


**PERCEPTIONS ON THE ADDITION OF CLINICAL PRACTICE TO THE  
DENTAL TECHNOLOGY CURRICULUM**

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**A thesis submitted in full compliance with the requirements for a Master's degree  
in Technology: Dental Technology at the Durban University of Technology.**

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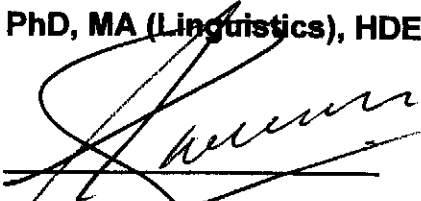
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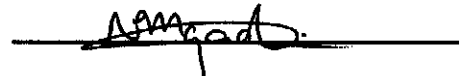
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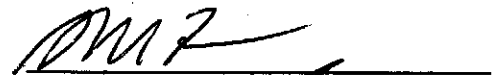
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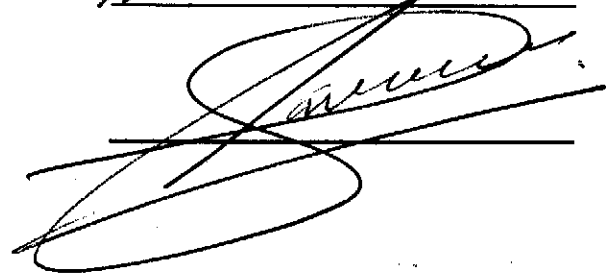


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## **ABSTRACT**

The Dental Technology profession in South Africa is currently undergoing a possible role transformation. In the past, Dental Technicians were restricted to laboratory work only and were not permitted to have direct contact with patients. Due to a demand for oral care, and a gap that is perceived to exist in service delivery, Clinical Dental Technology has emerged as a possible new profession in South Africa. The 1997 amendment to the Dental Technicians Act allows Dental Technicians to broaden their scope of practice through further education into the clinical aspects of the profession.

South Africa is one of few countries that have an enabling legislation in terms of the recognition of Clinical Dental Technology. However, there is to date no training programme or curriculum for people who would like to practise as Clinical Dental Technicians. The three institutions in South Africa that provide training for Dental Technicians do not provide training to those technicians who would like to pursue a clinical career path.

Internationally, Dentists have argued that Dental Technicians have insufficient clinical capabilities. They feel that technicians do not have sufficient knowledge and experience in dealing directly with patients, and consequently have identified a need for further training of Dental Technicians before they are recognised as Clinical Dental Technicians.

The aim of this study was to evaluate educational institutions' readiness in terms of the role transformation of Dental Technicians and to establish perceptions about the introduction of this new profession by Dentists, Dental Technicians and Dental Technology lecturers. The views of these three stakeholders have implications not only in terms of the development of a new curriculum, but were also found to raise serious concerns about the implementation of this profession in South Africa.

Data was collected by means of questionnaires and personal interviews with Dentists, Dental Technicians and Dental Technology lecturers in South Africa. The responses

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were transcribed and then coded according to pertinent themes for interpretation purposes.

The data revealed major differences in the perceptions of the proposed profession by the three sectors. This has important implications for the likely success of Clinical Dental Technology, given the need for these sectors to work together as members of the dental team. The data also reveals concerns about the type of training that would need to be incorporated into the curriculum and who would be able to provide such training. By using an overview of curriculum theory, this study also raises concerns that clinical aspects might be infused into the curriculum as simply the acquisition of additional technical skills, rather than as a significant shift in professional identity to incorporate patient care.

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## **DEDICATION**

This thesis is dedicated to the Lord Almighty, the originator and author of life; and to my Family, for their love, support and for being my source of inspiration.

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## ACKNOWLEDGEMENTS

As Bernstein (1996) points out, acknowledgements are rarely easy to write. This is not because of “narcissism and absence of gratitude” (Bernstein 1996: 5) but because so many people who have contributed to the study sometimes do not appear on the list. With this in mind I would like to extend my gratitude to the following:

- To my supervisor, Dr S. McKenna who worked tirelessly in guiding and supporting me throughout this thesis, I will forever be grateful for her encouragement and for instilling in me the confidence and enthusiasm for research.
- I thank Mr G. Somers, for his supervision and guidance
- Mr G. Bass and the Dental Technology staff at the Durban University of Technology. With heartfelt gratitude I acknowledge their support.
- To Ms A. Vahed, my mentor, thank you for your guidance and for making my transition to academia endurable. I will forever be indebted to you for your efforts.
- To Mr D. Malherbe and the Society for Clinical Dental Technology, thank you for your support and providing valuable information which made it possible for me to complete this thesis
- To my family, for their emotional support and perseverance whilst I was studying; a special heartfelt gratitude to my parents, Mr and Mrs Mqadi for being my pillars of strength.
- I extend my gratitude to all my friends for their encouragement, humour and capacity to put up with just about everything.
- Ms D. Greef and Ms L. Robinson for their assistance with the interview transcripts and for editing this thesis.
- Finally I would like to extend my gratitude the members of staff from DUT, TUT and CPUT who gave up their precious time and agreed to participate in the interview process; and to the dental community that participated in this study by means of questionnaires, Dentists and Dental Technicians, thank you for your valuable input.

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## **CHAPTER ONE: INTRODUCTION**

### **1.1 Introduction**

In the past, debates have taken place to ascertain whether the role of Dental Technicians could be transformed to incorporate clinical practice, in order to improve oral health care services that had been identified to exist amongst the edentulous population of South Africa. St George, Welfare and Lund (2005:342) pointed out that due to the limited oral health care services that exist in South Africa, "Plans are already underway to extend the role of professions complementary to Dentistry, and the establishment of the Clinical Dental Technician is one of many ways in which the traditional service provided by general dental practitioners will be delegated to other professional colleagues".

At present, the only clinical professions complementary to Dentistry are Dental Hygienists and Dental Therapists, both of whose work may, at times, require prescription from registered Dentists. In countries where Clinical Dental Technology exists, co-operation between Dentists and Denturists is common, with both groups benefiting from more referrals from each other. It has also been reported that following their examination by Dentists, patients appear to have better quality dentures (complete) when they have been provided by a trained denturist as compared to an illegally practicing technician (International Federation for Denturists, 2006). The purpose of this study is to evaluate how Clinical Dental Technology will affect the dental team, both academically and professionally in South Africa.

### **1.2 Background to the study**

Internationally, Dentists have convincingly argued about the efficacy and clinical capabilities of untrained or under trained Dental Technician (International Federation for Denturists, 2006) They felt that technicians did not have sufficient knowledge and

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experience in dealing directly with patients, so the need for further training of Dental Technicians in order for them to be classified as Clinical Dental Technicians has been identified.

Section 1 of the Dental Technicians' Act 19 of 1979 makes it appear as if there is already a regulated pathway of professional training for the Clinical Dental Technologist. However, this is only in theory. No provisions have been made by the Dental Technicians council for this profession. No such training is available in any of the three institutions in South Africa that provide training for Dental Technicians; This then leaves a question of how and where students could be trained for this profession if there is no provision for education regarding this career. The Act makes provision for such training but to date, no training is being offered to those technicians who would like to pursue this career path.

In 1997 an amendment to the Act was made. This amendment allows Dental Technicians to broaden their scope of practice through further education into the clinical aspect of the profession. South Africa is one of the few countries that has an enabling legislation without a training programme for Clinical Dental Technologists.

### **1.2.1 Distinguishing between a Dental Technician and Clinical Dental Technologist**

A Dental Technician or technologist is a person who has completed training in a South African Dental Technicians Council (SADTC) approved institution. The academic institutions provide the technicians with training in the art and science of fabricating corrective devices and replacements for natural teeth and tissues. The Dental Technicians' Act of 1979 states that "No person other than a Dentist *or a Clinical Dental Technologist*, shall for gain, supply or undertake to supply any artificial denture or other dental appliance; or pretend to hold himself or herself out to be entitled or prepared to supply, make, repair or work upon a denture or any other dental appliance" (Act no.19 Section 27 A and B) This implies that Dental Technicians without clinical training are prohibited from having any direct contact with the patient without the presence of a

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Dentist or a Clinical Dental Technologist. Thus the job description of a Dental Technician involves processes associated with the design, manufacture and repair of fixed and removable oral and extra oral appliances and prosthesis as prescribed by the Dentist, but does not include direct contact with patients.

In South Africa there are currently three institutions recognised by the Dental Technicians Council (SADTC) that provide training for this profession: Cape Peninsula University of Technology (CPUT), Durban University of Technology (DUT) and Tshwane University of Technology (TUT).

A Clinical Dental Technologist (CDT) is defined by the Dental Technicians' Act as "a person who has undergone training in treating patients requiring complete artificial dentures and who is registered as such under the Medical, Dental and Supplementary Health Service Professions Act, 1974" (Section 1 of 1979). Their scope of practice includes that of Dental Technicians together with:

- Fitting of complete dentures where there are no natural teeth remaining and there is no disease or unhealed hard or soft tissue.
- Fitting and relining removable dentures subject to patient having obtained an oral certificate from a Dentist.
- Taking impressions, relining and taking other non-invasive clinical procedures involved in the construction of a denture.

Clinical Dental Technicians first train as Dental Technicians. They then undergo further training to become clinically competent to provide removable dental appliances. CDT is described as "a profession which is somewhat unique" because it combines both technical and clinical skills (Meeds, 2004:21). Currently, there are no institutions South Africa that provide training for this profession.

In order to understand the difference between Dentists and Technicians, it may be useful to briefly consider the history of the profession. According to the International Federation of Denturists (IFD, 2006: 2), in the 16<sup>th</sup> Century, there was no distinction between Dentists and Technicians. However, as Dentistry classes were introduced to

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university studies in Paris, a formal distinction between the two professions emerged. Extractions were done by the Dentist and those who specialised in the construction of dentures were called Technicians. In 1921, however, New Zealand did not have enough human resources to provide the required oral health care and services to their community. This resulted in “allowing non Dentists to perform designated dental procedures” (International Federation for Denturists, 2006). This revolutionised the future of Dentistry, and denturism<sup>1</sup> or Clinical Dental Technology became a worldwide development.

It can be said that CDT is not a new profession. In Canada, technicians have been legally carrying out clinical work since 1958. (St George et al., 2005:341). It has been estimated that “600,000 dentures are provided illegally by Dental Technicians in the UK and dentures have been provided by such people since Egyptian times” (International Federation for Denturists, 2006). Eighty per cent of those registering as Dentists under the clause in the first Dentists Act 1921 in the UK were, in fact, ‘Dental Mechanics Technicians’. The General Dental Council has been the catalyst for uniting and modernising the regulation of the dental profession and bringing in new registered professionals to meet the increasing demand for high quality National Health System and private dental treatment. The process has also brought together many representative associations with wide and diverse views to reach a point where all members of the clinical dental team will be registered under one body (Meeds, 2004:21).

### **1.2.2 The South African Health Scenario**

Poor oral conditions are important public health concerns. Because of their high prevalence, severity and the public demand for services, they have an impact on individuals and society. Oral disease levels appear to be increasing in major sectors of

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<sup>1</sup> The term ‘denturism’ is the most commonly used name internationally, however in South Africa and other countries such as Denmark and the United Kingdom, the term ‘Clinical Dental Technology’ is used.

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the South African population, especially the underserved, disadvantaged and urbanizing communities (Department of Health, 2004).

The primary goal of an oral health service is to provide comprehensive oral care to those in need of such services. One of the main arguments behind the proposal for Clinical Dental Technology in South Africa is the fact that the majority (eighty percent) of South Africans are dependant on the state for oral health care service (Faragodien, 2002:5). According to Naidoo et al. (2001: 505), “Only about eleven percent of oral health professionals are in the public sector”. This clearly indicates that the majority of our population have limited or no oral health care available to them which may lead to tooth loss thus resulting in loss of function. This may lead to malnutrition, especially in the lower socioeconomic level population.

According to the Demographic and Health survey conducted in 1998, “62% of respondents reported that they had lost some of their natural teeth” (Naidoo et al., 2001: 507). The report revealed that out of the 62% of the population who require dentures, only 29% have access to these services. The SADTC formulated a society to look into the matter and thus the Society for Clinical Dental Technology (SCDT) was formed. This society identified that the main causes of patients not having dentures, even though they need them, are the high costs and non-functional dentures. They have further argued that the one of the ways to improve this phenomenon of poor service delivery to denture wearers is to allow Dental Technicians to operate as Clinical Dental Technicians, thus reducing the problems encountered by patients that depend on delivery from the state (International Federation for Denturists, 2006).

The needs of a large percentage of the population that depend on dentures are not catered for. Within the current public health care sector, it was envisaged that Clinical Dental Technology would be an alternative to a very small part of the work of Dentists, and would contribute to the efficiency and effectiveness of good community and dental health care. According to the ‘profession review meeting (200), the two countries used as an example of Clinical Dental Technician training requirements had the following statistics: “Canada has a population of approximately 32 million. There are 2,000 registered Clinical Dental Technicians (denturists). Ratio 1:16,000. Australia has a



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population of approximately 20 million. There are 1,500 registered Clinical Dental Technicians (dental prosthetics). Ratio: 1:13,300". The Clinical Dental Technician Association (CDTA) estimates that in South Africa the current requirement for CDTs is approximately 2,000. This would equate to a ratio of approximately 1:26,000 (Meeds, 200). The profession believes that the demand for CDTs is increasing. People are living longer and as the cost of dental treatment increases, people who cannot afford to have treatment choose to have teeth removed instead (Allen, 2005:34).

According to Malherbe (2005), Dentistry has shifted its emphasis from prosthetics to crown and bridge and implant work to treat partially edentulous patients. He further elucidates that there is a trend in dental schools to reduce and even in some instances, eliminate removable prosthetic coursework from their curriculum. It can thus be argued that Dental Technicians receive more specialized training in removable prosthodontics than Dentists do.

Dentists however have convincingly debated against the efficacy and clinical capabilities of untrained or under trained Dental Technicians' ability to recognize pathology and refer appropriately (International Federation for Denturists, 2006). Notwithstanding this, Dentists also felt that technicians do not have sufficient knowledge and experience in dealing directly with patients (International Federation for Denturists, 2006). A survey regarding the opinions of Dentists in 2003 revealed that the majority thought it was possible to work closely with Denturists, though the Dentists did not think the denturists should be allowed to treat patients with natural teeth remaining (Allen, 2005:34). A need for further training of Dental Technicians to become Clinical Dental Technicians has thus been identified.

### **1.2.3 The Dental Technicians Act**

Despite the definition of CDT in the Dental Technicians' Act of 1979, the absence of clinical training has resulted in illicit Dental Technicians, referred to as 'quacks', offering

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services to community members without any knowledge of the clinical aspect of this profession (Malherbe, 2005)

The 1997 Amendment Bill states that “in terms of Section 32A (3) of the Act, a Dental Technician and Dental Technologist may work for any member of the public”. This amendment allows Dental Technicians to broaden their scope of practice through further education into the clinical aspect of the profession. “South Africa lags behind to embrace the positive results of implementing this addition to the health team, despite having made provision for Clinical Dental Technology through enabling legislation in 1997” (Malherbe, 2005:1). To date thirty four countries recognise Clinical Dental Technology and have put training programmes in place with the assistance of the International Federation of Denturists (Malherbe, 2005).

### **1.3 Purpose of the study and research questions**

The main challenge that faces the recognition of the Clinical Dental Technology as a profession is the formulation of a curriculum that will address the clinical aspect of Dental Technology.

1. The purpose of this study is to ascertain the views of Dentists, Dental Technicians and Dental Technology lecturers about the proposed introduction of Clinical Dental Technology in South Africa.
2. Another purpose of this study is to evaluate the impact that the addition of the clinical aspect of this profession will have on the current curriculum being used in the three academic institutions that offer this course in South Africa.
3. This study also aims to assess the institutional readiness of the transitions that may occur as training of Clinical Dental Technologist is introduced.

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4. The final objective of this study will be to outline the different curriculums that are currently being used in other countries. This would be used to form a foundation of guidelines on the curriculum content that could be used by the South African institutions.

Research Questions:

1. What are the views of those in the dental team (Dentists and Dental Technicians) about the proposed introduction of Clinical Dental Technology?
2. What are the views of lecturers currently teaching Dental Technology courses about the proposed introduction of Clinical Dental Technology?
3. What impact will the implementation of Clinical Dental Technology have on the current Dental Technology curriculum?
4. Are the academic institutions that offer training for Dental Technicians ready for the transition?
5. What are the challenges that will be faced by the curriculum developers regarding this profession?

## 1.4 Rationale for the study

No study has yet been conducted neither have interventions been made to ensure that Dental Technicians are adequately prepared for the clinical aspect of this profession. An evaluation of the educational institutions' readiness and capability to facilitate the change of the Dental Technology profession needs to be carried out. This would ensure that academic institutions keep up with the industry for which they are preparing their learners.

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The result of analyzing curriculum theories and designs applicable to this profession may provide valuable information and assist in the formulation of a curriculum that would be used by the South African institutions. The result of this study may further assist the Society for Clinical Dental Technologists with more evidence to set in motion the implementation of Clinical Dental Technology.

## **1.5 Assumptions and Delimitations**

### **1.5.1 Assumptions**

In this study, it is assumed that the views of Dentists and Dental Technicians that either completed the questionnaire or participated in the interview process are a true reflection of their feelings towards the Clinical Dental Technology profession.

#### *Inclusion criteria*

In order to be included for participation in the study, the Dentists and Dental Technicians had to comply with the following criteria:

- The Dental Technicians must be registered with the SADTC
- The Dentists must be registered with the Health Professionals Council of South Africa (HPCSA) and be a member of the South African Dental Association (SADA)
- They had to be currently practising in the dental field

If the respondent complied with the inclusion criteria but their informed consent was not signed, their responses were excluded from this study.

### **1.5.2 Delimitations**

This study was limited to Dentists and Technicians registered under the South African Dental Association and the South African Dental Technicians Council.

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The views and perception of two streams of personnel from the dental team were considered for this study i.e.: Dentists and Dental Technicians/Technologists

## 1.6 Abbreviations

B.Tech:	Bachelors Degree in Technology
CDT:	Clinical Dental Technician
CDTA:	Clinical Dental Technicians Association
CPUT:	Cape Peninsula University of Technology
DT:	Dental Technology
DUT:	Durban University of Technology
GBC:	George Brown College
GDC:	General Dental Council
HEQC:	Higher Education Qualification Council
HEQF:	Higher Education Qualification Framework
HPCSA:	Health Professions Council of South Africa
IDEC:	International Denturist Educational Centre
IFD:	International Federation for Denturists
NHD:	National Higher Diploma
NQF:	National Qualifications Framework
OBE:	Outcome Based Education
SADA:	South African Dental Association
SADTC:	South African Dental Technicians Council
SAQA:	South African Qualifications Authority
SCDT:	Society for Clinical Dental Technology

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TUT: Tshwane University of Technology

VCC: Vancouver Community College

## 1.7 Overview of dissertation

Chapter Two focuses on the South African oral health care and educational situation. It also considers the different models of education and provides guidelines for the formulation of Clinical Dental Technology from other countries. Chapter Three gives a detailed description of the sampling techniques that were used for this study. It also focuses on how the questionnaires were designed and distributed. Furthermore the collection of primary data and issues of authenticity and trustworthiness are discussed. Chapter Four then outlines the results collected from the questionnaires and interviews. These results are analyzed and discussed. The final chapter draws up the conclusions and recommendations that have come about from this study.

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## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

In order to appreciate the basis of this study, it is necessary for the reader to have an understanding of the context in which it was conducted. The purpose of this chapter is to provide the reader with an overview of the learning and teaching environment in South Africa's higher education sector and, most importantly, factors that influence the Dental Technology curriculum and may, in the near future, affect that of Clinical Dental Technology.

### **2.2 Curriculum and teaching**

Curriculum specialists have different perspectives and definitions. It is thus important that these definitions are explored in order to understand the mechanism of curriculum development and to note how different value orientations can produce very diverse curricula.

#### **2.2.1 Research paradigms**

"Research paradigms can be seen as descriptions...of how knowledge is constructed, that is, of what counts as 'truth'. Adherents to a new paradigm adopt a new way of observing, reflecting on and describing the world" (McKenna, 2003:216). Paradigms frame the ways we view the world and exist within it. According to Kuhn (1970) a paradigm controls the methods, standards and problems a community uses as well as a broader constellation of beliefs, values and techniques. In this study, the community would be the institutions and departments offering studies in Dental Technology. It may

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be of value to be acquainted with the different types of paradigms, and it is to this brief discussion that my focus will turn.

Different philosophers describe paradigms in different ways and indicate that there are two, three or four paradigms. The distinction between paradigms is in the understandings of the nature of reality. When two people view curriculum from a constructivism or a positivist point of view, it is likely that they will have opposing views about curriculum. People working in the constructivism paradigm reject the traditional epistemological claims about knowledge as an objective representation of 'reality', but are rather concerned with the reconcilability of plurality of knowledge and its reference to reality. Positivism on the other hand, bases knowledge solely on observable facts and rejects speculation about 'ultimate origins' (Teddle, 1998). For the positivists, the curriculum may be more about what methods best allow the student to absorb the fixed reality presented in the syllabus, whereas for a constructivist, the curriculum is likely to be perceived as a contextual and highly contested space where learners and educators construct knowledge together.

### 2.2.2 Definitions of curriculum

It is fundamental that studies of curriculum are undertaken in the emerging policy landscape of South African higher education. Over decades many definitions of the word curriculum have been used. These differing perceptions of curriculum have been a matter of intense debate in the Twentieth and Twenty-first century. Tyler's rationale (1949) prescribes four 'questions' that any curriculum planner must address, Taba (1962) provides several steps to follow, Walker's naturalistic model (1990) describes three 'elements' of curriculum planning; Johnson's (1967) model represents curriculum as the output of another and Goodlad's (1979) 'conceptual system' describes three different levels of curriculum decision making. There are clearly various ways of understanding the notion of curriculum.



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### 2.2.2.1 *Fixed vs open curriculum*

Because there are many theories and underpinning ideologies that shape education, every curriculum specialist has his or her preferred definition and every teacher has a working definition, even if it is only implicit in action. Some people have referred to curriculum as “the accumulated tradition of organized knowledge contained in school” (Doll, 1989:54) while others consign to it as ‘the modes of thinking and inquiring about the phenomena of our world (Beyer, 1976). Doll (1989:56) believes that a more precise definition of curriculum “emphasizes 1. Guided and pre-selected experiences. 2. Plans for learning 3.Outcomes of being educated and 4. Systems for achieving educational production.” From this it is evident that Beyer emphasises the ideological aspects of curriculum while Doll emphasises a more structured approach. For the purpose of this study, curriculum will be defined as the sum of all learning experiences. Curriculum thus includes all aspects which directly or indirectly influence the learning process.

There are variations in the kinds of activities that curriculum planning encompasses. These activities range from planning of practical tasks to the selection of teaching materials and plotting guidelines for assessment. The main challenge for developing a clinical curriculum will be to design a programme that will equip Dental Technicians with the skills that will, upon graduation, enable them to practise a broad spectrum of effective denturism, whilst still maintaining the desirable high standards. In agreement with Doll (1993), education should be an open and multi dimensional process, as opposed to Tylers’ famous theory (1949) which represents a closed system of planning and practise. From Tyler’s theory, the concern is more with finding out about individual students and contexts but through the formulation of a curriculum framework which is specified in advance.

Tyler’s theory suggests that goals are predetermined, over and above experiences and methods for developing those experiences. Assessments are then designed to correlate the experiences only with preset goals, not to explore what the students generate personally after reflecting on the experience. (Doll, 1993:175). In my study, a curriculum is understood to be an open-ended ‘plan’, which includes key features of the

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programme and a recognisable orientation about how learning takes place. The actual learning process should be developed by the individual educator who has more knowledge and more contact with her students and can thus identify their learning styles and contexts and adapt the learning method accordingly. Learners learn differently and a generic teaching method cannot always be effective as the types of students that enter the course differ every academic year. This statement is closely aligned to Doll's (1993) statement that a curriculum generates not only predefined, inter-determined yet bounded realities but is made up of an "ever increasing network of local universalities."

#### **2.2.2.2 Curriculum and syllabus**

The idea of syllabus and curriculum are often conflated. This is an error because curriculum encompasses the syllabus and all other aspects related to the learning and teaching programme. Cohen, Manion and Morrison (2005:32) indicate that a curriculum is often misunderstood as a controlled (and controllable) ordered and pre-determined, uniform, predictable and largely behaviourist outcome.

Bernstein (1975) points out that formal educational knowledge is realised by three main message systems through which students come to understand exactly what and how they are expected to learn: syllabus content, pedagogy and evaluation. These theories imply that a cast-in-stone method cannot be used in order to achieve the objectives of the learning programme. For example, in the case of Clinical Dental Technology it will be vital that the curriculum takes note of the learning context and is adaptive to the dynamic South African health sector.

Rowntree's technology approach (1974) assumes that ends can be relatively easily formulated and specified in advance. In this approach, the processes of doing and reflecting on doing are important. Through this process, the curriculum becomes richer with time. The first step in his approach is to specify the objectives. These are of critical importance as they provide the basis for teaching and a measure for its effectiveness. He then suggests that appropriate objectives will be gleaned from the backgrounds,

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skills, interests and attitudes of the learner group. There is a link between his approach and that of South Africa's outcomes based approach whereby outcomes and assessment criteria are pre-determined. Outcomes are what students must be able to do after a learning experience. Assessment criteria are the ways in which this can be measured. This approach is of particular interest when designing the Clinical Dental Technology curriculum, as this subject will not only be a theoretically based course but will be accompanied by an intense practical component. The course will be intense as the number of years needed to complete this curriculum will be minimal in order to fit within the national qualifications framework. It is therefore important to ensure that within a minimum learning time the students are well equipped to deal with patients upon graduation. A new disciplinary identity, such as CDT, challenges the force of classification. The analysis of data in Chapter Four will return to this notion.

Bernstein (1996) uses the terms "classification" and "framing" to describe how curriculum is ordered. He describes classification as the relationship between disciplines or bodies of disciplinary knowledge in educational settings and how they maintain boundaries that mark their identity. He further argues that the strength of disciplinary identities lies in their ability to insulate themselves from other disciplines. Bernstein compares two idealised types of curriculum structures: the collection type where individual disciplinary components of curriculum remain insulated from each other and the integrated type where different disciplinary components are brought together on a principled basis. Traditionally, both Dental Technology and Dentistry curriculums are taught through individual disciplinary components. It is unclear at this stage whether the introduction of clinical aspects will provide the impetus for a more integrated type of curriculum. I now turn to look at South African imperatives impacting on our notions of curriculum.

### ***2.2.2.3 Curriculum structure in South Africa***

South African academic institutions are faced with two broad obligations: a local concern for equity and social reconstruction on one hand and responding to global

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changes in the role of universities in knowledge economy on the other. The challenge for higher education is to produce, through research and teaching and learning programmes, the knowledge and graduates that will enable “South Africa to engage proactively, critically, and creatively with globalization and to participate in a highly competitive global economy” (Education White Paper 3, 1997). It is important to note that a holistic understanding of the word curriculum encompasses these national concerns and imperatives. The curriculum restructuring policy argues that universities should increasingly match the graduates out of their institutions to the needs of a modernizing and transitional society (Moore, 2002). This policy is directly related to what is occurring in the Dental Technology profession where there is a role change from what has been traditionally being offered by the institution (in terms of curriculum) to what the curriculum needs to include in order to facilitate the emerging role of technicians.

There has been a recent focus on programmes offered at academic institutions. This is not new in the technikon sector where the curriculum has always been structured in a fairly fixed way towards the development of a particular career. Traditional universities on the other hand have had the option of providing knowledge to be applied over a range of career contexts. With the higher education restructuring process that is occurring, such universities are being pressurized to restructure towards the basis of courses (Moore, 2002). This then leaves the question of whether this structure will equip graduates for the challenges they may be faced with in industrial/commercial world. It is believed that programmes enable greater responsiveness of the system. The shifts in the Dental Technology curriculum are being driven by such responsiveness pulls. An argument against a programme focused course is that students need more than a fixed set of skills. They need to be able to develop new knowledge across a range of contexts. We do not know all the contexts in which Dental Technicians will do clinical work or all the realities that may confront them, so the curriculum must move beyond teaching only specific skills and encompass problem solving practices.

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#### 2.2.2.4 Curriculum planning models

Curriculum planning models can be classified into three broad sections: “curriculum as a process, curriculum as a product, and curriculum as content” (Bertram, Fotheringham and Harley, 2000). This means that curriculum can be viewed as a body of knowledge to be transmitted, an attempt to achieve certain outcomes in learners and the interaction of educators, learners and knowledge in order to achieve the learning objectives. For the purpose of this study, only curriculum as content will be discussed as my aim is to establish how content for the Clinical Dental Technology course will be selected. Kelly (2004) argues that there are two broad arguments when it comes to thinking about the selection for knowledge to be included in the curriculum,

- Knowledge that is worthwhile in itself: its presence does not need to be justified because of its intrinsic value and should thus be learned.
- Selection from the culture of our society: the society must make choice on what they feel the students should learn in order to be citizens of a particular community.

Habermas (1972:120) defines curriculum as “an ideological selection from a range of possible knowledge”. He states that the continuing human interest is in preserving life and that this interest “is rooted in life organized through knowledge” (Habermas, 1972:211). Not all knowledge can be included in the curriculum. A selection of what is deemed to be worthwhile knowledge that will be applicable to the scope of Clinical Dental Technology must be made. The justification for that selection will depend on the ideologies behind the course content for the programme. Curriculum theorists, like Habermas and Bernstein, help us to understand that no course construction or pedagogy is neutral or value free.

The addition of clinical work to the current Dental Technology curriculum will require some form of educational change. According to Hopkins (1994), change can show itself in one of two ways: incremental change which is gradual and subtle from one state to another and planned change which seeks to interrupt the status quo and to establish a new way of doing things. The introduction of clinical practice to the Dental Technology is

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a form of a planned change. There are, according to Hopkins (1994), two models for approaching curriculum change, the adoptive and adaptive models of change. The adoptive approach adopts a model of central development and planned dissemination. This strategy takes a top-down approach; as opposed to the adaptive model of change which is more sensitive to the situation of local context and individual institutions. These models are aware of the environment in which they intervene and are concerned with developing capacity for change. These two models are considered again in Chapter Four in regards to the data from the three institutions.

### 2.2.3 The South African education context

Dental Technology is a course offered at CPUT, DUT and TUT. The SADTC developed a course outline for all the institutions to follow in order to establish uniformity in the type of graduates. The use of the convenor system also ensured that the quality of the University's courses exhibited the following:

- competence in the subject area of the course
- knowledge and understanding of the principles which are effective in student learning
- Experience in selecting and using a range of teaching approaches and assessment methods.

The problem encountered, however, is that academics from the former technikon sector have had minimal exposure to the development of curriculum, especially as in our profession as the syllabus was dictated by the Council governing this profession (Dental Technicians Act, Act 19 of 1979, Section 19.2). The recent transition from Technikon to Universities of Technology has resulted in the dissipation of the convenorship system. This has left many academics in the old technikon sector with limited curriculum expertise. In order to redress this problem, imbalances of the past system must be addressed to secure the future for the new education system. The convenor system required former technikon sectors to follow a national curriculum, developed by one technikon, which provided guidelines, and orientation to the course contents. This was

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in contrast to what was being done in universities, where they were more independent and each university could determine its own content. Due to the recent transition of Technikons to Universities of Technology, the convenorship system has ended. The three institutions are now at liberty to specialize in certain fields without having to rely on the national curriculum. Curriculum collaboration by institutions offering the same programme is now on a voluntary basis. The death of the convenor system has revealed many academics in the old technikon sector with limited curriculum development expertise.

### ***2.2.3.1 Curriculum development in South Africa***

Lownie (2001) stated that the main dilemma facing contemporary South African dental curriculum developers is to provide for students from a variety of backgrounds. His argument was based on the fact that due to the school education system, some students are under prepared for academic study at tertiary level. The concern of South Africa's new government about the quality of the past education programmes in schools has led to many changes in our education system. These past programmes were influenced by the ideology of Christian National education and 'Bantu' or elementary school education, which were developed from a strong behaviourist orientation. The elementary school order was designed to "train the lower orders" (Lawton, 1975:95). The intension was to produce a labour force able to understand the simple written instructions. This resulted in two different curricula: a high- culture curriculum for those from within a small racially determined minority who were academically minded (who were from high to middle class) and a totally different curriculum for the masses (Lawton, 1975). The education system thus reinforced the racially based divides of the country. The legacy of apartheid ideology remains with us and impacts upon the work that we do. Many educators working in higher education institutions were themselves educated under the apartheid regime, as were the parents of students at our institutions. To transform the systems of the past, the government introduced a system which advocates an outcome-based approach. However, even though post-Apartheid

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redress is taking place, the transition is a lengthy procedure thus there are still some learners from disadvantaged educational backgrounds who matriculate under prepared for academic study at tertiary level (Allais, 2007).

### **2.2.3.2 Outcomes based education**

Outcomes based education, according to Spady (1994), is a student centered learning philosophy that focuses on measuring student performance. OBE contrasts with traditional education, which focuses primarily on the resources that are available to the student. “OBE does not specify or require any particular style of teaching or learning. Instead, it requires that students demonstrate that they have learned the required skills and content”. Spady (1994 as cited in Furman 1995) articulated three guiding principles for his version of OBE:

- a relentless focus on outcomes as a driver for the education programme,
- expanded opportunities and support for students to achieve these outcomes,
- high expectations for students, frequently stated as the ‘success for all’ claim,

However critics such as Jansen (1997) and Allais (2007) are critical and sceptical of the philosophy of OBE as they feel that it ‘promises more than it can deliver’. The desired outcome is selected first and the curriculum is created to support the intended outcome. Lorenzen (2002) argued that OBE by nature eliminates traditional assessment tools such as tests or grades. He further stated that learning in this understanding is really behaviour modification rather than free inquiry by individuals, learning which makes many intended and unintended detours as it unfolds. He and other critics of OBE concluded that breaking down learning into ‘exit outcomes’ distorts the nature of knowledge. There was no evidence that OBE improves curriculum, “it may add to the mastery level defined content but there is no built-in critical reflection on the content itself”. To support this notion, Froese (1994) stated that there was no internal self critical framework in place in OBE.



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The current Dental Technology courses are developed within the OBE approach with a strong programme focus. The criticisms of OBE will thus need to be taken into account in the development of a CDT curriculum. It is practical to suggest that the Clinical Dental Technology should be integrated into the current Dental Technology curriculum that already exists. Theoretically this will ensure that technicians who embark on this course will have sufficient academic background and are well prepared and committed to their studies. Studies have revealed that mature students generally perform better academically (Edwards, Macdonald and Merriman, 2007:5). Their increase in life experiences and maturity mean that they expect much more of themselves. They have a deep psychological need to be seen as capable of self-direction and to be in control (Edwards et.al., 2007:6). However this will not entirely solve the problem, as residues of Bantu education are sometimes evident even though the learner has undergone undergraduate studies and under-preparedness continues to be a problem. Another area of concern will be the number of years that will be required to complete this course. Already the current Dental Technology programme runs for four years. If further training is incorporated as a continuation of what already exist, the feasibility of the programme must be evaluated. It is thus essential that we scrutinise what is currently being offered by the academic institutions of South Africa that offer Dental Technology.

#### **2.2.4 The current Dental Technology curriculum**

As has been stated, CDT is not offered in South Africa at present. The current Dental Technology qualification is being offered within the context of the legacy of apartheid and student disadvantage. The impact of a common syllabus developed through the convenor system was even more intensified in the Dental Technology curriculum because the Act that governs this profession called for uniformity amongst the three institutions that offer this programme. “No person or institution shall offer or provide any education and training ... Unless such education is approved by the Council” (Sub-section 16(1) of 1979). Sub-section 19-2 of this Act is prescriptive about what must be taught by the education institutions and the method of assessment that should be

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followed. In essence, the type of curriculum adopted is closely related to Tyler's theory which emphasises the importance of a prescriptive mode of learning. Even though institutional transitions have occurred, the Council's prescribed curriculum has remained constant. The curricula emphasis in this profession focuses on laboratory processes and procedures associated with the design, repair and manufacture of removable oral and extra-oral prostheses prescribed by Dentists, Dental Specialists or Medical Practitioners.

The current Dental Technology programme requires three years of intense theory and practical work, at a diploma level or four years at degree level. This profession is broken up into four major components: Orthodontics, Prosthetics, Cobalt Chromium and Crown and Bridge. These four sections are taught over the period of three or four years. Furthermore, subjects such as Oral Anatomy, Tooth Morphology, Physics, Chemistry, Communication and Material Science form part of the Dental Technology curriculum. (Dental Technicians, Act 19 of 1979. Section 19.2) Additionally, Research Methods and Techniques and Business Practice are taught at third and fourth year levels. All these subjects aid in ensuring that upon graduation, the learners are competent in all subject areas and are able to make informed decisions and assessment of cases in order to effectively manufacture a functional prosthesis. Prosthetics is one of the main subjects covered by the students. Their first year is spent almost entirely on the fundamentals of prosthetic work. This is then advanced as the years progress.

Due to the job description of Dental Technicians and restrictions within the Dental Technicians Act of 1979 (as discussed in Chapter One), the clinical aspects of the dental profession are not the main focus. In researching what adaptations will need to take place in the Dental Technology curriculum to address clinical aspects the perspectives of academics about the current curriculum will also be analysed in Chapter Four of this study.

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### 2.2.5 International models

This study considers data from Dental Technology academics, Dental Technicians and Dentists against the backdrop of international curriculum theories and the South African context as discussed. It would also be prudent to consider international models of Clinical Dental Technology curricula as part of the context of this study.

Bertram et al. (2000) state that research has shown that it is very difficult to change the curriculum on a national scale. They state that numerous factors could influence the success of a curriculum innovation and these include:

- beliefs about the change process
- focus on the lecturer
- training and support
- institutional structure and organisation
- the character of the innovation.

Before identifying the curricula of the South African's training institutions that offer Dental Technology, it may be of value to examine similar education systems offering Clinical Dental Technology in other countries which have evolved and are operational. The background of such systems could contribute to a better understanding of the position of technikon education and indicate directions for its future development. It is to these international models that my discussion now turns.

#### 2.2.5.1 *George Brown College*

The George Brown College (GBC) in Toronto offers three year full-time programme in Clinical Dental Technology which is sanctioned by the International Federation for Denturists (IFD). This programme was originally established in 1975 as a two and a half year course and was expanded to a three year course in 1985 following a major curriculum revision (George Brown Full-time Programme Guide, 2007- 2008 )Their programme includes 270 hours of clinical training and studies of basic science, dental

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science, health promotion, management and denturist practice. To be more specific, the following subjects are offered:

- Anatomy of head and neck,
- Pre-clinic prosthetics (laboratory practical)
- Biology: General anatomy and physiology,
- Dental material science, Computer skill and application,
- Dental histology, Pathology, Physiology and Pharmacology,
- Gerontology,
- Radiographic interpretation preventative Dentistry,
- Periodontology and Embryology,
- Microbiology and Infection control,
- Nutrition and management.

More than 1,900 hours are spent learning to fabricate and fit dental prosthesis. The Denturist programme in this institution runs separately from that of Dental Technology. Furthermore, this college offers training for Clinical Dental Technicians based in the United Kingdom. Their academic training is carried out through a process of distance learning, e-learning and on site seminars within the UK. Even though the long distance studying approach has been followed for the theoretical components of this course, clinical examinations take place in the George Brown City College, Toronto. The clinical examination is eighty hours and the academic component is 2.5 years. A pre requisite for this course is to be registered Dental Technician (George Brown Full-time Programme Guide, 2007- 2008).

### ***2.2.5.2 Vancouver Community College***

The Vancouver Community College (VCC) runs a diploma programme for the duration of two years. This is of interest as their curriculum is closely comparable to that of the George Brown College; however the amount of time spent by the students at VCC training institution is significantly decreased. Vancouver Community College also runs

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this programme on a full time basis and it is also separate from the Dental Technology programme. It may be of interest to evaluate and compare the Dental Technology programme that the training institutions of South Africa are currently offering to that offered by the international institution. This may provide us with insight in determining whether the denturism programme should run as a separate course or be incorporated into the existing programme.

In VCC, the academic courses are delivered in a modular format of two to three courses per module. The delivery mode combines home study with an onsite lecture series and closed book examinations for academic courses with competency based clinical practice sessions and an examination.

This mode requires candidates to study the subject material and complete all assignments within a timed framework established by the International Denturist Educational Centre (IDEC). Prior to writing a supervised closed book examination for each course within the block (module), the learners are required to attend an in-depth review of the subject matter of all courses included in that particular module. In addition, the learners must complete an intense competency based clinical practical session and clinical examination. This clinical examination encompasses clinical demonstrations and clinical practice on pre-screened clients under the direction and assistance of faculty members. (Vancouver Community College, 2008)

Candidates are given credits for their practical experience and education as Dental Technicians. However, they must successfully complete all academic courses related to clinical application to practise as Clinical Dental Technician students

### ***2.2.5.3 Significance of these models to South Africa***

These models are of particular importance to the training institutions in South Africa which already offer Dental Technology. When one takes a closer look at the international models, there is an interesting overlap between subjects that their curricula include and those that are being covered by the Dental Technology curricula in South

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Africa. Even though design and fabrication of dentures is studied in depth both in theory and practice, the pertinent emphasis in South Africa on physiology and pathology is restricted.

It is thus logical to recognize that there are sections that do need to be looked at in order to broaden the technician's clinical and pathological knowledge. It can then be recommended that it would be beneficial to incorporate or integrate the component of clinical practice into an existing Dental Technology programme. To what extent this may be effective is still a matter of debate and will be discussed in depth in Chapter Four. Theoretically, this can be easily implemented but from a practical side, one has to look at the resources and the availability of staff to implement this in the institutions. Currently there are a very few technicians that are qualified to be Clinical Dental Technicians (qualified from international institutions), none of the current staff members at the academic institutions that offer Dental Technology are qualified to teach Clinical Dental Technology until they have obtained that qualification themselves. The need for professional development is required prior to the implementation of this new profession or alternative methods, such as the use of service departments, could be used to ensure CDTs receive adequate training from qualified individuals in the clinical field.

#### **2.2.6 Content selection for Clinical Dental Technology**

The expertise needed for a profession is based on a well-established body of theoretical knowledge which is then applied to specific problems. With most learners there is a natural progression from being a 'novice' reliant on abstract rules (protocols) and needing to learn facts, through various stages to becoming an expert, where one has an intuitive grasp of the whole situation. The acquiring of knowledge is seen to be a lower level skill compared to the acquiring of professional skills (Edwards et.al., 2007). The core knowledge area subjects for all dental professionals are: medical emergencies, disinfection and contamination, radiography and radiation protection. They should also concentrate on legal and ethical issues, complaints handling (IFD, 1991: 2).

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A proposed learning outcome set by the GDC is that Clinical Dental Technicians should 'be competent at recognizing abnormal oral mucosa and related underlying structures and at making an appropriate referral' (St George et.al., 2005:341). Brady (1992:110–115) has made an attempt to draw up a list of criteria for selecting content. These can be summed up as follows:

- Validity: Content is regarded as valid when it is authentic
- Significance: Content has to be fundamental to the subject or field in question
- Interest: Holding student interest is ideal for making learning more productive, but this has been a problem for curriculum designers as the students' interest may change from time to time
- Learner ability: Content should be adapted to suit the ability of the learners
- Consistency with social reality: Content should provide learners with a useful orientation to the world around them.
- Utility: Content which is most useful to learners in coping with their present and future should be selected.

These fundamental requirements may aid in the selection of content for the Clinical Dental Technology curriculum.

There is concern expressed in literature (St George et.al., 2005) that CDTs can misdiagnose and mistreat patients with possibly fatal results. It has been argued by Dentists that CDTs are not equipped to handle patient diagnosis and screening and thus, those patients who do not consult their Dentists but rather denturists have a higher risk of cancers presenting in the mouth that are misdiagnosed or when there is a delay in diagnosis. Even though these errors can occur with specialized healthcare professionals including the referring practitioner, maxillofacial surgeon, and oral pathologist, the critics of the Clinical Dental Technology strongly argue that this happens mostly in countries where denturism is practised. It is hoped that any future changes in the way that care is provided in the primary care setting, would include remuneration to general dental practitioners for examining edentulous patients as it does at present. "Although no studies have shown that screening reduces patient

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mortality, oral and oro-pharyngeal cancers found as a result of non-symptom driven examination have been found to be associated with a lower TNM stage which may require less aggressive and debilitating treatment to be carried out.” (St George et.al., 2005)

### 2.2.7 The proposed CDT curriculum

It is important that the content for the CDT curriculum incorporates all the fundamentals of clinical and patient care in order to ensure that learners are competent to deal with any case that may present itself in their practice. It is thus very important to review and evaluate international models and their objectives, as this may give us an insight about what their curriculum entails, how it is taught and how it could be adapted to the needs of the South African population. The objectives of the international institutions that offer education for denturists are as follows:

- Engineering and scientific basis of dentistry related to the provision of removable dental prosthetic devices including the mechanisms of knowledge acquisition, applied medical devices, methodology and the evaluation of evidence.
- Common oral problems, diagnosis, treatment planning and maintenance of stable treatment results.
- Scope and perspectives of contemporary removable appliances, their clinical, mechanical and biological basis.
- Principles of health promotion and disease prevention
- Broader issues of professional practice including ethics, medico-legal consideration. Health and safety legislation and the maintenance of a safe working environment.

(IFD, 1991:3)

These objectives are achieved by including the following subjects:



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#### **2.2.7.1. Biomedical science**

There should be a continuing emphasis on achieving a strong grounding in biomedical sciences appropriate to CDT. The biomedical sciences range from molecular processes at cellular level to the anatomy and physiology of the whole body, with particular emphasis on the head and neck. These studies should also include nutrition and genetics. Furthermore, learners should be introduced to pharmacology and basic therapeutics including aspects of microbial metabolism. Behavioural sciences, including a knowledge of social and cultural influences and communication skills are a major priority and should be integrated with other components throughout the course (IFD, 1991:6).

#### **2.2.7.2. Oral biology**

The oral and dental aspects of biological sciences should include the theoretical and practical instruction necessary to provide the student with knowledge of the structure and function of the oral cavity and associated structures with particular emphasis related to removable dental appliances. The study of the physiological and biomechanical concepts relevant to the mouth is also essential for the understanding of oral processes, such as salivary and masticatory activities as well as changes that occur with the onset of oral and dental diseases with ageing (IFD, 1991:6). The role of oral micro-organisms in oral and dental disease should be integrated with other aspects of the programme. Oral biology courses should be designed to support and be supported by other biomedical science courses and will provide an excellent opportunity to link different parts of the curriculum by illustrating the relevance of basic biomedical subjects through application in an oral context.

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#### **2.2.7.3. Communication**

Communication skills are an essential aspect of CDT. There should be an emphasis on the need to communicate to patients the knowledge and understanding of treatment proposed or advice given. Patient involvement in treatment planning must be stressed. Communication skills must be taught throughout the programme so that all students achieve good communication skills (IFD, 1991:7). This is one of the subjects that the current South African Dental Technology programme already addresses. To prevent an overlap, it may be of benefit to review what the programme offers and should there be a need, possibly integrate the missing knowledge, skills and attitudes into the existing subject. The addition of Clinical Dental Technology would be a fundamental shift in the identity for Dental Technicians, as they would now be required to deal with people. Patient care is all about communication and understanding issues from a more holistic perspective, as the 'human element' becomes paramount.

#### **2.2.7.4. Human disease**

Sufficient instruction in human disease should be given to enable the student to understand its manifestation. "Teaching human disease provides CDT learners with an understanding of diagnostic services used in investigation and treatment" (IFD, 1991:7). In providing a basis for the study of CDT subjects, the course should allow the learner to communicate effectively with other health care providers and other members of the dental team about the patients. This is important as these professionals would be expected to function with other health professionals as opposed to a normal Technician who is restricted to laboratory work, thus has minimal contact with both the patients and other health care providers.

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#### ***2.2.7.5. Pathology and microbiology***

Teachings in pathology and medical microbiology should be integrated with other subjects in the human disease modules, such as immunology, and should teach the principles of subjects concerned using examples relevant to CDT. The course should be structured in such a way that it involves clinical teaching on patients. This will aid learners in acquiring the necessary skills to elicit appropriate dental exposure and expertise. (IFD, 1991:7).

#### ***2.2.7.6. Emergencies***

According to the Baseline Competency Guide, learners should be proficient in procedures related to “resuscitation and other medical emergencies that may affect patients receiving treatment related to removable dental appliances. This should be repeated annually throughout the course and learners should learn how to recognise and take appropriate actions in situations such as an anaphylactic reaction, hypoglycaemia, upper respiratory obstruction, cardiac arrest, fits, vasovagal attack, inhalation or ingestion of foreign bodies” (IFD, 1991:7). These are part of one of the courses that Dental Technicians are compelled to attend and be competent in. Should it be recommended that a DT diploma or degree be a prerequisite for CDT, it would not be necessary for this subject to be repeated, but there should be some form of reinforcement.

#### ***2.2.7.7. Ethics, law and professionalism***

The legal basis under which patients are treated should be taught as well as the ethical responsibilities of all medical professionals. No students should “treat patients without

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proper understanding of these matters, especially consent, assault, duty care and confidentiality. The legal requirement to maintain full, accurate clinical records should also be appreciated by the student. There should be guidance on the key ethical and legal dilemmas confronting practitioners on the basics of employment law. Students should have the opportunity to consider the ethical and legal dimensions of a day-to-day practise". (IFD, 1991:9).

Ethical and safety issues should form an important part of the introduction to denturist elements of the curriculum. The course material should not ignore the moral and ethical dilemmas that confront the denturist in practise. "The ethical approach to patient care will subsequently be reinforced in the course being broadened as the course progresses to encompass the legal obligations of CDTs, particularly as they apply to practise." (IFD, 1991:9) Good record keeping should also be emphasised. Even though Jurisprudence is taught in the Dental Technology programme to familiarise the learners with the code of conduct and ethos of the DT profession, it is essential that a CDT is aware of their professional and moral responsibilities to both the community they serve as well as the health profession which they are representing. The increased focus on ethical issues in a CDT curriculum also relates to the shift in professional identity when patient care is included. Dealing with people (and not only models in a laboratory) requires a much deeper understanding of ethical responsibility.

#### ***2.2.7.8. Health, safety and infection control***

Topics including infection control, substances hazardous to health, fire regulation and safety regulations should be discussed and emphasised throughout the duration of this course. Furthermore, learners are expected to be fully "aware of infectious and transmittable diseases that could be hazardous to patients or colleagues, and must obtain appropriate medical advances" (IFD, 1991:11). This is important as failure to do so may lead to cross infections, thus placing the health of all concerned in danger.

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#### **2.2.7.9. Gerodontology**

“The most prevalent group requiring removable prosthesis are the elderly. The learners should be able to understand management strategies for the dental care of the elderly and participate with other members of the team in implementing them. The learners should be aware of the presentation of dental and oral diseases and disorders in elderly patients, and the range of psychological and social factors involved in such situations” (IFD, 1991:12). The student should be able to distinguish between normal and abnormal consequences of ageing, and learn to avoid stereotyping elderly patients.

#### **2.2.7.10. Dental biomaterial science**

The learners would have gained an in-depth knowledge of dental materials during their study of Dental Technology, but would need to further this knowledge to cover “the science of dental materials in clinical use” (IFD, 1991:12). This includes their indication, manipulation and storage.

#### **2.2.7.11. Preventative Dentistry**

CDT learners should have a basic understanding of the concept of preventative Dentistry. The curriculum should include behavioural and epidemiological science relevant to their scope of practice, the interpretation of data and the aetiology and natural history of diseases. It should also include “the understanding of social, cultural and environmental factors which contribute to health, illness and the capacity of the health care professionals to influence these, the principal methods and limitations of diseases prevention and health promotion and contribution of research methods in Dentistry” (IFD, 1991:13). This area of the curriculum allows the CDT to play a positive role in the lives of their patients. Again, the inclusion of this area relates to the change in

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professional identity from a laboratory-based Dental Technician to someone expected to engage in patient care

## 2.3 Conclusion

The aim of this chapter was to give an overview of the literature related to the educational context both internationally and in South Africa. The purpose of this was to understand the educational scenario that currently exists under which the new profession of Clinical Dental Technology would be taught should it be implemented in South Africa. The literature has revealed that there are international models that could be used as a foundation for the curriculum formulation of the Clinical Dental Technology course. The next chapter will outline the methods used to collect data on the views of Dentists, Dental Technicians and Dental Technology lecturers about the addition of clinical practice to the current Dental Technology curriculum.

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## **CHAPTER THREE: METHODOLOGY**

### **3.1 Introduction**

To evaluate the impact of CDT on the current Dental Technology curriculum, it was beneficial to conduct a study to gauge the views of those people that may be affected by the role transformation. The purpose of this chapter is to outline the research design used and to reveal how the investigations used to answer the research questions were developed. The details of how the data was collected and analyzed will be discussed.

Most research in the area of Dental Technology, in particular in Health Sciences, is quantitative and involves searches for imperative truths. This study is concerned with contextual understanding and attitudes, so a quantitative approach would be inappropriate. According to Neuman (1997:14) even though these two styles of research share basic principles of science, the manner in which they are approached may differ in significant ways, each one having its strengths and limitations.

### **3.2 Study Design**

#### **3.2.1 Choice of Research design**

The research design chosen for this study was qualitative. The reason for this is that qualitative research is more holistic in the sense that it “attempts to provide a contextual understanding of the complex interrelationships of causes and consequences that affect human behavior” (Neuman, 1997:327). In doing so it seeks to avoid the deliberate manipulation of variables. A further consequence of this holistic emphasis is that “qualitative research tends to incorporate a wide variety of specific research techniques, within one research project” (Vulliamy, Lewin and Stephens, 1990). This qualitative study will be an interpretation of perceptions rather than ‘scientific facts’. The strengths of qualitative research is derived primarily from its inductive approach, focus on specific situations or people, and its emphasis on words rather than numbers (Maxwell,



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1996:17). An in-depth understanding and interpretation of the issues around the possible introduction of Clinical Dental Technology will be discussed openly and in detail.

### 3.2.2 Data collection methods

Detailed data was captured through open-ended questions using the techniques of interviews, and questionnaires. This is what Terre Blanche et al. (2006: 47) describe as 'written and spoken language' data collection. Maximum variation sampling was used as information was collected from various groups i.e. Dental Technicians, Dentists and Lecturers using different methods. This was important because qualitative research requires a relatively small number of individuals or situations and preserves the individuality of each of these in their analysis, rather than collecting data from large samples and aggregating the data across individuals or situations (Maxwell, 1996:19) For this reason, it is important to seek out a range of 'voices' as no one 'voice' is seen to hold the whole truth. In this study I hope to collect different opinions about the inclusion of clinical aspects in the Dental Technology curriculum.

Purposeful sampling (Patton, 1990) was also used as it achieved representativeness. This sampling method is a non-random method of sampling where the researcher selects 'information-rich cases' for an in-depth study. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research. This form of sampling was utilized due to the nature of the population size thus the term purposeful sampling. This was done to ensure that the broadest range of information and perspectives on this study is obtained. The data was collected by means of questionnaires and personal interviews with the respondents. These are discussed in more detail later.

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### 3.2.3 Ethics

Miles and Matthews (1994) identified some disadvantages associated with qualitative research and these include the following:

- Researcher bias can affect the design of a study.
- Researcher bias can enter into data collection.
- Sources may not all be equally credible.
- Study group may not be representative of the larger population.
- Analysis of observations can be biased.
- Any group that is studied is altered to some degree by the very presence of the researcher. Therefore, any data collected is somewhat minimally skewed.
- It takes time to build trust with participants that facilitates full and honest self-representation. Short term observational studies are at a particular disadvantage where trust building is concerned.

When embarking on this study, these disadvantages were taken into consideration and the responses were collected in an ethical manner. The questionnaire was formulated and designed in a manner that would be conducive to the respondent. The validity of the questionnaires was verified by doing a pilot study in order to gauge the opinions of various stakeholders. Their views were then taken into consideration and the questionnaire was adapted accordingly. In order to gain representativeness of the population that could be affected should Clinical Dental Technology be implemented, access to the registratory bodies of both these professions were obtained. Furthermore, permission was received from all the academic institutions prior commencing with the interview processes (see Appendix A for an example of this). Even though some of the problems identified by Miles and Matthews (1994) may have been encountered, it was anticipated that the information received from the respondents was an authentic reflection of their thought and views regarding Clinical Dental Technology.

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### 3.3 Data collection

#### 3.3.1 Interviews

Literature has revealed that face-to-face interviews have long been the dominant interview technique in the field of qualitative research, providing useful information in both spoken and body language. Kvale (1996) states that interviews have always placed the researcher at an advantage because it is possible to discuss issues that are important to the participants, rather than forcing them to respond to closed questions. Interviews also give them a chance to clarify ambiguities or confusion over concepts. Furthermore, social cues, such as the voice and body language of the interviewee can give the interviewer extra information that can be added to the verbal answer of the interviewee (Kvale, 2006). It can thus be argued that an interview is much more personal than a questionnaire as “It gives us an opportunity to really understand how people think and feel” (Terre Blanche et al., 1999:297). Additionally, observation can take place allowing attitudes to be revealed, and patterning and interrelationships to be observed. For this reason, the academic staff of the three institutions that offer Dental Technology (CPUT, DUT and TUT) were interviewed.

##### 3.3.1.1 Sample size

The three institutions that participated in this study had a total number of twenty Dental Technology academic staff members. Participation was voluntary and the number of lecturers who participated in this study numbered thirteen as seven could not participate due to time constraints and lack of availability. Three staff members were unable to participate in face-to-face interviews and requested to have questionnaires sent to them. A follow up to their responses was done telephonically. Institutional visits were undertaken to conduct interviews on site.

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### **3.3.1.2 The interview process**

Cohen et al. (2005:275) define interviews as “the interchange of views between two or more people on the topic of mutual interest”. They further argue that interviews seek “the centrality of human interaction for knowledge production and emphasize the social situatedness of research data” (2005:275). In this study this means that the understandings of educators were collected through interviews in order to ascertain the ways in which they perceive the changes in the field of Dental Technology. Interviews allowed the participants to discuss their interpretation of how effective Clinical Dental Technology will be in their institution and in the profession at large. It also allowed them to express how they regarded the situation associated with the implementation of Clinical Dental Technology from their own point of view

The interview format was semi-structured. An advantage of this synchronous communication was that the answer of the interviewee was more spontaneous and an extended reflection can be achieved by the interviewer formulating questions as a result of the interactive nature of communication. With structured interviews, the contents and the procedures are predetermined. This means that “the sequence and wording of the questions are determined by a means of a schedule” (Cohen et al., 2005:276). This was not ideal when conducting this research, as it would have left me with limited freedom to make modifications. With this in mind, a semi-structured interview format was more suited to this study as modification to the sequence of questions and changes of wording were constantly undertaken depending on the direction of the interview. An “interview schedule or a list of objectives” (Terre Blanche et al., 1999:299) was drawn up in order to ensure that relevant valuable information for this study is gathered (refer to Appendix B). An ‘open-ended item’ schedule was followed. Kerlinger (cited in Cohen et al. 2005: 278) defines this structure as “that which supplies a frame of reference for respondent’s answers and puts a minimum of restraint on the answers and their expression” (Cohen et al., 2005:275). Open-ended questions were used in order to capture the interviewees’ insights into the subject matter and to allow me to make a

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fuller assessment of the respondents' views. This structure allowed unexpected or unanticipated answers to be received from the respondents, resulting in unthought-of relationships.

Tuckman (as cited in Cohen et al., 2005:279) suggested that the indirect approach of questioning is more likely to produce frank and open responses as opposed to direct questions which may cause the respondent to become cautious and give a less than honest answer. For the purpose of this study, an indirect approach was adopted. The social nature of the interview has the potential for all sorts of bias, inconsistencies and inaccuracies (as cited in Bailey, 1990:176). William (as cited in Bailey, 1990) argued that assumptions to which the study is based cannot be met in certain populations due to prejudice. Phillips (as cited in Bailey, 1990) on the other hand, argues that "The assumption by many social scientists that they can engage in research without influencing what they obtain in the way of data, is preposterous". Phillips makes the subjectivity of interviews very clear. It can be concluded that there is some basis for the criticisms made by William, Phillips and the others. Certain persons' words often differ from their deeds and certainly the same word can mean different things to different people or in different situations. The sheer variability in human characteristics or attitudes that generally must be studied or controlled for, make social research extremely difficult.

### ***3.3.1.3 Accuracy of the data collected***

According to Bailey (1990:175) errors on the side of the respondent may be caused by:

- deliberate lying,
- unconscious mistakes,
- accidental errors cause by misinterpretation of the question and memory failures.

An assumption was made by the researcher in this study that the respondents had no reason to give false or misleading information while conducting these interviews. Some

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of the above mentioned errors were addressed by first talking to the respondents and introducing the topic, also making them feel that there was no need for them to lie as there were no 'right or wrong' answers, but was merely interested in their point of view regarding this matter. Furthermore, the interview process allowed for re-phrasing of questions should the interviewees not understand what the question meant

Other errors that can be made by the interviewer include:

- asking errors,
  - probing errors,
  - recording error
  - flagrant cheating or consciously recording a response without even asking a question.
- (Bailey, 1990:180)

To ensure that the above mentioned errors were eliminated, I had to practice beforehand on how the recording device worked and possible questions were drawn up to assist with the structure of the interview. With one interview however, the tape recorder ran out of space two minutes before the interview ended. In this case, I was aware of what had happened, and without drawing this to the respondent's attention. I took manual notes to capture the rest of the interview. After every interview, footnotes were jotted down to ensure that critical information was captured. Although literature has given most attention to the possible effects of the interviewer's social and physical characteristics on the respondent's reaction, it should be clear that interaction goes both ways. The respondent can also be biased and can intimidate the interviewer, causing them to record incorrect or biased answers.

#### ***3.3.1.4 Capturing the data***

The interviews were tape-recorded in order to capture what was discussed for transcription and analysis purposes. Using a tape recorder has the advantage that the interview report is more accurate than writing out notes, and assists in the transcription

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process for the interviews (Bryman, 2001). However recorders can have a negative effect on the respondents and may lead to constrained responses. To compensate for this, the importance of confidentiality was stressed and adhered to in order to put them at ease. A signed consent from the interviewee to use this device was obtained prior to proceedings of the interview (See Appendix D). It was important not only to rely on the tape recorder so some notes were taken during the interview and field notes were used to record the main themes that surfaced after each interview.

### 3.3.2 Questionnaires

For the purpose of this study, the views from two groups were collected by questionnaire: those of Dental Technicians and those of Dentists. Questionnaires were used because they have many advantages such as they save time, and they can be sent to respondents simultaneously. Miles and Matthews (1994) argue that questionnaires can be advantageous because they can be completed at the respondent's convenience, assuring anonymity, without interviewer bias, and with greater accessibility. This was imperative in this study as it required responses from respondents from all the nine provinces of South Africa.

#### 3.3.2.1 Questionnaire design

A covering letter (Appendix , E and G) and a consent form (Appendix F and H) accompanied the questionnaires. This letter served to inform the respondents about the scope of the research and the associated ethical issues and to assure anonymity and confidentiality as well as plead for their co-operation. A dichotomous questioning approach was avoided when compiling the questionnaires for this study (See Appendix I, J and K). According to Wilson and McLean (1994), this type of approach allows for quick completion of questionnaires but “does not enable the respondents to add any remarks and free responses” due to the limitations of pre-set categories. In order to

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obtain authenticity, richness and depth of the respondents' views, open-ended questions were also used for the purpose of this study. Cohen et al. (2005:255) argue that these types of questions are "the hallmarks of qualitative data".

According to Bailey (1990), the main disadvantages attached to questionnaires are their lack of flexibility, low response rate, and many questions may be unanswered. For these reasons, they were distributed to all possible respondents. A follow-up letter was sent to the respondents in order to re-emphasize the importance of the study and the value of the respondents' participation after thirty days.

### **3.3.2.2 Sample selection**

A non-probability sampling method was used for the purpose of this study. This type of sampling "avoids representing the wider population, it seeks only to represent a particular group, a particular named section of a wider population" (Cohen et al., 2005: 295). This is important to this study as the results obtained will only be a reflection of the thoughts and feelings of those who participated.

In order to be included for participation in the study, the Dentists and Dental Technicians have to comply with the following criteria:

- The Dental Technicians had to be registered with the SADTC
- The Dentists had to be registered with the HPCSA and SADA
- They were all required to be currently practicing in the dental field

The list of contact details of all Dentists and Dental Technicians were requested from the South African Dental Association (SADA) and the South African Dental Technicians Council (SADTC) and payments were made to access their databases (Appendix L). These are two of the main organizations that govern the practice of the dental profession in South Africa. The databases reflected that there were 1475 Registered Dental Technicians and 3584 Dentists in South Africa.



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### **3.3.2.3 Distribution of questionnaires**

Quota sampling was used for the purpose of questionnaire distributions of this study. A total number of 3034 Dentists and 418 Dental Technicians had email addresses. It was therefore necessary to post the rest of the questionnaire in order to increase the questionnaire distribution. These were the candidates used for this study. After two months, the response rate was very low so questionnaires were distributed by hand at the Dental Technicians Association of South Africa (DENTASA) annual general meeting, in the Dental Technology forums and to all Dental Technicians in local laboratories within the researcher's reach who were willing to participate in this study.

## **3.4 Data Analysis**

### **3.4.1 Interpreting the data**

Data analysis is a selective process (Miles and Matthews, 1994) of resolving data into its constituent components, to reveal its characteristic elements and structure. "Description lays the basis for analysis, but analysis also lays the basis for further description. Through analysis, we can obtain a fresh view of our data. We can progress from initial description through the process of breaking down data into bits, and seeing how these bits interconnect, to a new account based on our re-conceptualization" (Dey, 1996: 30). For the purpose of this study, thematic analysis was used. "This technique may include counting how often certain words or themes occur" (Neuman, 1997:31). This was important in this study as it allowed for critical conversation analysis from the responses generated through the use of interviews and questionnaire. The need to take account of context is a recurrent theme in qualitative analysis. Contexts are important as a means of situating action and of grasping its wider and historical import (Dey, 1996). Data collection can itself be perceived as an interactive process through which the researcher struggles to elicit meaningful interpretations of social action (Dey,

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1996:37). Without classifying the data, we have no way of knowing what it is we are analyzing, nor can we make meaningful comparisons between the different bits of data, thus “classifying data lays the conceptual foundations upon which interpretation and explanations are based”(Dey, 1996:40).

#### **3.4.1.1 Transcription**

A transcriber was used to type up interview transcripts and questionnaire responses. Transcription practises can be thought of in terms of a continuum with two modes: naturalism, in which every utterance is transcribed in as much detail as possible, and denaturalism, in which idiosyncratic elements of speech are removed (Oliver, Serovich and Mason, 2005). These two positions correspond to certain views about the representation of language. Denaturalized transcription grows out of an interest in the information content of speech and dissatisfaction with the empiricism of naturalized work. Transcription choices reflect both explicit and implicit assumptions. In naturalized transcription, it can be argued that the analyst is presented with speech as it is spoken by the participant rather than over-filtered through the transcriber. One has to bear in mind that transcription errors can occur. These can be due to both technical and human error. It can thus be concluded that transcription often erases the context along with some crucial, non-verbal data. A critical theorist sees different things than a deconstructivist or a symbolic interactionist does (Miles and Matthew, 1994). To test the credibility of the transcribing process, the researcher actively participated in the transcribing process. This was done by reading the transcripts; I looked for common themes and ideas among the responses. The data was coded for interpretation purposes. Joppe (2000) defines coding as an analysis that involves how you differentiate and combine the data you have retrieved and the reflections you make about this information.

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### 3.4.1.2 Coding and theme identification

Kerlinger (as cited in Cohen et al. 2005:283) defines coding as the translation of question responses and respondent information to specific categories for the purpose of analysis. The interviews and questionnaires were coded using the NVivo 7 system. This qualitative software package is capable of handling rich text records and facilitates data management chores which are subject to error when done manually. Utilizing this software ensures that the analytic process is more transparent and accountable. NVivo 7 is referred to as a 'theory building software' and it allowed me to display and analyze relationships between people, views and concepts. Such software can allow basic "code and retrieval" of data (Richards, 2005), and more sophisticated analysis using "algorithms to identify co-occurring codes in a range of logically overlapping or nesting possibilities, annotation of the text, or the creation and amalgamation of codes" (Bazeley, 2007:25). Some packages can be used to make theoretical links or search for "disconfirming evidence" My use of NVivo was at a basic level of linking similar ideas and looking for central issues and differences.

The coded themes were then conceptualized and placed back within the overall context from which they emerged. The type of reporting format varies depending on the type of questions used. In this study, open-ended interview questions were used which "yield word-based accounts that take up considerably more space" (Cohen et al., 2005:286) as opposed to structured interviews which may be reported in the form of a table or graph.

In order to ensure anonymity, all the data collected from both the questionnaires and through the interview process were coded. All the questionnaires received from Dentists were coded with a letter 'D' and a number. E.g.: A questionnaire from Dentist Mooglie<sup>2</sup> was coded as 'D1'. All the Dental Technicians were coded with a letter 'T' followed by a letter. E.g. A response from Dental Technician Mr. Zoe was coded as 'TA' and the responses from academic were coded with the letter 'L' followed by a letter (similar to the Dental Technology coding).

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<sup>2</sup> Pseudonym

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### 3.5 Validity and reliability

Neuman (1997:138) defines reliability as “the information provided by indicators that does not vary as a result of characteristics of the indicator, instrument or measurement device itself”. According to his definition, the results obtained should be similar provided that the same method was used, it does not really matter who conducted the research. Validity on the other hand, is defined as “the degree of fit between a construct”. It refers to how well the conceptual and operational definitions mesh with each other. (Neuman, 1997:141) . Neuman then argues that it is more difficult to achieve validity than reliability as “validity is part of a dynamic process that grows by accumulating evidence overtime, without it, all measurement become meaningless” (Bohrnstedt, 1992: 217).

It has been the exception, rather than the rule, that a qualitative research report includes a discussion of the reliability and validity of the results. According to Kvale (1996) the lack of such a discussion seems to indicate that there is not any problem with reliability and validity within qualitative research. This, of course, is not true. The questions of validity and reliability within research are just as important in both qualitative and quantitative methods, though they may have to be treated somewhat differently. The commonly held assumption that qualitative methods pay attention to validity and not to reliability is false. According to Symon and Cassell (1998:71) “critiques have questioned the reliability and validity of research carried out using qualitative techniques”. They have even been known to question the integrity of qualitative researchers. In agreement with this, Stenbacka (2001:552) stated that “if a qualitative study is discussed with reliability as a criterion, the consequence is rather that the study is no good”. Neuman (1997:138) agrees that “reliability and validity are salient in social research because constructs in social theory are often ambiguous, diffuse and not directly observable”. Clearly these critics miss the point: a qualitative researcher can only report on the event recounted to them. The worth of this approach is that it yields genuine insights into the processes which shape the behavior, and its coherent account makes sense, that is, it has face validity.

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Interpretation of open-ended research questions may be difficult as there is a possibility that the responses may not bear a degree of similarity. It is thus important to note that all perceptions will be considered valid. Maxwell (1996:60) argued that the main threat to valid interpretation is imposing one's own framework or meaning on the results, rather than understanding the perspective of the people who were studied and their meanings they attached to their words and actions. To increase the reliability of the data collected, questionnaires were sent out to a large number of Dental Technicians and Dentists. From these, only the common themes that arose were identified and discussed in this study. The validity of each question was assessed individually rather than just of the whole questionnaire, thus ensuring that critical information was not lost due to the fact the respondents preferred answering questions that they felt comfortable with.

Einster (1991:58) points out that "the most important test of any qualitative study is its quality". It is important to note that in this qualitative research, authenticity and trustworthiness were used as vital quality indicators. Generalisability when recording the findings was avoided and it was clearly indicated that the views projected in this study were those of the Dentists, Dental Technician and Dental Technology lecturers that participated and not necessarily the general view of all the groups represented. Reliability is largely built into a quality interview process in which there is coherence (Symon et al., 1998:70). In this study, reliability was gained by following a semi-structured interview process. The researcher attempted to be non-judgemental and open to all responses during the interview process, only recording what had been said and attempted to set aside personal bias in analyzing the data.

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### 3.6 Conclusion

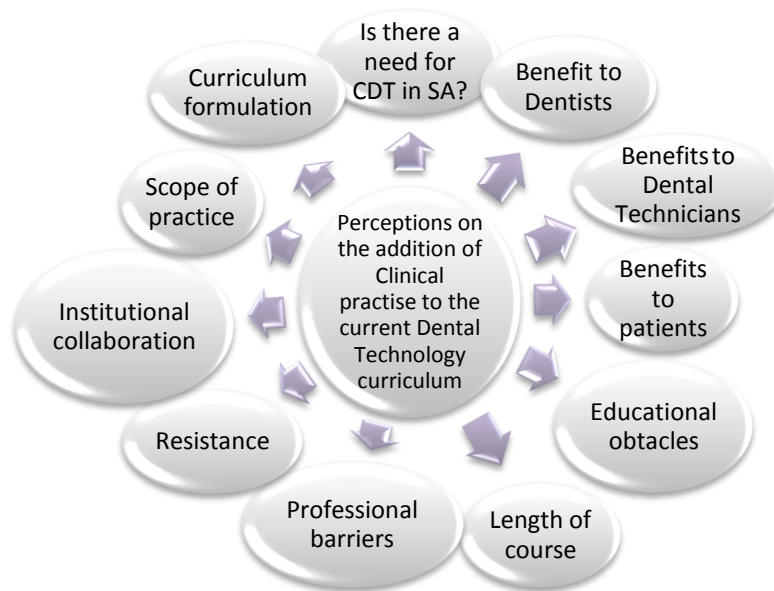
This chapter has described how the data was collected for the purpose of this study. The sample size that was used was somewhat appropriate and it is the researcher's belief that all the three groups that participated in the study were adequately represented, even though the response rate was less than anticipated. This was an expected problem as questionnaires generally have a low response rate. It can thus be concluded that the implementation was reasonably successful. The next chapter will outline, describe and discuss the data collected in order to give an in depth understanding of the perceptions that exist around the issue of Clinical Dental Technology.

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## CHAPTER 4: ANALYSIS AND DISCUSSION OF RESULTS

### 4.1 Introduction

In this chapter, the perceptions of the respondents who participated in this study will be presented. Diamond (1989:21) points out that prior to creating or redesigning a course or curriculum, it is important that the following are considered: “1) how important the course is to the academic departments and the institution, 2) how it would be received by others, and 3) whether necessary support is available”. With this in mind data was collected from Dentists, Dental Technicians and Dental Technology lecturers to gauge their perceptions on whether the South African Dental Health sector had a need for the addition of CDT to the dental team to improve service delivery, and how this profession would be perceived by the dental team and the general public. Views on how a curriculum should be formulated and how institutions should be equipped to facilitate the education process for this new profession were also evaluated. This section will provide an analysis of the themes (illustrated in Figure 4.1 below) that were identified from the questionnaires and interviews on the issue of Clinical Dental Technology.



**Figure 4.1:** Themes that were identified from the data collected from Dentists, Dental Technicians and Dental Technology Lecturers

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## 4.2 Need for CDT

### 4.2.1 Dentists' Perceptions

The responses from the questions addressed to the Dentists on the need of CDT in South Africa revealed that only a minority (18% of 37) of Dentists thought that this profession would benefit the dental fields and the population at large. "There is an unmet need as far as dentures are concerned. The needy people are in the low socio-economic bracket."(D20<sup>3</sup>). One of the issues raised in the literature and discussed in the second chapter of this thesis was that there are not enough dental professional personnel to render services to the entire South African population, especially in the rural areas. A study conducted by Hartshorne (2001) revealed that the Dentist to population ratios in the Western Cape in 1995 was 1:7974. He further pointed out that those who did not have access to dentures were those of "an elderly, less educated low income group" (Hartshorne, 2001:399).

Another Dentist in support of the notion of CDT argued that "...Dental Technicians have a better understanding of the principles of how things work. This could prove especially valuable when making dentures" (D15). This is directly aligned to an argument raised by the SCDT in Chapter Two that Dental Technicians receive more intense training in prosthetic work in comparison to Dentists.

These views were, however disputed by the majority of Dentists who responded to the questionnaire:(72%) who strongly disagreed with the notion of introducing CDT in South Africa. These Dentists perceived that the addition of this profession into the dental team would not improve service delivery. They also indicated that dentures produced by such persons will not be cost effective as was argued by the IFD (see page 6, Chapter Two). "Rash statements that such treatment would be cheaper have been made by certain

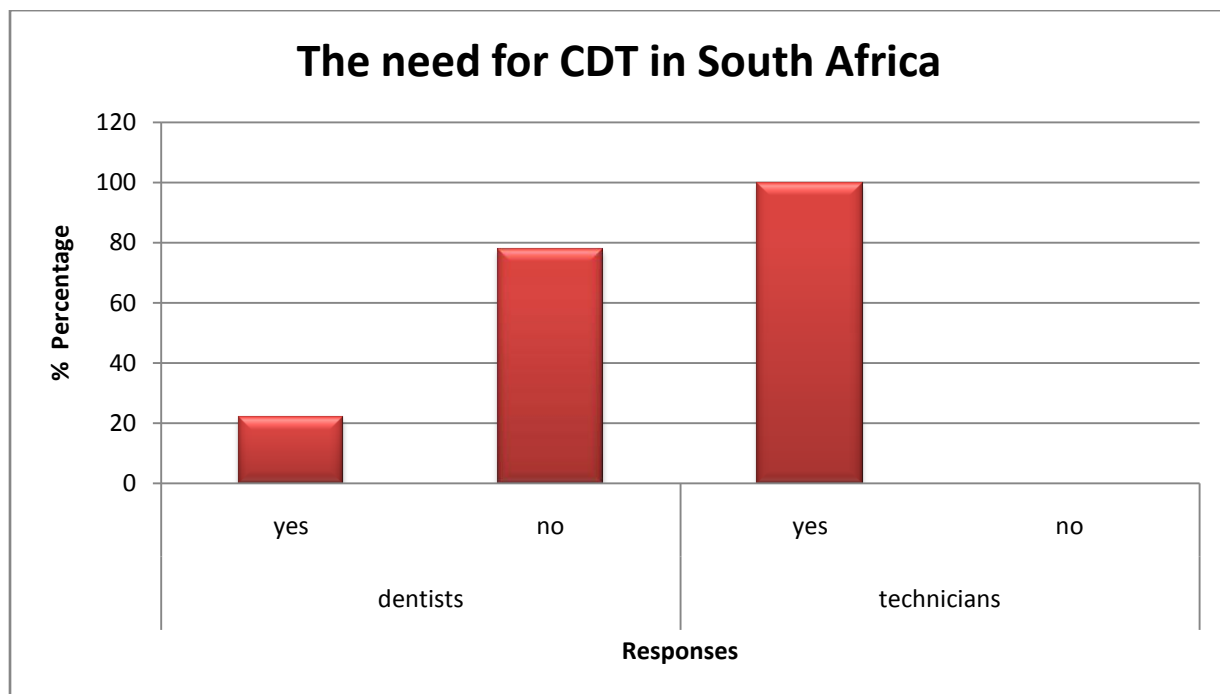
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<sup>3</sup> To ensure anonymity, all the names of those who responded to the questionnaire and those who participated in the interview process were omitted and codes were used as discussed in Chapter Three.



technicians /technologists but no scientific data is available to support this assertion” (D16).

Most of the Dentists who responded expressed concern about the clinical capabilities of technicians who may become CDTs as the Dentists felt that “There [was] no capacity to adequately train such a worker” (D16). Furthermore, they claimed that “Edentulousness is dropping in SA. [Thus] we [would] need less and less oral health workers doing full removable prosthetics- not more” (D16). This is in contradiction to the study conducted by Naidoo et al. (2001) which is discussed in Chapter Two and the recent South African oral health surveys conducted.



**Figure 4.2:** A bar diagram illustrating a comparison of responses from Dentists and Dental Technicians on whether they see a need for Clinical Dental Technology in South Africa

#### 4.2.2 Dental Technicians' perceptions

From the above graph (Figure 4.2) it is evident that 100% of the 21 Dental Technicians that participated in this study argued that there was a need to introduce Clinical Dental Technology in South Africa. They felt that this would not only benefit the patients, but

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also the profession and the general dental community at large. The general feeling was that service delivery would be improved and the quality of the work produced would be superior, eliminating the 'trial and error' situation caused to the patients due to "miscommunication between the Dentist, the laboratory staff and the patient as well" (D15).

The questionnaire data therefore indicates that there is a great discrepancy between the Dentists and the Dental Technicians in terms of their perceptions of the need for CDT. This has important implications for the curriculum in terms of ensuring industry buy-in. I turn now to the data regarding the need for CDT that was obtained from the interviews with academics.

#### 4.2.3 Lecturers' perceptions

In support of the Dental Technicians' perceptions of the need of CDT in South Africa, LA<sup>4</sup> and LG argued that in the past, the government had allocated a budget for denture services and people who need them could receive dentures at a very low or even at no cost to them. The appliances were manufactured at the educational training institutions who worked in collaboration with major government clinics and hospitals. Such services have been terminated due to lack of funds, so a large number of the population have been left with no hope of ever owning a dental appliance due to the exceedingly high costs associated with such. According to the SCDT (Malherbe, 2005) this then justified the need for CDT which in theory would decrease the costs as the appliance would be made by one person. LF, in agreement with most of the technicians, identified that there was a need for CDT in South Africa however pointed out that "the current situation is there's less Dental Technicians in the country than Dentists"(LF). This statement could be true when one looks at the number of Dentists and Dental Technicians registered under the HPCSA and SADTC that are currently practicing. As stated in Chapter One, this study only took into account the Dentists who were registered under SADA which

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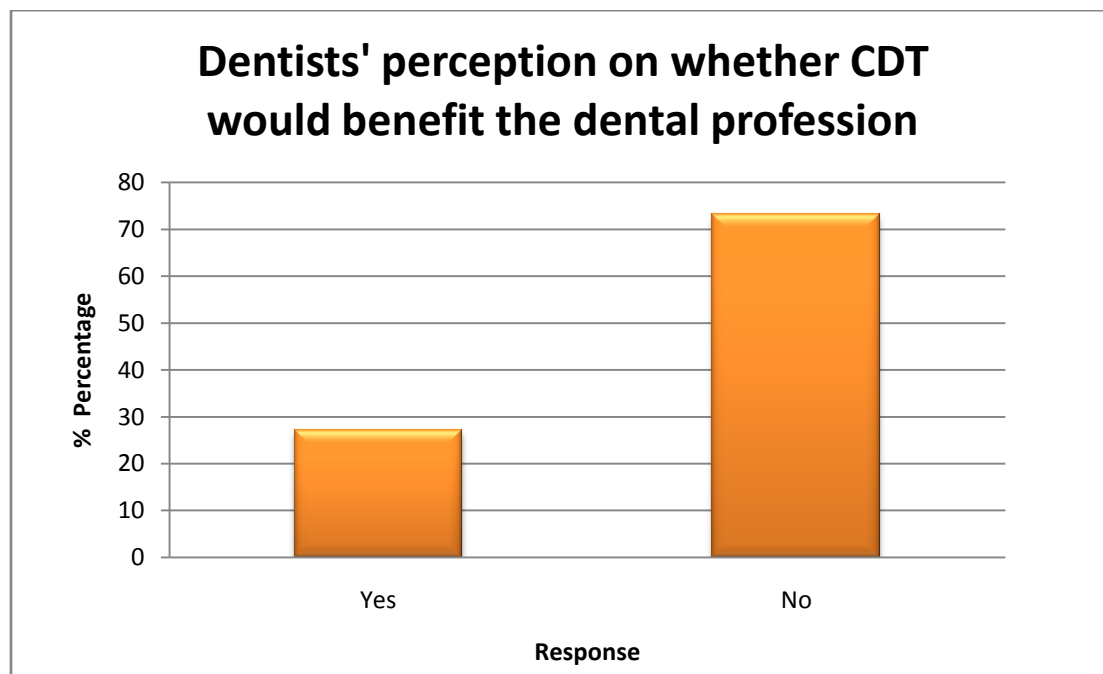
<sup>4</sup> For anonymity purposes, all the Dental Technology lecturers who participated in this study were renamed as alphabets. This was structured in no particular order.

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was an organization which does not compel Dentists to register. The SADTC however requires all training and qualified Dental Technicians to register prior to practising as a technician. From this it is possible that the number of Dentists in South Africa considerably surpasses the number of Dental Technicians. This then raises the question whether CDT would be able to fill the current gap in service delivery or whether it will serve to fix one problem by creating a few others.

“We see educated people – people with finances – in Parliament sometimes, without dentures. And we ask ourselves what’s actually happening here. Is it not accessible; is it not promoted or what is really the problem?” (LD). This statement outlines a critical issue of dental awareness in South Africa. It asks the one question whether the problem that we are faced with is that of accessibility to services or that of ignorance about the state of dental health amongst our population. This leads us back to the question, is there really a need for CDT in our country?

### 4.3 Benefits of CDT to Dentists



**Figure 4.3:** Dentists' perception of the benefit of CDT to the Dental profession.

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#### 4.3.1 Views from Dentists

As illustrated in Figure 4.3 the majority (73% of the 37) Dentists that participated in the study felt strongly that the introduction of CDT would not benefit their profession. They vehemently argued that introducing CDT would not only lead to inferior work being produced by such professionals but also it would impinge on their scope of practice by taking away a significant portion of their income. They also felt that this would “degrade their profession” (D17) as patients would not be able to tell the difference between Dentists and other dental professionals. As argued in Chapter Two and verified by these responses, it is evident that Dentists are very protective over their territory and they felt uneasy about the changes should CDT be implemented in SA.

The minority of Dentists (27%) that felt that CDT would be beneficial to them as they argued that Dental Technicians receive extensive training in the field of prosthetics and are thus better equipped to deal with the problems “associated with shade taking, bite registrations, try-ins and adjustments” (D15). They felt that this would not only save them time and unnecessary frustrations, but would also allow them to concentrate on other aspects of dentistry and be able to ensure their patients receive the best services. These Dentists however did argue that Clinical Dental Technicians cannot work independently of them. They also felt that they (the Dentists) would rather refer patients to the Clinical Dental Technicians for appliances to avoid any cases of unforeseen illnesses such as cancer from being misdiagnosed due to negligence.

In agreement with those Dentists who are supportive of the introduction of CDT, some technicians felt that Dentists spent too much time on denture patients instead of concentrating on chair side work and preventative dentistry that would benefit them both professionally and financially. The Dentists could “see more patients and spend less time worrying about frustrating work such as try ins and retry’s” (D6).

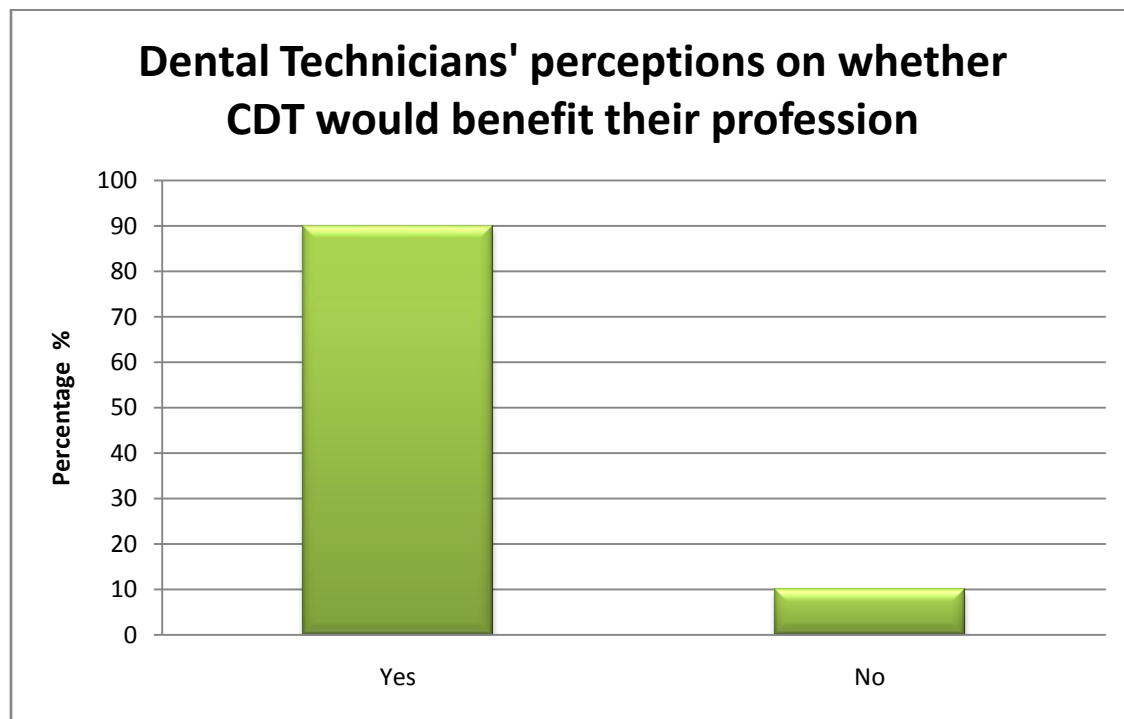
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### 4.3.2 Views from Dental Technicians

Only 6% of the Dental Technicians supported the majority of the Dentists by stating that they did not see how the introduction of the CDT profession could benefit the Dentists. These technicians felt that this new profession may impose on the current dentistry scope of practice resulting in competition between the two professions, which may possibly lead to clientele loss for the Dentists. Malherbe (2005) raised similar concerns about competition between the sectors, as discussed in Chapter One of this thesis. The other 94% of Dental Technicians felt that the addition of this component into their practice would be beneficial to them. This is where the discussion will now turn

## 4.4 Benefits to Dental Technicians

### 4.4.1 Dental Technicians views on the benefit of CDT to them



**Figure 4.4:** An illustration of the perception of Dental Technicians about the benefit of CDT to their profession

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As illustrated in Figure 4.4, the majority of Dental Technicians (90% of the 24 respondents) felt that the addition of CDT would benefit the profession tremendously. They argued that this would help them work independently from the Dentists and would eliminate the flaws that come with inaccurate impressions and miscommunication between the Dentists and the technicians. “I think there’s a lack of interest on the Dentists’ side ... they just take the bite, they rush it” (LB). “Sometimes you can’t read the handwriting, sometimes you don’t understand what they exactly mean” (LK). From this it is evident that Dental Technicians perceive that the Dentists they work with, lack time and passion for prosthetic work and rush the work to get this done. As a result, the patient has to come in on numerous occasions for alterations, resulting in frustration by all parties concerned. The technicians believed that if they had control over such matters, they could produce better work.

From a professional point of view, the development of CDT was seen as broadening the career possibilities. “This would create another career path for technicians and would also allow the technicians some autonomy” (LF). The technicians would have a choice to specialize in certain fields of the profession. As stated in Chapter Two, there are already technicians who are currently practicing denturism illegally. One of the technicians argued that “The introduction of Denturists as accountable professionals will displace the practice of illegal provision by quacks associated with unhygienic procedures, exposure to transmittable diseases and criminal access to materials” (TG). This would help the profession immensely as these illegal workers are not doing justice to the profession and as a result the credibility of the DT profession is therefore brought into question.

There were a minority of Dental Technicians (10%) who felt that the introduction of this profession may pose a problem for them. They stated that “Dental technologists already work long hours. It’s just going to add to the work load.” (TT, 2008) They could not see the feasibility of CDT due to time constraints experienced with their current workload. They saw this new challenge as one they did not need to embark on as it would not be of benefit to them.

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Furthermore they expressed concern regarding the safety and the cleanliness of the dental laboratories, “We all know that labs are mostly dusty and filled with fumes of metal, acrylic and noisy machinery. Thus technicians should have a respectable entrance, foyer area as well as a dental surgery type chair and instruments in a separate room”. This technician and those that were of this view, are in agreement with the concern that was raised later in this chapter by the Dentists.

#### **4.4.2 Dentists’ views on the benefit of CDT to Dental Technicians**

Different views about the benefit to Dental Technicians of the addition of CDT as a profession in South Africa were seen from the Dentists. There were some Dentists who argued that the addition of CDT to the South African dental team would result in reduced income for Dental Technicians. The motivation behind this statement was that the current laboratories are not equipped to deal with the clinical side of dentistry. In order for this to be achieved, more space would be needed and additional equipment such as a dental chair and sterilizing and disinfecting units would have to be purchased and maintained. They also felt that this would be time consuming for the technicians as they would have to spend time dealing with the patients to gauge their needs, take impressions and construct the appliances, not to mention the patients who would come back time and again to complain about minor problems with their dentures. “Full fixed prosthodontics is filled with difficulties and problems and the rewards are not great.” (D16)

One of the issues that transpired from these responses was the concern expressed by Dentists that those Dental Technicians who practise as denturists may lose their existing clients (Dentists) that they were currently working with, and thus the implication of this would be a reduced income revenue for the technician. “They may lose the support from certain dental practitioners” (D17). This may pose a problem for technicians who have already established working partnerships with Dentists and it could be detrimental to the success of their businesses and be negative for the field

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generally. There is even a possible scenario of job losses and the closure of some Dental laboratories.

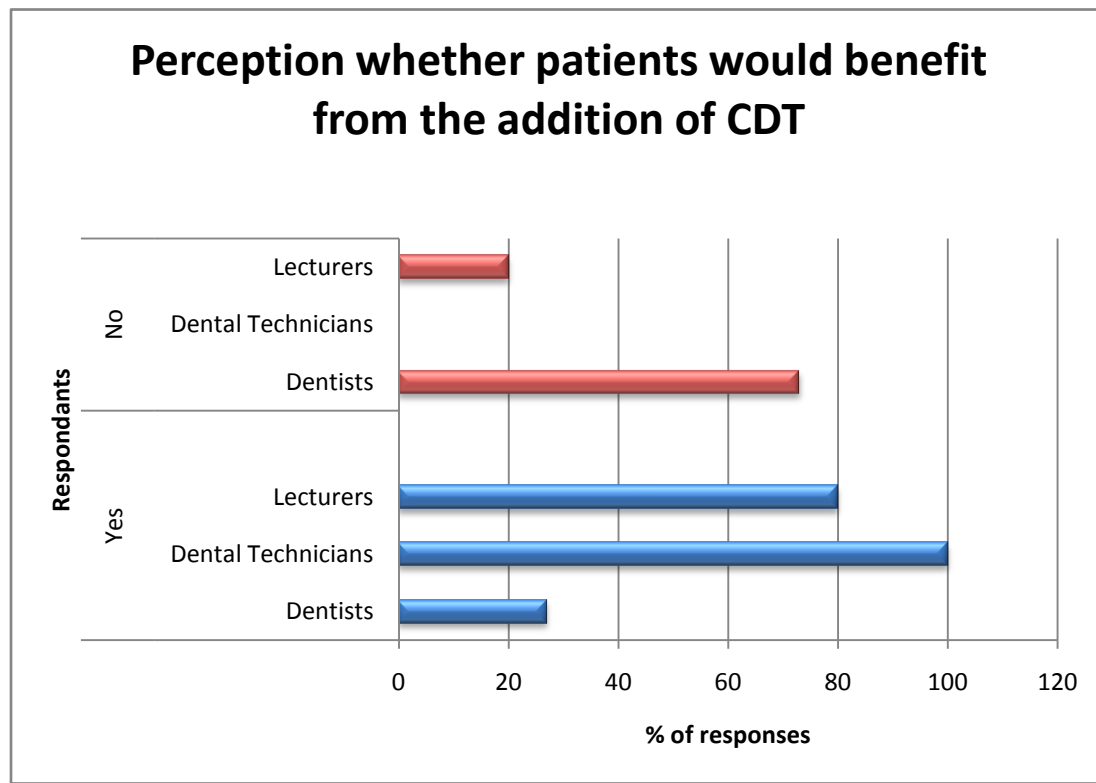
On the other extreme, some Dentists felt that technicians would benefit from undertaking some clinical work as “Dental Technicians have a better understanding of the principles of how things work. This could prove especially valuable when making dentures” (D15). Although such views were in the minority, some Dentists did believe that Dental Technicians could bring expertise to the relationship between Dentists, technicians and patients if they engaged in clinical work. “Dental Technicians would also have a better understanding of how to improve function and patient comfort in this regard with minimal adjustments to the appliance” (D15).

With this knowledge, Dental Technicians would then be able to reap the benefits and job satisfaction as they would be able to see the products of their hard work at face value. This may not only be of benefit financially, but also on a professional level, as they could take pride in the work produced in order to ensure patient satisfaction. According to one Dentist, the undertaking of clinical work by Dental Technicians would improve the communication amongst the dental team members resulting in improved service delivery for our country. “A collaborative effort to improve patient care” (D6). This would result in professional growth for all the parties concerned as they could exchange views and discuss possible solutions to the problems most of the clinicians may be experiencing with the patients. In the end, this Dentist suggested that the patient would be the most important person in the triangle and would receive the best treatment available in the least time. As indicated above, however, this view was not shared by most Dentists.



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## 4.5 Benefit to the Patient



**Figure 4.5:** A bar graph illustrating perceptions from different

### 4.5.1 Dentists' perspective on benefit to patients

“It will harm the patient—only a registered Dentist has the ability to do clinical work of this nature” (D11). Such strong negative views from Dentists about the undertaking of clinical work by Dental Technicians were common in the data. As can be seen in Figure 4.5 (above), the majority of the Dentists (73%) felt that CDT would not benefit the patients at all. They strongly believed that the patient will receive inferior quality treatment and appliances because inexperienced, untrained personnel would be working in their oral cavity and the results could be dangerous or even fatal to the patients' health. This is of particular interest as these Dentists seem to indicate that if

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CDT is approved in SA, the further training that Dental Technicians would have to receive would still be inadequate for them to be allowed to practice as clinicians. This view was expressed even though no curriculum has been developed in South Africa yet. The literature discussed in Chapter Two revealed similar views from Dentists internationally.

However, 27% of Dentists expressed the opinion that patients would benefit from the introduction of clinical practice by Dental Technicians as their needs would be met since they would receive “Specialized care by an individual who only focuses on one treatment domain”(D13). This will also result in saving time and money while optimum treatment and results are achieved. “It may save them some expense initially, since they do not have to pay a dental practitioner”. The patients who otherwise could not afford dental treatment could access such services at a fraction of the initial amount. “Possible shorter treatment time” (D24), patients would not have to remain edentulous for a long period of time while waiting for their prosthesis to be completed by a qualified Dentist. I will now look at how technicians viewed whether CDT would benefit patients.

#### **4.5.2 Dental Technicians’ perspective**

One Dental Technician gave the following analogy about the role of Dental Technicians doing laboratory-only work or also doing clinical work: “If you want an artist to paint a specific scene there are two ways of doing it: you can explain the scene to him and he can then paint it or you can take him to the actual scene” (TI). A Dental Technician is the manual person who constructs appliances for patients. This is a technical and artistic job, much like painting and this technician suggests that it helps to know what the technician is dealing with as opposed to receiving a model and instructions prescribing what is to be done instead of visually seeing what they need to and then constructing the appliance.

“I really think it would only benefit full denture patients, as most people requiring partial dentures usually ... need restorative work done as well” (TT). Some technicians are

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under the impression that CDTs would only benefit edentulous patients as they require minimal or no chair side preparation as opposed to those patients who require partial dentures and have remaining natural dentition which may require treatment prior to insertion of dentures. This is borne out of a perception that the nature of the edentulous patient cases are not as complex as those of people with remaining dentition in the oral cavity and less frequently requires the presence of a Dentist in order for an appliance to be constructed. Teeth have a tendency to drift in order to compensate for the space created due to extraction or removal of the adjacent or opposing dentition. Such drifting may cause numerous problems as undercuts may be created and if severe, this may require tooth preparation or modification to be done prior the construction of a prosthesis . It can therefore be argued that the point raised here is of utmost importance and may contribute to the final restoration manufactured.

## 4.6 Resistance

### 4.6.1 Resistance from Dentists

As has already been indicated above, from the questionnaires that were completed by the Dentists for the purpose of this study, one of the most common issues raised was the strong sense of resistance to Clinical Dental Technology. The majority of the Dentist respondents were in agreement that South Africa does not have a direct need for the CDT profession, “You are trying to create a need when one does not exist” (D14) and they strongly felt that the reason why the relevant stakeholders were identifying a need for such services unnecessarily was to impinge on their current scope of practice. Furthermore “Some Dentists [felt] that their territory [would be] ‘encroached’ upon” (D15). They were also of the opinion that there was already enough competition amongst themselves and that an additional profession was not justified “We will need less and less oral health workers doing full removable prosthetics-not more”

D16, in support of his colleagues who are against the notion of CDT, argued that “The Human Health Resources Plan of the Department of Health does not make provision for

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this kind of worker". He further stated that if there was a need for the profession, it would have been identified by the Department of Health and solutions to the problem would have been identified, strategies put in place and implemented to rectify the problem. This Dentist, and those of the same view, believed that this profession "would in effect be a third mid-level worker with hygienists and therapists" (D16). Increasing the number of personnel within the dental team with overlapping job descriptions, adding to the confusion that patients are exposed to as they are unaware of the job description of each dental member. They felt that it would be very important that the profession should be "... clearly defined and limited / monitored by the relevant authorities, otherwise it can become uncontrollably wide" (D17). There was also the fear that CDTs could end up working as Dentists which is something they are not trained for, which would be "detrimental to the dental profession and the whole image of SA Dental Services"(D18).

There was a rallying call to educators in the field to ensure that the profession of CDT was not implemented: "Many dental academics would hopefully do everything in their power to stop this disaster!" (D18). The Dentists with views such as this, felt that the addition of the CDT as a profession would be a disaster to the dental team as they felt that Dental Technicians could not master the art of being both a clinician and a technician, but that there should be a distinction between the two and they should be kept as separate professions. This can be substantiated by the response of D19, "Leave clinical Dentistry to the Dentists and the technical work to the technicians" (D19).

Some Dentists even cited the example of comparing CDT to the existing members of the dental team. They felt that an addition of CDT within this team would be a "creation of another monster which no one [was] going to control like dental therapy created by the apartheid regime" (D20) whereby the scope of practice was defined but closely related to that of Dental practitioners. It is interesting to note the reference to the apartheid regime as being responsible for introducing unnecessary levels of dental professionals. The apartheid regime is also called upon by others to explain why the current dental care in SA is so poor that CDTs are necessary.

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#### 4.6.2 Resistance as seen by Dental Technicians and Lecturers

Another problem that may be encountered with the implementation of this profession would be the registration of Clinical Dental Technicians. According to LI: “As soon as they work with a patient ... the technicians have to get registered at the Health Professionals Council not with the Dental Technicians Council” Currently there are negotiations taking place between the oral health stakeholders. There is the possibility that Dental Technology and all other oral health professions be registered under one body. This would then have implications on the registration of Clinical Dental Technicians.

This would possibly cause a problem as most Dentists are opposed to this profession, “Some Dentist will not allow this profession to be implemented without a fight. It might mean a legal battle.” (TI, 2008)

One of the arguments that Dentists raised to support their resistance of CDT was the issues of training and skilling CDTs to an acceptable standard as they felt that “There [was] no capacity to adequately train such a worker.” The respondent failed to elaborate on what angle this was from, whether they were talking about a lack of infrastructure or a lack of perhaps experts who were qualified to lecture to those enrolled into an academic institution to pursue a career in this profession. “Substandard work will be done because of the lack of knowledge of the physiological impact of supplying and fitting dental appliances” (D9). The problem of inadequately trained CDT was a major concern. This was particularly a problem for Dentists as they felt that technicians wouldn’t receive the necessary training, so the need for the formulation of a curriculum that would address this problem was identified. The point raised here was of interest and will be dealt with in detail in the next section.

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## 4.7 Professional barriers

One of the professional barriers of CDT was identified to be “Difficulties with monitoring/policing of the technologists to ensure they stay within set parameters.” (D17) This has been a problem within the dental profession where there are overlapping roles between Dentists, Hygienists and Therapists, leading to some professionals practicing outside their scope of practice due to lack of monitoring by relevant professional regulators. Should such a situation occur in Clinical Dental Technology, it may lead to “Risk of Dental Technologists placing appliances without doing the necessary clinical assessments and diagnostic records, resulting in missed pathology e.g. cavities, cancerous lesions etc.” (D17). Not only would the patient’s health be jeopardized but also the reputation of the new profession as a whole. This concern was raised in Chapter Two, as literature revealed that there had been a case of misdiagnosis by a CDT which led to a cancerous lesion going undiagnosed.

According to D29, “As soon as one deals with a large unsophisticated, and/or indigent population group there is the tendency to delegate health care provision to lower levels of health care providers. This tendency brings with it some temporary solutions, for the respective Departments of Health, but in the long run, the level of health care provision suffers from the belief that some treatment is better than no treatment”. This could be a professional barrier for CDT as it is expected of them to produce inferior quality work. It is up to Clinical Dental Technicians to ensure that they raise the standard of work produced in order to convince the critics and those who are skeptical about this profession to recognize it as one of the solutions to the dental problems South Africa is faced with

Another barrier that this new profession may be faced with is the problem of payment for services rendered which includes “medical aid fee structures” (D28). Currently, Dental Technicians are in the process of getting used to claiming directly from the medical aid with the required authorization from Dentists. This matter would need to be dealt with in order to ensure that CDTs claim directly for work done, if CDT is to become a recognized profession in South Africa. Clearly the administrative work of Dental

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Technicians would differ significantly if CDT is introduced. The extent to which such business skills should be included in the new curriculum would also need to be considered.

#### 4.8 Scope of practice

There was a dispute over the proposed scope of practice for CDTs as the stakeholders had different views about the restrictions to be placed on Clinical Dental Technicians. 27% of the Dentists felt that “Technologists will only render a complete denture service to patients. Partial dentures and other denture related services according to the Act are excluded”(D12:2008). Dental Technicians felt that it would be logical to construct both complete and partial dentures, and should there be a need for a partial denture then the patient should consult a Dentist. Internationally, this has been an acceptable procedure. In countries such as New Zealand, Clinical Dental Technicians have even broadened their scope of practice to include implant work (Briscoe, 2004).

The problem that may be faced here in South Africa would be to regulate whether CDTs adhere to the prescribed scope of practice and would practice in areas where their services are desperately required. According to LI, “...oral therapists were supposed to go to the rural areas ...But they remained within the urban areas” and it is questioned whether the same would not happen with CDTs. As stated in Chapter One, there is a massive division in access to oral health care in South Africa, between urban and rural areas. According to Naidoo et al. (2001) while “the majority of the South Africans are dependant on the State for oral health care services, less than 10% of the population utilizes such services” (2001:505). Gugushe (1999 as cited in Naidoo et al 2001) highlighted that “there were problems in the structure and management of oral health services in most of the provinces, the public dental health services are essentially Dentist driven and that there are inequalities in oral health care as delivery is essentially urban based.” It can thus be concluded that in order for CDT to fulfill its intended purpose which would be to serve the community that has been previously

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disadvantaged and has not had access to denture services, regulations and ethical ethos have to be followed by such professionals, to prevent history from repeating itself.

#### 4.9 Educational obstacles

Up to this point the chapter has considered the general perceptions of CDT held by the three stakeholder groups: Dentists, Dental Technicians and Academics. Great disparities between the views of these three groups have been highlighted and some of the possible implications have been raised. The chapter now turns to a discussion on what the views of these three groups were about educational issues related to the possible introduction of CDT.

Some respondents felt that the addition of CDT as a course at tertiary level may cripple the throughput rate of Dental Technicians, “It will require a longer training period for technicians, which might cause a lapse in rolling out of newly trained technicians” (D36). One of the main barriers identified were those of education: how such a course would be taught, where and how this would be done, leading to the educational obstacles that may be encountered.

“My concern is that we might be shot down because it is, once again, with the current economic state of South Africa, which is affecting any field, I think it’s an institutional limitation in terms of facilities or where do we teach it, how do we add it on to the curriculum?” (LE). The concern raised here is that of infrastructure in our universities. Space is very limited with all the courses that are currently being offered thus the addition of a new course would require adequate floor space and training centres to ensure that adequate training with real life simulations are achieved. Should CDT be implemented and a curriculum be developed, it would require that there are clinics where this can be done or alternative methods may be used.

Another issue raised by lecturers was that of “staff workload”. Most of the academics that were interviewed for the purpose of this study raised this issue. They felt that they



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were somewhat understaffed and barely coping with their current workloads, so the addition of another course which would be expected to be taught by them would create problems. This by no means implies that they were not willing to lecture or receive adequate training for this course, but merely that they did not believe they had enough human resources to ensure that this would be done. “I haven’t got any time to think about that. We’ve got quite a workload” (LH).

The question of whether CDT should be integrated into the current DT curriculum or whether it should be a separate course on its own was raised in both the questionnaires and the interviews. This then led to the concern of “entrance requirements”: should an equivalent diploma or degree in Dental Technology be a pre-requisite to the CDT course or should it just remain as a separate course. If it were to remain as a separate course, then what discussions need to take place in order to ensure that the entrance criterion would be a balance between that of Dentistry and Dental Technology respectively? As it stands, the minimum requirements from school are not the same for Dental Technology as for Dentistry. Dentists need a matric exemption and most universities have additional requirements for entrance to Dentistry over and above this. The entrance requirements to DT is a school-leaving certificate and many DT students have relatively low points. LE then suggested that in order for this to be achieved, “discussions... [and] deep intense workshops are required”. These should not only be restricted to Dental Technicians but also to Dentists and educational specialists, health representatives and those who would represent the general public of South Africa.

“Training should be provided by highly trained individuals with the necessary skill and experience” (D13). This was one of the concerns raised by a Dentist and in agreement with this, D29 argued that “South Africa has a tremendous shortage of adequately educated dental academics. I don’t believe that the present pool of dental academics in South Africa justifies the existence of more than one School of Dental Medicine”. According to this Dentist, current staff members in academic institutions are overworked and an additional load to what they are currently doing will lead to the dental

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educational standards being compromised. This is directly linked to the statement previously made by one of the lecturers in connection with workloads.

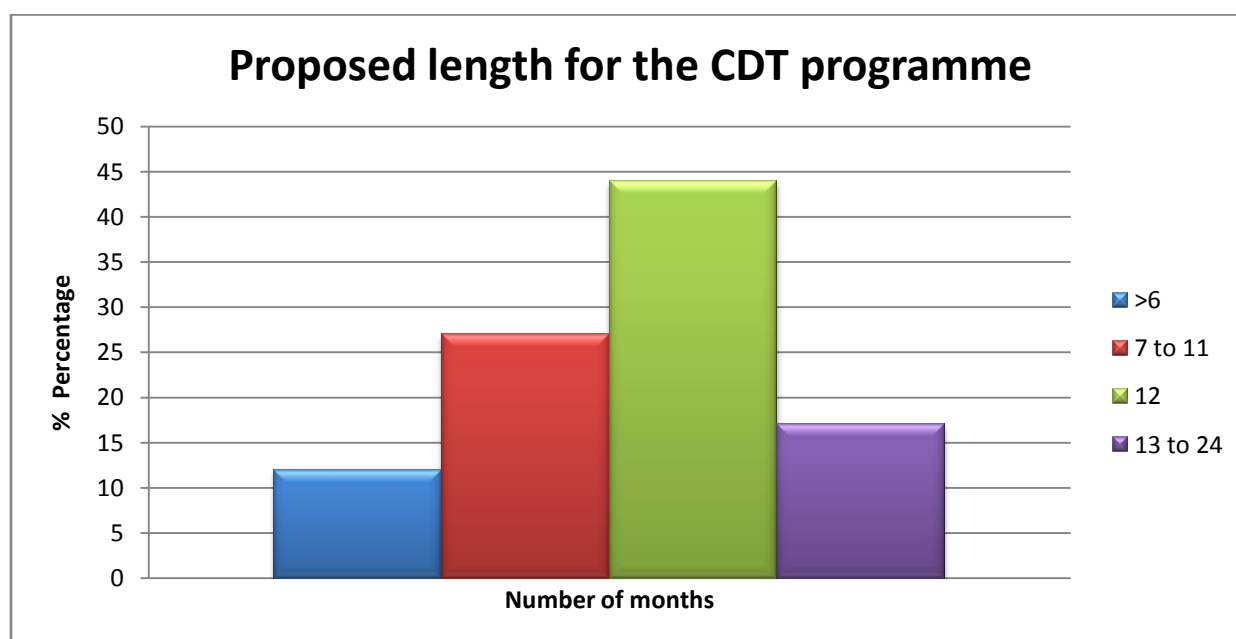
A need for “sufficient training of these technicians in the necessary diagnostic subjects such as radiology, pathology, microbiology etc” (D17) was identified. This, the academics did not dispute as they were well aware that they would have to undergo staff training and development prior to lecturing this course “Anyone can learn anything, so it’s just a matter of training. So then train us and then we will go for it” (LC). This highlights one question: whether it is that simple to train people without a change in attitude or mindsets, this quote from LC seems to demonstrate one of the worrying attitudes that were raised by the Dentists, indicating that it is the entire aspect of human interaction and patient care that would be at stake and not simply an additional set of skills to be curriculated. However, LC’s statement does appear to indicate that lecturers are committed to learn this aspect of the profession and are willing to facilitate the knowledge they would have gained for the learners. As stated it will not be an easy process but one that must be facilitated in order to ensure success. The discussion will now turn to the proposed length of the CDT course as it is important that the length chosen is feasible both on a professional and an educational level.

#### 4.10 Length of course

As previously stated, the data collected revealed different views regarding a suitable length of the CDT course. The main determinant would be how it would be structured, how it would be integrated and what the entrance requirements would be. “I can’t say it fits into third year, it fits into fourth year, you’ve got to weigh out how long it will take, what sort of impact it would have” (LE). The impact referred to here is of the content to be covered, the resources and the general standard of the competence of those students graduating from this course. This, according to some lecturers, can only be achieved if CDT is “integrated with the current curriculum” (LE) as this would ensure that learners have had a background to Dental Technology and could thus expand their

knowledge by being exposed to the clinical aspect of this profession, as opposed to school leavers who have no knowledge of the Dental field who would then be expected to specialize in one component of Dental Technology. Further discussions need to be embarked upon surrounding this discussion as there are many important factors that may contribute to this and the advantages and the disadvantages of such need to be weighed up in order to ensure that a workable solution is achieved.

The decision about the duration and positioning of the CDT aspects in the curriculum may also depend on how the notion of clinical care is conceptualized: would it be a fundamental shift in the discipline of DT to incorporate patient care or is it conceptualized as just an additional set of skills to be added? This relates to whether the inclusion of clinical aspects affects the notion of Dental Technology as a discipline or whether it leaves DT as it presently exists as a discipline with just some 'extra bits' added. These are some of the discussions that must be considered prior to formalizing the CDT course. Figure 4.6 below illustrates the views of the Dentists, Dental Technicians and lecturers on how long the course of CDT should be after qualifying as a Dental Technician/ Technologist.



**Figure 4.6:** A graph illustrating the Dentists, Dental Technicians and Lecturers collective views on how long the education period for CDTs should be.

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It has been previously outlined that a lapse of output of newly trained Dental Technologists may surface due to the extended training period of technicians. To eliminate such problems, LE suggested that “For the older generation a National Higher Diploma (NHD) or an equivalent to a Bachelor of Technology (B.Tech) degree should be the entrance requirements, and there should be an additional year of a separate curriculum for Clinical Dental Technology, after qualification as a dental technologist or technician”. If CDT is integrated into the DT programme, the time spent by the technicians in training institutions would be longer. This may result in a shortage of technicians in industry as the training which would have been three to four years long would be converted to five to six years. Even after this time period, it may not be guaranteed that they would work as Dental Technicians as they would also have the option of specializing as Clinical Dental Technicians. This would leave the other three disciplines of Dental Technology (i.e. Crown and Bridge, Chrome and Orthodontics) neglected. According to LD, it would be illogical that a “person in order to become a denturist, which is not what a Dentist does, has to now study longer than a Dentist just to do a portion of what a Dentist does” .

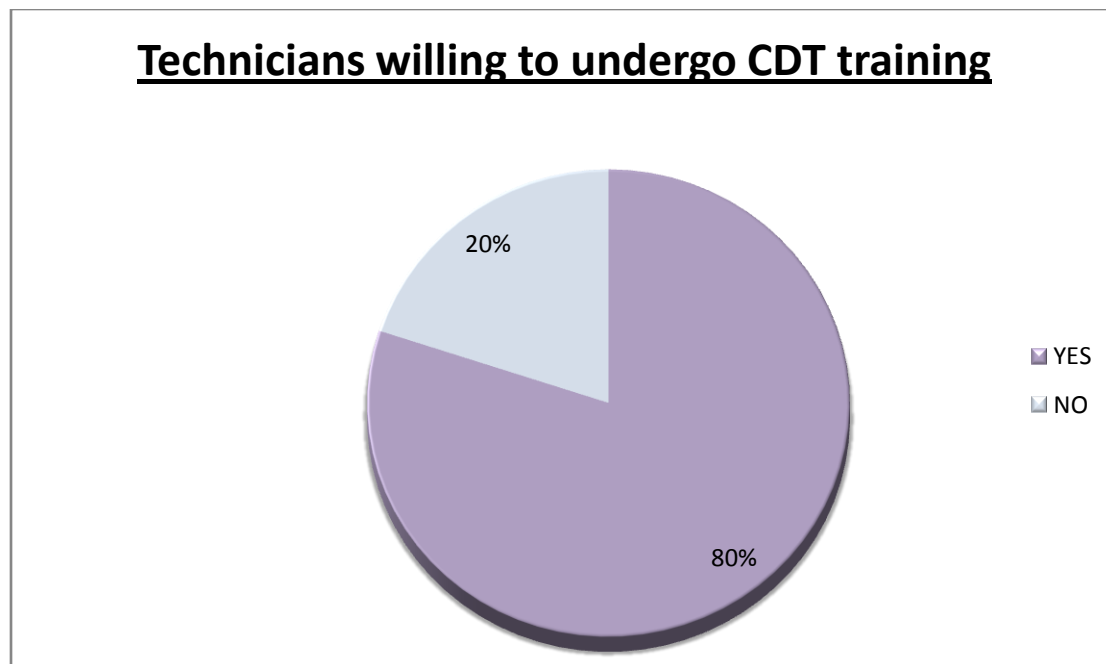
To counteract this dilemma, LC suggested that “third year should be a pre-requisite for this course”. This would give the learner an option to either pursue a B.Tech degree in Dental Technology, or branch off to Clinical Dental Technology or alternatively go out and work as a Dental Technician. However, he pointed out that those who are selected to pursue the CDT course should be screened by the department first to ensure that they exhibit the capability to handle patients as “you can’t have an abrasive person dealing with patients, so even in that aspect, there should be a profile of the person, and to see that they can actually deal with patients” (LC).

At the other extreme LF felt that “it’s irrelevant what the time studied is beforehand because with the clinical aspect and the exposure that you need I think at least two years training is necessary before you can say you’re unleashed on the public, because there is no control of what is happening in your practice and you are working directly with patients.” He was not concerned with the time spent training but rather with the quality of CDTs that would be produced by the institution. There were variations

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between what people perceived as an adequate time period for this course ranging from “five years of studying” (D30) to “one night a week for six months”(TJ). LD suggested that it was necessary to “Formulate a two-year syllabus from the data that is available ”. He felt that two years would be adequate to cover the subject matter required for one to practise as a CDT. While most technicians and certain lecturers felt that “a full academic year or alternatively over two years when it is done on a part-time basis” (TG, 2008) was an acceptable length of study to cover the required content. This time period coincides with that of the CDT courses offered in other countries where Clinical Dental Technology is offered such as the George Brown College in Toronto.

From the data collected, the notion of studying further and becoming CDTs was positively accepted by the Dental Technicians that participated in this study. As illustrated in figure 4.7, 80% of the respondents were willing to undergo training. This clearly shows that Dental Technicians want to broaden their scope of practice, “I will be the master of my own destiny”(TD). The twenty percent of the respondents that did not want to study further had several valid reasons such as, “I am four years from retirement” (TC) and this meant that further training would not be of benefit to him. Others were happy with their current working conditions and did not see the need to further advance themselves in the clinical field as they “do not want to work with patients” (TK). This issue of vocation was raised by one of the academics who indicated that not every person would have the passion to work with patients as it requires a certain level of tolerance and human interaction skills.



**Figure 4.7:** A pie graph illustrating the percentage of Dental Technicians willing to train as CDTs

#### 4.11 Institutional collaboration

Academic respondents pointed out that it would be of benefit for the CDT profession to collaborate with existing dental schools when formulating a curriculum and teaching CDTs: “the theoretical part would be heavily reliant on the clinical part, so we would have to actually explore the idea of incorporating this programme in collaboration with universities that offer dentistry” (LF). In that way, it would be easier to ensure that learners receive the education that is relevant and taught by experts within that field. With there currently being very few (legally qualified) Clinical Dental Technicians in South Africa, it would be very difficult to source academics who would be interested in lecturing this to students who may be interested in this course.

“Initial training of Dentist lecturers on how much information to impart to the technician student without overwhelming them with too much unnecessary information” (D6) Academics felt that it would be imperative that such collaborations are done when an outline of the curriculum is in place. This would ensure that the lecturers impart relevant

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knowledge to the technicians. This is very important as failure to negotiate this may lead to misconceptions and miscommunication. Furthermore, this may unnecessarily increase the length of the education period that a CDT may be subjected to.

“Make use of part-time lecturers” (LK). This suggestion that part time lecturers be used, may counteract the problem of staff workload. These could be from other institutions or alternatively be from industry. But the biggest complaint with this profession is that it is still a new concept in South Africa, thus, to find people to confidently impart knowledge on this subject matter who are already not affiliated with an institution may be problematic. One cannot expect “a Dental Technician [to teach as they] definitely wouldn’t have enough anatomy and physiology and all of the clinical background” (LF). Those who are selected to teach CDT need to have the relevant background and experience. The idea of introducing part time lecturers into the programme needs to be carefully evaluated as it has been previously stated, in some institutions “... there [are] not enough staff [members] to bring in another programme” (LJ).

#### 4.12 Curriculum formulation

“Curriculum development is an extremely complex and intricate process involving many decision situations” (Finch and Crunkilton, 1993:43). It is imperative that a curriculum formulated for CDT is an internationally acceptable training programme that caters for the local needs within the guidelines of the South African Qualifications Authority (SAQA), the National Qualifications Framework (NQF) and the National Standards Body for Health Sciences and Social Services. The data revealed that one institution had already started formulating a curriculum for CDT. This institution took it upon themselves to take up the challenge as they could see the need for such education in South Africa. According to LI who was actively involved in this formulation, “We looked at what a Dental Technician needs to be able to make dentures, and we worked out the whole syllabus around that”. This never transpired due to the “people who were concerned with Clinical Dental Technology at that stage were not in agreement with what we did. They wanted to go the whole scope whereas we thought we should get in.

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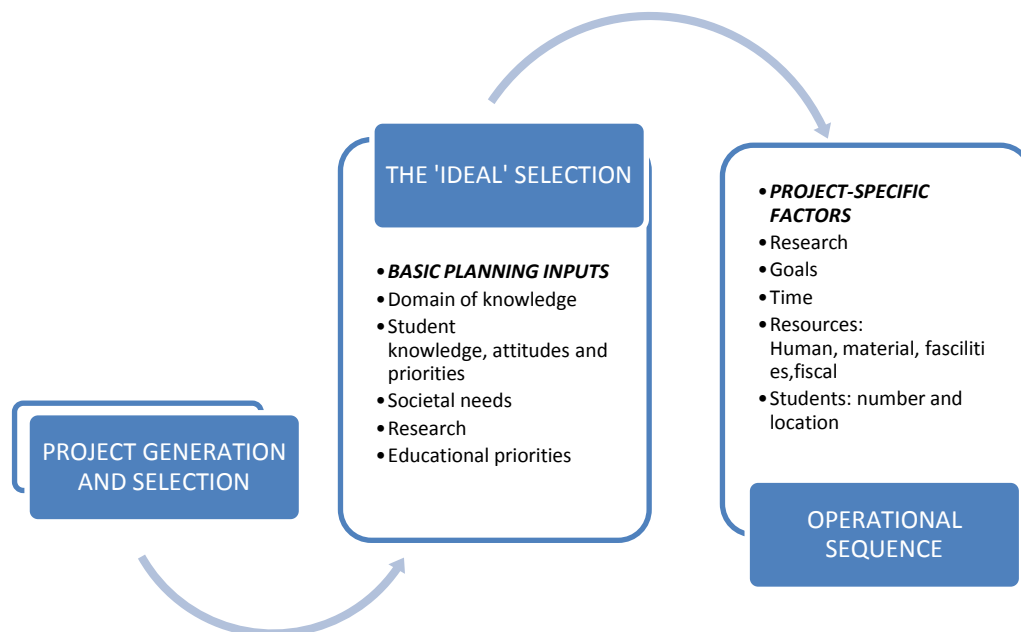
...Doing things in the politically correct fashion” (LI). LI argued that there was a dispute amongst the stakeholders on the content of the syllabus they were trying to formulate. Some wanted to broaden their scope of practice whereas they were under the impression that they should start off by covering the basics and get the course registered and then they could expand on the scope of practice once this had been achieved.

This is the problem faced with curriculum development: all relevant stakeholders must be in agreement on what is to be done in order to ensure success. “The decision to create or redesign a course or curriculum should not be taken lightly, since it will require committing time and effort. In addition, entering into this activity can have a direct impact on the professional careers of the faculties involved” (Diamond, 1989:21). As Diamond points out, creating a curriculum is not an easy process as one has to look at the long term implications of the course to be constructed, and also the assessment practices to be used and the content to be selected. This process cannot be a ‘one man show’ as it requires different views from stakeholders who may be affected by the new profession. These should include an “instructional developer, faculty representatives... with a strong academic base, and representatives from the relevant departments... Industry representatives, content experts and coordinators” (Diamond, 1989:41). Involvement of such persons may become problematic as the data from this study shows that they do not all agree on what should be done. It is thus imperative that a compromise is reached for the benefit of the course to be formulated. Allais (2007:2) argues that “the idea of using learning outcomes to drive curriculum reform seemed to be a useful way of transforming the authoritarian apartheid curriculum, because different stakeholders would have an opportunity to provide input into the creation of the outcome statements which made up the qualification.” Although Allais is critical of the OBE system, she does indicate that the focus on inputs from multiple stakeholders is an important one.

The process of formulating a curriculum has numerous stages. As the diagram 4.8 (Diamond, 1989:101) below illustrates, the initial process is to select what may be ‘ideal’ to an operational sequence, in the face of what the reality of the situation is. There are



several factors that may influence these decisions such as accreditation requirements, credit restrictions, staff constraints and the effectiveness of the existing programmes. The data collected from those who participated in this study provides a mixed picture. The 'domain of knowledge' in the 'Ideal' phase of Diamond's (1989) model is highly contested. The notion of 'societal needs' is also argued about in this study. Data has revealed that there are mixed views on whether there is really a need for CDT in South Africa. The Dental Technicians seem to think that there is, while the Dentists believe that the oral team can survive without the addition of such personnel. Perhaps it is imperative that views of other members of the oral team and maybe those of the society in general are taken into account in order to conclusively decide whether the CDT profession would be beneficial in South Africa, as the views of Dentists and Technicians may be clouded with issues of professional restrictions and 'territories'.



**Figure 4.8:** A flow chart illustrating the first phase of project selection and design from Diamond (1989:101)

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“It is important that [a curriculum] content reflects the needs of the working world” (Finch and Crunkilton, 1993:125). The respondents had a few ideas on how the curriculum for CDT should be formulated. Most felt that it would not be a difficult process as the current Dentistry course that is offered in South Africa could be used as a solid foundation: “take the dental curriculum, what Dentists do as a curriculum, then you will basically see that there’s a prescribed syllabus that allows a Dentist to place dentures in the mouth” (LD). This statement is in agreement with an argument raised by Finch and Crunkilton (1993:72) that “before any curriculum planning decisions can be made, consideration must be given to assessing current programs”. As a foundation, this could aid in the selection of what would be relevant for Clinical Dental Technicians, as it would be pointless to educate them on extractions if their scope of practice does not allow them to do such procedures. Ideally, what the syllabus should entail would be “Anatomy, Holistic approach to patient care and Preventative care” (D13). TG also suggested taking “the International Baseline Competencies into account.” These are the guidelines that were formulated by the IFD to ensure that the approved institutions to offer the course uphold a certain standard as outlined in Chapter Two of this thesis.

It may seem as if one could randomly select and decide which content is most important to include in a curriculum, but this is far from reality. In an educational setting, the curriculum developer is confronted with several factors that may affect what should actually be taught. These factors may include “time and money available, internal and external pressures, federal, state, and local requirements; skills needed by employers; academic and vocational education content concerns” (Finch and Crunkilton, 1993:128).

From the data collected, it was apparent that most respondents felt that curriculum development for CDT was an easy process and it was just a matter of incorporating it into the current Dental Technology programme. However this is not true, as Finch and Crunkilton (1993) have pointed out: there are a lot of factors that need to be taken into account. As stated in Chapter Two, a curriculum is not just a syllabus, it also involves how a course would be taught and the assessment practices. It is therefore imperative that “lecturers, institutional reps from various institutions [from] DUT, CPUT and TUT... need to be work-shopped significantly. Furthermore, representation from the Centre for

Higher Education Development (CHED), the educational sector, representatives from the various institutions on a level need to be involved” (LE). Content selection must be based on the data that has to be collected prior this process. Some of these have been outlined in Table 4.1 below. These would be imperative should the CDT curriculum be formulated in SA as they would for a foundation of a feasible outline for the course.

<b>General Standard</b>	<b>Data</b>
<ul style="list-style-type: none"> <li>• <b>Prospective enrollment</b></li> </ul>	<ul style="list-style-type: none"> <li>• Student interest</li> <li>• Student ability</li> <li>• Enrollment trends</li> <li>• Drop out rates</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Availability of qualified instructor</b></li> </ul>	<ul style="list-style-type: none"> <li>• Background of current instructors</li> <li>• Qualification of local persons</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Available facilities</b></li> </ul>	<ul style="list-style-type: none"> <li>• Current facilities</li> <li>• Potential for expansion or remodeling</li> <li>• Funds available</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Available equipment</b></li> </ul>	<ul style="list-style-type: none"> <li>• Current equipment</li> <li>• Funds available</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Employment opportunities</b></li> </ul>	<ul style="list-style-type: none"> <li>• follow-up of graduates</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Delivery of program that upholds established guidelines</b></li> </ul>	<ul style="list-style-type: none"> <li>• Current class schedules</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Other similar programs available</b></li> </ul>	<ul style="list-style-type: none"> <li>• Current and planned</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Opportunities for cooperative programs</b></li> </ul>	<ul style="list-style-type: none"> <li>• Possibilities for collaboration with institutions and industry</li> </ul>

**Table 4.1:** A table illustrating possible sources of data requires to determine if programme standards can be met. (from Finch and Crunkilton 1993:65)

“When curriculum development is taking place, the instruction that is to be built on this framework must be kept in mind” (Finch and Crunkilton, 1993:11). Finch and Crunkilton further stress the importance of looking at the process of formulating a curriculum holistically. This may be beneficial in the formulation of a CDT course. The outcomes would give an indication on the selection of courses that would benefit the learners to be

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competent in their scope of practice. Perhaps the Develop A Curriculum (DACUM) approach may also be used as it “allows more relevant content to be identified and incorporated into the curriculum” (Finch and Crunkilton, 1993:146). This process (DACUM) may be defined as “a single sheet skill profile that serves as both a curriculum plan and an evaluation instrument of occupational training programs” (Adams, 1975:24). Although DACUM has been criticized as being a technician approach to developing a curriculum, the practical approach of DACUM might be useful for the development of CDT. However, it is imperative that this is done after there have been negotiations between the various stakeholders about the role and position of the new profession.

#### 4.13 Summary of the results

The data which was collected from Dentists, Dental Technicians and Dental Technology lecturers revealed very useful information with regards to the curriculum development of the CDT programme. The results above have revealed that there are different views with regards to the addition of clinical practice to the scope of practice for Dental Technicians. Data has revealed that it is questionable whether Dental Technicians could address the problem of service delivery in South Africa without interfering with their current professional descriptions. Even though the addition of clinical practice could possibly benefit both the Dental Technology profession and the quality of prosthetic work received by the patients, the manpower to cope with such advancements is somewhat questionable.

The results also reflected that whilst the educational institutions that offer training for Dental Technicians responded positively to the notion of adding clinical practice to the Dental Technology curriculum, concern was expressed on whether they were adequately equipped to lecture this discipline effectively. Educational obstacles were outlined and a need for further training in the clinical field was identified. Furthermore, the option of institutional collaboration with institutions that offer clinical training to members of the dental team was identified. The results further outlined what the course content for Clinical Dental Technology should be and revealed the need for further

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workshops and different forums to be opened for academic discussions on the issue of curriculum for this course.

#### 4.14 Conclusion

“Decision making in the educational arena involves policy and operational decisions... both of these have a direct influence on whether curriculum will be successful” (Finch and Crunkilton, 1993:69). This chapter has outlined the perception of Dentists, Dental Technicians and Dental Technology lecturers on the advantages and disadvantages of the addition of clinical practice to the current Dental Technology curriculum. Furthermore, it delineated possible problems that may be encountered when formulating the curriculum for CDT and the possible solutions thereof.

With the current higher education transformation that is occurring in South Africa and the new HEQF that has been formulated and implemented, it is important to note how these would affect the proposal of a CDT course should this profession be implemented. These discussions will be embarked upon in the next chapter.

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## **CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

The purpose of this study was to gather perceptions of the addition of clinical practice to the current Dental Technology curriculum that exists in South Africa. A detailed analysis of the themes identified from the responses of the perceptions collected from Dentists, Dental Technicians and Dental Technology Lecturers was provided. Many issues that needed to be considered when formulating a programme for the Clinical Dental Technology course were identified.

### **5.2 Overview of findings**

From the data collected, it is evident that not all stakeholders of the dental team will be satisfied with the addition of Clinical Dental Technology programme. This is due to many underpinning issues that have been identified in Chapter Four of this thesis. One of the main reasons that could be the cause of this could be directly related to the clarity of the role of a Clinical Dental Technician within the dental team that currently exists in South Africa. It is therefore recommended that the concept of this profession is clarified, as data in this study revealed that there was no clear distinction on the role that these professionals would play in the Oral Health care of South Africa.

One of the strong arguments behind the introduction of CDT in South Africa was that of the gap that exists in service delivery, in terms of oral health care, especially in the rural communities. Even though statistics have shown that there is a shortage in the number of oral health professionals to service the public sector, it may be beneficial to weigh up the advantages and disadvantages of introducing the clinical practice to the Dental Technicians' scope of practice. The results of this study revealed that there are a limited number of Dental Technicians in the country and whether these technicians would be

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able to make a difference in service delivery to the public without creating a problem in terms of a shortage in Dental Technicians that would adhere to the traditional scope of practice for technicians, is still a matter of intense debate.

The main aim of introducing this new profession (CDT) would be to bridge the gap whilst maintaining sound ethos and good practice. It is imperative therefore that if the profession of CDT is introduced, its professionals would have to adhere to an ethics of patient care and professionalism. As indicated in Chapter Four, other dental professions which were added to allow for greater access to oral care, have raised problems where individuals failed to adhere to their scope of practice and explored other avenues within the dentistry profession which were not in their field of expertise. It is thus recommended that should CDT be added as a profession, a regulatory board be formulated in order to monitor the development of this new profession and ensure that rules are enforced to prevent Clinical Dental Technicians from practising duties beyond their scope of practice.

The responses received from the Dental Technology academics revealed that all the three institutions that offer the Dental Technology programme are willing to offer the CDT course. However, these institutions felt that they were not adequately equipped to take on this responsibility and that this need for additional human and physical resources would have to be addressed. There was a strong feeling that collaboration with traditional Universities that offer training to Dentists, Therapists and Hygienists would benefit the course and strengthen the relationship amongst the dental team.

As Stenhouse (1975:4-5) pointed out, “A curriculum, like the recipe for a dish, is first imagined as a possibility, then the subject of experiment”. This has to be borne in mind when formulating a curriculum for this new profession as curriculum is not only about outlining the content, but also about the way it is taught and the assessment practices used, amongst many other considerations. It may be of benefit to revert to international models as they may prove to be a good source to formulate a good foundation for this ‘recipe’. The Baseline Competency guide formulated by the International Federation for Denturists that has been discussed in Chapter Two of this thesis could be used as a guide for content selection. This by no means implies that by adapting this guide we

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would have a curriculum to be used by Clinical Dental Technicians. The literature reviewed indicated that some former Technikon sector academics have limited curriculum formulation expertise due to the convenor system. There are two changes that are currently taking place both in the Dental Technology profession as well as in the Higher education sector, and both of these may have implications for any new programme that may be formulated. There are discussions that DT may be registered under the HPCSA and that the DT course may be changed to a university degree on the new Higher Education Qualifications Framework instead of the National Diploma and B.Tech Degree which was offered by the former technikon sectors. This will directly influence the enrolment of learners into the programme because a national senior certificate exemption is a minimum entrance criterion for degree study. The status of the CDT qualification would have to be considered within any revisions of the DT programme.

As stated in Chapter Four, there are changes within the educational sector that may have an impact of the NQF level of Clinical Dental Technology. In the Higher Education Qualifications Framework (Department of Education, 2007), there is no longer a B.Tech degree which has until now been offered by universities of technology and held at the same NQF level as an Honours Degree obtained from a University. Instead there will be an Advanced Diploma which is at the lower NQF level 7, the same level as a Bachelor's Degree. By prescription, the purpose of this diploma is to "provide intellectual enrichment, enhance flexibility in the light of changing circumstances, enable change in career path or offer... applied specialization" (Government Gazette, 2006). These changes in the national programme offerings registered on the NQF will add an additional issue to be considered in the development of a CDT programme. It may be that the CDT is structured as an Advanced Diploma which could be taken after the pre-requisite Diploma in DT is completed.



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### 5.3 Recommendation for practise

It is recommended that a study be done to assess whether the academics of traditional universities that offer training to dental personnel would be willing to take on the responsibility of working in collaboration with the Universities of Technologies that may offer training for Clinical Dental Technicians. As it stands, there is minimal (if any) collaboration that exists between these institutions. This is important as they may find that there are synergies between CDT and one of the dental courses offered in Universities, such as Dental Hygiene.

It is also recommended that a task team is selected and an intense workshop takes place amongst stakeholders in oral health care, academics and curriculum experts is run to provide a place for discussion of the various interests from different stakeholder groups. This would aid in proper channels being followed in terms of formulating and implementing a curriculum for Clinical Dental Technology. Furthermore, this would assist in determining the entrance requirements, content selection, assessment practices and the structure of the programme holistically.

It is also imperative that the institutions are assessed to gauge whether there will be sufficient infrastructure for the adequate training of Clinical Dental Technicians or alternatively if there would be other ways to which learners could be exposed to clinical practice, for example by incorporating a collaboration with state hospitals for work-integrated learning aspects of the programme.

The Dental Technicians must take an active role in ensuring that their profession is improved. As it stands, the responses reflected that some appear to passively accept whatever role transformation does or does not happen. There needs to be an increased concern within this sector with global changes occurring in the field.

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## 5.4 Areas for future study

It is recommended that further research be done using a larger sample size. The response from the questionnaire sent out to Dentists and Dental Technicians was poor, thus it was not possible to draw a definite conclusion on the general perception of these groups in terms of Clinical Dental Technology.

A study needs to be undertaken in order to determine the views of other personnel within the dental team as well as the views of other academic institutions that offer training for any member of the Dental team.

A major impetus for South Africa to introduce CDT is the lack of dental provision to disadvantaged people, particularly in the rural areas. This study indicated that this new profession can go some way to address this. But further studies are needed as to the extent to which the new profession would address this issue and how the curriculum could ensure a focus on working in this sector.

## 5.5 Closing statement

The amendment bill to the Dental Technicians Act was made in 1997, allowing Dental Technicians the opportunity to practise as Clinical Dental Technicians through adequate training. It has now been eleven years and no training for such persons exists in South Africa. The findings of this study indicate the need for a formulation of a CDT curriculum but raise a number of cautions. The CDT will form part of a dental team and will require the professional support of a Dentist, amongst others. The data in this study shows strong negative views of Dentists towards the introduction of CDT. These issues would need to be taken into consideration at a national structural level as well as by those involved in developing a curriculum.

Another major finding was the need, from a curriculum perspective, to consider how the introduction of clinical work fundamentally affects the identity of the Dental Technicians.

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The introduction of patient care could be considered simply in terms of the addition of a few technical skills or could be seen to require a significant shift in the entire curriculum to reflect a focus on the patient as a whole. Practical consideration such as who would be qualified to teach a revised curriculum and how such a revised curriculum would be structured in terms of content and length of study were also discussed. The institutional impact, such as needing clinical facilities, was discussed alongside a consideration of such facilities would be needed by members of this new profession once they have graduated.

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## Appendix A: Permission to conduct interviews with academics



Tshwane University  
of Technology

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### **Directorate of Research, Innovation & Partnerships**

Ref. number: CRIC Q5-2008 (P Mqadi)

Enquiries: Mrs Dilla Wright

Tel. (012) 382-5154

[wrightd@tut.ac.za](mailto:wrightd@tut.ac.za)

20 March 2008

Ms P Mqadi

Department of Dental Sciences  
Durban University of Technology  
P O Box 1334

Durban

4000

Dear Ms Mqadi

**RE: Application for permission to conduct semi structured interviews with the academic staff of the Dental technology program at the Tshwane University of Technology**

We refer to your request pertaining to the above-mentioned.

Further comments and recommendations from the reviewers are included and attached for your perusal. The questionnaire is approved for distribution.

Please direct all enquiries to the undersigned.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'P.D.F. Kok'.

**PDF Kok (Prof)**

**Director Research, Innovation & Partnerships**

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### **Reviewer 1:**

I have gone through the research proposal of Ms P Mqadi of DUT, and I have concluded that the research issue being investigated is very relevant, as is the type of information she wants to gather at TUT.

I was also satisfied by her answers to the very comprehensive checklist for ethical issues which was submitted as part of her proposal.

My recommendation is therefore that she be given permission to conduct her proposed semi structured interviews with the academic staff of our Dental Technology program.

### **Reviewer 2:**

I perused the documents of Ms Precious Mqadi who is registered for her MTech Dental Technology at the Durban University of Technology. Her interview schedule and informed consent documents are in order.

I want to recommend that she **be granted permission** to conduct the proposed semi-structured interviews with the academic staff of the Dental technology programme. Further, I want to recommend that the FRIC request her to submit a summary of the research results to the course-coordinator of the TUT Dental Technology programme at the conclusion of her study. In that way, TUT can directly benefit from the outcome of this study

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## **Appendix B: Interview Schedule**

OBJECTIVES FOR THE SEMI-STRUCTURED INTERVIEW THAT WILL BE CONDUCTED WITH THE DENTALTECHNOLOGY ACADEMIC STAFF OF DUT, TUT AND CPUT:

- A. Awareness of the current role transformation in the Dental Technology profession
- B. Personal views on Clinical Dental technology as a profession.
- C. Obstacles that might be faced by this new profession should Clinical Dental technology be implemented in South Africa.
- D. Guidelines for clinical dental technology curriculum development.
- E. Implications on the current dental technology curriculum should a curriculum for clinical dental technology be proposed to the institution.
- F. Preparedness of current lecturers in the institution to lecture on the clinical aspect of this profession.
- G. Educational limitations that can be foreseen with clinical dental technology.

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## Appendix C: Information letter for Dental Technology Lecturers



*Dear Dental Technology Lecturer*

### **REQUEST TO PARTICIPATE IN THE INTERVIEW PROCESS**

I am a student pursuing a Master's degree at the Durban University of Technology through the Department of Dental Services and would be very grateful if you would participate in the interview process.

*The title of my thesis is:*

### **PERSPECTIVES ON THE ADDITION OF CLINICAL PRACTICE TO THE DENTAL TECHNOLOGY CURRICULUM**

*Background to the study:*

As you may know, the Dental Technology profession in South Africa is currently undergoing role transformation. In the past, dental technicians were restricted to laboratory work only and were not permitted to have direct contact with patients.

In 1997 an amendment to the Dental Technicians Act was made. This amendment allows dental technicians to broaden their scope of practise, through further education, into the clinical aspect of the profession. To date, no such training is being offered by any of the three institutions in South Africa that provide training for dental technicians who would like to pursue this career path.

### **Purpose of the study:**

The purpose of this study is to evaluate the impact that the possible addition of the clinical aspect of this profession will have on the current curriculum that is being used in the three academic institutions that offer dental technology in South Africa. This study also aims to assess the institutional readiness of the transitions that may occur as training of Clinical Dental Technologist emerges.

---

To achieve these aims, I am collecting data from Dentists, Dental Technicians and from academics in the area of Dental Technology.

**Confidentiality:**

The information which you furnish will be treated with the utmost confidentiality and your anonymity is assured. Participation in this interview is completely on a voluntary basis; however your participation in this study will be of great importance. Without the views of the academics who would be affected by the proposed changes, my study will not be complete.

Please feel free to contact me or my supervisor with any questions or concerns.

Your time, opinions and assistance with this project are valuable and are greatly appreciated.

*Yours sincerely*

Ms N.P Mqadi

(Bachelor of Technology: Dental Technology, Reg. Dental Technologist)

Research Student

Tel: 031 204 2850 / 082 428 4785

E-mail: [preciousm@dut.ac.za](mailto:preciousm@dut.ac.za)

Supervisor

Dr. S. McKenna

E-mail: [mckenna@ukzn.ac.za](mailto:mckenna@ukzn.ac.za)



---

## Appendix D: An informed consent form for Dental Technology Lecturers



### INFORMED CONSENT FORM

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Title of Research:** Perspectives on the addition of clinical practice to the Dental Technology curriculum.

Name of Supervisor : Dr. S. McKenna

Name of Research Student : N.P Mqadi

Name of Department : Dental Services

The purpose of this study is to evaluate how the addition of the clinical aspects of the Dental Technology profession will impact the curriculum that is currently being offered by the three South African academic institutions that offer this course.

Please tick the appropriate answer:

1. Have you read the participant information letter? YES / NO
2. Have you received enough background information to this study? YES / NO
3. Do you understand that your anonymity and confidentiality is assured? YES / NO
4. Do you understand the implications of your involvement in this study? YES / NO
5. Do you understand that you are free to withdraw from this study:
  - a) At any time YES / NO
  - b) Without having to give a reason for withdrawing YES / NO
6. Do you agree to participate in this study? YES / NO

Participant's name : \_\_\_\_\_ (in block letters)

Signature : \_\_\_\_\_

Witness name : \_\_\_\_\_ (in block letters)

Signature : \_\_\_\_\_

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Should you have answered NO to any of the above questions above, please do not hesitate to contact either myself or my supervisor who will be able to assist you.

Research student : Precious Mqadi

Signature : \_\_\_\_\_

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## Appendix E: Participant information for questionnaire to Dentists



*Dear Doctor*

I am a student pursuing a Master's degree at the Durban University of Technology through the Department of Dental Services.

Research title:

**PERSPECTIVES ON THE ADDITION OF CLINICAL PRACTICE TO THE DENTAL TECHNOLOGY CURRICULUM**

Background to the study:

The Dental technology profession in South Africa is currently under role transformation. In the past, dental technicians were restricted to laboratory work only and were not permitted to have direct contact with the patients.

In 1997 an amendment to the dental technicians Act was made. This amendment allows dental technicians to broaden their scope of practise through further education into the clinical aspect of the profession. To date, no training is being offered by any of the three institutions in South Africa that provide training for dental technicians who would like to pursue this career path.

**Purpose of the study:**

The purpose of this study is to evaluate the impact that the possible addition of the clinical aspect of this profession will have on the current curriculum that is being used in the three academic institutions that offer Dental technology in South Africa.

This study also aims to assess the institutional readiness of the transitions that may occur as training of Clinical Dental Technologist emerges.

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**Confidentiality:**

The information which you furnish will be treated with the utmost confidentiality and your anonymity is assured. Completion of this questionnaire is completely on a voluntary basis; however your participation in this study will be of great importance.

You are free to withdraw from the study at any stage.

Please return the questionnaire either by e-mail or alternatively in the stamped addressed envelope included for your convenience.

Your time, opinion and assistance with this project are valuable and greatly appreciated. Please complete the attached Consent Form.

*Yours sincerely*

.....

N.P Mqadi

Research Student

(B-Tech: Dental technology

Reg. Dental Technologist)

Tel: 031 204 2850 / 082 428 4785

E-mail: [preciousm@dut.ac.za](mailto:preciousm@dut.ac.za)

.....

Dr. S. McKenna

Supervisor

(PhD: Education)

E-mail: [mckenna@ukzn.ac.za](mailto:mckenna@ukzn.ac.za)

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## Appendix F: An informed consent form for Dentists



### INFORMED CONSENT FORM

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Title of Research:** Perspectives on the addition of clinical practice to the Dental Technology curriculum.

Name of Supervisor : Dr. S. McKenna

Name of Research Student : N.P Mqadi

Name of Department : Dental Services

The purpose of this study is to evaluate how the addition of the clinical aspects of the Dental Technology profession will impact the curriculum that is currently being offered by the three South African academic institutions that offer this course.

Please tick the appropriate answer

1. Have you read the participant information letter? YES / NO

2. Have you received enough background information to this study? YES / NO

3. Do you understand that your anonymity and confidentiality is assured? YES / NO

4. Do you understand the implications of your involvement in this study? YES / NO

5. Do you understand that you are free to withdraw from this study:

a) At any time YES / NO

b) Without having to give a reason for withdrawing YES / NO

6. Do you agree to participate in this study? YES / NO

Participant's name : \_\_\_\_\_ (in block letters)

Signature : \_\_\_\_\_

Witness name : \_\_\_\_\_ (in block letters)

Signature : \_\_\_\_\_

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Should you have answered NO to any of the above questions above, please do not hesitate to contact either myself or my supervisor who will be able to assist you.

Research student : Precious Mqadi

Signature : \_\_\_\_\_

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## Appendix G: Participant information letter to Dental Technicians



*Dear Technician*

I am a student pursuing a Master's degree at the Durban University of Technology through the Department of Dental Services.

Study Title:

**PERSPECTIVES ON THE ADDITION OF CLINICAL PRACTICE TO THE DENTAL TECHNOLOGY CURRICULUM**

Background to the study:

The Dental technology profession in South Africa is currently under role transformation. In the past, dental technicians were restricted to laboratory work only and were not permitted to have direct contact with the patients.

In 1997 an amendment to the dental technicians Act was made. This amendment allows dental technicians to broaden their scope of practise through further education into the clinical aspect of the profession. To date, no training is being offered by any of the three institutions in South Africa that provide training for dental technicians who would like to pursue this career path.

**Purpose of the study:**

The purpose of this study is to evaluate the impact that the possible addition of the clinical aspect of this profession will have on the current curriculum that is being used in the three academic institutions that offer Dental technology in South Africa.

This study also aims to assess the institutional readiness of the transitions that may occur as training of Clinical Dental Technologist emerges.

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**Confidentiality:**

The information which you furnish will be treated with the utmost confidentiality and your anonymity is assured. Completion of this questionnaire is completely on a voluntary basis; however your participation in this study will be of great importance.

You are free to withdraw from the study at any stage.

Please return the questionnaire either by e-mail or alternatively in the stamped addressed envelope included for your convenience.

Your time, opinion and assistance with this project is valuable and greatly appreciated. Please complete the attached Consent Form.

*Yours sincerely*

.....

N.P Mqadi

Research Student

(B-Tech: Dental technology

Reg. Dental Technologist)

Tel: 031 204 2850 / 082 428 4785

E-mail: [preciousm@dut.ac.za](mailto:preciousm@dut.ac.za)

.....

Dr. S. McKenna

Supervisor

(PhD: Education)

E-mail: [mckenna@ukzn.ac.za](mailto:mckenna@ukzn.ac.za)



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## Appendix H: An informed consent form for Dental Technicians



### INFORMED CONSENT FORM

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Title of Research:** Perspectives on the addition of clinical practice to the Dental Technology curriculum.

Name of Supervisor : Dr. S. McKenna

Name of Research Student : N.P Mqadi

Name of Department : Dental Services

The purpose of this study is to evaluate how the addition of the clinical aspects of the Dental Technology profession will impact the curriculum that is currently being offered by the three South African academic institutions that offer this course.

Please tick the appropriate answer

1. Have you read the participant information letter? YES / NO

2. Have you received enough background information to this study? YES / NO

3. Do you understand that your anonymity and confidentiality is assured? YES / NO

4. Do you understand the implications of your involvement in this study? YES / NO

5. Do you understand that you are free to withdraw from this study:

a) At any time YES / NO

b) Without having to give a reason for withdrawing YES / NO

6. Do you agree to participate in this study? YES / NO

Participant's name : \_\_\_\_\_ (in block letters)

Signature : \_\_\_\_\_

Witness name : \_\_\_\_\_ (in block letters)

Signature : \_\_\_\_\_

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Should you have answered NO to any of the above questions above, please do not hesitate to contact either myself or my supervisor who will be able to assist you.

Research student : Precious Mqadi

Signature : \_\_\_\_\_

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## Appendix I: Questionnaire to Dental Technicians

*Please tick the appropriate block*

1. In your view, what would be the role or scope of practise of a Clinical Dental Technician?

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2. Do you see a need for Clinical Dental technology in South Africa?

Yes [ ]

No [ ]

3. How do you think Clinical Dental technology will benefit patients?

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4. How do you think Clinical Dental technology will benefit technicians?

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5. How do you think Clinical Dental technology will benefit dentists?

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6. What are the obstacles that might be faced by this new profession should Clinical Dental technology be implemented in South Africa?

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7. Given an opportunity and choice, would you consider studying further to become a Clinical Dental Technician?    Yes [   ]                      No [   ]  
Why?

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8. Ideally how long would you be prepared to study for in order to obtain a qualification in clinical dental technology?

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9. What obstacles or barriers do you think may be encountered with the implementation of this profession?

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THANK-YOU

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## Appendix J: Questionnaire to Dentists

1) In your view, what would be the role or scope of practise of a Clinical Dental Technician?

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2) Do you see a need for Clinical Dental technology in South Africa?

Yes [ ]

No [ ]

3) What are the educational obstacles that might be faced by this new profession should Clinical Dental technology be implemented in South Africa?

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How might these obstacles be overcome?

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4) How do you think Clinical Dental technology will benefit patients?

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5) How do you think Clinical Dental technology will benefit the technicians?

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6) How do you think Clinical Dental technology will benefit dentists?

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7) What obstacles or barriers do you think may be encountered with the implementation of this profession?

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THANK-YOU



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## Appendix K: Questionnaire to Dental Technology Lecturers

Questionnaire for Dental Technology Lecturers
<i>Please answer these questions as fully as possible. There are no 'right' or 'wrong' answers to this questionnaire – I am simply interested in your personal views.</i>
1. What changes do you think are occurring in the Dental Technology profession in South Africa at the moment?
2. What is causing these changes to occur?
3. What are your views about the role transformation of Dental Technicians to include Clinical work?
4. What obstacles do you foresee if Clinical Dental Technology is implemented in South Africa? <i>(You may wish to consider practical issues for technicians, professionalism issues, legal issues, issues around academic readiness or any other obstacles.)</i>
5. What benefits do you foresee if Clinical Dental Technology is implemented in South Africa?

6. Do you think that the course you offer should be adapted to include Clinical aspects of the profession? Please explain why/why not.
7. What do you think will have to change in the current curriculum if it is decided that the course you offer should include clinical aspects of the profession?
8. What guidelines or issues do you think will need to inform the way in which your current curriculum is adapted to include clinical aspects of the profession?
9. Do you think the lecturers in your department are qualified to lecture on the clinical aspect of this profession if it were to be included in the curriculum?  YES / NO  [Circle correct answer]
10. If you answered 'YES' to the above, please indicate how such expertise was gained. If you answered 'NO' to the above, please indicate how this problem could be overcome.

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11. Can you add anything about the possible role change for Dental Technicians and the implications for the programmes offered by your department?

**Thank you for your time. Your input is greatly appreciated.**

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## Appendix L: Request for Data bases from SADTC and SADA

Dear Precious

A list of our members will cost R730 (VAT inclusive). By copy hereof I am requesting that you are e-mailed an invoice. Once payment is received and I am advised thereof the extraction will be done and sent to you.

Regards

*Ann Bayman*

Office/CPD/DPL Administrative Manager

Telephone: 011 484 5288

Direct fax to e-mail: 086 683 0392

Alternative landline fax: 011 484 0660

e-mail: [annb@sada.co.za](mailto:annb@sada.co.za)

Website: <http://www.sadanet.co.za>

**From:** Precious Mqadi [<mailto:preciousm@dut.ac.za>]

**Sent:** 28 January 2008 03:00 PM

**To:** [annb@sada.co.za](mailto:annb@sada.co.za)

**Subject:** RE: Dentist database

Hi Ann

I'm seeking information on registered Dental Practitioners. Please could you send me an invoice so as I could make the necessary payments

Regards

Precious

>>> "Ann Bayman" <[annb@sada.co.za](mailto:annb@sada.co.za)> 23/01/2008 08:57 AM >>>

Dear Precious

Please advise whether it is the Registered Dental Practitioners in SA or the Dental Technicians details you are seeking.

Regards

*Ann Bayman*

Office/CPD/DPL Administrative Manager

Telephone: 011 484 5288

Direct fax to e-mail: 086 683 0392

Alternative landline fax: 011 484 0660

e-mail: [annb@sada.co.za](mailto:annb@sada.co.za)

Website: <http://www.sadanet.co.za>

---

**From:** Precious Mqadi [mailto:[preciousm@dut.ac.za](mailto:preciousm@dut.ac.za)]

**Sent:** 23 January 2008 08:24 AM

**To:** [annb@sada.co.za](mailto:annb@sada.co.za)

**Subject:** Dentist database

Dear Colleague

I am a student currently pursuing a masters degree at the Durban University of Technology. My thesis investigates the impact of clinical dental technology to the current dental profession.

In order for me to gather data for analysis I need to contact and gain response from dental practitioners throughout South Africa. This will be done in the strictest confidence and participation in this study is voluntary.

Please could you provide me with the e-mail and physical addresses of all the technicians registered under this organization. If there are any fees involved for accessing this database, please let me know and I will gladly comply.

Trust that my request will reach your favorable consideration.

I await your earliest response

Regards

Precious Mqadi  
Department of Dental Services  
Durban University of Technology  
P O Box 1334, Durban, 4000  
Tel : +2731 373 2850  
Fax : +2731 373 2047  
e-mail : [preciousm@dut.ac.za](mailto:preciousm@dut.ac.za)  
website: [www.dut.ac.za](http://www.dut.ac.za)

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Dear Ms Mqadi

Following the receipt of your email kindly receive the following information.

The list that you require is in the form of a Excell spreadsheet. There is a fee payable of R242-00 for the list. After you have paid the amount into our bank account and sent us your proof of payment we will gladly forward the list to you.

Our banking details are as follows.

ABSA bank Pretoria

Cheque account

Branch number: 32 33 45

Account number: 233 014 2955

Hoping that everything is in order and if not please do not hesitate to contact the writer hereof.

Kind regards

Miss Deidre Bothma

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**From:** Precious Mqadi [mailto:preciousm@dut.ac.za]

**Sent:** 21 January 2008 02:43 PM

**To:** anitha\_sadtc@yebo.co.za; deidre\_sadtc@yebo.co.za

**Subject:** Dental Technician database

Dear Colleague

I am a student currently pursuing a masters degree at the Durban University of Technology. My thesis investigates the impact of clinical dental technology to the current dental technology profession.

In order for me to gather data for analysis I need to contact and gain response from dental technicians throughout South Africa. This will be done in the strictest confidence and participation in this study is voluntary.

Please could you provide me with the e-mail and physical addresses of all the technicians registered under this organization. If there are any fees involved for accessing this database, please let me know and I will gladly comply.

Trust that my request will reach your favorable consideration.

I await your earliest response

---

Regards

Precious Mqadi  
Department of Dental Services  
Durban University of Technology  
P O Box 1334, Durban, 4000  
Tel : +2731 373 2850  
Fax : +2731 373 2047  
e-mail : [preciousm@dut.ac.za](mailto:preciousm@dut.ac.za)  
website: [www.dut.ac.za](http://www.dut.ac.za)