicated and acknowledged by means of complete references.

A.M. THULO

ACKNOWLEDGEMENTS

Whenever we pursue a goal or ideal, we have to make investments before and during the process to enjoy the returns later: My thanks are due to:

- God for giving me strength, wisdom and perseverance to complete this project.

- My supervisor, Prof. W.J. Fraser, for his continued support, invaluable suggestions and time spent reading the drafts and his for faith in my ability.

- My editor, Prof. T. Kuhn for his patience and encouragement during the editing of this document.

- The participants in this study, for their time and effort.

- My colleagues, Titus, Nazeema, Ishmael, Puleng, Anna and Elmie for their moral and material support, assistance, encouragement and expertise. Without your support this study would not have been possible.

- My mother, Ditsekiso, late father, Leshata, sisters Lebogang and Busisiwe and to my brother Moropa for their faith in me, support, encouragement and helping me carry on when the going got tough.

- My husband Moeletsi, for his love and faith in my ability, and to my children Santo and Mpho, for helping with the typing and other chores and for sometimes being without a mother.

- My friend and colleague Anna, for being a real friend, motivator and study partner throughout the years, and Simon, my study partner, for motivation, material and moral support. Tshidi, for her faith in me and for her encouragement.

DEDICATION

FOR MOELETSI, SANTO, MPHO

and

MY PARENTS

ABSTRACT

Democratic principles and values in South Africa and technological innovations influence the design of educational programmes provided by higher education institutions. The diagnostic radiography programme at the Medunsa Campus of the University of Limpopo has to align itself with policy requirements and the requirements of the world of work. Against this background this study aims at answering these questions: How has Radiography changed as a science and what demands are placed on practitioners to meet competence requirements in a changing working environment? What impact does the changing role of the radiographer have on the academic department in terms of curriculum development and curriculum management? What strategies should curriculum leadership use to improve the quality of the programme offered in terms of expectations essential to a competitive and changing working and teaching environment?

A qualitative study was used where structured personal interviews were conducted with academe and clinical personnel to answer these questions. The responses were coded to facilitate the process of data analysis. The findings of this investigation indicate that changes in the Department of Education and the Department of Health transformation have an impact on the curriculum. The investigation has also revealed that there is lack of collaboration between the academic and the clinical personnel. It also indicates that professional development should be made more relevant in terms of focusing on areas that affect radiographers, for instance clinical personnel need to be aware of principles of primary health care and lifelong learning. In line with the changing nature of leadership, the proactivity of the academe cannot be underestimated as this could help in maintaining quality and excellence in the programme.

KEY WORDS

Curriculum

Curriculum Restructuring

Curriculum Leadership

Diagnostic Radiography

Excellence in Terms of Curriculum

Higher Education

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CHAPTER ONE

ORIENTATION TO THE STUDY

CHAPTER 1

ORIENTATION TO THE STUDY

Destiny is not a matter of chance; it is a matter of choice;
It is not a thing to be waited for; it is a thing to be achieved.

William Jennings Bryan

1.1 INTRODUCTION

Higher education is faced with challenges that include reviewing its role, trends at national and international levels, a demand for excellence and higher performance from learners as well as a need for learners to be able to adapt and cope with rapidly changing technology.

These challenges have an impact on curricular relevance and quality. The diagnostic radiography programme at the University of Limpopo Medunsa Campus needs to be responsive to these challenges and align itself with the requirements set out by policies on the transformation of the education and health sectors. The Medical University of Southern Africa merged with the University of the North in January 2005 and will from this point be referred to as the Medunsa Campus.

This study is concerned with investigating the role of curriculum leadership in facilitating the process of curriculum restructuring and management of the diagnostic radiography programme. The study relates to the Medunsa Campus of the University of Limpopo, where the researcher is employed in the Department of Radiography.

As Radiography is critically influenced by technology, developments in the profession are taking place at a very fast rate. The problem is that in real life technological developments take place at different rates between private and government institutions as well as between rural and urban areas due to disparities in

the availability of funding or budget allocations. This implies that first and third world environments have to be catered for in the teaching programme.

The introductory chapter discusses the background to the problem. The problem statement, sub-problems, aims and objectives and an outline of the research procedure are outlined to provide the rationale for the study. Finally the proposed structure of the study is outlined.

1.2 PROBLEM STATEMENT

The acknowledgement of changes in our society as well as the values and practices of our democracy has resulted in the transformation of higher education. This transformation is guided by policy documents and reports such as:

National Commission on Higher Education (DOE 1996)

White Paper on Higher Education (DOE 1997)

National Plan on Higher Education (DOE 2001)

White Paper for the Transformation of Health Services in South Africa (1997)

The educational approach has changed form a teacher-centred approach to a learner-centred one. Inefficiencies of the previous system in addressing societal needs, the curriculum being too structured and prescriptive, the lack of initiative and the divide between education and training are some of the issues that informed the change. The academe now has to design the curriculum according to expected outcomes and change its teaching and assessment strategies.

From a higher education perspective the academe have to meet the requirements of the White Paper of 1997 that states:

> *In South Africa today, the challenge is to redress past inequalities and to transform the higher education system to serve a new social order, to meet pressing national needs, and to respond to new realities and opportunities* (Department of Education, 1997:7).

Similarly the health care sector now has to align itself to the constitution of the Republic of South Africa, which underscores the values of human dignity, equality and freedom. This has given rise to the right to healthcare and the drafting of the patient's rights charter. The Department of Health has adopted a primary health care approach to provide for the basic health needs of all citizens (Department of Health, 1997). Radiology services are thus required at primary, secondary and tertiary centres. However due to a shortage of radiologists and the extension of their roles, it has become imperative for radiographers to be competent and proficient in skills that were previously exclusive to radiologists for instance report writing and barium studies.

The Council on Higher Education (CHE) states that weaknesses in higher education limit the realisation of the social benefits of higher education for the development of society. Education is therefore required to develop human potential and to address social needs and issues like poverty, housing, technological literacy and health promotion (HIV/AIDS, diabetes, tuberculosis).

The Medunsa Campus of the University of Limpopo is situated about 30km North West of Pretoria, in the township of Ga-Rankuwa. It is a higher education institution that was established to cater for the medical requirements of a rapidly expanding black population. The student population has been and is still mainly black. However, due to the merger process the community served by the Department of Radiography has changed as it now serves the community of the Limpopo Province. The needs of this community have to be assessed so that there can be customer satisfaction (Pretorius, 2003:130).

The Limpopo Province occupies the most northern area of the nine South African provinces. It comprises mostly rural areas (About South Africa demographics, 2005).

Most of the hospitals in this province are not sufficiently equipped and have a shortage of trained human resources, especially in radiography. More primary health centres are being built and equipped and it may become incumbent on Medunsa Campus to provide human resources in all aspects of healthcare, including radiography.

The academe's engagement in research has now become even more critical. Projects such as the assessment of community needs, research into developments in the field of radiography in South Africa, how radiography in South Africa compares with other countries and how our graduates are coping in the world of work are very critical, as these would inform improvements in practice. Institutional support should be provided in this regard, especially in postgraduate programmes in order to provide the expertise required in clinical practice.

As previously stated, radiography is very critically affected by technological changes. Development in technology from analogue to digital systems affects radiographic techniques as well as the equipment used, such as new imaging modalities, improved image receptors, the use of computerised x-ray machines.

Diagnostic modalities in diagnostic imaging are also increasing. Some of the changes that have been taking place include modalities such as Magnetic Resonance Imaging (MRI), Spiral Computerised imaging (CT), Doppler Sonography (Price, High & Miller, 1997:1). There is also the development of Computed Radiography (CR) and Direct Digital Radiography (DR) that replaces radiographic film, intensifying screens and cassettes. This intensifies the role that technological literacy plays in radiography.

The introduction of these new modalities and the developing role of the radiographer introduce new dimensions in radiography training (Castle, 2000:267). The role of radiographers is also changing because of a shortage of, or in some instances, a complete unavailability of radiologists. The role is extending to areas that traditionally belonged to radiologists, including pattern recognition (red dot system) where the radiographer needs

to indicate to medical officers where the pathology might be and what it could be (Horak, 1997:5).

The role of the radiographer is also extending into roles that were previously assigned to radiologists, such as barium enema investigations and intravenous injections (Price, Miller & Mellor, 2002:225). The role of radiologists now extends to molecular and interventional radiology, resulting in greater participation in patient management.

The Department of Radiography at Medunsa Campus needs to be responsive to these challenges and align itself with the requirements as stipulated by policy and workplace requirements. The quality and relevance of the programme need to be critically considered, more so because of the focus that is placed on quality education. The role of the academe is very critical in ensuring that the workforce is thoroughly prepared for the changing world of work.

1.3 RESEARCH QUESTIONS

Having taken the above-mentioned problem statement into consideration, the following research question emerged:

What role should leadership in the Department of Radiography play in facilitating the process of curriculum restructuring and implementation in Radiography to ensure that it meets the requirements, needs and expectations essential to a competitive and changing working and teaching environment?

Sub-questions supporting the primary question:

- How has Radiography changed as a science and what demands are placed on practitioners to meet the competence requirements in a changing working environment?

- What impact does the changing role and changing nature of the world of work of the radiographer have on the academic department in terms of curriculum development and curriculum management?

- What strategies should curriculum leadership use to improve the quality of the programme offered in terms of the expectations essential to a competitive and changing working and teaching environment?

1.4 AIM AND OBJECTIVES

The aim of this investigation it to determine the role that leadership in the Department of Radiography can play in facilitating the process of curriculum restructuring and implementation in Radiography to ensure that it meets the requirements, needs and expectations essential to a competitive and changing working and teaching environment.

The above-mentioned goal will be reached through the achievement of the following objectives:

- To determine the changes in Radiography and the demands placed on the practitioners to meet the competence requirements in a changing working world.
- To determine the impact of the changing role and changing nature of the world of work of the radiographer on the academic department in terms of curriculum development and curriculum management.
- To explore the strategies that curriculum leadership can use to improve the quality of the programme offered in terms of expectations essential to a competitive and changing working and teaching environments.

1.5 RESEARCH METHODOLOGY

King in Short (1991:259-262) explains that curriculum studies (specifically curriculum evaluation) usually fall within the parameters of evaluative inquiry. Evaluation research is carried out to analyse policy and its implications for curriculum

design, determine the alignment of the radiography programme to policy requirements and working world expectations. According to King, in Short (1991:260) and McMillan and Schumacher (1997:541) evaluation research aids in decision-making and provides information about a specific issue that may or may not be relevant; as such it has the potential to improve the practice.

This sub-section describes the research approach and methods that were used to achieve the aims of the research as discussed in section 1.3.

1.5.1 Research Approaches

Qualitative research strategies were employed to understand the reasons behind curriculum restructuring and to explore the role of curriculum leadership in curriculum design and management that would ensure a relevant and excellent programme. According to Merriam (1998:17) qualitative study "assumes that there are multiple realities, that the world is not an objective thing out there but a function of personal interaction and perception. It is a highly subjective phenomenon in need of interpretation rather than measuring".

1.5.2 Data Collection Methods

Data were collected mainly through a literature review and interviews conducted with personnel attached to both the clinical and academic sections of the Department of Radiography. These issues will be dealt with in more detail in Chapter 4.

1.5.2.1 Literature Review

Primary and secondary literature sources were reviewed. Primary sources, according to McMillan and Schumacher (1997:125-129), provide "detailed information of current research, theories and methodologies used to investigate a problem". These include educational journals, government documents, dissertation and theses, periodicals, yearbooks and monograms.

McMillan and Schumacher (1997:122-123) describe secondary sources as sources that "give an overview of the field, a general knowledge of what has been done on the topic and a context of placing current primary sources into a frame work". These would include published reviews, textbooks, encyclopaedias, handbooks and yearbooks.

The changes in the role of the radiographer were identified through a literature review, to determine the relevance of radiography training to what is required by the current market. Literature review was also conducted to improve the understanding of the terms frequently referred to in the study. Government official documents were analysed to determine their effect on radiography training as well as on the role of the academe. The information will be integrated into the study (McMillan & Schumacher, 1997:119).

The rationale for the literature review is linked to what McMillan and Schumacher (1997:120) state as:

- Defining and limiting the problem
- Placing the study in perspective
- Selecting methods and measures
- Avoiding replication
- Relating findings to previous work and suggesting further research.

1.5.2.2 Individual interviews

According to McMillan and Schumacher (1997:263) interviews are vocal questionnaires that provide the interviewer's interpretation of the world. Vocal questionnaires were therefore structured in order to establish the respondents' thoughts and experiences about the:

- Changes in radiography
- Demands placed on practitioners by the changing working world
- Skills and competences required to practise today
- Strategies that could be used to maintain quality and relevance of the training programme.

A total of eight interviews were conducted among the following categories: educators, chief radiographers and newly qualified personnel. A critical dialogue was conducted with radiography practitioners to determine the types of change they are experiencing in the field, how they are coping with change and how the newly qualified practitioners cope in the world of work. The coping skills of newly qualified radiographers were observed as qualified staff orientated and worked with them during their community service year. Their opinions helped to establish the "presence or absence of certain normative ideals in curriculum practice" (King in Short, 1991:260).

The newly qualified personnel were interviewed to determine how they were coping, what shortfalls they observed in their training and what development initiatives they were involved in. This assisted with suggestions on how the curriculum can be modified to accommodate the needs of the trainees as required by the world of work.

Interviews were conducted with radiography educators. These provided information on policy and its effect on their role, the role that they can play in curricular issues and support that they get from the institution to be able to participate fully in these activities. The interview schedules are attached as Appendix B.

Table1.1: Data collection methods used in the study

QUESTION	METHOD	SOLUTION OR REASON FOR APPLYING THE STRATEGY
What are the changes in Radiography as a science and what are the demands placed on practitioners because of these changes?	Literature study Interviews	Provide an understanding of Radiography as a science, developments in the field and the skills and competences required in the changing world of work. Establish areas of change to provide the skill and competences required.
What impact does the changing role of the radiographer have on the academic department in terms of curriculum development and curriculum management?	Literature study Interviews	Determine the effect of change on the academic as well as the clinical department.
What strategies should curriculum leadership employ to improve the quality of the programme?	Literature study Interviews	Determine the strategies that can be used to ensure quality and excellence.

1.6 BENEFITS OF THE STUDY

McMillan et al. (1997:542) state major reasons for conducting evaluation research such as planning, improving and justifying procedures, programmes and/or products.

The study would therefore benefit the Department of Radiography in the following ways:

- The academe will gain better understanding of policy and its effect on the curriculum.
- They will be reoriented towards changes in technology and developments in the profession and the effects of these changes on their role.
- They will be orientated towards the needs of the community, the employer and other stakeholders in terms of the kind of radiographer they need.
- They will be made aware of the role they can play in ensuring that their graduates meet the workplace expectations.

- Most importantly, the academe and radiographers in practice will realise their role in ensuring that the training programme is of high quality and is relevant and acknowledge their role as leaders of the profession.

1.7 CLARIFICATION OF TERMS

Terms that are frequently used in this study are explained to clarify the context in which they are used.

1.7.1 Curriculum

Breier (2001a:xiv) defines curriculum as teaching and learning activities and experiences provided by education institutions. Ornstein and Hunkins (1998:10) define it as a "plan for action or a written document that includes strategies for achieving desired goals or ends". According to Carl (1995:31) curriculum is "an educational track on which pupils move under leadership of their teacher on the way to adulthood".

The National Education Policy Investigation (NEPI) curriculum research group (1992:1) indicates that curriculum is central to the education process. They state that it includes:

- Aims and objectives of the education system and goals of school.
- Content to be taught including skills and processes.
- Teaching and learning strategies.
- Assessment strategies.

Curriculum thus has a social and a political dimension. The Radiography learner has to provide service to the community whose needs are taken into consideration and the community benefits from the service provided. The democratic constitution of South Africa shapes the curriculum because of policies that are introduced by people of a particular orientation and that require the alignment of the education system.

For the purpose of this study curriculum would mean those activities that both the educator and learner will be engaged in to achieve the required outcomes.

1.7.2 Curriculum Restructuring

Pretorius (2002:77) states that transformation in education and training results in changes in curriculum. He further terms the effect of curricular changes as curriculum development and also as curriculum change (2002:78). Breier (2001c:1) states that there are a number of influences that are "steering the curricular in particular directions". He also refers to this process as curricular development (2001b:157). Strydom, Hay and Strydom (2001:38) define it as a process that involves "rejection of the traditional structuring of the curriculum".

The terms *curricular change*, *curriculum development* and *curriculum restructuring* seem to be used interchangeably. According to the researcher the term *curriculum restructuring* refers to those activities that involve major changes brought about by political and social challenges. The terms *curricular change* and *curriculum development* refer to subtler changes.

1.7.3 Curriculum Leadership

Leithwood (2003:104) suggests that leadership does not take a new meaning when qualified by a term. Fullan as cited by Cunningham and Cordeiro (2000:173) states that the role of a leader is to look for a starting point, for actions that can be taken to start a point of reform.

Reddy (2001:87) outlines the role of academic leadership, which includes formulation of academic policy and strategy, determining the nature of programmes offered and the quality of these programmes. Glatthorn (1997:20) defines curriculum leadership as performing the functions that enable schools "to achieve their goal of ensuring quality in what students learn".

Tanner and Tanner as cited by Dixon (1999:38) state that it is not only leadership that should take part in curriculum development but that educators "can contribute significantly to the development of new knowledge about the curriculum when they are provided with adequate resources and consultative and supervisory assistance".

All academe need to be involved in curricular issues and the necessary training and support should be provided. The functions that these people will perform involve setting of goals and working towards achieving those goals. Involvement of all academe ensures obtaining expertise from different people with different life experiences.

In this study curriculum leadership is the leadership of any member of staff who at a particular point has the required knowledge and skills to lead the department in any curricular activity.

1.7.4 Diagnostic Radiography

Radiography is a profession in the medical science field that uses radiation to image body parts and can also be used to treat disease. Bentley (2005:48) indicates that it is "an invaluable tool of investigation for the service of medicine and industry alike". The rays that are used include x-rays, gamma rays, radionuclide, ultrasound and magnetism. These rays can be used together with computerisation.

Diagnostic Radiography is one of the four categories in the field of Radiography. It is the practice of producing images of internal body structures by means of x-rays, ultrasound and magnetism. These images enable the radiologist to make a diagnosis of abnormalities in the body. The images may be of the skeletal system, organs in the body or contrast media examinations demonstrating organs, the vascular system or cavities.

For the purpose of this study Diagnostic Radiography is the imaging of anatomical and physiological structures of the body by using x-rays, sound and magnetic fields.

1.7.5 Excellence in terms of the Radiography Curriculum

Barnett (1992:59) explains excellence as exceeding the expected standards. UNESCO (1995:36) explains it as hoping to achieve the highest standard. The academic excellence-planning group (San Francisco State University, 1996) defines excellence

as the creation of an environment that will facilitate educational transformation and the development of the programme and people in an institution.

Pretorius (2003:130) indicates that the traditional explanation for quality was "associated with excellence and striving for perfection". Glatthorn (1997:22) states, "A quality curriculum is essential in achieving educational excellence". Excellence is thus exceeding the set standard of quality.

Based on the aforementioned, the researcher has come to the conclusion that excellence in the Radiography Curriculum means ensuring that it is relevant and its quality exceeds the required standard.

1.7.6 Higher Education

Higher Education is the third and last level on the national qualifications framework, following after the further education band. It ranges from level 5 up to level 8 on the NQF. It covers all learning programmes related to national certificates, diplomas and degrees (Lemmer, 2002:37). Admission in this band is based on successful completion of the grade 12 examinations.

1.8 PROGRAMME OF STUDY

Chapter 1 provides an orientation to the study. The problem statement, aim and objectives, research methodology, clarification of terms and outline of study are outlined.

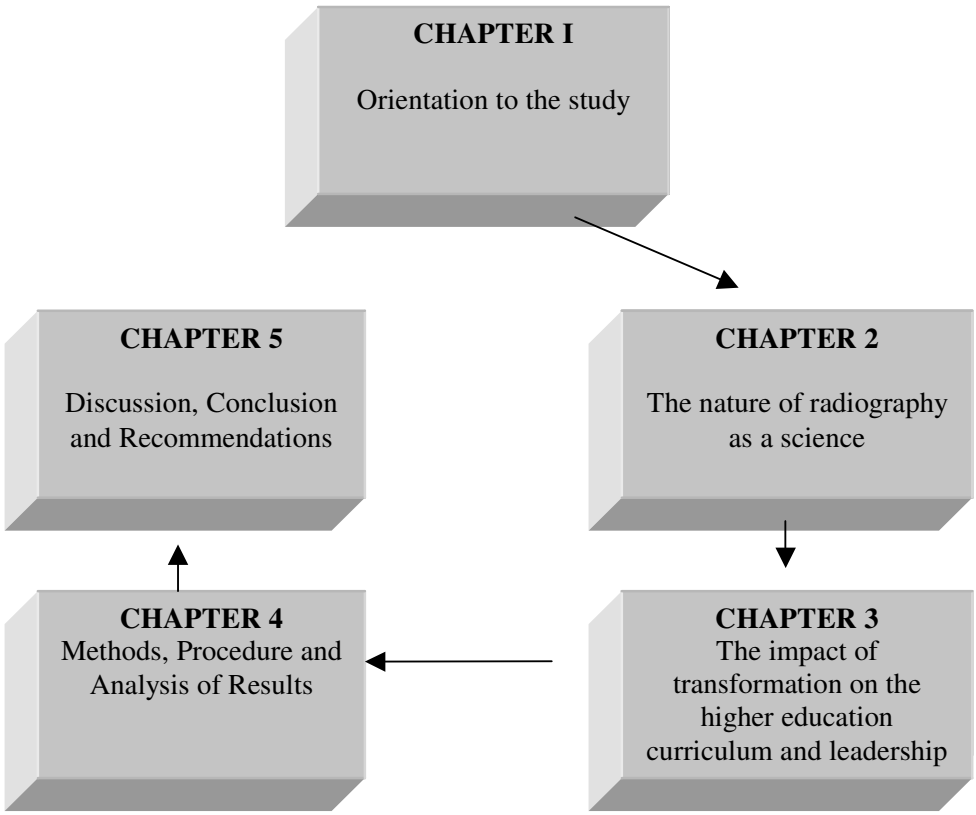
Chapter 2 discusses the nature of Radiography as a science. Its role in health care, affiliation bodies, education and training requirements, career opportunities and changes in the role of radiographers are discussed.

Chapter 3 deals with the implication of higher education transformation on the Radiography curriculum and the role of curriculum leadership in maintaining quality and excellence in the curriculum at the institution.

Chapter 4 outlines the procedure that was followed in the investigation and provides for the analysis of the results.

In chapter 5 the researcher draws conclusions from the data and makes recommendations for improvement.

Figure 1.1: An overview of chapters in the study



1.9 CONCLUSION

Chapter provides the background to the study. The problem statement, aim and objectives, as well as the procedure followed through the research are outlined to give an orientation to the investigation.

The next chapter will look into Radiography as a science. This will provide the information on the role that Radiography plays in the health sciences, the developments in the profession and their effect on the radiographer's practice. This will in turn highlight some of the curricular changes that need to be implemented in the training programme.

CHAPTER TWO

THE NATURE OF RADIOGRAPHY AS A SCIENCE

CHAPTER 2

THE NATURE OF RADIOGRAPHY AS A SCIENCE

When we try to pick out anything by itself,
We find it is tied to everything else in the universe.

John Muir (1838-1914)

2.1 INTRODUCTION

This chapter discusses the nature of Radiography as a science. It highlights the role of Radiography in medicine, the impact of technology on Radiography and how the role of the radiographer has changed due to technological changes and development in the medical imaging field. A comparative analysis is made to compare the changes in South Africa to those in the United Kingdom and Hong Kong.

The nature of radiographic knowledge involves the natural sciences, i.e. the engineering field as well as the social sciences, i.e. sociology (Castle, 2000:267). The profession of Radiography combines the application of science and technology. Technological changes and the changing body of knowledge influenced by science have implications for radiographic practice. This renders it important for an understanding of its nature a science as it provides better understanding of the changes taking place in the profession.

The developments in this field have an impact on Radiography training. This chapter also addresses the role of the academe in the field of Radiography and the type of support that can be provided to radiographers in these times that are complex, competitive, globally interconnected and technologically advanced.

2.2 RADIOGRAPHY AS A SCIENCE

Science according to the Concise Oxford dictionary (1982) can be defined as the study of how things are made and how they function. Mouton (1996:15) describes the

term as a body of knowledge that has evolved over time and "at a given time is accepted by the community as being valid and reasonably sound".

Medical science is the study of knowledge about systems of the body and disease. Its primary goal is the improvement of the quality of life through knowledge of the human body and pathology and the use of diagnostic tests that would help in prescribing relevant medication.

Radiography is a profession that uses the application of science and technology (Castle, 2000:267). It thus combines knowledge from the disciplines of natural science, technology and the humanities. The study conducted by Castle (2000:268) concludes that the nature of radiographic knowledge is similar to the knowledge from mechanical engineering combined with sociology disciplines, i.e. natural sciences and humanities.

This necessitates basic knowledge in the areas of mathematics and physical science in the further education and training band. Training in this field is further supported by knowledge from the areas of biophysics, radiation technique, image recording, anatomy physiology and pathology.

Radiography is part of the health care team that is made up of a group of trained professionals that work integrated, collaboratively and interdependently to provide health care to patients. The team includes many different professional groups such as medical doctors, social workers, psychologists, occupational therapists, physiotherapists, radiographers and pharmacists among others.

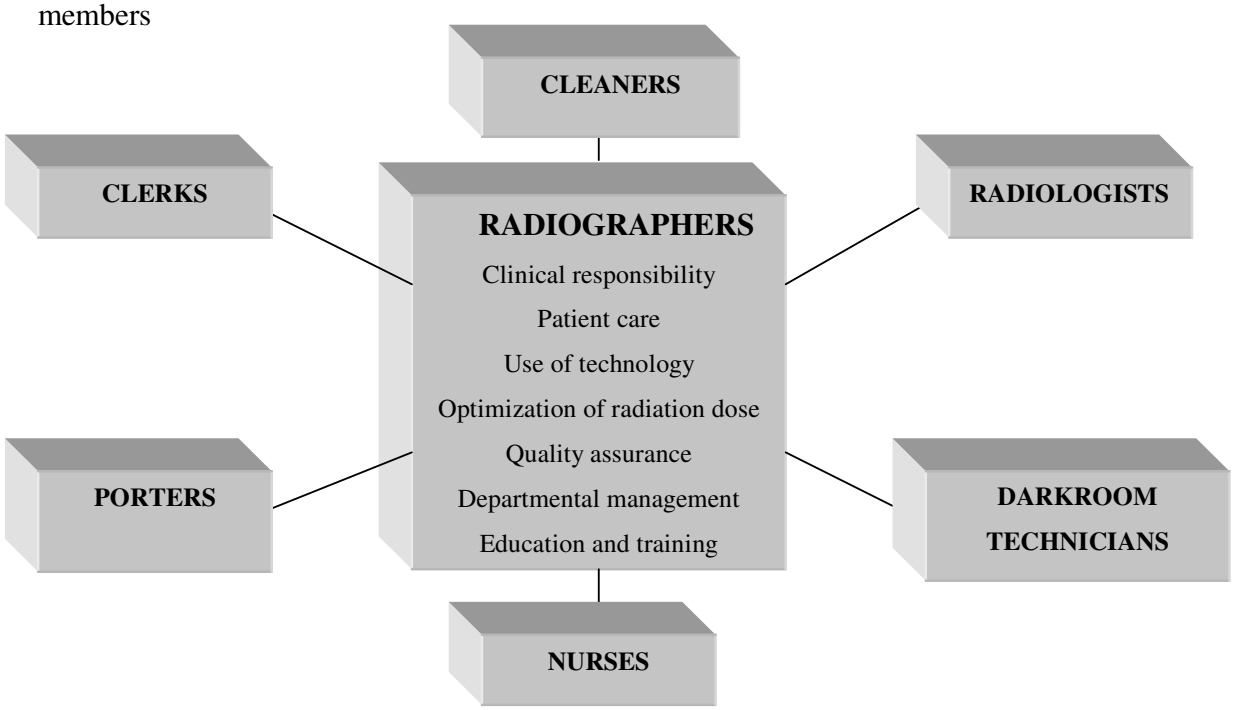
2.3 THE RELATIONSHIP BETWEEN RADIOGRAPHY AND RADIOLOGY

The discipline of Radiology is a science-based area of specialisation that works with radiation for diagnostic or therapeutic purposes in medicine. Bentley (2005:48) says Radiography is "an invaluable tool of investigation for the service of medicine and of industry alike".

The Radiology, Radiography or Imaging Department employs radiologists and radiographers. Radiologists are medical doctors who specialise in Radiology. Their traditional function includes making a diagnosis from images produced by radiographers. They traditionally had limited interaction with patients as most examinations involve radiographers producing the images and taking radiographs to them for reporting. During contrast medium examinations radiologists would inject the contrast medium and radiographers would take the radiographs while monitoring the quality of images produced.

The Radiographer is in charge of the team that is stationed in the imaging department. This team includes clerks, porters, darkroom technicians, and cleaners and in some instances nursing staff allocated in the department. These personnel members support the 'core' business of the radiographer in the management of the imaging department. Figure 2.1 shows the team in the x-ray department together with the competences of the radiographer as discussed in section 2.5 on page 20. In an academic hospital it is the radiographer's responsibility to supervise learners in clinical training sessions.

Figure 2.1: Areas of competence of radiographers and other x-ray department team members



2.4 PROFESSIONAL BODIES

Radiographers, including learner radiographers must register with the Health Professions Council of South Africa (HPCSA). This body promotes the health of the population and controls ethical and professional ethics standards as well as education and training. They also accredit and monitor clinical training centres. The body that functions under the umbrella body of the HPCSA and deals with issues that directly deal with radiography is The Professional Board of Radiography and Clinical Technology (Health profession council of South Africa, 2005).

Radiographers may also register with the Society of Radiographers of South Africa (SORSA), which is a professional association. SORSA is the mouthpiece of the radiography profession; unfortunately membership is not representative of all radiographers. The society also has an input on curricular issues and it liaises with international bodied on curricula issues.

There is also a standard generating body (SGB), which is made up of representatives from HPCSA and SORSA, academe from Radiography technologists, diagnostic radiographers, sonographers, nuclear medicine and radiation therapy personnel, who are responsible for the standardisation and relevance of the curriculum.

All workers in the government sector, including radiographers, can belong to a workers union that functions as a central negotiations structure, e.g. the National Education Health and Allied Workers Union (NEHAWU). Unions negotiate for better wages and conditions of employment for all members (NEHAWU, 2005).

2.5 RADIOGRAPHY EDUCATION AND TRAINING

Radiography training takes place after Grade 12. Training is thus done at universities of technology (previously known as Technikons) and universities, in conjunction with hospitals where learners do their clinical training.

The progamme has a theoretical component in which learners study the theory and principles of Radiography. During the clinical component they practise what they have learnt, initially through demonstrations and simulations, then working on patients under the supervision of qualified radiographers. The skill required in this field is meeting the needs of the patients and producing radiographs that are of good diagnostic value while ensuring that the patient receives radiation dosages that are as low possible.

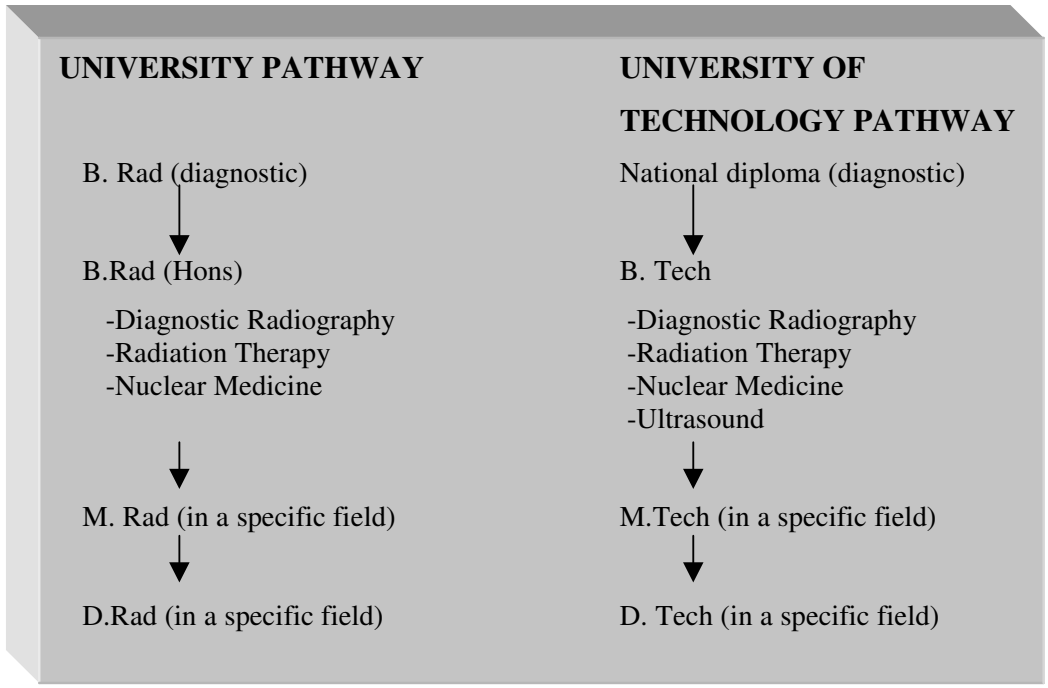
Learners in the first year of study have to be registered as radiation workers and with HPCSA. The HPCSA stipulates the number of clinical hours that learners need to do in their three-year clinical training period, which is currently 2500 hours. They also periodically inspect hospitals that are accredited for clinical training to determine conditions under which learners do their clinical training.

Medicine today is not limited to the use of x-rays only but uses gamma rays, radionuclides, ultrasound (sonar) and magnetism. This diversity has given rise to different career pathways that radiographers can choose to specialize in:

- Diagnostic Radiography
- Therapeutic Radiography
- Nuclear Medicine
- Ultrasound

These pathways for training offered at universities and universities of technology are indicated in Figure 2.2.

Figure 2.2: Current radiography education pathways



At Medunsa Campus learners train for three years to qualify for the bachelor of Diagnostic Radiography qualification. All newly qualified radiographers then have to do one-year community service as stipulated by the Health Professions Council act no. 56 of 1994.

Postgraduate qualifications in the fields of sonography, nuclear medicine, radiation therapy and diagnostic radiography are available although not at Medunsa Campus presently. The trend at other institutions is for learners to qualify at honours level after four years of study. They qualify in the different fields having done Diagnostic Radiography in their first year of study, continuing with Diagnostic Radiography in their second year of study while receiving some introductory sessions in the specialties of their choices.

Areas of competence for a diagnostic radiographer as outlined by Finch (1997:7) and Peer (2003:57) include the following:

- Use of technology.

  This involves creating and maintaining environments that will support health and safety of all concerned. It thus includes using radiographic equipment in such a manner that no harm can be incurred by patients, other workers, the public and that the equipment is undamaged.

- Patient care and positioning.

  Looking after the needs of the patient and positioning the patient so that radiographs of good diagnostic value are produced.

- Optimisation of radiation dosages and radiation protection.

  The radiograph must be taken with minimum exposure of patients, staff and public to ionising radiation.

- Clinical responsibility.

  Ability to assess, plan, implement and evaluate the clinical examination in order to produce images of good diagnostic value. It also includes the patient's rights charter as stipulated by the Department of Health.

- Quality assurance.

  Ensuring that the quality of radiographs is good by monitoring and maintaining the quality of equipment at a high standard. Evaluating the quality of the radiographs before patient in released.

- Education and training of students and other medical professionals.

  Providing advice on choice of imaging modalities to best demonstrate the patient's condition, teaching others so that informed decisions can be made and harm is prevented because ionising radiation is harmful to the body. Supervision of students on clinical training.

- Management and organisation of the radiography department.

  Ensuring that there are sufficient resources, e.g. properly functioning equipment, staff, radiographic film and chemicals so that quality care to patients is maintained.

2.6 CAREER /JOB OPPORTUNITIES FOR QUALIFIED RADIOGRAPHERS

Radiographers are by law expected to do community service for a year after qualifying. They practice at institutions selected by the Department of Health in consultation with different provincial health departments (Health Professions Council act no. 56 of 1974).

After training they can work in hospitals where they will be allocated to areas such as theatre, emergency room, patient's bedside or do various examinations in the x-ray department. Promotion opportunities range from being a radiographer, to assistant director, where supervisory and administration duties increase as the ranks change. They can also be employed at private clinics to perform similar duties as in the hospitals.

The scope of Radiography in industry is increasing. Radiation is used to inspect welds and castings, canned food products, airbags and is used at airports for security checks, among other functions. Presently training is provided on sight in South Africa but other countries have formal training in Industrial Radiography.

Commercial organisations, e.g. Siemens and Phillips also employ radiographers for selling machines, image recording materials, processing equipment and chemicals. These companies also provide on-site training and support to institutions that purchase their equipment.

Radiographers have a right to practise privately and can also take part in the academic field as educators for radiography learners. All radiographers should take part in research to develop and maintain the body of knowledge in the profession in order to keep up with the rapid developments of technology and science.

2.7 CHANGES AFFECTING RADIOGRAPHY AS A PROFESSION

Radiography today is characterised by change and uncertainty. According to Sim, Zadnik and Radloff (2003:99) change and uncertainty "are a result of economic and political

factors, technological revolution, changing consumer expectations and increased competition". The last 30 years have seen major developments in radiography (Horak 1997:3; Sim et. al., 2003:100).

The working relationship between the radiologist and the radiographer makes it difficult to talk about the radiographer only when trying to understand the duties of the radiographer and the effects of change and technology in the Radiology Department. Radiography is closely linked to Radiology, which involves making a diagnosis from the images that are produced.

Traditionally the radiographer was the primary liaison between the patient and the radiologist. Radiographers perform radiographic examinations and make images available for diagnosis. They also assist in interventional Radiology by controlling and monitoring the quality of the images being produced.

Castle (2000:267) and Price, Miller and Mellor (2002:224) indicate that advancement in role development has necessitated the blurring of the traditional job performance boundaries between the two professions. The job descriptions of these professionals vary between academic and non-academic institutions (Price et. al., 2002:224). Training institutions have an advantage of radiology registrars that are used to do other jobs while consultants perform the more specialized tasks.

In areas where there are shortages of radiologists, the less specialised tasks do not enjoy the attention of radiologists. This is where radiographers in other countries get training to perform these duties, e.g. United Kingdom. In South Africa patients will often be referred to other institutions, including private institutions, but the question of costs is still a major concern.

2.7.1 Transformation Initiatives Impacting on Radiography as a Profession

Higher Education is called on to address the needs of the democratic Republic of South Africa. The constitution of the Republic of South Africa states that

- every one has a right to access to health care services, including reproductive health care;
- every one has a right to equality which includes the full equal enjoyment of all rights and freedoms. Unfair discrimination is prohibited.

These rights call for increased healthcare provision in all areas of the country, including rural areas. The White Paper on transformation of health systems in South Africa (Department of Health, 1997) indicates that the government has set itself the task of ensuring that quality healthcare is delivered to all citizens of South Africa.

Medical care is classified into levels with different roles provided at primary, secondary and tertiary levels of care (van Zyl, 2004:167). The Government focuses on primary healthcare centres to make the first level of health care accessible to all citizens. Functioning in a primary healthcare centre requires cooperation between different health care professionals; a multidisciplinary approach is used, especially in areas with staff shortages. This demands that the professionals be multi-skilled.

2.7.2 Shortage of Radiographers and Radiologists

The minister of health, Dr Tshabalala-Msimang (2004:5) has identified radiography profession among other medical professions as professional categories that are in short supply across the public sector. As an incentive to provide health care equitably to all citizens of South Africa, financial remuneration was implemented to attract professionals to rural areas. This is an attempt to reduce shortage of these professionals in these areas.

Finch (1997:11) reiterates the Department of Education's concern that those countries that have "a shortage of radiographers actively seek to recruit these professionals from poorer

countries". The study conducted by Eriksen (Finch, 1997:7) shows radiographer/radiologist ratios for different countries. These ranged from 391 radiologists to 2570 radiographers and in some instances to 55 radiographers to 5 radiologists with a population of 26 million people. Three of the countries in the study had no radiologists at all. This reality also impacts on the role of the radiographer in different situations.

This is also the case in South Africa as radiographers (not excluding other professions) seek employment in other countries for higher salaries. This drains even more of the professions that are already in short supply.

2.7.3 The Developing Role of the Radiographer

The radiographer's responsibility is encompassed in the integration of the seven key areas of competence as indicated in sub-section 2.5 on page 22. Technological change, improvement and the introduction of diagnostic imaging equipment and modalities have an effect on the radiographer's competence in performing his or her task. These changes occur at a different rate from country to country, and place to place within the same country.

The challenges that radiographers are faced with are to be able to adapt to their role as presented at different environments. Factors that affect the radiographer's role can be summarised as follows:

- Growing demands for radiological services
- Shortages of radiographers/radiologists
- Role extension for radiologists.

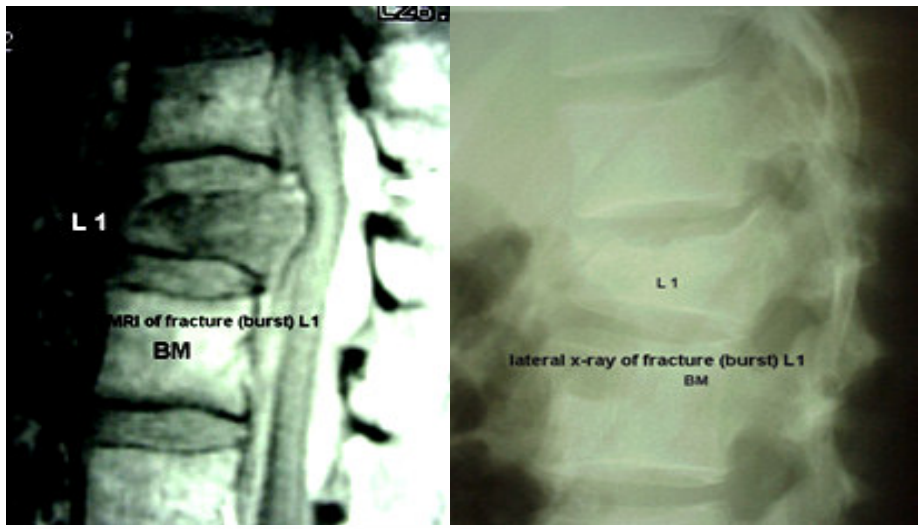
Development in the role of the radiographers is two-fold. Firstly it occurs because of the developments within the scope of their work and it is called role expansion. Secondly it occurs because radiographers have to take up roles that were previously carried out by radiologists and this is regarded as role extension (White & McKay, 2002:71; 2004:219).

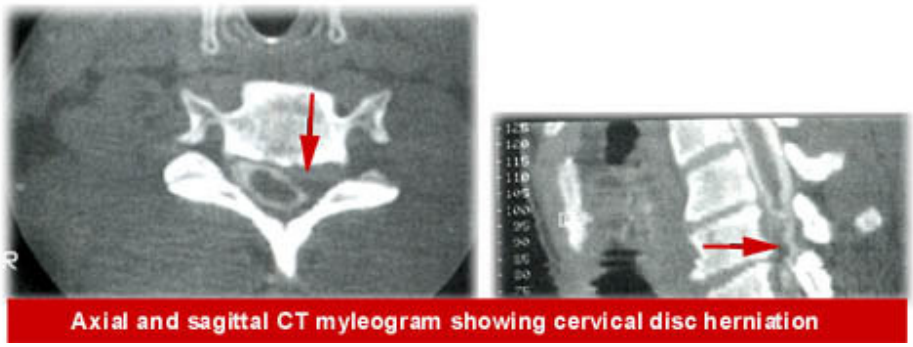
2.7.3.1 Role expansion

As indicated in section 1.2 on page 2 the role of the radiographer is expanded by, among other things, technological advancement. Technology affects the role of the radiographers through the development of new and improved equipment, e.g. the introduction of daylight systems and improved image receptors. New imaging modalities bring new equipment and techniques with them, e.g. CT, MRI and doppler sonography (Horak, 1997:3; White & McKay, 2002:72).

Figure 2.3: MRI of spine (picture 1), X-ray of the spine (picture 2) and CT scan of the spine (picture 3).

Picture 1 Picture 2





Picture 3

Images from different imaging modalities are shown in Figure 2.3. Picture 1 illustrates an MRI image that is produced by means of magnets. MRI's advantage above that of x-rays is that radiation is not used and images ca be taken from different planes without moving the patient. Picture 2 shows a conventional x-ray radiograph of a patient's spine. Picture 3 is that of CT scanning. CT scanning evolved from tomography and multiple x-rays are taken at different levels to check the depth of the abnormality. This modality uses less radiation and shorter study times than conventional modality.

Computers in imaging departments have also introduced changes to the way in which things are done. Radiographic images can be digitised and stored on discs. Computers have also introduced filmless departments, where images are distributed by picture archiving and communication system (PACS).

2.7.3.2 Role extension

As has already been indicated in the introductory chapter (section 1.2 on page 2) role extension into roles that were traditionally performed by radiologists takes place because of a shortage or in some instances the complete unavailability of radiologists or radiologists taking part in molecular and interventional radiology. This would then leave other roles unattended. The roles that are taken up by radiographers include ultrasound investigations, intravenous injections, barium enema studies and report writing.

In the absence of radiologists, medical doctors often ask radiographers for their opinion about radiographs. This task of helping physicians with a diagnosis was identified as critical and workshops were provided for training in pattern recognition (Horak, 1997:5). On evaluating the radiograph, the radiographer would indicate with a 'red dot' where they suspect some abnormality on the radiograph and this role is considered as the most basic form of pattern recognition. Writing the report is the final phase of the pattern recognition activity.

Unfortunately the performance of this role has not been legislated and not much has been seen to take place in this area. The ethical codes of professional conduct for radiographers still states that radiographers shall work under the supervision of medical practitioners and shall not interpret radiographic investigations (Medical and Dental Professions Board of the Health Professions Council of South Africa, 2002). This is an issue that probably needs further research to determine its implementation, further development of radiographers and the availability of guidelines that inform this role.

'Ultrasound' has since been officially allocated to radiographers in South Africa. Training is provided as a postgraduate qualification and it forms part of the diagnostic radiography category. This will help in addressing obstetric investigations at the primary healthcare centres, which are closer to the patient's place of residence.

2.8 COMPARATIVE STUDY OF THE DEVELOPING ROLE OF THE RADIOGRAPHER

Radiologists are presently coming into more contact with patients by being involved in molecular and interventional radiology. This demand extends their role while leaving some other traditional functions unattended. These are functions like intravenous injections, barium enema studies, the red dot system and reporting on radiographs. The 'red dot system' requires extensive knowledge of anatomy and physiology as well as radiographic appearances to help doctors with radiograph interpretation in cases where the radiologists are not available to report on the radiographs.

According to Price, Miller and Mellor (2002:224) the United Kingdom (U.K) seems to be the most advanced country in accommodating these changes. They undertook a study in the year 2002 as a follow up to their study in 1998 to assess the rate of role extension across the U.K. This study revealed an increase in the performance of these activities, indicating that some activities were a norm or becoming common practice (Ibid, 2002:231). They indicated that radiographers are even involved in report writing (Ibid, 2002:226). Training is available in areas like intravenous injections, barium enema

investigation, report writing (Radmagazine for medical imaging and radiotherapy professionals, 2004:18).

Hong Kong has also experienced this role change although at a slower rate than in the U.K. because of the dominance and control by the medical professions (White & McKay, 2002:72). They indicate that a shortage of radiologists, especially in the U.K, has reduced their resistance to allowing radiographers to perform duties that were traditionally theirs (Ibid, 2002:72; 2004:219).

2.9 THE ROLE OF THE ACADEME

Dubbey as cited by Mofokeng (2002:117) explains an institution of higher learning as a place that "provides a high-level of teaching and research and which does so in the context of national development, nation building, leadership, rigorous disciplined thinking, creativity and service to the community". All these activities are provided by academia.

2.9.1 Functions of the Academe

2.9.1.1 Research

Research is one of the major functions of higher education institution educators. They are required to contribute to the body of knowledge in their professions. Publishing in reputable journals, writing of research articles and presentations at conferences are also considered promotion criteria.

The nature of Radiography requires practitioners as well as the academe to keep up with the rapid developments in the fields of science and technology (Payne & Nixon, 2001:250). In this regard Nixon (2001:31) states that the technological developments as well as a changing knowledge base increase the potential for research. The College of Radiographers as indicated in Nixon (2001:31) states in the code of conduct of radiographers that it is the duty of a radiographer to develop his or her practice by

engaging in research. Involvement in research will inform change in practice as well as in education and training matters.

There is an increased demand for postgraduate qualifications in countries with increased higher education participation (Fielden, 1998:8). This is also true in Radiography; therefore educators are expected to supervise learners engaged in this activity. The academes competence in the areas included in the postgraduate curriculum is highly critical.

2.9.1.2 Teaching and learning

Teaching is the principal task of an educator. Mofokeng (2002:131) and Hassan (2003:55) sadly point out that higher education educators are not required to have teaching qualifications on appointment but that their scientific track record is considered to be more important. Their knowledge about how learning takes place, curricular issues and assessment strategies is acquired in practice.

Educators must continue to be engaged in learning to improve their knowledge and skills. Fielden (1998:9) summarises the competencies of a model educator as follows:

- Awareness and understanding of different ways of learning.
- Mastery of new developments in teaching and learning.
- Awareness of factors impacting on the curriculum.
- Knowledge, skills and attitudes relating to assessment strategies to be able to promote effective learning.
- Commitment to maintaining professional standards.
- Knowledge of current developments.
- Awareness and knowledge of technological applications.
- Sensitivity to the needs of the employer.
- Awareness of the needs of learners and stakeholders.
- The ability to teach a diverse range of students and also large number of learners.

- Interest and motivation to engage in continuous development of personal and professional strategies.

2.9.1.3 Community service

One of the purposes of higher education is to meet the social development needs of the society and to meet the need for active citizenship (Favish, 2003:24). These can be achieved through the provision of community service. Perold and Omar as cited by Mofokeng (2002:139) define community service as activities designed to deliver social benefit to a community.

The academe can provide this service by responding to the developmental needs of the community. The academe should take part in projects that support local economic development, work with other organisations that are committed to the development of the economy, e.g. local councils and schools and as a service provider by supplying workforce to communities and building intellectual capital (Humphreys & Conlon, 2003:68).

Community outreach programmes can be provided to develop the skills of community members or to upgrade their standard of performance by means of workshops and/or seminars. Contact with the community ensures that the academe is aware of the needs of the community and can respond appropriately in terms of training.

2.9.1.4 Learner supervision

Professions that have clinical components require clinical supervision to be provided during the learner's clinical training. Learners are supervised in terms of their clinical skill, including radiation protection and patient care. Clinical supervision informs the educator's future planning and teaching and learning strategies. Clinical assessments are also performed to evaluate the performance of the learners during their clinical sessions.

2.9.2 Improving the Functions of the Academe

Institutions of higher learning depend on their staff to provide service. The World Bank as cited by Fielden (1998:3) commented that "a high quality and well motivated teaching staff and a supportive professional culture are essential in building excellence". Institutions have a bigger role to play in ensuring that the quality of teaching and learning is excellent. Management has to provide support to academics to ensure improvement in their performance and motivation needed to commit to the goals of the institution. They have to identify their strong and weak points so that they can start the process of development of weak points.

Opportunities for staff development should be provided in the form of courses. Incentives should be provided for personal development. Time management programmes should also be provided so that time can be divided between teaching, research and community service. Learner support in the form of study skills and time management should also be provided for learners who require remedial strategies.

2.10 CONCLUSION

A comparative study was embarked on in this chapter to indicate the differences in role development in different countries. This study was found to be necessary as the radiographers who qualify in South Africa are also employable abroad. The training of these professionals must prepare them to adapt to and cope with circumstances in other countries.

South Africa is experiencing the same technological change and imaging development as most countries around the world. The introduction of new imaging modalities requires further training of the radiographers. Increased demand for radiological services as well as the expansion of radiologist's traditional role introduces extension to the role of the radiographer. Pattern recognition is being stressed and training in red dot system was discussed and workshops were provided.

Policy guidelines that take cognizance of changing role of the radiographer in South Africa have not yet been drafted. These guidelines will ensure an improved service to the patients and will also serve as protection of the patients and the radiographer performing these duties.

Training has to be in line with the needs of the communities, adjust to technological changes and must be guided and supported by policy. Furthermore it needs to equip learners with competencies that will help them cope with and adjust to the demands of the world of work. The discussion of changes in Radiography highlights the need for restructuring the curriculum to maintain the provision of quality service to the patients.

The next chapter will analyse policy documents that guide the process of transformation in higher education as well as curriculum transformation and the effect of these change initiatives on the curriculum. The role of the academe in ensuring excellence in the programme will also be analysed.

CHAPTER THREE

THE IMPACT OF TRANSFORMATION ON THE HIGHER EDUCATION CURRICULUM AND LEADERSHIP

CHAPTER 3

THE IMPACT OF TRANSFORMATION ON THE HIGHER EDUCATION CURRICULUM AND LEADERSHIP

Quality does not just happen by accident. It requires commitment and constant attention from all those who are involved in the process.

SBA Isaacs

3.1 INTRODUCTION

Chapter 2 provided the background on Radiography as a science. The effects of change in technology as well as the knowledge and information explosion on radiography practice were outlined. The chapter outlines the changing role of the radiographer.

The changing role necessitates re-evaluating the training programme in Radiography to determine if the programme still meets the requirements of the changing world of work. Change in South African policy to redress past inequalities as well as societal needs also impacts on the curriculum for Radiography training.

In this chapter policy documents such as White Papers, SAQA and NQF documents are analysed as they provide guidelines for the type of higher education required to reconstruct and develop South Africa. Policy that guides curriculum restructuring will be analysed to determine its influence on learner preparation. The changing role of leadership will be discussed to clarify the changing role of the academe.

Global pressures have an influence on society and individual and institutional roles within the social structure. The workforce required in the information age economy and workplace is expected to have high levels of communication, collaboration, interpersonal and leadership skills. The education system is thus challenged to prepare the workforce with these skills to be able to sustain economic and social development.

3.2 TRANSFORMATION IN HIGHER EDUCATION

Higher education has been identified to play a vital role in economic and social development (UNESCO, 1995:3). It is challenged to address and respond to the developmental needs of South Africa. UNESCO (1995:7) argues that the response of higher education to a changing world should be guided by the words: Relevance, Quality and Internationalisation.

According to the Minister of Education (Department of Education, 1997:3), transformation of higher education must reflect changes that are taking place in the democratic South Africa and must "redress past inequalities, serve a new social order, meet pressing national needs and respond to new realities and opportunities".

3.2.1 Reasons for Transformation

The need for transformation is based on the observation that the system of higher education is limited in its ability to meet social, political, moral and economic demands. At the 10th general conference of the Association of African Universities (2001:70) the inability of the graduates to adapt to the needs of the market was identified as part of the crisis that higher education is faced with.

White Paper 3 on Education (Department of Education, 1997:8) states these reasons for the deficiency:

- Inadequate distribution of access and opportunity.
- Mismatch between output and needs of economy.
- Lack of foundations of a critical civil society with a culture of public debate and tolerance.
- Governance of institutions characterised by fragmentation, inefficiency and ineffectiveness.

- Insufficient attention to pressing local, regional and national needs of the South African society.

These reasons have led to re-evaluating the purpose of higher education and articulating a new vision and role of higher education institutions.

3.2.2 The Vision and Role of Higher Education

White Paper on Education 3 (Department of Education, 1997:11) proposes that the transformed, democratic, non-racial and non-sexist system of Higher Education should ensure that all "South Africans enjoy an improved and sustainable quality of life, participate in a growing economy, and share in a democratic culture".

The report by the Commission on Higher Education (CHE) (Department of Education 2000:10) states that higher education must help erode inherited inequalities and provide opportunities for social development through equity of access and opportunity. Ensor (2004:340) reiterates this by stating that the role of higher education is the provision of opportunities to improve life chances of all South Africans and the provision of social and economic development opportunities.

Education White Paper 3 (Department of Education: 1997:10) clarifies this role as:
Human resource development: The development of human talent and potential through lifelong learning.
High-level skills training: The development of knowledge and skills in all workers that will contribute towards the development of the nation.
Production, acquisition and application of new knowledge: Continuous technological improvement and innovation, research and the integration of these into the training capacity.

According to UNESCO (1995:8) the challenge of modern economies on graduates is the skill to update their knowledge constantly and the ability to seek and create jobs. These

concerns of UNESCO are embraced in the seven plus five critical outcomes as indicated by SAQA (see section 3.4.2, table 3.3).

3.2.3 Principles that Guide the Transformation Process

White Paper 3 explains the guiding principles of the process of transformation of higher education as indicated in table 3.1 on page 45. The envisaged higher education system must address past injustices, be equitable, tolerate diversity and be democratic. The system itself must function effectively and efficiently with conditions that allow development to take place while providing quality programmes. Principles of academic freedom, institutional autonomy and public accountability must also be functionalised with the main aim of contributing to the country's development.

In the Education White Paper 3 (Department of Education, 1997:2) the Minister of Education states that the transformation of education in South Africa must reflect the changes that are taking place in the country and also reflect the values and practices of democracy. Inherited inequalities and inefficiencies of the past must be redressed and the system must respond to the needs of the nation, to new realities and opportunities (Department of Education, 1997:3).

The overall objective is the development of the higher education system that is based on effective and efficient delivery, good governance and management, responsiveness, equity, quality and excellence (Department of Education, 2000:11).

Table 3.1: Principles guiding the process of transformation of higher education

Principle	Implementation
Equity and redress	All citizens to have fair opportunities to enter the higher education system and to succeed.
Democratisation	The governance of the system should be democratic, representative and participatory.
Development	Conditions must be created to facilitate transformation in higher education.
Quality	Academic and educational standards must be applied and maintained while evaluations are done to inform improvement or renewal.
Effectiveness and efficiency	The system must function optimally, in such a way that desired outcomes are achieved.
Academic freedom	Absence of outside interference or obstacles when performing academic work.
Institutional autonomy	Self regulation and administrative independence with respect to student admission, curriculum, teaching and assessment, research, academic regulations.
Public accountability	Institutions are answerable for their actions and decisions to their governing bodies, institutional community and the broader society.
Diversity	Enabling choice and developing responsiveness to varying needs.

Source: Hassan, 2003:88

3.3 RESTRUCTURING THE SYSTEM OF EDUCATION AND TRAINING

The driving force for new national standards of education and training indicated by Van Loggerenberg (2000:53) are summarised as:

- Counteracting the former system: the need to provide educational opportunities to all and abolish the consequence of previous curricula in terms of outcomes, content, curricular structure, teaching and assessment strategies.

- Bridging the gap between education and training: designing an integrated system of education and training that will provide learners with competencies required in an economy that demands multi-skilled workers.
- Preparing South Africans for the 21st century: addressing the realities of the changing world in the curriculum, i.e. globalisation and changing job market.

To address these concerns South Africa introduced the National Qualifications Framework (NQF) to integrate the system of education and training into a single, integrated, national system. The primary objective of this structure is "to create an integrated national framework for leaning achievements and to enhance access to, and mobility and quality within education and training" (Department of Education, 1997:14).

This system is to be operationalised by Outcomes Based Education as an approach that has the potential to meet the demands of the information age workforce. The form of Outcomes Based Education (OBE) implemented in South Africa is designed around outcomes related to future life-roles of learners and is called transformational OBE (Killen, 1999:2).

The White Paper on Education and Training (Department of Education, 1995:10) introduced the policy directions, values and principles for the new integrated system of education and training. It states that:

> *Education and training are each essential elements of human resource development. Rather than viewing them as parallel activities, the ministry of education believes that they are in fact closely related. In order to maximise the benefits of this relationship, the ministry is committed to an integrated approach to education and training, and sees this as a vital underlying concept for a national human resource development strategy.*

In this era that is characterised by change and uncertainty, it is critical that the workforce be continuously trained. The system of education must ensure that learners are prepared to be lifelong learners and must be structured in such a way that the learners can progress

easily between various areas, levels and providers of learning with their learning being accredited (SAQA, 2000:3). The concept of the National Qualifications Framework (NQF) was introduced to provide a single, coherent and unified approach to education and training.

The NQF is a framework for the provision of lifelong learning opportunities (Pretorius, 2002:82) that is directed at addressing the personal, social and economic needs of the South African society holistically and has changed the focus of higher education curricula to a skills focus (NCHE in Strydom, Hay & Strydom, 2001:38). The NQF consists of a classification of qualifications grouped into three bands, namely general education, further education and higher education and training bands and eight levels with increased learning complexity (NQF Substructures, 2005:2).

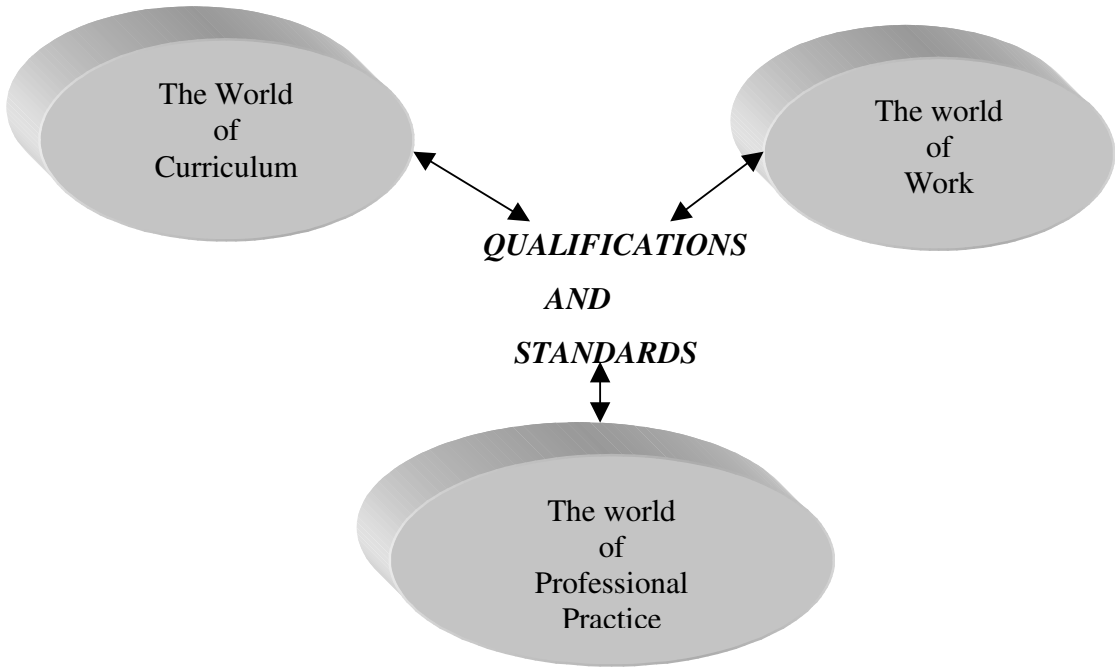
The NQF standard setting and quality assurance processes are embraced in:

- Ensuring that knowledge that is relevant for the current world is created through partnerships between and amongst varied groupings of society.
- Ensuring that there is a balance between the need for quality education and the needs of the individual as demanded in the world of work (NQF substructures, 2005:1).

The NQF is a quality assurance system that looks after the development and registering of standards and qualifications. National Standard Bodies (NSBs) and Standard Generating Bodies (SGBs) are responsible for the quality of the qualifications and standards. Education and Training Quality Assurers (ETQAs) are responsible for promoting quality among providers and accredit them (SAQA, 2000:13).

The NQF provides a way of describing competence required in a field by measuring performance using required standards. The ability to perform to a required standard will culminate in awarding a qualification. The standards and qualifications must reflect the framework around which the curriculum is designed and must also reflect the requirements of the professional boards and employers.

Figure 3.1: The relationship between qualifications and standards, world of work, curriculum and professional practise standards.



The principles that underpin the objectives of the NQF are summarised in table 3.2 on page 43. They allow for the integration, relevance, credibility, flexibility, legitimacy, access, progression, articulation and portability, and they recognise prior learning, be it through formal or informal learning. There is also guidance of learners through the provision of counselling.

The division between theory and practice (academic and vocational) has led to social division through indicating the types of jobs learners are training for e.g. mental or hard labour. The objective of the NQF is to integrate the two for the benefit of maximum human resource development and to match what is taught at school and what is required at work. Killen et al. (1999:200) indicate that this is based on the reality that post-schooling learners have to go seek employment. What is taught at school thus needs to be relevant.

A match between the schooling and the requirements of the world of work will be achieved when all stakeholders are involved in the planning and coordination of qualifications. This consultation and collaboration will provide for the legitimacy of the qualification.

These principles make up the quality indicators for national outcomes and requirements of the NQF. The South African Qualifications Authority (SAQA) was established through SAQA act no 58 of 1995 to develop maintain and monitor the implementation of the NQF (National qualifications framework and standard setting, 2000:3-4).

Table 3.2: Principles underpinning the National Qualifications Framework

PRINCIPLE	THE NATIONAL QUALIFICATION FRAMEWORK MUST:
Integration	establish the basis for an integrated approach as a part of a human resources development policy aimed to integrating theory (academic) with the practical (vocational);
Relevance	be and remain responsive to national economic, social and political development needs;
Credibility	have national and international value and acceptance;
Coherence	work within a consistent framework of principles and certification which allows learners to link credits into a meaningful learning or career pathway;
Flexibility	allow for multiple pathways leading to the same learning ends;
Legitimacy	provide for the participation of all national stakeholders in the planning and coordination of standards and qualifications;
Access	provide ease of entry to appropriate levels for all prospective learners in a manner which facilitates progression;
Progression	ensure that the framework of qualifications permits individual learners to move through the levels by accumulating appropriate combinations of credits;
Portability	enable learners to transfer their credits from one context to another;
Articulation	provide for learners, on successful completion of accredited prerequisites, to move between components of the delivery system;
Recognition of prior learning	through assessment, give recognition to learning which has already been acquired in different ways, e.g. through life or work experiences;

Guidance of learners	provide for the counselling of learners by individuals who meet nationally recognised standards or education, training and development practitioners.

Source: NQF and Quality Assurance, 2000:5

3.4 EDUCATIONAL RELEVANCE TO THE INFORMATION TECHNOLOGY ERA

Maintaining the relevance of education to societal needs and the need to be a lifelong learner necessitates a change in focus from teaching to learning. The learners have to be actively involved in constructing their own knowledge and a different educational approach has been introduced which is learner-centred.

3.4.1 Change of Focus from Teaching to Learning

Technology expansion, knowledge expansion and educational innovations require a graduate who will be able to cope, adapt and continue learning in the world of work. Fielden (1998:3) and Hassan (2003:54) indicate that knowledge doubles every five to ten years. This makes it impossible for learners to learn a body of knowledge. They need to understand the foundation of a subject and how to access and use new knowledge as it becomes available (Hassan, 2003:54).

According to the constructivist theory of learning, learners need to be actively involved in creating their own meaning, in generating meaning (Ornstein & Hunkins, 1998:115). Literature states that such learning need to build onto previously existing knowledge (Ornstein et al., 1998:115; Van Loggerenberg, 2000:141). The learner's active involvement is very critical; hence the learner-centred approach to learning.

UNESCO (1995:8) indicates that the renewal of teaching and learning is essential for enhancing its relevance and quality. It is further stated that programmes should develop the intellectual capacity of learners, should be designed in an interdisciplinary and multidisciplinary approach and methods of delivery used should increase learning effectiveness.

In support of this, the White Paper on Education and Training 1 argues that modern societies and economies require citizens with a strong foundation of general education, the desire and ability to continue to learn, to adapt to and develop new knowledge, skills and technologies, to move flexibly between occupations, to work cooperatively and to set and achieve high standards (Department of Education, 1995:15).

The challenge that educational institutions are faced with is preparing learners with high levels of communication, collaboration, interpersonal and leadership skills. The hallmark of the information age workplace is effective working teams that can collectively discover and solve significant problems together (Spady, 1994:29). This demonstrates a paradigm shift in the teaching and learning process. These objectives can be met by implementing OBE as initiated by the South African Education Department to address the issue of social change (Soudien, 1997:3).

3.4.2 Implications of OBE for Teaching and Learning

OBE has its roots in the educational theories of mastery learning and competency-based learning (Soudien, 1997:2). Mastery learning is built on the premise that all learners can master the desired outcomes provided the educators create conducive conditions for learning. Competency-based learning focuses on a new skill that the learner can demonstrate after instruction.

OBE is a learner centred-approach that is based on the philosophy that all learners can learn and succeed, schools must create conditions for all to succeed and there must be a continuous striving after improvement (Spady, 1994:28). OBE regards learning as an integrative process between educator and learner, the learner being at the centre of the process and the educator facilitating the process. The focus of learning is on knowledge, skills and attitude that learners will need in their lives.

Assessment is very important in this approach. Its purpose is to check whether the learners have achieved the outcomes and then to provide remedial strategies when outcomes are

not achieved. Methods used are formative as well as summative. Formative assessment is developmental and informs further planning while summative assessment is conducted at the end of a lesson, a unit or course (Van der Horst & McDonald, 1997:170-172). Alternative forms of assessment such as portfolios, practical work and projects are also used.

Developing the learner's knowledge, skill and attitudes will allow them "to contribute to their own success as well as the success of their family, community and nation as a whole" (Department of Education, 1997:10).

In addressing the relevance and quality of education, SAQA stipulates the seven critical outcomes and five developmental outcomes that should be addressed in the curriculum. The essence of these outcomes is indicated in table 3.3. According to Spady (2004:166) these outcomes serve as a standard against which programmes are measured. Killen and Spady (1999:203) indicate that the intention of these outcomes is to describe the characteristics that all citizens regardless of their profession should have. These should be built into the curriculum and assessed to determine if they are achieved.

According to Spady (1994:31) the information age demands 'long-term sustainable performance, self initiated and self directed continuous learning capabilities and not just specific content and skills for specific tasks'. This indicates that the knowledge and skills learned in school must be adaptable to all situations.

Table 3.3: The essence of SAQA critical outcomes

NUMBER	OUTCOME
1a	Critical, creative problem-solving
1b	Responsible, discerning decision-making
2	Effective, collegial teamwork/team membership
3	Organised, responsible life management
4	Critical, systematic investigation
5	Versatile, clear, persuasive communication

6a	Scientifically aware, technologically adept action/implementation
6b	Conscientious, responsible community/environmental stewardship
7	Expansive, global, systemic thinking
8	Inquisitive, reflective learning strategies
9	Active, responsible, global citizenship
10	Sensitive and aesthetic awareness
11	Productive educational and career competence
12	Resourceful, entrepreneur opportunity creation

Source: Spady, 2004:169

Schooling should thus "emphasise interpersonal competence and the ability to deal with complex open ended issues" (Spady, 1994:31). People in the world of work will then be critical thinkers who can communicate, collaborate, solve problems, are responsible and contribute positively to the community and country. This will address the deficiencies as identified in White Paper 3 (see section 3.2.1).

3.4.3 Curriculum Alignment to Societal Needs and Expectations

Knowledge is the essential feature of the modern society (Barnett, 1992:11). Clark in Barnett (1992:11) states that higher education is bound up with knowledge in two ways: in advancing understanding through research and knowledge through teaching. Knowledge is distributed to society by releasing graduates into society. Institutions should thus receive indications from society about its needs or the knowledge capacity it needs (Ibid:12).

The finding that there is a mismatch between output and societal needs indicates that the knowledge produced is not only the prerogative of institutions. Barnett (1992:22) states "the society is coming to determine the forms of knowledge that it wishes for itself" as such collaboration is required between society and educational institutions.

Curriculum development starts with situation analysis. Aims, goals and outcomes are determined through a situation analysis performed to identify the needs of the community. According to Mostert and Pratt in van Loggerenberg (2000:12) consultations between

learner, community and discipline knowledge ensure that the curriculum is legitimate and accountable.

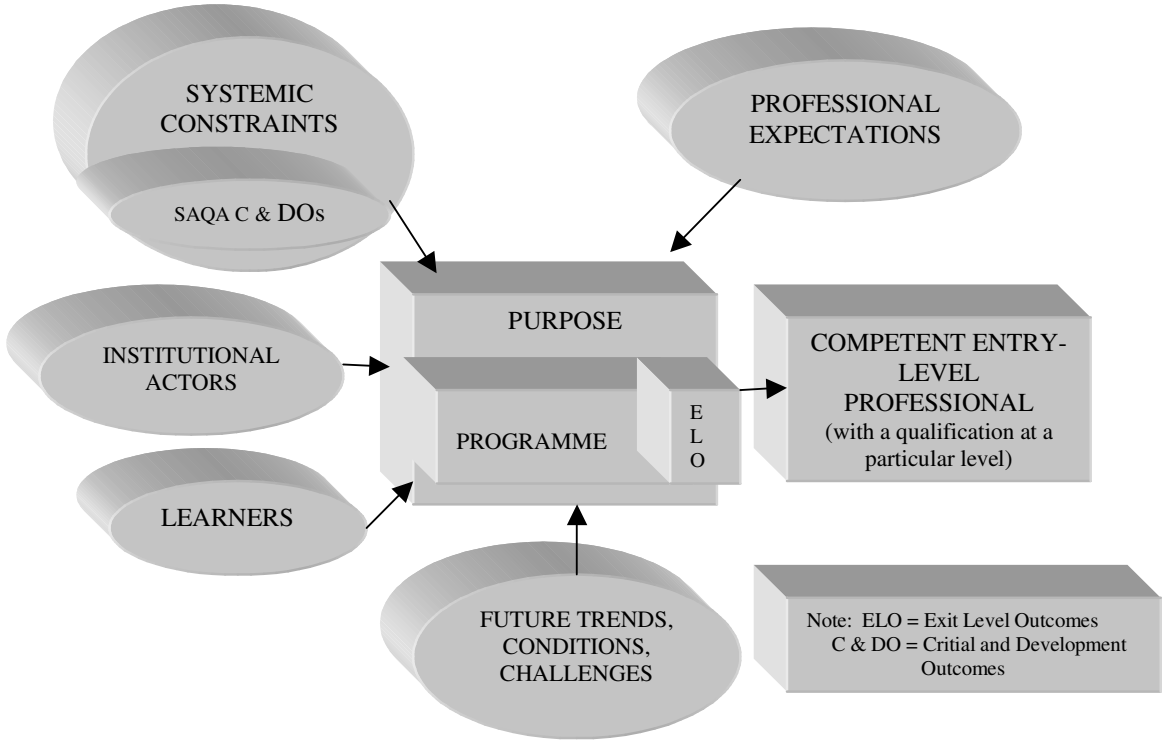
Curriculum, being a social product, requires engagement of stakeholders to determine valuable knowledge, basic skills and essential experiences necessary for a particular programme (Nepi, 1992:2). A clear understanding of what the learners will be doing in future should drive this process (Killen and Spady, 1999:201). The programme design starts with the purpose of the programme supported by a planned combination of learning outcomes and these together with assessment criteria are offered for public scrutiny (Moore, 2003:305).

Factors that impact on this process as indicated in Figure 3.2 on page 50 include professional expectations (stipulated by professional boards), expectations of the community (assessed through needs analysis), learner needs, institutional issues (mission statements, rules, government regulations e.g. SAQA requirements) and future trends and challenges of the qualification.

Future trends and challenges in Radiography will include continuously observing the needs of the communities, observing the changes in the role of the radiographers and in technology, and then providing the necessary training to keep up with developments and ensure competence. For example: report writing will require extensive training in anatomy, physiology and pathology, including radiological appearances, which should be coupled with clinical experiences in reporting. Professional expectations will be stipulated through the documentation of the competences of radiographers and the code of conduct.

At the 10th general conference of Association of African Universities it was clearly stated that the challenges that are facing higher education is to conform to the nature of national demands on education, which are very dynamic.

Figure 3.2: Some factors that influence curriculum design



Source: Killen and Spady, 1999:202.

3.5 DEPARTMENTAL IMPLEMENTATION OF POLICY INITIATIVES AND PROFESSIONAL REQUIREMENTS

Every journey starts with a first step. It is not unusual to hear comments like: "Whose duty is it to ensure that all these are in place?" This section focuses on curriculum leadership and identifies the curriculum leader in an institution.

3.5.1 The Role of Curriculum Leadership

The following definitions intend to provide insight into what curriculum leadership involves. Leithwood (2003:104) suggests that leadership does not take a new meaning when qualified by a term. This indicates that there is an individual who takes a leading role in promoting and supporting organizational activities. Fullan as cited by Cunningham and Cordeiro (2000:173) states that the role of a leader is to look for a starting point, for actions that can be taken to start a point of reform.

Van der Westhuizen (1991:94) states that educators and learners look up to the leader for direction and motivation. Manning (2002:49) also outlines the tasks of leadership, among other tasks, as defining direction, deciding priorities, inspiring innovation and driving action.

According to Reddy (2001:87) the role of academic leadership includes formulation of academic policy and strategy, determining the nature and the quality of programmes. On the other hand Glatthorn (1997:20) defines curriculum leadership as performing the functions that enable schools "to achieve their goal of ensuring quality in what students learn".

The American Society for Engineering Educators as cited by Courter and Heywood (2002:1) indicates that curriculum leadership is only possible when there is thorough knowledge of curriculum theory and practice. Stark, Briggs and Rowland-Poplawski (2002:331) reiterate further that literature reinforces "the idea that understanding curriculum planning in a department requires knowledge of four determinants: a) the context, b) the roles played by individuals, c) the planning processes that are used and d) types of decisions that are made".

According to Courter and Heywood (2002:1) leadership has to do with expertise and they distinguish between three levels of curriculum leadership. The first level is said to relate to knowledge and experience of using classroom assessment techniques. The second level relates to the ability to understand educational theory and to undertake classroom research. On this level the leader would be evaluating self and a practice assessment would be

performed. Researchers consider the level of knowledge used in level two to be more advanced than that of level one.

The third level of leadership is when these individuals call on others to engage in research into their practice and participate in class as well as school development. Their role would be to "lead others in the curriculum venture" through support and motivation (Ibid:1).

Research studies performed by Stark et al., (2002:337) in their study on curriculum leadership roles identified seven roles. They also identified areas of concern that characterise each of these roles. Furthermore, these roles can be linked with steps in the curriculum planning process.

The identified roles are sensor, facilitator, initiator, agenda setter, coordinator, advocate and standard setter. The sensor role is concerned with identifying internal and external issues like the need to modify or change the curriculum and the trends that are set out in the market place. The facilitator would lead the process of curriculum planning; the initiator would introduce drafts of changes or ideas while the agenda setter would bring issues to the table for discussion. These roles are concerned with putting forth and discussing curriculum ideas, proposals and processes (Ibid:342). The individuals acting the four roles contribute towards the development of the curriculum.

The coordinator sees to the smooth running of the implementation process by engaging in tasks like problem solving and ensuring that the programme conforms to requirements. The advocate links the department to the institution and ensures that the required resources are available. The two roles are concerned with implementing the curriculum by ensuring that resources and support are obtained (Ibid:337).

To ensure that the curriculum reaches a state of excellence requires that these roles be taken up to determine the alignment with policy requirements as well as engagement in continuous planning of the curriculum to improve the programme.

3.5.2 Transformation within Curriculum Leadership

Tanner and Tanner in Dixon (1999:38) state that it is not only leadership that should take part in curriculum development but that educators "can contribute significantly to the development of new knowledge about the curriculum when they are provided with adequate resources and consultative and supervisory assistance".

Edmonstone and Western (2002:35-36) reiterate this point of view when stating that leadership is "not an individual but a collective activity" and that leadership exists at all levels of an institution. Lee, Gambling and Hogg (2004:71) also state that "transformational leaders create a culture that recognises everybody as a leader of something". This indicates that the 'boss' mentality has to be replaced by a more collaborative approach to leadership.

3.6 IMPLICATIONS OF TRANSFORMATION ON ACADEME

The functions of the academe are teaching and learning, research, community service and participating in institutional committees. These functions have been discussed in section 2.9.1 on page 30. This section will focus on how the educational transformation and the changing nature of leadership affect those roles.

3.6.1 Teaching and Learning

The shift from a teacher-centred approach to learner-centred approach has resulted in a paradigm shift from teaching to learning. The changing view of leadership also has an impact on the academe's practice. The academe should acknowledge that this change exists and know what their role in the new approach and paradigm is.

A further stumbling block to this role change is the current preparation of the academe for teaching and learning activities (Fielden, 1998:12; Hassan, 2003:56). The academe lack training in this field as they are employed on knowledge of a discipline e.g. a radiographer will educate the other radiographers. Previously emphasis was not placed on educational knowledge as well. This has retarded progress in educational transformation as issues like curriculum design, assessment and OBE are new to them.

Curriculum reform in the health sciences requires training in skills that will ensure the competence of practitioners in the primary health care centres (London et al., 2003:23). Multidisciplinary and intersectional collaboration poses new challenges in terms of meeting with the demands of the changing curriculum and these are further complicated by the introduction of new ways of teaching in support of changes in the country.

Role change involves moving away from being a teacher to being a facilitator, from not being the source of knowledge but the manager of knowledge (Holtzhausen, 1998:33). Williams in Holtzhausen (1998:33) emphasises that there is a need for facilitators to enhance their professional skills and also change their attitudes towards change. According to Van der Westhuizen in Hassan (2003:65) the shift from the traditional approach to OBE includes:

- Adopting a more facilitative role instead of transmitting information.
- Becoming innovative and creative in facilitating learning.
- Inculcating problem solving skills, creativity and critical thinking in learners.
- Focusing more on assessment.

Facilitation of learning follows the process of curriculum development and design. Quality is one of the issues that are enjoying the highest priority in transformation. According to Hassan (2003:94) quality is "linked to the capacity and commitment of the educator, the appropriateness of the curriculum and the way standards are assessed". As such academes need to be able to determine the relevance of the curriculum and implement the necessary changes. The process of curriculum development, design and implementation go hand in hand with the building of quality programmes.

The training of educators in this critical period is very crucial. Hassan (2003:56) argues that the skills that the academe need to be trained in include implementation of co-operative, collaborative learning experiences, being facilitators, improving their practice by being reflective and teaching as a community. Curriculum development and design issues as well as taking leadership role in issues relating to learner and community development must also be included in academic development programmes.

The educator competencies as stated in the norms and standards (Department of Education, 2000:15-22) should form a basis for the development of the academe. These roles include being a mediator of learning, interpreter and designer of learning programmes and materials, a scholar, researcher and lifelong learner, among other roles. According to the researcher the roles indicated in the norms and standards are similar to those indicated by Hassan (2003:56) as well as the roles of the academic radiographer as indicated in section 2.9.1 on page 31. The roles according to the norms and standards are summarised in table 3.4 on page 56.

The next question then is: how are the transformation initiatives going to be implemented? The academe themselves, the departments and institutions have to realise the challenge that they are faced with and start with the relevant training to be able to effect change in line with policy and societal requirements.

Table 3.4: Educator roles according to the Norms and Standards

ROLE	EXPLANATION
Mediator of learning	The educator must provide favourable conditions for learning where learners have to construct their own understanding. The educator needs to be sensitive to the diverse needs of learners, including those who have learning difficulties and also use different strategies to accommodate all learners.
Interpreter and designer of learning programmes and materials	The educator must accommodate different levels of understanding of learners when designing learning materials and other resources.
Leader, administrator and manager	The educator must participate in school decision-making structures, classroom administrative duties and also manages learning in the classroom.
Scholar, researcher and lifelong learner	The educator must improve his/her practice by being a reflective practitioner, participating in research and being a lifelong learner.
Community, citizenship and pastoral role	The educator needs to practise and promote a critical, committed and ethical attitude towards developing a sense of respect and responsibility towards others while upholding the constitution and promoting the democratic values and practices in schools and society.
Assessor	The educator must know how to integrate assessment into the teaching and learning process, how to use assessment to gain information about learner progress and provide feedback to learners.
Learning area/subject/discipline/phase specialist	The educator must have knowledge of the subject matter and skills, values, principles, methods and procedures relevant to the level of study.

3.6.2 Enhancement of the Leadership Role for Academe in Radiography Curriculum Restructuring

The quality improvement process needs to start with the academe themselves as participants and leaders in curriculum design and planning. Knowledge and constant review of philosophical perspectives underlying curriculum design and planning is critical for the academe. Close collaboration with the community will determine satisfaction of the community as well as employers and graduates and will provide the necessary feedback to inform future programme modifications or changes.

Ruscheniko (1998:11) indicates that the Radiography curriculum is seriously overloaded. This factor is attributed to the radiographers' not taking control of their own 'working life' or their curriculum relevance. To take care of this, radiographers need to be able to take leadership in their own curriculum and its restructuring.

London et al., (2002:23) undertook a study in 1999 to determine how doctors doing community service are coping. The study revealed that there is a need for the review of their curriculum that should be aligned with the demands of the work place. The question that needs to be addressed for Radiography graduates is how they are coping. Addressing this question will inform the curriculum as well determine if legislation that informs the practice of radiographers is addressing the needs of the community.

Relevant strategies that would ensure the development of the academe in areas that are critical are essential. As already indicated, the 10th General Conference of the Association of African Universities (2001:1, 2-3) stated that leadership and curricular reform need to be re-evaluated to enhance the quality of training and research. The association recommended that leadership and management training programmes as well as systems of quality assurance be put in place.

3.7 CONCLUSION

This chapter reviewed literature relating to aligning the curriculum with the needs of the community and the policy prescriptions. This study reveals the changing role of the academe and also highlights the lack of educational skills of the academe that could be encountered when implementing restructuring initiatives.

The next chapter presents a summary of the problem statement and the research approach adopted to find answers to the questions and sub-questions stated in Chapter 1. The research design and methodology are discussed in detail.

CHAPTER FOUR

METHODS, PROCEDURES AND ANALYSIS OF THE RESULTS

CHAPTER 4

METHODS, PROCEDURES AND ANALYSIS OF THE RESULTS

Analysis is the critical starting point of
strategic thinking.
Kenichi Ohmae

4.1 INTRODUCTION

As indicated in Chapter 1, the purpose of this study is to determine the role that leadership in the Department of Radiography could play in facilitating the process of curriculum restructuring. The data obtained in this study will be used to clarify the role of the academe as well as of practising radiographers in the clinical departments in ensuring that the Radiography workforce of tomorrow is competitive.

The purpose of this chapter is not only to discuss the methods and procedures used to investigate the research questions, but also to analyse the results of the study qualitatively by coding and classifying the transcribed responses.

4.2 RESEARCH QUESTIONS

The research question as discussed in section 1.3 on page 5 of this study was operationalised into the following three sub-questions that form the basis of the discussion for this section.

- How has Radiography changed as a science and what demands are placed on practitioners to meet the competence requirements in a changing working environment?

This question endeavours to provide insight into the effect of technological change on radiography practice. The changing body of knowledge influenced by science has an

impact on radiography practice since it is a profession that combines the application of science and technology. It is essential that these changes as well as the expectations of the world of work be identified so that they can be catered for in the curriculum.

- What impact does the changing role and changing nature of the world of work of the radiographer have on the academic department in terms of curriculum development and curriculum management?

This question tries to clarify changes brought about by technology on the role and functions of the radiographer. It also addresses the extent to which educational transformation affects teaching and learning and thus the role of the academe. Transformation within the health sector also has an impact on the type of practitioner needed to realise the vision of these transformation initiatives. Determining this vision will help the academe to be aware of their changing role, the shortcomings of the curriculum and what needs to be done to meet the requirements and thus the needs of the community.

- What strategies should curriculum leadership use to improve the quality of the programme offered in terms of the expectations essential to a competitive and changing working and teaching environment?

This question is divided into two aspects. The first aspect tries to determine who the curriculum leader is and also what curriculum leadership means. It indicates how the academe and radiographers in clinical practice see themselves in relation to the qualifying radiographer and his/her profession.

The second aspect is essential to determine how curriculum leadership can improve the quality of the programmes offered. This question will help provide strategies that curriculum leadership can use to improve the quality of the programme. This is critical in maintaining the quality and relevance of the programme in terms of preparing the learners for the changing world of work.

The next section discusses the research design used in this study.

4.3 RESEARCH DESIGN

This section clarifies the research approach adopted in this study to find answers to questions as reviewed in section 4.2 on page 59. The research approach used was a qualitative method and was discussed in section 1.5.1 on page 7. The purpose of the research design is to ensure that the best strategies and methods are selected to make available the information required to make decisions regarding the topic under investigation.

The researcher has selected a qualitative research strategy as method to gather evidence during the investigation and focuses mainly on the conducting face-to-face interviews. These will be explained in detail in the next section.

4.4 DATA COLLECTION METHODS

Data were collected through personal interviews with the academic personnel, senior qualified radiographers and newly qualified personnel from Medunsa Campus as indicated in section 1.5.2 on page 7.

4.4.1 Definition and Rationale

In this investigation semi-structured, face-to-face interviews were conducted. Fred and Oishi (in Hassan, 2003:244) define interviews as “a purposeful conversation in which one person asks prepared questions (the interview) and the other answers them (the respondent)”.

Fowler (in Hassan, 2003:244) states that personal interviews are probably the most effective way of gaining the co-operation of most populations. Interviews also have a

higher response rate than questionnaires (McMillan et. al., 1997:263). This method also ensures that all questions have responses as the interviewer can ask probing questions in trying to seek clarification on the spot (McMillan et. al., 1997:274) and also extend the data.

Another advantage of interviews is that using multiple respondents from different backgrounds allows for the triangulation of the findings contributing to the validity and reliability of the interview schedules and outcomes of the investigation (Marshall & Rossman in Hassan, 2003:245).

4.4.2 Selection of Respondents

Purposeful sampling was used to select the candidates. Selection was based on the characteristics of the individuals relevant to the research problem in terms of being knowledgeable, available, convenient and willing to participate in the study (Wiersma, 1991:265). This means that all personnel involved in the teaching of Radiography were considered and became part of the sample. The selected candidates were seen to be in a position to shed light about the topic as they were directly involved with learners as well as two of them being ex-Medunsa Campus graduates and were considered to be the key personnel (McMillan et al., 1997:171).

The interview respondents were selected from the following three groups of people:

- Academe from the Department of Radiography.
- Chief radiographers in clinical practice.
- Newly qualified radiographers on community service.

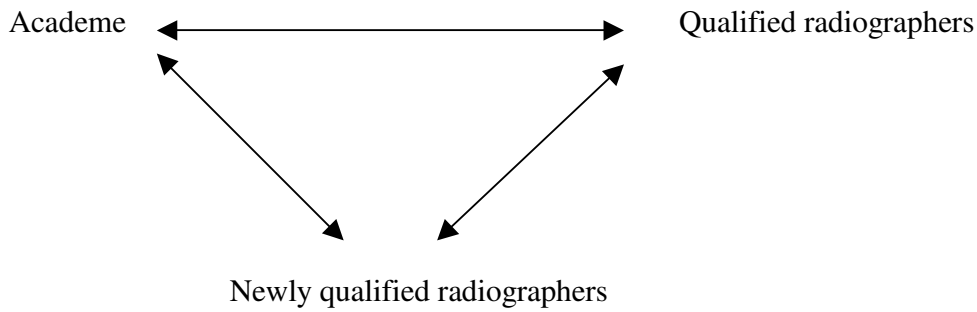
Academic staff were selected based on their involvement in the education and training of radiographers. Their qualifications, skills, teaching experience and professional development are important issues in terms of curriculum reconstruction and management.

Since Radiography training has a clinical component, the radiographers in clinical practice were included in the study. Their role in training is supervision during clinical practice. This education and training role of clinical personnel is also indicated in the competences of radiographers as indicated in section 2.5 on page 22. The input of these radiographers cannot be underestimated as they work with newly qualified radiographers as well as support them during their induction period. Their input can help to determine the relevance and quality of the programme.

The learners themselves can provide first-hand information concerning their experiences during their early period as qualified radiographers and how they cope in the world of work. All the newly qualified personnel at the institution were selected for the study.

Triangulation of data has been achieved through involving the three groups of participants as depicted in Figure 4.1.

Figure 4.1: Data triangulation.



The ideal situation would have been to work with all radiographers, but the setting up of appointments for interviews was impractical and time-consuming considering their work schedule. The selected candidates were chosen because of their experience in working with learners as well as their role in supervising of newly qualified personnel.

A total of eight interviews were conducted in the following categories:

- Chief radiographers – two candidates.
- Newly qualified personnel – two candidates.
- Educators – four candidates.

4.4.3 Ensuring Reliability, Validity and Trustworthiness of the Procedure

Reliability is enhanced by the consistent quality and character of interview questions. The questions should thus mean the same thing to all the respondents. Similar types of questions were repeated for the three different groups of respondents so that the responses can be compared and contrasted (see Appendix B). Each respondent was asked the questions as worded in the schedule.

According to McMillan et al., (1997:404) validity is the degree to which the interpretations and concepts have mutual meanings for the researcher and respondent. The respondents were made to relax and allowed to respond in the way they felt comfortable. If the answer was found to be irrelevant, the respondent was steered back to the question through follow up questions.

4.4.4 Content and Construct Validation of the Interview Schedules

This section is concerned with designing the questions for the interviews. The interview schedule for the three groups of candidates was identical except for the word department that means clinical and academic department for practitioners and academe respectively. The interview questions and what the researcher wanted to determine are tabulated in table 4.1 on page 65. In instances where the responses were not clear, probing questions were asked to clarify the response. The probing questions asked would on the transcribed data that can be requested for further scrutiny.

Table 4.1: Interview questions and their purpose.

Interview question asked	Reason for asking the question	What the researcher wanted to determine
1. Could you tell me about your career path and your development as an academic scholar?	To determine the academic background of the respondents and their experience in the field.	Introductory question aimed at establishing the background of the respondents.
2. The world and everything in it, including radiography, is changing. What are the prominent changes that you experienced in Radiography specifically?	To determine whether they are acquainted with policy as well as changing radiography practice.	To establish whether they are aware of what policy demands on them.
3. What strategies are set up by the institution and the department of radiography to ensure that new knowledge and skills are acquired as quickly as possible to accommodate these changes? What do you as an individual do to focus on your own scholarly development within these changes?	To determine how the individual and the departments keep up with new developments.	To find out how information is dissipated and knowledge is shared among members.
4. What role do you think research plays in effective and efficient teaching and learning in a Radiography Department?	To determine their understanding of the role of research.	To establish their perception regarding research.
5. Which community service projects are you involved in?	To determine the extent of involvement in research.	To establish their perceptions and involvement in community service projects.
6. What role, do you think, does community service play in curricular issues?	To determine perceptions about the role of community in curricular issues.	To establish perceptions of the relationship between curriculum and community service.
7. Do you see policy requirements in terms of curriculum development unfolding into practical imple-mentation in your practice to better prepare the learners?	To determine whether they are acquainted with policy.	To establish whether they have read the policy provision and whether they are implementing it.
8. As an academic, do you see yourself to be in a leadership position and why?	To establish their perceptions about leadership.	To establish the respondents' understanding of leadership and its role during change.
9. How would you describe your role in curriculum restructuring in terms of ensuring that the programme is relevant?	To determine their role in the integration of theory and practice in learner training.	To establish their understanding of their role in the holistic training of learners.
10. What does the department do to ensure that academic excellence and prominence are maintained in the institution?	To determine the strategies employed in the department to improve learner training.	To establish strategies used to improve student training.

11. How do you think your own product (programme) is coping in the world of work?	To determine the competence of newly qualified practitioners.	To establish gaps in learner training.
12. What are the stumbling blocks in their clinical competence, skills and attitude?	To determine inadequacies in learner training.	To determine areas of need.
13. What can be done to achieve clinical excellence and prominence in a Radiography Department?	To determine preferred strategies that can be used.	To find ways to improve.
14. Comparatively speaking how does Radiography in South Africa compare to our international counterparts in respect of role development?	To determine their knowledge and understanding of Radiography in the global arena.	To establish knowledge of our position in the global arena.
15. Are there any other issues you would like to comment on?	To highlight any other issue of concern to respondents.	A closing question aimed at indicating areas not covered by questions but that are critical for respondent.

4.5 CONDUCTING THE INTERVIEWS

Letters requesting the participation of different personnel members were sent to different heads of departments. The personnel members were contacted, briefed about the study and received formal letters requesting them to participate in the study (See Appendix A). They were assured of the confidentiality of the information and thanked for their time and co-operation.

The interviews with the academe were the first to be scheduled, as their work schedule is a little flexible. The interviews of the senior clinical personnel were the most difficult to arrange due to their responsibilities in the department based on their seniority level as well as their work load, as the department is short staffed. Departmental timetable allocations also added to the difficulties experienced in arranging for the interviews, especially for the junior members in the department. Nonetheless the difficulties were overcome and the interviews were scheduled. The atmosphere was made to be as relaxed as possible so that the respondents could feel free to respond to the questions.

The interviews were arranged as follows:

Respondent A1 interviewed on 29 April 2005 in the morning for 1 hour.

Respondent A2 interviewed on 3 May 2005 at 10:30 for 50 minutes.

Respondent A3 interviewed on 4 May 2005 in the morning for 45 minutes.

Respondent A4 interviewed on 4 May 2005 at 11:00 for 45 minutes.

Respondent B1 interviewed on 5 May 2005 at 8:15 for 45 minutes.

Respondent B2 interviewed on 6 May 2005 at 12:00 for 45 minutes.

Respondent C1 interviewed on 5 May 2005 at 13:30 for 45 minutes.

Respondent C2 interviewed on 6 May 2005 at 8:15 for 45 minutes.

The interviews were tape-recorded and notes were taken as backup. The interview schedules are attached as Appendix B. The audiocassettes are available for scrutiny.

4.6 DATA ANALYSIS

McMillan and Schumacher (1997:501) explain data analysis as a process "of organising the data into categories and identifying patterns (relationships) among the categories". In this study the data were analysed using the steps as indicated by Ary, Jacobs and Razavieh in Hassan (2003:270). These steps are organising, summarising and interpreting the data.

Immediately after the interviews the recorded proceedings were typed to put them into a readable format for analysis. The recorded data were reduced by comparing them to the notes and making minor amendments and additions to the transcripts to eliminate unmanageable information. According to Kvale (1996:192) this reduction process is called "meaning condensation".

The interview transcripts were investigated to provide a platform for the analysis and interpretation of the study. Data were organised by coding the responses to facilitate the process of analysing them (McMillan & Schumacher, 1997:508; Mason, 2002:150). According to Kvale (1996:192) coding the data involves reducing long statements into simple categories. Words, phrases and sentences that appeared often were identified to

determine units of meaning (McMillan & Schumacher, 1997:510). The purpose of categories is to reduce the amount of information into a few tables and figures to facilitate handling. According to McMillan and Schumacher (1997:508) and Mason (2002:151) the system used to categorise or index the data is determined by the researcher and is based on the focus of the research, field experiences or preplanning of the study.

For the purposes of this study similar responses were grouped together and codes were allocated. The codes were designed with a view to drawing the findings into specific categories. They were designed using alphabets and numbers, for example a change in technology would be CT 1, the 1 indicating the first change identified. As a validity check the transcripts were given to a colleague to check the correctness of the coding and categorisation.

Data were represented both in the qualitative and quantitative method. Descriptive statistics were used to give meaning to the data and Microsoft Excel was used to plot some of the readings on graphs to support the explanations provided. Tables with frequencies were used to represent the data quantitatively indicating the number of respondents for different categories.

The coding system used is described in the following tables (Table 4.2–4.15). These present the essence of the responses that were interpreted and coded in terms of the support from data and the researcher's experience in the field of Radiography.

Table 4.2: Coding system for change experienced by the respondents in radiography practice.

Sub-category	Explanation	Code
Change in technology	Impacting on equipment.	CT 1
	Resulting in role change.	CT 2
	Influencing the curriculum.	CT 3
	Impacting on communication and learning.	CT 4
Change in the health care sector	Aimed at striving after improvement in service provision.	CH 1
Change in the education sector	Aimed at striving after quality practitioners.	CE 1

Table 4.3: Coding system for identifying strategies used for the development of the respondents.

Subcategory	Explanation	Code
Individual initiatives	Embarking on personal development on an individual basis.	PD 1
Departmental initiatives	Continuous development programmes.	DD 1
	Internet facility.	DD 2
	Receiving support and encouragement to take part in projects.	DD 3
	Holding talks with members of the trade on new technology.	DD 4
	Embarking on community service projects.	DD 5
Institutional initiatives	Availability of library facilities.	ID 1
	Holding grand round meetings on current issues.	ID 2
	Programmes provided by continuous academic development services department (CADS).	ID 3
	Distribution of information brochures and newsletters.	ID 4
	Encouragement to attend workshops and seminars.	ID 5
	Provision of financial support.	ID 6
	Attending research support workshops offered at the institution.	ID7

Table 4.4: Coding system explaining the role of research in teaching and learning.

Explanation	Code
Research informs teaching and learning.	RT 1
Research and teaching support each other.	RT 2
Research uses scientific methodology but finding information is just as good.	RT 3
Research keeps you in touch with developments.	RT 4
Research improves Radiography.	RT 5

Table 4.5: Coding system for determining the involvement of the respondents in community service.

Explanation	Code
There is no involvement in community service.	CS 1
Involvement in community service could be increase.	CS 2
The respondent is actively involved in community service projects.	CS 3

Table 4.6: Coding system for describing the role of community service in curricular issues.

Explanation	Code
Community does not have any influence on curriculum especially at tertiary level.	CC 1
Community service identifies the needs of the community, therefore influence the relevance of the curriculum.	CC 2

Table 4.7: Coding system for describing the extent of the practical implementation of policy requirements.

Explanation	Code
The respondent does not know what is involved to be able to identify change.	PJ 1
The respondent can see the implementation to some extent.	PJ 2

Table 4.8: Coding system for describing the respondents' perceptions of leadership.

Explanation	Code
As an educator you are a leader.	LP 1
Leadership is situational.	LP 2
The respondents never thought of self as a leader	LP 3

Table 4.9: Coding system for describing the respondents' role in curriculum restructuring.

Explanation	Code
Actively involved in curriculum restructuring and management but more collaboration is required for quality results.	CR 1
Actively involved in curriculum restructuring and management.	CR 2
Not sure how to fit into this role.	CR 3

Table 4.10: Coding system for describing the role of the department in achieving academic excellence and prominence.

Explanation	Code
The department acknowledges the involvement of clinical as well as academic sections in student training.	EP 1
Quality assurance mechanisms are in place to a little extent.	EP 2
The department encourages personal and professional development.	EP 3

Table 4.11: Coding system for describing how "product" (Graduates) copes in the world of work.

Sub category	Explanation	Code
Practical performance of graduates	They are having a difficult time coping.	CP 1
	They are coping.	CP 2
	They should be able to cope.	CP 3
	Some are coping while some are having difficulties coping.	CP 4
	The respondent hopes that community service will help honing the skills.	CP 5
Academic preparation of graduates	Higher Education not preparing for the skills needed out there.	CA 1
	Higher education preparing well.	CA 2

Table 4.12: Coding system for identification of stumbling blocks experienced in learner clinical training.

Sub category	Explanation	Code
Type of training	Lack of relevant skills for the information age (Critical thinking, problem solving and servicing knowledgeable communities).	ST 1
	Minimal clinical practice hours (training hours).	ST 2
	Lack of clinical supervision.	ST 3
	Unavailability of equipment.	ST 4
Competence of educators	Using relevant teaching and training practices including assessments.	SE 1
	Separation between clinical personnel and academe resulting in a gap in training.	SE 2
Learner guidance	Proper orientation before beginning of training.	SG 1

Table 4.13: Coding system for identification of variables that can be used to achieve clinical excellence.

Explanation	Code
Increased expectation from learners.	ET 1
More experience in diverse clinical situations.	ET 2
Appropriate assessment strategies.	ET 3
More emphasis put on clinical competence.	ET 4
More clinical supervision.	ET 5
Well equipped departments.	ET 6
Introduction of specialisation programmes.	ET 7
Collaboration with other institutions offering radiography.	ET 8
Collaborative research projects.	ET 9
Collaboration between clinical and academic departments.	ET 10

Commitment and motivation levels of personnel and learners.	ET 11

Table 4.14: Coding system for describing how radiography in South Africa compares to radiography abroad.

Sub category	Explanation	Code
Poor comparison	Role development abroad is more advanced.	SA1
	The economy abroad is advanced therefore technology is also more advanced.	SA2
	Legislation abroad caters for the developed role.	SA3
	Radiographers abroad work as specialists (have specialist appointments).	SA4
Good comparison	Role development is advanced in South Africa.	SP1
	They keep on recruiting more from our country meaning that they are coping.	SP2
	HPCSA's guidelines for radiographers match those of counties abroad.	SP3

4.7 RESEARCH FINDINGS

This section deals with the responses generated by the interviews as conducted according to the selection criteria as indicated in section 4.4.2 on page 62 and the interview programme outlined in section 4.5 on page 67.

4.7.1 Background of the Respondents

As was indicated previously (see section 4.4.2) the respondents were selected from three groups of individuals deemed appropriate for this study. The academes from the Department of Radiography were numbered A1, A2, A3 and A4 for the purposes of analysing the data. Chief radiographers were identified as respondents B1 and B2 while newly qualified radiographers on community service were identified as respondents C1 and C2. Chief radiographers and newly qualified radiographers together are referred to as clinical personnel.

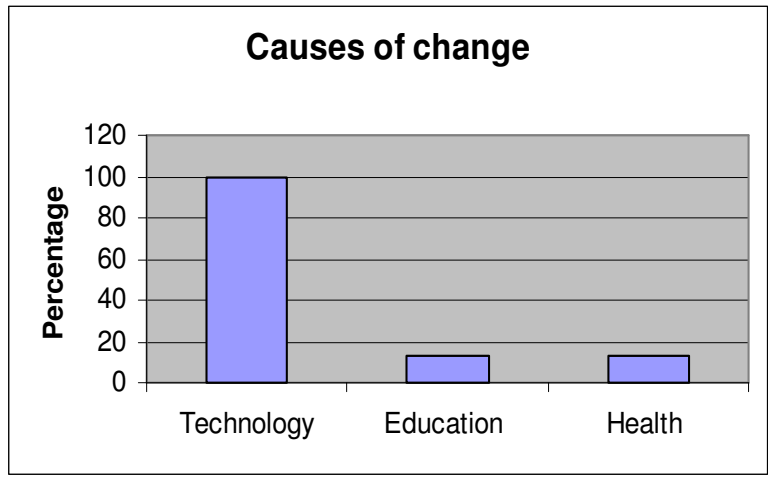
All the respondents are qualified radiographers by profession. Four of them are from the clinical practice while four are in the academic field.

It needs to be stressed that the sample used is small and thus not representative of the entire target population. Based on the explanation provided on the selection of respondents in section 4.4.2, a change in the opinion of one or two respondents could have a significant impact on the percentage points calculated.

4.7.2 Changes that the Respondents Experienced in Radiography

The main change factors identified were technological change and transformation in the education and health sectors. The distribution of responses shows that 100% of the respondents identified technological change, 13% indicated transformation in the health sector and 13% transformation in education. These responses are represented in Figure 4.2.

Figure 4.2: Respondent's opinions regarding the causes of change in radiography practice.



The breakdown of the respondents that identified technology as a factor responsible for change is provided in Table 4.15 on page 74. 88% of these respondents indicated that technological innovations impact on equipment used in the career field. The following are some of the responses:

If you look at the equipment that is used there, you know it is becoming more sophisticated by the day but only with the aim of giving better quality images with a reduction in radiation doses to patients.

The technical changes, the technological changes going from simple things like hand processing films to processing films through twelve minute processes and then ninety seconds and now we've gone from analogue to digital virtually in every aspect.

A smaller percentage (25%) said that this change in technology affects the role of the radiographer in that it extends into roles that were previously performed by radiologists. 38% indicated that change in technology has an impact on communication and learning while the same percentage said that the change influences curriculum as the curriculum has to be aligned to the requirements of the working environments.

Table 4.15: Technology variables influencing change in radiography practice

Variable	Respondents	Frequency
The impact of change in technology on equipment	A1, A2, A3, A4, B1, B2, C1	88%
The influence of change in technology on curriculum	A2, A3, A4	38%
The influence of change in technology on role change	A2, C2	25%
The impact of change in technology on communication and learning	A2, B1, B2	38%

4.7.2.1 Researcher reflections

All respondents identified the main factor that is responsible for change in Radiography as technology. It is interesting to realise that all academe relate change in technology to the learning process while the clinical counterparts focus on the equipment in the clinical practice. This response indicates divided focus between the academic and clinical

personnel, which shows that there is lack of integration between the two components of Radiography training. This can also indicate a lack of collaboration between the academe and clinical personnel. The questions that need to be addressed are: How will learners perceive this? How will it affect their training? How can integration be facilitated?

This division according to the researcher violates what is stated in the White Paper for Education and Training that states that education and training should not be viewed as parallel activities as they are essential to human resource development. The professional development of the respondents as determined in the next section (section 4.7.3) should include knowledge of policy documents that guides the process of transformation.

According to the researcher the changing role of the radiographer was indicated by too few practitioners (25%). This could have an impact on curriculum restructuring and management in terms of the alignment and knowledge of developing trends in the field.

4.7.3 Strategies Employed to Ensure that New Knowledge and Skills are Acquired

75% of the respondents indicated that they have and are still in the process of individually focusing on their own development. These respondents identified gaps in their daily practices and embarked on developing themselves in different areas as they saw fit. Some respondents expressed themselves as follows in this regard:

> *I think as a practitioner… you start to realise your inadequacies. You start to realise gaps, feeling like you should have more knowledge and more skills so that you could have more confidence in doing what you do.*

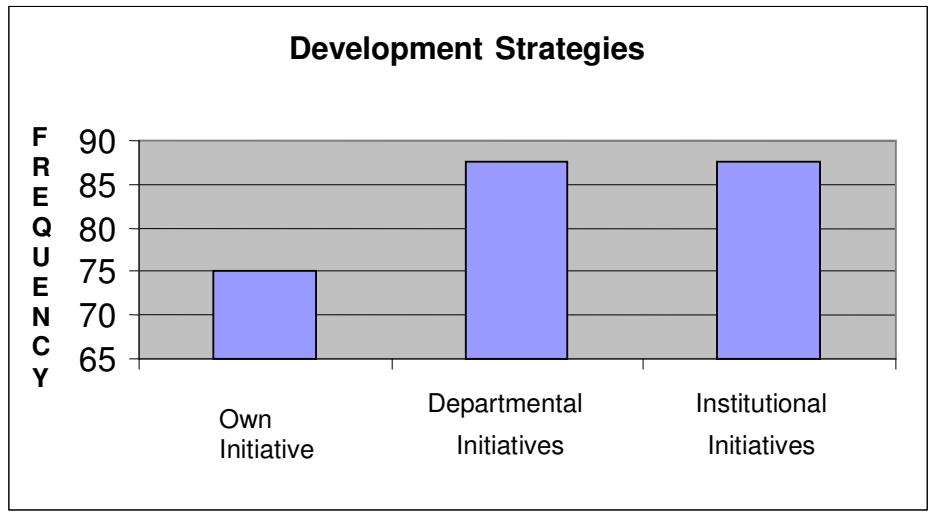
> *From my personal point of view I've always been an academic scholar. I've always had an interest …and so I've always been able to progress in my own personal direction and putting back into the radiography department what I've learned on a personal scale.*

50% of the respondents said their departments are supportive and encourage their taking part in developmental projects. The department's making available resources such as computers, internet facilities and printing of materials was indicated by 25% of the respondents. Continuous professional development projects are offered by the department and there are also departmental forums that focus on professional development as indicated by 50% of the respondents.

Institutional strategies mentioned are the availability of library facilities (25%), different departments collaborating on presentations during grand rounds (12,5%), courses provided by CADS (12,5%) distribution of information brochures and news letters (12,5%), encouragement to attend workshops (62,5% as well as providing financial support towards development (12,5%). One respondent (12,5%) indicated that workshops are offered to support research.

In summary, as indicated in figure 4.3 below, 75% of the respondents are involved in development after realising their gaps on an individual basis. 87,5% of the respondents are involved in different initiatives as made available by the department with the same percentage indicating that their development is guided by different institutional initiatives.

Figure 4.3: Indication of the respondent's development strategies



4.7.3.1 Researcher reflections

The discovery that 100% of the academe as well as 100% of the chief radiographer's realisation that there is a need for development as individuals is related to their being aware that there is change in the field and that they need to embrace the change and be equipped to handle or cope with it. Newly qualified personnel indicate that they are still focusing on improving their practice skills, which to the researcher is a reasonable reason.

In the researcher's opinion the departments and institutions are also aware of the need for development and are doing something to facilitate the development. The study does not focus on the effectiveness of their strategies but the initiatives could indicate that the departments are engaged in keeping up with technological and knowledge expansion.

4.7.4 The Role of Research in Teaching and Learning

62,5% of the respondents said that research informs teaching and learning. (Of these respondents 25% indicated that research and teaching and learning support each other while 12,5% indicated that finding information is just as good). 25% of the respondents said that research keeps you in touch with new developments. One respondent (12,5%) indicated that research improves Radiography.

4.7.4.1 Researcher reflections

This section also indicates the division between the clinical and academic components of Radiography training as already indicated in section 4.7.2.1 on page 74. Most of the clinical personnel (75%) were not sure whether roles like research and community service are relevant as demonstrated in section 4.7.5 and 4.7.6 on pages 78 and 79 respectively. The question that needs to be explored is: Why this perception? How does this affect training and the profession itself?

Literature indicates that the radiography curriculum is overloaded, as radiographers are not taking control of their own profession and therefore their curriculum (Ruscheniko et. al., 1998:1). According to the researcher collaboration between the two components of the programme would ensure that expertise from the two parts is brought together and this should strengthen competence in the profession in terms of keeping up with developments and maintaining quality and excellence in Radiography practice. According to Nixon (2001:31) the potential for research is increasing due to the evolving knowledge base and advances in new technologies. This means that there should be more knowledge on conducting research and more participation in research.

4.7.5 Involvement of the Respondents in Community Service

50% of the respondents were not involved in community service. One respondent said:

> *None at the moment but I realise that there is a lot that can be done to inform learners in schools about Radiography so that they make informed decisions about their future professions.*

25% acknowledged that they were minimally involved and that their involvement could be increased. Some of the responses were:

> *There's not much, to be honest. It has been just sporadic projects here and there and something that will come and go but nothing with a commitment to see it beginning and seeing it ending.*

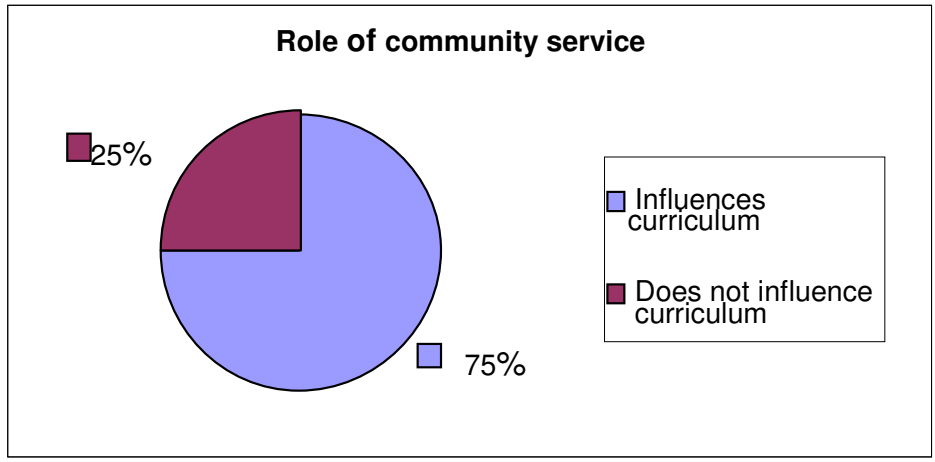
> *Presently I'm just attached to the Catholic project … where they've adopted about 5 families … and we provide groceries monthly so it's really in a small scale where mainly it is contributing food stuff to the community.*

25% were actively involved in their communities.

4.7.6 The Role of Community Service in Curricular Issues

75% of the respondents acknowledged that community service helps identify the needs of the community and therefore help in maintaining the relevance of the curriculum. 25% of the respondents said that the community does not have any influence on the curriculum, especially at tertiary institutions.

Figure 4.4: The role of community service in curricular issues.



4.7.6.1 Researcher reflections

Some of the academe realise the major role that community service plays in curricular issues but are not involved in community service. They also acknowledge this factor and admitted that they could do more for the community and in turn learn about their needs. They also stated that collaborative projects could get the involvement process started, which is something that the department can work on.

As indicated in section 2.9.1 on page 31 community service is one of the functions of the academe. Literature indicates the purposes of higher education as meeting the social development needs of the society and meeting the need for active citizenship (Favish, 2003:24). According to the researcher the findings of this study indicate that the academe

have not aligned their functions to transformation requirements and are thus not fulfilling their roles and functions as employees of a higher education institution.

4.7.7 Practical Implementation of Policy Requirements

A certain extent of practical implementation of policy requirements was observed by 75% of the respondents. One of these respondents saw small amounts of change in terms of health delivery in terms of improved service delivered to patients and indicated that *if we check the records we will realise that we get fewer complaints from the patients*. A quarter of the respondents did not know what was involved to be able to provide evidence of the practical implementation despite one (respondent) having indicated that *learners at Medunsa are not thoroughly prepared.*

4.7.7.1 Researcher reflections

For people who were involved in personal and professional development as indicated in the responses in section 4.7.3 on page 75 it is surprising that a quarter of the respondents were not sure about the change they had to see. The questions that come up are: Are they aware of policy requirements guiding transformation? Are those development strategies relevant and/or helpful? Is there follow up to see understanding of what has been learned? Are the individuals aware of how what they have learned should impact on their practice?

In the researcher's opinion the division between practice and theory also contributes to this. Having collaborative projects with the clinical personnel could close this gap as the clinical personnel would learn about transformation initiatives within the education sector. Training will also be improved, as expectations form learners will be the same and could be set to the same level of performance in both clinical and academic setups.

4.7.8 Perceptions of Leadership

75% of the respondents indicated that they are leaders because they are educators, while 28% of them indicated that in other instances they can be delegated a leadership role or they can lead projects within a department. One of the respondents (12,5%) said he never thought of himself as a leader. One respondent (12,5%) indicated that leadership is situational.

4.7.8.1 Researcher reflections

These responses indicate that the respondents are not aware of the changing role of leadership as well as the current trend that indicates that working collaboratively in the departments using strong points and expertise from different individuals at different periods has the potential of improving the performance and achievements of departments.

Literature as indicated in section 3.5.2 on page 53 states that leadership is not an individual activity and that there are limitations to what one individual can achieve. Lee et al., (2004:20) also indicated that there is a need for "research leaders to take forward the agenda for change". The researcher's conclusion based on this is that the respondents are not ready to take up the required leadership role.

4.7.9 The Respondent's Role in Curriculum Restructuring

100% of the academe acknowledged that curriculum restructuring and management is their function. 50% of them indicated that they are actively involved but their concern is that more collaboration is required between all stakeholders while the other 50% indicated that they are actively involved in curricular issues. The clinical personnel did not know that they could influence or contribute to curricular issues.

4.7.9.1 Researcher reflections

This outcome is also indicative of lack of collaboration between clinical and academic sections. Clinical personnel are excluded from of decisions that pertain to training while they are expected to see to the practical part of training. This conclusion was drawn from statements from clinical personnel such as:

> *There is lack of follow up by people who did theory to ensure that they practise what they learned. It is difficult to correct what you did not teach as you do not know what was taught.*

> *I think lecturers and the hospital staff need to talk about what we are taught as students and standardise our practice.*

> *Misunderstandings between school and hospital need to be ironed out. If there are fights students will be affected.*

In the researcher's opinion the other 50% of the academe were not too willing to commit themselves, which is very critical in determining the quality of the curriculum and determining its relevance. The respondents were not ready to engage in the third level of curriculum leadership as identified by Courter and Heywood (2002:1) which requires of individuals to call on to others to engage in initiatives that would lead to practice improvement.

4.7.10 The Role of the Department in Achieving Academic Excellence

Three of the academe (75%) indicated that there are quality assurance mechanisms but that much can still be done. One of the four (25%) indicated that the department encourages personal and professional development so that academic excellence can be achieved.

4.7.10.1 Researcher reflections

This question was specific for the academe. At this point no mention was made of the role that the clinical department plays in academic excellence or of the collaborative effort of implementing the quality assurance mechanisms in the clinical set up of which the clinical personnel would be part.

The academe did not take into consideration that curriculum is a social product and requires the involvement of all stakeholders as indicated by Nepi (1992:2). Increased awareness of quality being part of transformation needs the undivided attention and serious consideration from the departments and individuals within the department. According to the researcher the academe need to be very specific and clear about the initiatives for quality and excellence.

4.7.11 How "Product" (Graduates) Copes in the World of Work

100% of the newly qualified radiographers indicated that they are having a difficult time coping. One senior clinical personnel indicated that some (graduates) are coping and some are having difficulties while another one said they are coping. One respondent said they should be able to cope because their education prepared them well. 50% of the academe said they are coping well with 25% indicating that some skills are lacking. One personnel (25%) indicated that all professionals including radiographers are having a difficult time coping and was hoping that community service would hone the skills that they did not master during training. The summary of these responses is tabulated in Table 4.16 on page 84.

Table 4.16: Indication of how graduates are coping in the world of work.

Variables	Respondents	Frequency
HE is not preparing and developing learners holistically.	A1, A2	2
HE is preparing well so they should cope.	A4	1
Graduates are having a difficult time coping.	A1, C1, C2	3
Graduates are coping.	A3, B2	2
Some are coping, some are not.	A2, B1	2

4.7.11.1 Researcher reflections

According to the researcher the responses to this question were based on assumptions because of the different responses received and the reasons provided. 50% of the academe acknowledged that higher education is not preparing for the skills needed out there but one of these respondents said the graduates are coping despite having started by saying that they are getting "*conflicting reports*" and that education is not preparing for the skills needed in the work place.

One academe said that *they should be able to cope well as the department is preparing them well* and that if they were not coping they would not be recruited abroad. The question that arises here is: Are they really coping? Do they get extra training when they arrive abroad? What type of training is it? How long does this training take? The respondent did not clarify any of these issues.

The graduates themselves said that they are having a difficult time coping. This response is based on real experiences as they are newly engaged in the practice as qualified radiographers. Based on these responses the researcher believes that this issue needs further investigation.

According to the researcher keeping contact with graduates could help with curriculum alignment and the quality assurance of the programme. The information gained from the world of work experiences could help improve training to address the needs of the

community. As indicated in section 3.6.2 on page 57, the study that was performed to determine how doctors in community service are coping indicates that there needs to be a change in the curriculum to align it with the needs of the world of work.

4.7.12 Stumbling Blocks Experienced in Learner Clinical Training

Table 4.17 indicates the variables that were identified as the stumbling blocks to optimum clinical training. Variables indicated by many respondents are less time allocated for clinical work, lack of clinical supervision and the unavailability of some of the equipment that is needed for training.

Table 4.17: Stumbling blocks in learner clinical training

Variable	Respondents	Frequency
Lack of relevant training skills for the information age era.	A1	1
Minimal clinical practice (practical hours).	A3, B2, C2	3
Lack of relevant teaching and training practices including assessment.	A1	1
Division between clinical and academic departments.	A1, B1	2
Lack of clinical supervision.	A3, B1, C1	3
Unavailability of equipment at training sites.	A3, A4, C2	3
Proper orientation at the beginning of the programme that will help determine interest in programme.	B1	1

4.7.13 Strategies for Achieving Clinical Excellence and Prominence

The respondents answered this question by indicating the variables as tabulated in Table 4.18 on the next page. Variables often mentioned are learners gaining experiences in diverse clinical situations and more clinical supervision.

Table 4.18: Variables that could contribute towards clinical excellence.

Variable	Respondents	Frequency
More experience in diverse clinical situations.	A1, C2, A2	3
More clinical supervision.	A2, A3, C2	3
Well equipped departments.	A3	1
More emphasis on clinical competence.	A1, A2	2
Increased expectations from learners.	A1	1
Appropriate assessment strategies.	A1	1
Introduction of specialisation programmes.	A3, B1	2
Collaboration between clinical and academic departments.	B1, B2	2
Collaboration with other institutions training radiographers.	A4	1
Collaborative research projects.	B1	1
Focusing on motivation and commitment levels of personnel.	B2	2

4.7.13.1 Researcher reflections

Equipment in the clinical training institution is not a very critical factor as only one respondent indicated it. The researcher concludes that much can still be done with the available equipment. According to the researcher the most critical factors indicated are thorough supervision and more clinical time in the available environment as three respondents indicated these.

Variables like more emphasis on competence as well as increased expectations and assessment strategies can be fitted in within increased supervision and more time allocated for clinical practice. Collaborative projects are important as they will help determine what happens at other institutions for benchmarking purposes as well as standardisation within the profession.

The responses in this section indicate that the clinical personnel see the need for collaboration which is more that the researcher can say about the responses from the academe.

4.7.14 Comparison between Radiography in South Africa and Radiography Abroad

62,5% of the respondents indicated that this is a poor comparison. 80% of these respondents indicated that role development is more advanced abroad that in South Africa. One of them indicated that technology abroad is more advanced because of their advanced economy and 40% indicated that legislation supports their advanced role development. 60% of these respondents mentioned that radiographers abroad work as specialists.

25% of the respondents indicated that Radiography in South Africa is comparable to Radiography abroad. These respondents based their answers on the assumption that because our graduates cope, the countries abroad keep on recruiting radiographers from South Africa.

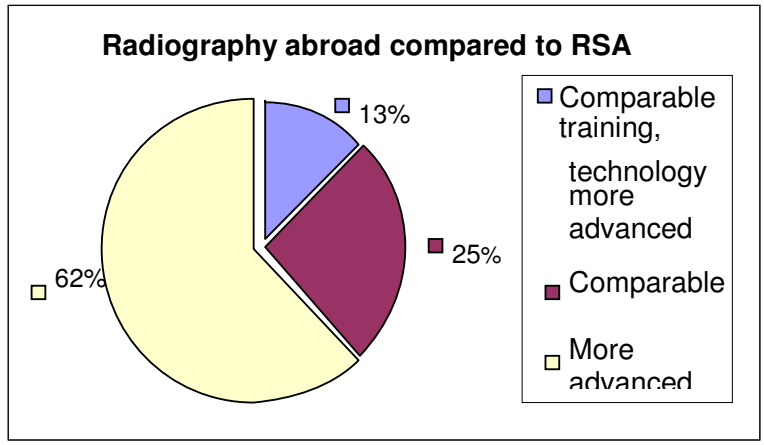
12,5% of the respondents argued that there is a good comparison because countries abroad keep on recruiting radiographers from South Africa, indicating that training is comparable and saying that the only difference is in the technology that is available as those countries abroad have an advanced economy.

In summary 62,5% of the respondents indicated that Radiography is more advanced abroad than in South Africa, 25% indicated that Radiography abroad and in South Africa is comparable while 12,5% indicated that training is comparable but technologically they are more advanced than in South Africa.

4.7.14.1 Researcher reflections

A large percentage (62,5%) of the respondents is informed about how Radiography in South Africa compares to Radiography abroad. To the researcher this indicates that the respondents are aware of avenues for improvement and will be able to use knowledge of experiences abroad to improve services in the local community in terms of finding ways to provide for the needs of the local market.

Figure 4.5: Comparison of radiography in South Africa and radiography abroad.



4.7.15 Other Issues of Concern to the Respondents

50% of the respondents underscored the need for improvement in clinical training. The following are areas in which they raised concern:

> *I would think that 3rd years should be given enough time for clinicals to spend I mean in the hospitals.*

> *We in fact learned a lot more at the bedside of a patient than in the classroom because our training was hospital-based, so in practical looked at the amount of hours spent in the clinical situation and the follow-up, our lecturers were also our clinical tutors which in a way would always be the ideal where we should be teaching at the bedside and re-enforcing in the classroom, we do it the other way*

One of the respondents emphasised the need for improved clinical training by saying:

> *I do also feel that radiographers who acquire extra qualifications but are not being able to come into teaching …who've got both the formal and the clinical expertise…we can actually use the*

intellectual abilities of these people out there to facilitate and to reinforce what we're doing in a clinical set up.

One respondent stated that he would like to see learners doing research while another participant indicated that involving or networking with commercial companies, for example Siemens or Phillips would benefit the profession, as new developments will be made known in time. He also indicated that these companies could also help fund research projects. This respondent further indicated that it is critical to determine the interest of the learners in the programme at the beginning of training as this affects their motivation, willingness and drive throughout their careers.

One respondent quoted the mission statement of the University of Limpopo and indicated that being a world class African university is a big task to accomplish in an era that has problems with regard to national identity. The sentiment then expressed was that this can be achieved because *I think we find ourselves at a better position at the right time*.

4.8 CONCLUSION

This chapter aimed at discussing the methods and procedures used in this investigation. The ideas, experiences and opinions of the respondents were coded and analysed. The researcher's reflections on the findings of the research we provided.

The next chapter aims at discussing the findings, drawing conclusions and making recommendations.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

After winter comes summer,
After night comes dawn
And after every storm, there
comes clear, open skies.
Rutherford - Scottish pastor

5.1 INTRODUCTION

The preceding chapter deals with data analysis and interpretation. This chapter aims at presenting a summary of the findings of the research. The summary is structured according to the three main research questions that emerged from the research problem as discussed in Chapter 1 section 1.3 on page 5.

The chapter starts by summarising the research problem and highlighting the research questions, aim and objectives. It further lists the main findings exposed during the investigation and substantiates them with findings from the literature. Lastly the recommendations and implications of the study as well as its limitations are discussed. Areas of further research are also recommended.

5.2 RESEARCH PROBLEM, RESEARCH QUESTIONS, AIM AND OBJECTIVES OF THE STUDY

It is important to refocus on the rationale for the research. It was based on how changes in higher education in South Africa affect Radiography as a programme. The strategies that could be used to ensure the alignment of the programme with the world of work and teaching environment expectations were to be determined. Policy documents as discussed

in Chapter 1 section 1.2 on page 2 were used as a frame of reference from which institutional transformation within the education and health sectors could be addressed.

The role of the academe in the education and training of radiographers need to be reevaluated to determine the strategies that could be used to render the programme relevant and of good quality. This investigation determines what needs to be done to achieve relevance and alignment to the requirements. As a result the questions that need to be addressed are:

- How has Radiography changed as a science and what demands are placed on practitioners to meet the competence requirements in a changing working environment?
- What impact does the changing role and changing nature of the world of work of the radiographer have on the academic department in terms of curriculum development and curriculum management?
- What strategies should curriculum leadership use to improve the quality of the programme offered in terms of expectations essential to a competitive and changing working and teaching environments?

As discussed in section 1.4 on page 6, the questions would be addressed with the aim of determining the role that leadership in the Department of Radiography can play in facilitating the process of curriculum restructuring and management in Radiography to ensure that it meets the requirements, needs and expectations essential in a competitive and changing working and teaching environment.

The following objectives have to be met to achieve the aim of this study:

- To determine the changes in radiography and the demands placed on the practitioners to meet the competence requirements in a changing working world.
- To determine the impact of the changing role and changing nature of the world of work of the radiographer on the academic department in terms of curriculum development and curriculum management.

- To explore the strategies that curriculum leadership can use to improve the quality of the programme offered in terms of expectations essential in a competitive and changing working and teaching environment.

5.3 MAIN FINDINGS AND DISCUSSION

The purpose of this section is to highlight the findings of the research in relation to the problem statement and questions, rationale of the study as highlighted in the section above (section 5.2 on page 90) and the literature review as presented in Chapters 2 and 3.

Research question 1

How has Radiography changed as a science and what demands are placed on practitioners to meet competence requirements in a changing working environment?

Literature as discussed in sections 2.2 on page 17 and 2.7 on page 24 shows that the profession of Radiography combines the application of science and technology (Castle, 2000:267). This means that as the body of knowledge (science) evolves and technology is advanced, medical science is affected and radiographic practice as well as training has to change accordingly. It has also been indicated that development has extended the roles of radiologists to include molecular and interventional radiology, thus leaving the gap for radiographers to perform some of the roles that were traditionally performed by radiologists (Price, Miller & Mellor, 2002:224-231).

The use of radionuclides, ultrasound, magnetism and gamma rays has given birth to different career pathways that are 'specialities' in radiographic practice (see section 2.5 on page 21). Technology has advanced equipment used in radiography specifically. New equipment and techniques bring about development in the role of the radiographer (Horak, 1997:3; White & McKay, 2002:72). Computers have also been introduced and facilitate digitisation in radiographic practice as well as teleradiology as has been indicated in section 2.7.3.1 on page 29.

Transformation in the education and health sectors places demands on practitioners to perform at a required level of competence. It is the responsibility of the NQF to ensure that knowledge that is relevant for the current world is created through the collaboration of all stakeholders (NQF substructures, 2005:1). In section 3.2.2 on page 38 it was indicated that the role of higher education as stipulated by the Education White Paper 3 (Department of Education, 1997:10) is the development of knowledge and skills in all workers that will contribute towards the development of the nation.

Literature also indicates that in tandem with knowledge that is said to double in five to ten years (Fielden, 1998:3; Hassan, 2003:54), learners are expected to have the desire and ability to continue to learn (Department of Education, 1995:15) so that they are able to cope with the requirements of the continuously changing working world (see section 3.4.1 on page 45).

London et al., (2002:23) performed a study to determine how medical practitioners in community service are coping. This study has revealed that the curriculum of medical practitioners needs to be reviewed to align it with the requirements of the world of work as the practitioners are having difficulties to cope (section 3.6.2 on page 57). Could this not be applicable to radiographers as they are also health professionals?

In terms of addressing research question 1, this study shows that the respondents are experiencing change in the field of Radiography. According to the responses in section 4.7.2 on page 73 this change was attributed to technological innovation (indicated by 100% of the respondents), transformation in education (indicated by 13% of the respondents while 38% more indicated that technological change influences curriculum) and transformation in the health sector (indicated by 13% of the respondents). These responses are shown in figure 4.2 on page 73.

The respondents indicated that technological change brings about change in equipment and techniques used. The role of radiographers is changing due to the introduction of new

modalities and also due to their roles extending into roles that were previously performed by radiologists (see sections 2.7.3.1 and 2.7.3.2 on pages 28-30).

The practitioners are expected to cope in a field that is affected by changing technology and transformation within the health sector. They are expected to be lifelong learners in order to keep up with new developments. Providing medical care at three levels of care increases the demand for health professionals and this in itself is problematic as radiographers among other professionals are in short supply as indicated by the South African government (Tshabalala-Msimang, 2004:50).

To be able to cope and adapt requires knowledge of what is expected of you (policy documents, rules and regulations of different institution). For personnel to be aware of these changes, their employers need to ensure that personnel are informed in time and receive the right kind of support. This study as shown in section 4.7.3 on page 75 indicates that all the respondents are involved in personal and professional development. 87,5% of the respondents were involved in development initiatives by the Department and the institution while 75% identified development gaps on their own and embarked on different processes to fill these gaps (see Figure 4.3 on page 76).

Education needs to prepare practitioners to have high levels of communication, collaboration, interpersonal and leadership skills as the information age work place requires effective working teams that can collaboratively discover and solve problems together (Spady, 1994:29).

As South Africa needs to be part of the global village, knowledge of what is happening in other countries can help local programmes in terms of benchmarking as well as planning. This study also tried to determine the respondents' knowledge of what is happening abroad in terms of the competence of graduates as well as radiographers' scope of work. The responses for comparing radiography in South Africa to radiography abroad as shown in section 4.7.14 on page 87 indicate that the majority of the respondents (62,5%)

acknowledge that Radiography in South Africa is lagging behind. Figure 4.5 on page 88 indicates these percentage distributions.

In conclusion to the first research question, the following could be drawn from the findings: Technological innovations have brought change in radiography in terms of the advancement in equipment and technique while transformation in the Department of Health and Education has brought change in terms of quality and access in service provision. Innovation with regards to radiology has left gaps which require radiographers to perform the roles that were previously performed by radiologists.

Practitioners have to cope with the use of new modalities, working with knowledgeable communities and providing services in a manner that is in line with policy requirements such as the primary health care approach and its requirements. These practitioners who also have an institutional function have to ensure that learners receive quality clinical practice so that they are well prepared for the world of work and can cope as qualified practitioners.

Research question 2

What impact does the changing role and changing nature of the world of work of the radiographer have on the academic department in terms of curriculum development and curriculum management?

Medical advancements and an enlightened public increase the demand for medical services. As already indicated, technological development brings in new imaging modalities such as CT scan, digital vascular imaging (DVI) and MRI (see section 1.2 on page 4). There is an increased demand for the use of these modalities, which is also based on their advantages. Radiographers who are already in the field have to learn how to function in these areas. Learners have to be competent in these areas of work.

The problem that is encountered is the unavailability of these modalities for practice purposes and in some instances learners are not permitted to use these machines in clinical

training centres. This factor is indicated in chapter 4 tables 4.17 and 4.18 on pages 85 and 86 respectively and is also a factor of concern to newly qualified radiographers as indicated in table 4.17 variable 6 on page 85 (indicated by respondent C2). One respondent said "*We are not allowed to operate the machines; we can only observe….it is said we will break the machines. Male students cannot even observe mammography….they give the reason of (patient) privacy"*. As indicated in section 2.7.3, the rate of development differs from urban to rural areas, government to private institution and of course country to country.

Despite the need for clinical personnel to function in these areas, their teaching function is also needed for learners as well as medical practitioners who need to know about the advantages and indications of different modalities as was discussed in section 2.5 on page 20. In this study (section 4.7.13 on page 85) two out of eight respondents indicated that there is a need for the introduction of specialisation programmes that will help improve competence in these new and improved modalities in the field. This is also indicated in table 4.18 on page 86. The introduction of these programmes will have an impact on the academic department in terms of the provision of resources for new programmes.

Working collaboratively with the community and engaging in research help provide information on what is happening in the world of work and will also highlight the needs of the communities. Community service and research are functions of the academe as discussed in section 2.9.1 on page 31. The involvement of the academe in community service projects is also critical for the development of the community. Most of the respondents (75%) acknowledged the importance of being involved in community service but half of the respondents were not involved in community service as indicated in sections 4.7.5 and 4.7.6 on pages 78 and 79 respectively.

Transformation focuses on enhancing the relevance and quality of education (section 3.4.1on page 45) and the accessibility and quality of health provision (section 2.7.1 on page 26). According to Van Zyl (2004:167) the provision of health care in a primary healthcare centre requires the use of a multidisciplinary approach and collaboration

between different healthcare professionals (see section 2.7.1 on page 26). The curriculum needs to be aligned with these requirements so that training can equip practitioners with the skills required in the work place.

In the training of professionals the trainers themselves should be aware of the challenges that are facing them so that their actions and planning can be aligned with these expectations (see section 3.6.1 on page 53). This means that there must be a match between what is learned at school and what is expected in the work place. To address this, it has been indicated in section 3.3 on page 42 that the NQF helps in the development and registering of standards so that the standards and qualifications reflect the requirements of the employers and the professional bodies.

This study has revealed that the respondents were involved in personal and professional development from personal and departmental and/or institutional initiatives as indicated in section 4.7.3 on page 75. The alignment of their development and policy requirements is questionable because some of the respondents (25%) were not sure about the type of change expected from learners. 75% of the respondents saw some extent of practical implementation (see section 4.7.7 on page 80). This questions whether they are acquainted with the policy requirements or whether the process of implementation is up to standard.

In conclusion to the second research question, the findings of the study can be indicated as follows:

- It is realised that the development of the academe in curricular issues is very critical for the delivery of quality training. The department should focus on developing or nurturing the development of leadership in all individuals. This will have an impact on how curricular issues are handled by the academe in terms of the delivery of quality training.

- The study also reveals that critical roles such as community service and research are not performed as they should by the academe. This is detrimental as

radiographers would have difficulties in serving the needs of the community without engaging with them. It is also important to keep in touch with graduates, which the study indicates is not optimally done. These activities would inform the curriculum which at the moment is said to be overloaded. This process of determining the curriculum is very complicated as it has to serve the needs of the first and third world environments at the same time. Thorough investigation and planning are thus essential for the development of a relevant programme.

- The academes have to ensure that the graduates can carry on learning and are able to cope and adapt to the change in the working world. Due to the rate of the increase of knowledge it is impossible for learners to learn a body of knowledge. This has brought a change from teaching to learning which is a new experience for academe and poses a challenge to them in terms of implementing these new expectations. To improve the quality of the training of learners, the quality of the academe as well as of practice in the working world has to be up to standard. The academes have to ensure their personal and professional development and also the continuous development of practitioners already in the field.

Research question 3

What strategies should curriculum leadership use to improve the quality of the programme offered in terms of expectations essential to a competitive and changing working and teaching environment?

Literature states that leadership has changed to a collective activity that exists at all levels in an institution (Edmonston & Western, 2002: 35-36; Tanner & Tanner in Dixon, 1999:38) and that a transformational leader provides opportunities for all people to be leaders at different points (Lee et al, 2004:71) (see section 3.5.1 on page 50).

This study reveals that personnel accept leadership within the jobs they were appointed in, for example, academe indicate in section 4.7.8 on page 81 that they are leaders because they are educators. Their commitment towards identifying their strong points and taking

up an active role in the functioning of the department is limited. This indicates that personnel limit their abilities as far as leadership is concerned.

In section 3.5.1 on page 51 it is indicated that Courter and Haywood (2002:1) identified three levels of curriculum leadership of which the third level is about individuals who will call on others to engage in improvement and school development. Looking at the leadership abilities of the respondents, the researcher concludes that they are not ready to fulfil this type of leadership.

The study also indicates that the clinical and academic personnel do not work in collaboration to ensure that the curriculum is relevant and quality training is provided. This is reflected in that the academe and clinicians do not see themselves as partners in training. This lack of collaboration is indicated in responses in sections 4.7.2 on page 73 and 4.7.4 on page 77.

As far as academic excellence is concerned, the academe indicated that there is a quality assurance mechanism in place but much still needs to be done to reach a satisfactory level. The interview schedule that addressed the stumbling blocks experienced in leaner clinical training (section 4.7.12 on page 85) highlights variables that could improve the clinical component of the programme. Limited clinical practice hours, improved clinical supervision and the unavailability and more specifically the lack of training on different equipment (as newly qualified radiographers said that they can only observe on some equipment for example CT scanning, mammography) are variables that were mentioned by a significant number of respondents (3 out of eight- 38%)(see Table 4.17 on page 84).

Chief clinical radiographers would like to see more collaboration between the clinical and academic components of radiography training (100% response) as indicated by their responses in table 4.18 on page 86. Is this wish not in line with the requirements of the White Paper on Education and Training that is committed to an integrated approach to education and training and that sees this integration as vital to national human resource development? This concern of the clinical personnel is also raised in the conclusion to the

study (in issues that are of concern to the respondents) where 50% of the respondents indicate the need for improved clinical training (see section 4.7.15 on page 88).

In conclusion to the third research question, the challenge that is faced by the academe is to ensure that their programme keeps up with changes in the working world and expectations of the community. The proactivity of all academe cannot be emphasised more in the process of maintaining quality and excellence in the programme as indicated by literature. It is critical that the academe keep in touch with the community as well as graduates to know their needs, to find out how they are coping and liaise with practitioners and employers to determine what is required in the world of work so that the curriculum can be aligned with these requirements. Collaboration with all stakeholders could form a platform for discussing improvements in radiography practice as a whole. The findings of this investigation indicate that much needs to be done by the academe in this regard.

The magnitude of this exercise requires the active involvement of all stakeholders, especially clinical personnel so that factors influencing curriculum design as indicated in section 3.4.3 on page 48 can be looked into and considered. The participation of all academe is essential as strengths and expertise from different individuals can be brought together in addressing the strategies as indicated in sections 4.7.10.1 on page 83 and 4.7.13 on page 85. The development of individuals in this area should be the priority of the department as teaching and learning experiences determine the quality of institutional graduates.

5.4 RECOMMENDATIONS AND IMPLICATIONS

This section presents the recommendations of this study and also includes the implications of these recommendations.

5.4.1 Recommendations Regarding Literature and Information

These recommendations focus on Radiography as a science:

- Policy guidelines that guide role development in South Africa should be made available and such information should be easily accessible to all interested parties. This would include guidelines on pattern recognition as it is presently not supported by ethical codes of conduct for radiographers. Re-evaluating radiographic practice and the needs of the society would also aid in policy development that would help address the needs of society.
- Areas of competence for local practitioners should be made available so that each graduate knows exactly what role he or she needs to fulfil in years to come. This would alleviate issues like "*some of the radiographers are unwilling to work with students….this is observed from their actions*" as indicated in the response by one of the clinical personnel.

5.4.2 Recommendations to Managers and Researchers

Literature indicated that the radiographer's control of their own profession is questionable (section 3.6.2 on page 57) and also indicates that the College of Radiographers upgraded the professional code in 2001; it states that it is the duty of radiographers to develop their practice by engaging in research and supporting the research of others (see section 2.9.1 on page 31). This study reveals that the participation of radiographers in research is insufficient.

Recommendations in this regard are:

- Building of research capacity, especially among the academe, is very critical.
- The academe should be encouraged to work collaboratively with clinical personnel as this could help with the problem of overloading of the curriculum as discussed in section 4.7.4.1 on page 78. They could also work on collaborative research projects so that the clinical personnel can engage in this activity.

Literature indicates that the nature of leadership is changing (section 3.5.1 on page 50). The recommendation in the 10th General Conference of Association of African Universities states that leadership and management training programmes should be put in

place (see section 3.6.2 on page 57). This study reveals that there is a need for the development of leadership among the respondents (section 4.7.8.1 on page 81).

The recommendation in this regard is the following:

- The development of training programmes, especially in leadership and curriculum that include all personnel in the department. This would ensure that the abilities and capabilities of all personnel in the department are used profitably for the benefit of the programme, department, institution as well as the community.

5.4.3 Recommendations to the Academe

The role of higher education according to Ensor (2004:340) is the provision of opportunities to improving life chances of all South Africans and the provision of social and economic development opportunities. This gives rise to the performance of the following activities by academe:

- Involvement in community service. Collaborative or departmental involvement could help "kick-start" the process as was indicated by the respondents. This involvement would help determine the needs of the community and thus help align the programme with the needs of the community and the requirements of the employers. It will also serve as a marketing strategy for radiographers that would ensure that those learners that apply to the programme know what it is about and could be retained in radiography practice. This will also ensure that the curriculum is relevant through the recognition of community experiences contributing to knowledge and providing understanding to its relevance and values outside the education system.

- Involvement and collaboration of academe with clinical personnel. As clinical personnel have a teaching function as well, this will ensure that there is standardisation and continuity in what is learned and practised. The two components of radiography training would inform each other so that relevance and quality are achieved.

- Contact with alumni and employers should be kept to check the graduates' progress and how they are coping. A record of these reports should be kept and the influence of these reports on curriculum could also be documented. This will provide evidence of development within the department and the programme.

5.4.4 Recommendations to the Clinical Personnel

- Despite personnel shortages, the clinical personnel should be aware of the role that they play in learner training. The type of practitioners these learners turn out is a result of good supervision or lack of it. Pride in the profession should guide the personnel's practices towards future practitioners.
- Personnel should take up the challenge to participate in research to develop the practice of radiography.

The limitations of this study are discussed in the next section.

5.5 LIMITATIONS

The study was limited to one clinical site but it could be extended to include other sites. This would give a bigger sample that is more representative and could be used as a generalisation of how Medunsa Campus graduates are coping in the world of work.

The inclusion of more clinical personnel would provide results that could be generalised. The number was limited by the availability of more respondents and financial obligations.

In the interviews some of the respondents may have given responses that are socially acceptable. An example that can be highlighted is the respondent who initially indicated that the learners at Medunsa Campus are not well prepared but later during the interview, when probed, indicated something to the contrary.

As far as the researcher is concerned there are recommended areas of research that emerged from this study and these are discussed in the next section.

5.6 RECOMMENDED RESEARCH

Conducting this study has indicated that the study is not an end in itself but it has opened up opportunities for further research.

A study on how the graduates are coping in the world of work is important as new graduates in this study indicated that they are having difficulties coping. Findings would help improve the practice by bridging the gap between schooling and the requirements of the world of work. This study should be performed locally as well as abroad. Issues that could be indicated are the type of entry or induction programme (if any) that the graduates go through in preparation for practising abroad.

The study has further revealed that the Radiography profession is more advanced abroad than in South Africa. Further study can be performed to determine the need and extent of development needed in South Africa. The extent of the implementation of pattern recognition (red dot system) in South Africa can be determined as well as the availability of legal guidelines that inform this role.

5.7 CONCLUSION

The findings in this study undoubtedly present a challenge to the academe as well as clinical personnel involved in radiography training to ensure that the programme is aligned with the community needs, policy requirements and expectations of learners and other stakeholders. It is hoped that the recommendations will be taken into consideration and implemented by the people concerned.

In conclusion the researcher would like to quote Samoff (2005) when saying:

> *Developing excellence in higher education is a learning process. Learning takes the past as a starting point, not as an answer or even a road map to an answer ….learning is discomforting….universities that fail to learn become irrelevant. When they are simply reactive, universities are so buffeted by current events that they can maintain neither their focus nor their direction. When they are critical and reflective and take the initiative, universities can achieve academic excellence by drawing insights and energy from society's tensions.*

REFERENCES AND SOURCES CONSULTED

About South Africa Demographics. Retrieved: March 9, 2005, from http://www.southafrica.info/ess_info/sa_glance/demographics/.

Barnett, R. 1992. *Improving Higher Education:Total Quality Care*. USA: Open University Press.

Bentley, H.B. 2004. Early days of Radiography. *Radiography,* 11: pp. 45-50.

Breier, M. 2001. *Restructuring in higher education in post-apartheid South Africa*. University of Western Cape: Education Policy Unit.

Breier, M. 2001a. Curriculum priorities in the new South Africa – an overview: *Curriculum Restructuring in higher education in post-apartheid South Africa*. University of Western Cape: Education Policy Unit.

Breier, M. 2001b. Future research: *Curriculum Restructuring in higher education in post-apartheid South Africa*. University of Western Cape: Education Policy Unit.

Breier, M. 2001c. Higher education curriculum development: the international and local debates: *Curriculum Restructuring in higher education in post-apartheid South Africa*. University of Western Cape: Education policy unit.

Brudrett, M., Burton, N. & Smith, R. (eds.) 2003. *Leadership in education*. London: Sage Publications.

Carl, A.E. 1995. Teacher Empowerment through Curriculum Development*: Theory into Practice.* Cape Town: Juta and Co.

Castle, A. 2000. Radiography: nature of knowledge and academic tribe. *Radiography*, 6: pp. 261-268.

Courter, S. & Heywood, J. 2002. The Perceptions of Science and Engineering Graduate Students to the Educational Theories Relevant to Skill Development in Curriculum Leadership. 32nd *ASEE/IEEE Frontiers in education conference*. Boston.

Cunningham, W.G. & Cordeiro, P.A. 2000. *Educational administration: a problem based approach*. Boston: Allyn & Bacon.

Currie, J. 2003. Understanding the impact of globalization on universities. *SAJHE/ SATHO*, 17 (1): pp. 16-23.

Dixon, E. 1999. *Development of a learning programme for the learning area Technology at colleges of education*. University of Pretoria: Unpublished PhD thesis.

Edmonstone, J. & Western, J. 2002. Leadership development in health care: what do we know? *Journal of management in medicine*, 16 (1): pp. 34-47.

Ensor, P. 2004. Contesting discourses in higher education curriculum restructuring in Sout Africa. *Higher Education,* 48(3): pp. 339-359.

Favish, J. 2003. A new contract between higher education and society. *SAJHE/SATHO*, 17 (1): pp. 24-29.

Fielden, J. 1998. *Higher Education Staff Development: A Continuing Mission*. Retrieved: December 9, 2003, from http://www.UNESCO.org/education/educprog/wche/principal/mission.html.

Finch, A. 1997. Profile and role of a radiographer: an international perspective. *The S.A. radiographer*, March: pp. 6-11.

General Conference of Association of African Universities (10th), 2001 Proceedings. Nairobi: Kenya.

Gerbers J.G. (ed.). 1996. *Effective research in the human sciences*. Pretoria: J.L. van Schaik Publishers.

Glatthorn, A.A. 1997. *The principal as curriculum Leader: Shaping what is taught and tested*. California: Corwin Press Inc.

Hassan, S. 2003. *A study of the dynamics of academic staff development at the Medical University of Southern Africa in an era of educational transformation.* University of Pretoria: Unpublished PhD thesis.

Hay, H.R. 2003. The nuts and bolts of a service-learning programme. *SAJHE/SATHO*, 17(3): pp. 184-190.

Holtzhausen S. 1998. The development of facilitators as a prerequisite to successful transformation of educational change. *SAJHE/SATHO,* 12 (3): pp. 33-36.

Horak, M. 1997. In focus. *The South African Radiographer.* September 1997: pp. 3-5.

Humphreys, J. & Conlon, J. 2003. Higher education and local communities. *SAJHE/SATHO*, 17 (3): pp. 66-74.

Killen, R. 1999. *Outcomes based education: some issues to consider in the South African context.* Workshop presentation at Vista and ML Sultan Technikon during May/June 1998.

Killen, R. & Spady, W. 1999. Using the SAQA critical outcomes to inform planning in higher education in South Africa. *SAJHE/ SATHO*, 13 (2): pp. 200-208.

King, J.A. 1991. Evaluative Inquiry: Situational assessment In Short, E. C *(ed.), Forms of Curriculum Inquiry*. Albany: State University of New York, pp. 259-270.

Kvale, S. 1996. *Interviews: An introduction to qualitative research interviewing*. California: Sage publications.

Lee, N.J., Gambling, T.G. & Hogg, P. 2004. Leadership in research. *Radiography*, 10: pp. 69-73.

Legislation:

Department of Education. 1995. *Education and training white paper*. Pretoria: Government Printers.

Department of Education. 1997. *A programme for transformation of higher education: White Paper 3*. Pretoria: Government Printers.

Department of Education. 2000. *Towards a new higher education landscape*- report by the Council on Higher Education (CHE). Pretoria: Government Printers.

Department of Education. 2001. *National plan for higher education in South Africa*. Pretoria: Government Printers.

Department of Health. 1997. *White paper for transformation of Health system in South Africa*. Pretoria: Government Printers.

Health Professions Council act no. 56. 1974. Pretoria.

Health Professions Council of South Africa. Retrieved: June 20, 2005, from http://www.hpcsa.co.za.

National Qualifications Framework and standard setting. 2000. A publication of the South African Qualifications Authority. Pretoria.

NQF and Quality Assurance. 2000. Retrieved: March 24, 2005 from http://www.thete.org.

NQF Sub-Structures. 2005. Retrieved: April 8, 2005 from http://www.saqa.org.za/show.asp?main=about/nqf-substructures.htm&menu=home.

SAQA, 2000. The national qualifications framework and standards setting. Pretoria.

Leithwood, K. 2003. Teacher leadership: Its nature, development and impact on schools and students. In Brudrett, M., Burton, N. & Smith, R.,(eds.) *Leadership in education*. London: Sage Publications.

Lemmer, E.M. 2002. Restructuring the system of education and training in South Africa. In Van Wyk, N. & Lemmer, E. (eds.), *Transforming Education: the South African Experience*. New York: Nova Science Publishers, Inc.

London, L., Ismail, S., Alperstein, M. & Baqwa, D. 2002. Diversity, Learning and Curriculum reform in the health sciences-Institutional challenges for a country in transition. *Perspectives in Education*, 20 (3): pp. 21-32.

Manning, T. 2002. *Discovering the essence of leadership*. Cape Town: Zebra Press.

Mason, J. 2002. *Qualitative researching*. London: Sage Publication.

McMillan, J.H. & Schumacher, S. 1997. *Research in Education: A conceptual Introduction*, 4th edn. New York: Longman.

Medical and Dental Professions Board of the Health Professions Council of South Africa. 2002. *Handbook on ethical rulings*. 2nd edn. Pretoria.

Merriam, S.B. 1988. *Case study research in education: a qualitative approach*. California: Jossey-Bass.

Mofokeng, L.E. 2002. *A study of in-service education and training (INSET) of university lecturers in South Africa*. University of Pretoria: Unpublished PhD thesis.

Moore, R. 2003. Curriculum restructuring in South African Higher Education: academic identities and policy implementation. *Studies in Higher Education, 28 (3): pp. 303-319.*

Mouton, J. 1996. Structure of science. In Gerbers J.G. (ed.), *Effective research in the human sciences*. Pretoria: J.L. van Schaik Publishers.

National Education Policy Investigation Research Group (NEPI), 1992. *Curriculum*. Cape Town: Oxford University Press.

NEHAWU. Retrieved June 20, 2005 from http://www.nehawu.org.za.

Nixon, S. 2001. Professionalism in radiography. *Radiography*, 7: pp. 31-35.

Ornstein, A.C. & Hunkins, F.P. 1998. *Curriculum Foundations, Principles and issues*. 3rd edition. USA: Allyn & Bacon.

Payne K. & Nixon S. 2001. External influences on curriculum design in radiography degrees. *Radiography,* 7: pp. 249-254.

Peer, F. 2003. What do we understand by the professional code of conduct for Radiographers. *The South African Radiographer*, 4 (1): pp. 54-59.

Pretorius, F.J. 2002. Changing the curriculum: Outcomes based education and training. In Van Wyk, N. & Lemmer, E *(eds.), Transforming education: the South African experience*. New York: Nova Science Publishers, Inc.

Pretorius, R. 2003. Quality enhancement in higher education in South Africa: why a paradigm shift is necessary. *South African Journal of higher education*, 17(3): pp. 129-135.

Price, R., High, J. & Miller L. 1997. *The developing role of the radiographer-Issues affecting the curriculum report*. University of Hertfordshire.

Price, R.C., Miller, L.R. & Mellor, F. 2002. Longitudinal changes in extended roles in radiography. *Radiography,* 8: pp. 223-234.

Prinsloo, E. 2002. Challenges to the provisioning of schooling in South Africa. In Van Wyk, N. and Lemmer, E. *(eds.), Transforming education: the South African experience*. New York: Nova Science Publishers, Inc.

Radmagazine for Medical Imaging and Radiotherapy Professionals, April 2004. 30 (347): pp. 18.

Reddy, J. 2001. Proceedings. *Association of African universities 10th AAU General Conference* papers. Kenya.

Report on team working in primary healthcare: realizing shared aims in potential health care. Retrieved: April 10, 2005 from http://www.rpsgb.org.uk/pdfs/teamworkin.pdf.

Ruscheniko, I. & Horak, M. 1998. SAQA and the NQF: the effects on radiography training. *The S. A. Radiographer*, October: pp. 5-13.

San Francisco State University Academic excellence planning group. 1996. Retrieved: March 21,2005 from http://www.sfsu.edu/~acadplan/aeintro.html.

Short, E. C *(ed.) 1991. Forms of Curriculum Inquiry*. Albany: State University of New York.

Sim, J., Zadnik, M.G. & Radloff, A. 2003. University and workplace cultures: their impact on the development of lifelong learners. *Radiography,* 9 (99): pp. 107.

Soudien, C. 1997. *Transformation and outcomes based education in South Africa: opportunities and challenges*. Retrieved: April 14, 2005 from http://www.findarticles.com/p/articles/mi-qa3626.

Spady, W.G. 1994. *Outcomes Based Education: critical issues*. USA: The American Association of School Administrators.

Spady, W. 2004. Using Critical Outcomes to empower learners and transform education. *Perspectives in education*, 22 (2): pp. 165-177.

Stark, J. S., Briggs, C.L. & Rowland-Poplawski, J. 2002. Curriculum leadership roles of chairpersons in continuously planning departments. *Research in Higher Education*, 43(3): pp. 329-356.

Strydom, K., Hay, D. & Strydom, A. 2001. Restructuring higher education curricular in South Africa: the leading policy formulation and implementations. In Breier, M. (ed.), *Curriculum Restructuring in higher education in post-apartheid South Africa*. University of Western Cape: Education Policy Unit.

The Concise Oxford Dictionary. 1982. 7th edition. Edited by Sykes J.B. Oxford: Oxford University Press.

Tshabalala-Msimang, M. 2004. Allowances for health professionals. *SA Fam Pract* 46 (1): pp. 50.

UNESCO. 1995. *Policy Paper for Change and Development in Higher Education*. France.

Van der Horst, H. & McDonald, R. 1997. Outcomes Based Education. A Teacher's Manual. Pretoria: Kagiso.

Van der Westhuizen, P.C. (ed.). 1991. *Effective Educational Management*. Kagiso Publishers.

Van der Westhuizen, P.C. 1991. The development of scientific management thought and some developments in the field of educational management. In *Effective Educational Management*. Kagiso Publishers.

Van Loggerenberg, A. 2000. *Implementing a problem-based learning model in the training of teachers for an Outcomes-Based technology curriculum*. Unpublished PhD dissertation. Pretoria: University of Pretoria.

Van Wyk, N. & Lemmer, E. (eds.). 2002. *Transforming Education: the South African Experience*. New York: Nova Science Publishers, Inc.

Van Zyl, G.J. 2004. South African Health-the future challenge. *Health policy,* 67: pp. 167-172.

White, P. & McKay, J.C. 2002. Guidelines and legal requirements which inform role expansion in radiography. *Radiography*, 8: pp. 71-78.

White, P. and McKay, J.C. 2004. The Specialist Radiographer - does the role justify the title. *Radiography,* 10 (3): pp. 217-227.

Wiersma, W. 1991. *Research methods in education*. 3rd edition. Boston: Allyn and Bacon.

APPENDIX A

ETHICAL STATEMENT, LETTERS TO THE HEAD OF DEPARTMENT (ACADEMIC), ASSISTANT DIRECTOR (CLINICAL CENTRE) AND THE PARTICIPANTS

THE ETHICAL STATEMENT

The purpose of this ethical statement is to inform that as a researcher, I will ensure that all research processes undertaken are conducted in accordance with professional and ethical procedures guided by the following principles:

- The study will not violate the principle of human rights and dignity of the respondents.
- The respondents will be informed before the research is conducted, during the process and after the research has been conducted.
- The approval of the participants will be sought in writing.
- The data collected from the participants will not be used for any performance appraisals, disciplinary measures or for any reward purposes, either promotional of monetary.
- The respondents will not be exposed to any form of risk or danger.
- The participation in this study will be voluntary and respondent's identities and interests will be protected.
- If at any stage I am required to use their names, a formal approval request will be made to the relevant participants.

1. Overview of the Research

The aim of this study is to determine the role that curriculum leadership at the Department of Radiography can play in facilitating the process of curriculum reconstruction and management. A qualitative study is used where structured interviews are conducted with academe and clinical personnel to find answers to the research questions.

Throughout the study I provided a background to the study, discussed the methods and procedures, and used the data obtained through literature and personal interviews to finally provide a summary of findings, recommendations and areas of further study.

2. Participation of Human Respondents

This study involves four participants employed at Medunsa campus Department of Radiography and four employed at George Mukhari x-ray Department. The participants are between the ages of 21 and 55 years. Four participants are male and four are female. Interviews were arranged for each participant at the time that was convenient for them. Each interview lasted for between 45 minutes to 1 hour.

3. Subject Approval and Informed Consent

Permission to conduct the interviews was requested and received from the Head of Department Radiography Department and Assistant Director X-ray department. The respondents were briefed about the purpose of the study and their role. They were informed of their right to choose to participate and their right to withdraw their participation at any stage. They were subsequently provided with letters requesting their participation in the study. Letters confirming their consent were also signed.

UNIVERSITY OF LIMPOPO
RADIOGRAPHY DEPARTMENT
P.O BOX 159
MEDUNSA
0204
7 APRIL 2005

THE HOD
DEPARTMENT OF RADIOGRAPHY
P. O BOX 159
MEDUNSA

Dear Sir

RE: Request for personnel members to participate in interviews pertaining to research on the Diagnostic Radiography Curriculum

I am an M Ed learner in the Department of Curriculum Studies at the University of Pretoria. I am presently conducting research on THE ROLE OF LEADERSHIP IN CREATING EXCELLENCE IN THE DIAGNOSTIC RADIOGRAPHY PROGRAMME THROUGH CURRICULUM RESTRUCTURING. I would like to request permission to invite your personnel members to participate in the interviews for this study.

The aim of this interview is to determine the role that academe can play to ensure that there is the alignment of curriculum with policy requirements and with the employer and workplace expectations. The outcome of this study will be used to make academe as well as clinical personnel aware of their role in ensuring that relevant and quality training is delivered for student radiographers.

All information will be highly confidential. Your personnel time and cooperation will be highly appreciated.

Yours sincerely

AM Thulo
Department of Radiography
(012) 521-4482 or 521-4531

UNIVERSITY OF LIMPOPO
RADIOGRAPHY DEPARTMENT
P.O BOX 159
MEDUNSA
0204
21 APRIL 2005

THE ASSISTANT DIRECTOR
X-RAY DEPARTMENT
GEORGE MUKHARI HOSPITAL
PRIVATE BAG X422
GA-RANKUWA

Dear Sir

RE: Request for personnel members to participate in interviews pertaining to research on Diagnostic Radiography Curriculum

I am an M. Ed learner in the Department of Curriculum Studies at the University of Pretoria. I am presently conducting research on THE ROLE OF LEADERSHIP IN CREATING EXCELLENCE IN THE DIAGNOSTIC RADIOGRAPHY PROGRAMME THROUGH CURRICULUM RESTRUCTURING. I would like to request permission to invite a few of your senior personnel members as well as learners from Medunsa who are currently on community service to participate in the interviews for this study.

The aim of this interview is to determine the role that practitioners can play to ensure that there is alignment of curriculum with policy requirements and with the employer and workplace expectations. The outcome of this study will be used to make clinical personnel as well as academe aware of their role in ensuring relevant and quality training for radiographers.

All information will be highly confidential. Your personnel time and cooperation will be highly appreciated.

Yours sincerely

AM Thulo
Department of Radiography
(012) 521-4482 or 521-4531

P.O BOX 159
MEDUNSA
0204
29 APRIL 2005

Dear Colleague

RE: Interviews pertaining to research on Diagnostic Radiography Curriculum

I am an M. Ed learner in the Department of Curriculum Studies at the University of Pretoria. I am presently conducting research on THE ROLE OF LEADERSHIP IN CREATING EXCELLENCE IN THE DIAGNOSTIC RADIOGRAPHY PROGRAMME THROUGH CURRICULUM RESTRUCTURING. I would like to invite you to participate in the interviews for this study.

The aim of this interview is to determine the role that practitioners can play to ensure that there is alignment of curriculum with policy requirements and the employer and workplace expectations. The outcome of this study will be used to make clinical personnel as well as academe aware of their role in ensuring relevant and quality training for radiographers.

All information will be highly confidential. Your time and cooperation will be highly appreciated.

Yours sincerely

AM Thulo

THE ROLE OF LEADERSHIP IN CREATING EXCELLENCE IN A DIAGNOSTIC RADIOGRAPHY PROGRAMME THROUGH CURRICULUM RESTRUCTURING

29 April 2005

Dear participant

You are invited to participate in a research project aimed at determining the role that curriculum leadership in the Department of Radiography can play in facilitating the process of curriculum restructuring and management.

Your participation in this project is voluntary and confidential. You will not be asked to reveal any information that will allow your identity to be established. You may withdraw at any stage should you wish not to continue with the interviews.

The results from this study will be used to clarify the role of a curriculum leader and the strategies the can be employed to ensure that the curriculum is of quality standard and is also relevant.

If you are willing to participate in this study, please sign this letter as a declaration of your consent, i.e. that you participate in this project willingly and that you understand that you may withdraw from the study at any time.

Participant's signature_____ Date_____

Researcher's signature_____ Date_____

Yours sincerely
AM Thulo

APPENDIX B

INTERVIEW SCHEDULES FOR ACADEME, CHIEF RADIOGRAPHERS AND RADIOGRAPHERS DOING COMMUNITY SERVICE

INTERVIEW QUESTIONS (CHIEF RADIOGRAPHERS)

1. Could you tell me about your career path and your development as an academic scholar?

2. The world and everything in it including radiography is changing. What are the prominent changes that you experienced in Radiography specifically?

3. What strategies are set up by the hospital and the Department of Radiography to ensure that new knowledge and skills are acquired as quickly as possible? What do you as an individual do to focus on your own scholarly development?

4. What role do you think research plays in effective and efficient radiographic practice?

5. Which community service projects are you involved in? Why / Why not?

6. What role do you think community service plays in curricular issues?

7. Do you see policy requirements in terms of curriculum development unfolding into practical implementation in your practice to better prepare the learners (if not why not)?

8. As a radiography practitioner, do you see yourself to be in a leadership position (why/why not)?

9. How would you describe your role in student clinical training to ensure that excellence and prominence are maintained?

10. What does the department do to ensure that academic excellence and prominence are maintained in terms of student training?

11. How would you say newly qualified radiographers from Medunsa under your supervision are coping?

12. In your opinion, what are the stumbling blocks in their clinical competence, skill and attitude?

13. What can be done to achieve clinical excellence and prominence?

14. Comparatively speaking: How does radiography in South Africa compare to our international counterparts in respect of role development?

15. Any other issues you would like to comment on?

INTERVIEW QUESTIONS (COMMUNITY SERVICE)

1. Could you tell me about your career path and your development as an academic scholar?

2. The world and everything in it including radiography is changing. What are the prominent changes that you experienced in Radiography specifically?

3. What strategies are set up by the hospital and the Department of Radiography to ensure that new knowledge and skills are acquired as quickly as possible? What do you as an individual do to focus on your own scholarly development?

4. What role do you think research plays in effective and efficient teaching and learning?

5. Which community service projects are you involved in? Why/ Why not?

6. What role do you think community service plays in curricular issues?

7. Do you see policy requirements in terms of curriculum development unfolding into practical implementation in your practice to better prepare the learners (if not why not)?

8. As a radiography practitioner, do you see yourself to be in a leadership position and why?

9. How would you describe your role in student clinical training to ensure that excellence and prominence are maintained?

10. What does the department do to ensure that academic excellence and prominence are maintained in terms of student training?

11. As a newly qualified practitioner how are you coping in the world of work?

12. What are the stumbling blocks in your clinical competence, skill and attitude?

13. What can be done to achieve clinical excellence and prominence?

14. Comparatively speaking: How does radiography in South Africa compare to our international counterparts in respect of role development?

15. Any other issues you would like to comment on?

INTERVIEW QUESTIONS (ACADEME)

1. Could you tell me about your career path and your development as an academic scholar?

2. The world and everything in it including radiography is changing. What are the prominent changes that you experienced in Radiography specifically?

3. What strategies are set up by the institution and the Department of Radiography to ensure that new knowledge and skills are acquired as quickly as possible? What do you as an individual do to focus on your own scholarly development?

4. What role do you think research plays in effective and efficient teaching and learning?

5. Which community service projects are you involved in? Why/ Why not?

6. What role do you think community service plays in curricular issues?

7. Do you see policy requirements in terms of curriculum development unfolding into practical implementation in your practice to better prepare the learners (if not why not)?

8. As an academic, do you see yourself to be in a leadership position and why?

9. How would you describe your role in curriculum restructuring in terms of ensuring that the programme is relevant?

10. What does the department do to ensure that academic excellence and prominence are maintained in the institution?

11. How do you think your own product is coping in the world of work?

12. In your opinion, what are the stumbling blocks in their clinical competence, skill and attitude?

13. What can be done to achieve clinical excellence and prominence?

14. Comparatively speaking: How does radiography in South Africa compare to our international counterparts in respect of role development?

15. Any other issues you would like to comment on.