# PERCEPTIONS OF THE PROFESSIONALIZATION OF DENTAL TECHNOLOGY

This work is submitted in fulfilment of the requirements of the degree of Master of Technology: Dental Technology in the Faculty of Health Sciences at the Durban University of Technology.

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# DECLARATION

This thesis is my own work and has not been submitted in part, or in full, to any other university for any purpose. I have not plagiarised the work of anyone else in completing the requirements for this task.

The research was conducted in KwaZulu-Natal in fulfilment of the requirements of the degree of Master of Technology: Dental Technology in the Faculty of Health Sciences at the Durban University of Technology under the supervision of Mr G H Bass and Mrs K Young.

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# ABSTRACT

This study investigates the perceptions of dentists, dental technicians and dental patients with regard to the professionalization of dental technology as it is currently constituted in South Africa. The origin of dental technology worldwide lies in a trade and has historically been performed by craftsmen under the instruction of dentists. In South Africa during the early 1900s dental technology was practised in much the same way but the need for formalization of this field had been recognised. By 1945 dental technology was regulated by the Dental Mechanicians Board, which enabled only registered technicians to practise dental technology within South Africa. This field continues to be practised similarly at present. In order to establish the professional development of dental technology it is necessary to consider this field within a framework of desired professional attributes. This framework is provided by Greenwood (1957), who defines a profession by the following five attributes: systematic theory, professional authority, community sanction, ethical codes and a professional culture. Owing to the varied implementation and regulation of dental technology worldwide, little research into the professionalization of this field has been conducted to date.

For the purpose of this study, dentists, dental technicians and dental patients in KwaZulu-Natal were interviewed in semi-structured interviews. The main themes emerging from this study were identified and considered with reference to the framework within which this study has been positioned.

This study concludes that dental technology, as it is currently constituted in South Africa is perceived to be a profession by dentists, dental technicians and dental patients. .The term profession, however, is poorly understood by all three sample groups. Despite being considered a profession, dental technology is not considered to encompass all the attributes of a profession. Dental technology is therefore identified as a developing profession that positions this field somewhere along the professionalization continuum between a profession and a business.

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# ABBREVIATIONS

| | |
|---|---|
| AGM | Annual General Meeting |
| CAD/CAM | Computer Aided Design/ Computer Aided Manufacture |
| CBAC | Central Bill Action Committee |
| CPD | Continuing Professional Development |
| CPUT | Cape Peninsula University of Technology |
| DASA | Dental Association of South Africa |
| DENTASA | Dental Technicians Association of South Africa |
| DMB | Dental Mechanicians Board |
| DTA | Dental Technicians Association |
| DTS | Dental Technicians Society |
| DUT | Durban University of Technology |
| FDT | Federal Dental Technicians |
| HPCSA | Health Professionals Council of South Africa |
| IDPS (SA) | Independent Dental Practitioners Association |
| NADL | National Association of Dental Laboratories |
| NDF | National Dental Forum |
| NDG | Natal Dental Guild |
| NAMDA | National Dental and Medical Association |
| SADA | South African Dental Association |

SADLA      South African Dental Laboratory Association

SADMA     South African Dental Mechanicians Association

SADTC     South African Dental Technicians Council

SAMC      South African Medical Council

SARDMA    South African Registered Dental Mechanicians Council

TUT        Tshwane University of Technology

UoT        University of Technology

# CHAPTER 1

# INTRODUCTION

## 1.1    INTRODUCTION

*WHO'S IN CHARGE? YOU ARE*

(Meskin, 1998:1070)

The practice of dentistry dates back to ancient times (Van Noort, 2002).  Over time dentistry has developed and the formation of auxiliary dental professions such as dental technology, denturism and oral hygiene have become part of the oral health team.  Organised dentistry has, however, resisted much of this change and for the most part remained 'in charge'.  Dentists are reluctant to give up the 'exclusivity' of this profession to 'non-dentists' (Meskin, 1998), who may be able to fill a specific dental niche more effectively.  Unfortunately this mindset affects the inter-professional relationship between organised dentistry and its auxiliary professions, more specifically dental technology.  The lack of interaction and relationship fostering is rooted at educational level and, in practice, leads to the breakdown of communication between the parties (Christensen, 2005).

Despite the progress of the dental technology field at educational and professional levels as well as the significant contribution of technicians to dental material science (Malament, et. al. 1996), effective communication and mutual understanding between dentists and technicians remains questionable (Heffron, 1979).  The dentist-technician relationship has long been one filled with tension and mistrust often proceeded by the 'blame game' (Karateew & Beschizza, 2004).  Poor communication between members of the dental team not only affects the members of this team but ultimately results in poor patient care (Freeman 1998).

## 1.2    PURPOSE OF THE STUDY

The aim of this study is to establish whether dental technology, as it is currently constituted in South Africa, is perceived to be a profession.  Through gaining this knowledge it is hoped to:

1) identify the extent of professionalization within dental technology,
2) identify if any attributes of professionalization are not evident in dental technology,
3) provide useful information to the dental technology industry in respect of professionalization and
4) provide the public with knowledge of dental technology as a profession to improve their choices in respect of services rendered to them.

## 1.3    INTRODUCTION TO DENTAL TECHNOLOGY

Dental technology is an important aspect of dentistry (Careers in Dentistry, 2004). This field is concerned with the design and manufacture of oral prostheses.  The restorative process begins with a patient in need of dental restorative care presenting to a dentist.  The dentist then evaluates the patient's dental needs (Warden, 2002).  Should the evaluation require prosthesis to be manufactured, instructions are conveyed to the dental laboratory in writing.  A negative (called an impression) of the section of the oral environment to be restored accompanies the written instruction.  It is from this impression that the prosthesis is constructed.  The technician interprets the written instruction and produces a functional and aesthetically pleasing prosthesis (Warden, 2002).  The completed prosthesis is then delivered and charged to the dentist, who in turn fits and bills (laboratory fee) the prosthetic restoration to the patient.  The trademark of a qualified dental technician is the ability to skilfully handle small instruments, accuracy, artistic ability and attention to detail (Careers in Dentistry, 2004).  According to Christensen (2002:10), "Dental technology is an attractive area for people who have artistic skills, good hand-eye coordination, and an interest in learning and advancing their abilities".

## 1.4 THE HISTORY OF DENTAL TECHNOLOGY

Dental technology originated, as did several other professions, as a trade (Welie, 2004; Haden, Morr & Valachovic, 2001). It is noteworthy that from the conception of this field its professional development has been fashioned by organised dentistry. As such the controversial progression from a trade has led to the current structure of dental technology as it is practised today. In order to trace the professional development of dental technology it is necessary to examine the founding and history of dental technology within organised dentistry.

### 1.4.1 The history of dental technology globally

Dental ailments have been around for as long as mankind itself. The earliest reference to dentistry can be found in Egyptian manuscripts dated 3700 B.C. Archaeological evidence in ancient Egypt suggests that, in 3000 B.C., the first known dentists were the primary dentists to the pharaohs (Stetter, 1993). However, there is no evidence indicating that mechanical dentistry, which involved the manufacture of oral appliances was being practised in ancient Egypt at that time (Stetter, 1993).



**Figure 1.** Etruscan teeth, around 2000 years old (Fotosearch, 2010).

The Greeks, Etruscans and Romans all made valuable contribution to the field of dentistry. It was the Etruscans, however, that made the most valuable contribution in the field of restorative mechanical dentistry during the period 400 to 100 B.C. The quality of crown and bridge articles produced during this time was high and

compared favourably with articles produced in Europe and America in the late 19<sup>th</sup> century (Wilwerding, 2009). An illustration of an Etruscan bridge is reproduced in **Figure 1** above.

During the Middle Ages common ailments were treated with superstitious practices rather than medical procedures (Bretheus, 1941). Toothache, for example, was thought to be caused by a worm living in the tooth. An imaginative carving of this superstitious belief can be seen in **Figure 2** below.



Figure 2. Carving depicting a 'tooth worm' (Fotosearch, 2010).

This could only be remedied by a painful extraction of the offending tooth (Wilwerding, 2009). All manner of techniques and materials were used to restore the appearance of those affected by the loss of dentition. Materials such as wood, ivory, bone, (Van Noort, 2002), animal teeth (Wilwerding, 2009) and even human teeth taken from the dead (Pain, 2001) served as replacements. It can be appreciated that these prostheses required manufacture. Hence, we start to see the necessity for someone to perform technical services.

Arguably the profession of dental technology had its origins in the 19th century. Two significant events occurred in dentistry almost simultaneously. These resulted in painless and affordable dental treatment to the general public. The discoveries allowed for painless tooth extractions and the opportunity of the lost dentition being replaced by a cheap prosthetic alternative. Up until the mid 19th century restorative dentistry was limited by the lack of technological knowledge and the high cost involved, as well as the lack of painless treatments. The anaesthetic effects of nitrous oxide were discovered by a young dentist, Horace Wells, in 1844. As a result of the discovery of anaesthesia, people suffering from toothache could now receive painless dental care. This was a major advancement in dental curative care. Shortly after the discovery of anaesthetics a further significant discovery was made that was to lead to the dental technology industry as we know it today.



**Figure 3**. Vulcanite denture, mid 19th to early 20th centuries (Vulcanite dentures, 2008).

In 1843 Charles Goodyear discovered a flexible rubber called vulcanite. By 1851, Nelson Goodyear, Charles's brother, had developed and patented a manufacturing process to produce hard rubber (Vulcanite Dentures, 2008). This material was both inexpensive and easy to work with, making it an ideal material from which to construct dentures (Van Noort, 2002). An example of such a manufactured vulcanite denture can be seen in **Figure 3** above.

Arguably the discovery of anaesthetic coupled with the invention of vulcanite was the beginning of the modern dental technician (Bass, 2009; Vulcanite Dentures, 2008). Dentures could now be cheaply mass produced and dentists were now free to concentrate on the clinical aspects of dentistry.



**Figure 4**. Dental Technician in a German Dental Laboratory. Stahlgebissmacherei der Zahnklinik der Friedrich Krupp A.G. Essen ca. 1885. (Fotosearch, 2010).

Up until the late 19th century these technological services were performed by the dentist themselves or by craftsmen such as jewellers, turners and goldsmiths. As production volumes increased so dentists in the 20th century increasingly used dental laboratories (Hoffmann-Axthelm, 1987). This was largely due to the specialised equipment required and the complex nature of the procedures. The first successful commercial dental laboratory in the United States of America was established in 1887 (Waldman, 1988). In America during the early 1900s an estimated 97 percent of all laboratory work was being done within the dental office. Just half a century later the roles had reversed, with an estimated 90 percent of laboratory work being completed in commercial dental laboratories (Leeper, 1979). **Figure 4** above illustrates such a dental technician working in a commercial laboratory in Germany.

## 1.4.2  The history of dental technology in South Africa

The history of dentistry in South African can be traced back to the early 1900s.  At that time part of the curriculum of dental students consisted of Dental Mechanics and Dental Prosthetics as subjects required in acquiring their qualification.  These dentists produced oral restorations themselves or 'allowed' laymen to produce prostheses in the practice laboratories (Grobler, 1977:411).  During this time the Medical, Dental and Pharmacy Act of 1928 regulated the dental profession in the then Union of South Africa.  The Act confined the work of the dental mechanician[1] to the laboratory and prevented public contact and the prescription of treatment.  Owing to the lack of formal education and professional certification at this time anyone could call themselves a dental mechanician.  Canvassing of patients by illicit practitioners was rife as the pressure of the economic situation and poor patient education continued.  This Act did not prevent the flourishing trade of illicit mechanicians.  In 1929 it was agreed upon by the Dental Association of South African (DASA) (Dominica, 2010) that a voluntary registration of mechanicians would help to stamp out illicit practices.  As a result a Vigilance Committee was established.  The Vigilance Committee was made up of 15 members, all of whom were members of dental societies from around the country, who resolved to form a register of dental mechanicians, control the conditions of apprenticeship and make restrictions on dentist to only employ registered dental mechanicians (Grobler, 1977).

It can be noted that this was the embryonic stage of the formalisation of the dental technological profession in South Africa.  From the outset of the development of organised dental technology, dentists dictated the terms of its formation.  This situation was not unique to South Africa and occurred in many countries in the world.

> *The actions of the [dental] profession during this period were not entirely admirable.  Some dentists would seek laboratory services on the basis of cost rather than quality, some would delegate duties for which the technician was*

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[1] Dental technicians were referred to as dental mechanicians at this time.

*not trained and some would make unreasonable demands. In efforts to retain the craft in an auxiliary position, dentists should have been concerned with the qualifications, status, and economic welfare of the members of the auxiliary craft. This was not the situation. The dental profession was, to a considerable extent, responsible for the events which eventually took place.*

(Fee, 1974:12)

The DASA meeting of 1929 led to the formation of a number of important regulations that would structure the dental technological profession in the future. Firstly, mechanicians were from now on to undergo official training, in the form of an apprenticeship programme including an examination of dental mechanicians. Secondly, a Dental Mechanicians Bill was formulated. Not all dental mechanicians welcomed the introduction of an apprenticeship programme, particularly the examination process and treated the intentions of the dentists with suspicion resulting in tensions within the industry (Grobler, 1977).

### 1.4.2.1 Apprenticeship and examinations

During 1932, several years after the initial 1929 DASA meeting, dental mechanicians were placed on the schedule under the Apprenticeship Act (Act 26 of 1922). This called for a number of activities, namely: appointing an Apprenticeship Committee, registering of dental mechanician societies and the appointing of both an Employer and Employee Committee. Lengthy discussions around issues of the period of apprenticeship, maximum number of apprentices, wages and educational standards and orientation of apprentices were held. It was expected of employers to "indenture"[2] (Grobler, 1977:436) an apprentice within a four month period. **Figure 5** below illustrates a similar mechanician's apprenticeship within the U.S. Military. The bulk of dental work at this time consisted of the extraction of teeth and their subsequent replacement by dentures (Fee, 1974). In July of 1934 the conditions of

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[2] "Indenture" is used here as synonymous with training. It gives us an indication of the extent of the content of training at the time, which was the manufacture of vulcanite dentures.

apprenticeship, as drawn up by the Apprenticeship Committee, were published in the Government Gazette under the apprenticeship Act of 1922 (Grobler, 1977).



**Figure 5.** U. S. Military 12 week mechanician apprenticeship 1944 (Fotosearch, 2010).

In addition, the first contentious examination for dental mechanicians was held in late 1932. One hundred dental mechanicians had passed the examination and were set for the voluntary registration process. It was estimated that the 100 mechanicians registered represented only one third of the practising dental mechanicians. In order for the Draft Bill to be proceeded with, the Minister of Public Health required 165 men to be registered before 1932. The requirement of representation of the majority of legitimate dental mechanicians thus resulted in further examinations (Grobler, 1977).

### 1.4.2.2 The Dental Mechanicians Bill

At a meeting held by DASA in 1929 the conditions of registration of dental mechanicians was proposed. The primary concern with the registration process was the level of competence of applicants. Initially, registration would be voluntary. It

was proposed thereafter that further regulations to the admittance of registration be implemented.  These included

that mechanicians must have been employed for five years prior to 12 December 1931,

those with less than five years experience should complete such experience prior to registration and

those mechanicians who had not started working before 12 December 1928 would have compulsory examination prior to registration (Grobler, 1977).

Much controversy surrounded the issue of dental mechanician registration.  A large number of dentists opposed this proposal claiming "that because of the arbitrary limiting of their field the dental mechanician should have corresponding protection" (Grobler, 1977:411).  A near split of DASA by the opposing groups resulted. Mechanicians on the other hand were insistent that this registration be compulsory from the onset, and refusing to participate until such time.  Arguments both for and against registration continued within and between the two fields for the better part of two centuries (Grobler, 1977).

By the end of 1928 the South African Medical Council (SAMC) passed the controversial decision to form a register.  The Committee for Medical and Dental Education, Examination and Registration was assigned the task of drawing up the rules regulating registration.  The registration draft rules were as follows.

> *Any person who has for five years previous to March 3, 1930 been engaged as his sole or principal occupation in the work of dental mechanician and (i) after examination produced a certificate to that effect from a registered dentist, or one from a registered dental mechanician to the profession; (ii) before June 30, 1930 makes application for registration to Council; (iii) produces evidence of good character to the satisfaction of the Council will on payment of a fee of £1 be registered as a dental mechanician as provided in Section 32 of Act 13 of 1928.  Secondly, any person who previous to March 3, 1930 has been engaged in the work of a dental mechanician for a period of*

*less than five years and who before June 30, 1930 notifies the Council of the period during which he has been so engaged, will be registered as a dental mechanician when he shall have completed five years employment at such work, subject to the conditions specified above and any person who wishes to be registered as a dental mechanician who has not made application before June 30, 1930 shall before such registration pay such fees and produce such certificate of character and of training and of having such examination as the Council may approve or prescribe.*

(Grobler, 1977:419)

The principles of registration were approved and advocated by DASA and the South African Registered Dental Mechanicians Association (SARDMA) in 1930 and were finally published in the Government Gazette in July 1931, three years after the Medical Dental and Pharmacy Act 13 of 1928 became law (Grobler, 1977). Prior to approving these principles no information can be found regarding SARDMA, or thereafter. Whether SARDMA was a legitimate organisation supported by a significant number of dental mechanicians at the time remains questionable. Registration of dental mechanicians was a new concept worldwide and South Africa was taking the lead. The Union of South Africa is believed to have been the first country of the British Empire to open registration of dental mechanicians. No former guidelines existed (Grobler, 1977).

Conditions under which dental mechanicians could practise their trade were for the first time gazetted in the Government Gazette in 1932. This notice reads:

*A dental mechanician may carry on his calling either in the laboratory of his employer or his own laboratory. A dental mechanician may not advertise nor publish his name and calling unless (a) he is working for the profession in his own right, (b) the publication is restricted to circulars or communications issued under cover dentists and (c) a dental mechanician may not exhibit in showcase to the public.*

(Grobler, 1977:437)

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In 1932 a number of dental mechanicians were reluctant to form part of a voluntary register. The Cape Society of Dental Mechanicians wrote to The South African Dental Journal to air their views.

> *They wished the registration of dental mechanicians throughout the Union to be compulsory and did not want the voluntary scheme to be proceeded with. Secondly, they wanted this matter to be dealt with on an industrial basis: (a) Recognition of the SADMA and its affiliation to the Federation of Trades and Unions, (b) equal representation of dental mechanicians on any Board of Control or Committee set up to investigate the conditions of registration, wage etc and (c) the inclusion of an apprenticeship clause designed to meet the circumstances of the dental* profession*. Thirdly, compulsory registration and all the penalties for infringement should be made legally binding to all concerned. A Board of control should lay down the terms of employment of registered dental surgeons throughout the Union of South Africa.*

(Grobler, 1977:426)

Later in 1932 the Medical Council advised SADMA that it was prepared to recommend the amendment of the 1928 Act to include compulsory registration. Dental mechanicians were required to indicate their approval of this amendment through complying with the voluntary registration process without further delay. In an attempt to make headway a conference was held by DASA, SADMA and public health members in 1932. Matters discussed were:

1. (a) registration,
   (b) examinations;
2. apprenticeships and
3. regulating working conditions and wages.

A Bill was later proposed in 1933 based on the resolutions from the former conference. A meeting held by DASA and the Department of Labour proposed the "Bill to Regulate the Status of Dental Mechanicians" (Grobler, 1977:433) comprising 29 clauses. This Bill was originally rejected for being "unsuitable" (Grobler, 1977:433), but there is no further information indicating the cause of inaptness. A

draft Bill was resubmitted and the general policy of the Bill was approved by DASA, most branches of SADMA, the South African Medical Council and the Department of Public Health (Grobler, 1977).

In 1933 the United South African Nationalist Party took over the government of the Union of South Africa.  This change in government affected the passage of the Bill and resulted in its delay.  This delay was extremely disturbing to dentists, one of whom made the following statement to express his concern for the deteriorating image of dentistry: "The dental profession is sinking into a morass of blood and vulcanite" (Grobler, 1977:438).  During this time DASA and SADMA did not halt their efforts to end illicit practice.  A Dental Surgeons and Dental Mechanicians Joint Voluntary Board was established to continue this effort.  By 1935 no headway had been made and the legislation controlling dentists and dental mechanicians remained unchanged.  Dental mechanicians used this period to organise their national representation.  At a meeting with secretary of Public Health, SADMA raised two new points.

> They wished to create a Dental Mechanicians Board completely separate from the Medical Council and all existing bodies.  This new body would regulate all matters relating to dental mechanicians.  Secondly, they wanted to provide by law for standard rates of pay.

> (Grobler, 1977:442)

A new draft Bill was proposed by the SADMA at a conference held in late 1935.  Up until this time these draft Bills had only been proposed by DASA.  The primary objective of the Bill was to establish a Dental Mechanicians Board, freeing dental mechanicians from the Medical Council.

> The concept Board was to be composed of seven members, three dentists would represent the DASA, and three dental mechanicians would represent the SADMA.  An independent chairperson would be appointed by the Minister.  The Board would have the power to open and maintain a register of dental mechanicians who had fulfilled the requirements of the Board for registration.  The clause which determined that only a dentist or registered dental

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*mechanician could carry on the work of a dental mechanician protected the preserves of the dental mechanician. This Board would discipline and administer Rules of Conduct for registered dental mechanicians. It would determine minimum wages and a scale of minimum payment for piece-work. No person other than a dentist or registered dental mechanician or a licensed person would have the right to be in possession of unmounted[3] artificial teeth for purposes of trade.*

(Grobler, 1977:443-444)

The Bill proposed was very similar to that of 1932 with a number of inclusions. In 1936 the SAMC stated that it had no objections to the removal of registration and examination of dental mechanicians from its control. Due to the exclusion of substantial improvements of wages and conditions of the craft, the Bill was opposed by a number of mechanicians. No agreement could be reached. The new government announced in 1939 that it was prepared to proceed with legislation in 1940 provided that DASA could reach an agreement with the dental mechanicians regarding these matters. A negotiation was entered into between the two parties upon the recommendations of DASA which suggested: a wage of £30 per month with an equal hourly rate for "journeymen"[4] (Grobler, 1977:446), working hours of 44 hours per week excluding lunch, two weeks paid leave annually and overtime at time and a half. The SADMA felt that an agreement could be reached in terms of an industrial agreement rather than an Act of parliament. An outline of suitable conditions was prepared by the SADMA and included the following amendments from that proposed by DASA: £35 per month or £3.10 for a full set of dentures[5] (Grobler, 1977). The Second World War broke out in 1939 and continued till 1946, this once again led to a halt in the formalization of the Bill for the duration of this period.

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[3] Unmounted artificial teeth refer to artificial teeth that have not yet been incorporated in the manufacture of dentures.

[4] Contract workers

[5] A full set of dentures includes an upper and lower denture.

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Literature suggests that mechanicians had formed societies around South Africa to discuss occupational matters. The formation of the South African Dental Mechanicians Association (SADMA) was in process with the objective of improving the dental mechanician's trade conditions as well as informing mechanicians of new materials and techniques. By 1942 the SADMA had become the registered trade union for dental mechanicians of the Union of South Africa (Grobler, 1977).

For the first time, in 1942, the issue of inter-personal relations between dentists and dental mechanicians was raised. It appeared that this relationship needed urgent attention and could be addressed by setting distinct boundaries around the dental mechanician's profession. The formation of a conciliation board was requested in 1942 to consider a dispute between the registered trade union SADMA and 30 dental employers. The board was formed and eight delegates and a chairman were appointed as members of the Board. These delegates included four dentists, four mechanicians and the chief inspector of labour of Johannesburg. The dental members of the board felt that wages could not be fixed until the question of "inter-relations" (Grobler, 1977:450) was settled. Further discussion around the holistic status of the profession as well as stabilizing the inter-professional relationship between dentists and mechanicians though establishing a minimum wage, conditions of employment etc. was proposed. A list of wages, pay for "piece-work" (Grobler, 1977:451) and working conditions was drawn up and agreed to, on condition that it came into operation concurrently with the mechanicians Bill (Grobler, 1977). In 1944 a rival society, Dental Technicians Society (DTS), formed to protest against the passing of the Dental Mechanicians Bill. The strike action planned by the society, however, was cancelled before it took place (Grobler, 1977).

In a final attempt to advance the passage of the Bill a central bill action committee (CBAC) was established by the executive of the DASA in 1944. The CBAC distributed copies of the Bill to dentists throughout the country to inform them of its purpose. It also circulated information outlining the principal benefits of the Bill to the public, dentists and mechanicians. Every member of parliament was provided with information and personally contacted by a dentist regarding the Bill. The CBAC also intended to improve the relationship between the dentists and legitimate mechanicians (Grobler, 1977). In July 1944 the Bill received the unanimous

approval of the federal council[6] but it was not until 1945 that the Bill passed the first and second readings. Despite the efforts of the DTS to obstruct the passing of the Bill, in May 1945 the Bill passed the third reading and on the 5th of June 1945, after 17 years of negotiation, the Bill was finally passed (Grobler, 1977).

The Dental Mechanicians Act 30 of 1945 made provision for: the establishment of a Dental Mechanicians Board (DMB), the appointment of a registrar, registration of dental mechanicians, examinations, contracts of apprenticeship and employment, rules and regulations. It regulated the trade of unmounted artificial teeth and defined acts performed by dentists and mechanicians. A Dental Mechanicians Labour Committee was established to function as part of an industrial council (Grobler, 1977).

The passing of this Act was a momentous step forward in the evolution of the dental technology profession. Dental technicians were now protected by law and the profession regulated by the DMB. This was significant in that only registered dental technicians could practise their profession and those registered could no longer be exploited as cheap labour. A legally defined profession of dental technicians had finally been established (Grobler, 1977). However, according to Malherbe (2009) the Act of 1945 was not only concerned with the education and certification of dental technicians but also with maintaining authority. Owing to the comparatively high number of dentists and their professional status, technicians could do little to prevent the involvement of dentists in the amendment of the Dental Technicians Act. Dentists were given the exclusive privilege to sell appliances and restorations made by technicians. This provided organised dentistry with a work force that was incarcerated by them as well as formally educated in their field (Malherbe, 2009).

### 1.4.2.3    The history of education in dental technology

The training of dental technicians progressed from the apprenticeship programme of 1945 to a higher education qualification in 1979. This course was offered as a three year, full time, National Diploma in Dental Technology at tertiary institutes then

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[6] Government Council of that time.

referred to as technikons. As part of this qualification a further year of in-service training was required, culminating in the national professional board examination. The successful completion of the examination and registration with the SADTC entitled the individual to practise as a legitimate dental technician (Bass, 2007). According to Bass (2000) the progression in training, at the time, of dental technicians was revolutionary and placed technicians in an improved position.

In 1987 the Dental Technology programme was recurriculated from the former three year National Diploma to a four year Higher National Diploma. "Ultimately the structure of the course remained the same with the primary change being the inclusion of Research Methodology as a subject and a course in computer science" (Bass, 2007:6). The programme was further recurriculated in 1997. The course was reconstructed to comprise a three year diploma, which enabled graduates to "work only as employees in dental laboratories" (Bass, 2007:6), as well as a one year postgraduate bachelor's degree in technology, which enabled graduates to become laboratory owners and, therefore, employers of diploma graduates (Bass, 2007). The subject Research Methodology was included to form part of the bachelor's degree along with Business Practice II, which was introduced as a replacement for the course in computer science (Bass, 2007). In addition to the bachelor's degree a masters as well as a doctorate degree were introduced within this same period of circulation. Prior to this date a masters diploma in Dental Technology was available, with the only two such qualifications in South Africa being received from Technikon Natal (Bass, 2009).

The 1997 curriculation of the Dental Technology diploma and bachelors degree is still in place today at several universities of technology (UoT) around the country; namely: the Durban University of Technology (DUT), the Tshwane University of Technology (TUT) and the Cape Peninsula University of Technology (CPUT) (Bass, 2007).

**1.4.2.4    The history of dental technology associations.**

Unfortunately very little documented information with regard to dental associations in South Africa exists, particularly with regard to dental technology. Information

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acquired is largely anecdotal and derived from communication with relevant association members.

The earliest dental association to be formed in South Africa was the Dental Association of South Africa (DASA) in 1922. During the initial formation of the dental technology profession in 1929, the DASA nearly split due to the severity of disagreement between opposing groups of dentists with regard to the newly recommended legislation of dental technology (Grobler, 1977). The DASA was the only association representing the dental profession that had official government recognition. Because of apartheid there were however several other dental associations around the country at the time. These included: the Independent Dental Practitioners Association (SA) (IDPA(SA)), the National Dental Forum (NDF), the Natal Dental Guild (NDG) and the National Medical and Dental Association (NAMDA) (Domenico, 2010; Samuels, 2010). During 1997 these associations amalgamated with DASA to form the current South African Dental Association (SADA), which presently has 11 branches (Domenico, 2010). There was no increase in membership in SADA in 1998 from that of DASA in 1997, which arguably may indicate that there was no significant support of the latter associations (SADA, Annual report, 2008-2009). According to Domenico (2010) SADA is representative of the majority of dentists in South Africa.

The first historical reference to a dental technology association in South Africa is during the 1930s. Literature suggests that at this time the South African Registered Dental Mechanicians Association (SARDMA) represented dental mechanicians in South Africa with regard to the approval of principles of apprenticeship (Grobler, 1977). Prior to SARDMA approving these principles no information can be found regarding the organisation, nor thereafter. Whether SARDMA was a legitimate organisation supported by a significant number of dental mechanicians at the time remains questionable. By 1932 mechanicians had formed societies throughout South Africa to discuss occupational matters. At this point there were dental mechanicians societies in the Cape (refer to **Figure 6**), Durban, Johannesburg, the Orange Free State, Port Elizabeth and Pretoria with a combined membership of at least 150, out of approximately 300, mechanicians (Grobler, 1977).

The formation of the South African Dental Mechanicians Association (SADMA) was in process with the objective of improving the dental mechanician's trade conditions as well as informing mechanicians of new materials and techniques. Despite the decision by DASA in 1924 that this body should be formed, it was not until 1930 that it formally convened. By 1942 the SADMA had become the registered Trade Union for dental mechanicians of the Union of South Africa (Grobler, 1977). The SADMA, was however not a statutory body and had no legal standing (Steyn, 2010).



**Figure 6**. Cape Society of Dental Technicians 1931[7] (Steyn, 2010).

In 1944 a rival society, Dental Technicians Society (DTS), was formed to protest against the passing of the Dental Mechanicians Bill. The strike action planned by the society, however, was cancelled before it took place (Grobler, 1977). The enduring legitimacy of this association is questionable as no further information regarding the DTS can be found in the literature.

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[7] Front row: D.J. Ackerman (Hon Secretary), W.M. Moys (President), W.H. Wash, back row G. Rix and B.H. Amyot (Treasurer), inset F. Powell (Treasurer)

During 1945, as part of the implementation of the Dental Mechanicians Act 30 of 1945, provision was made for the establishment of a Dental Mechanicians Board (DMB) and the appointment of a registrar (Grobler, 1977). Furthermore a Dental Mechanicians Labour Committee was established to function as part of an industrial council (Grobler, 1977). The board comprised seven members - three mechanicians, three dentists and a chairman (Heydt, 2010). The identity of only one of the three mechanicians serving on the board is known, being Mr R B Dunlop. The three dentists included Dr R B Bird, Dr F Hossack and Dr A Kessel and the chairman was the Under Secretary for Health (Heydt, 2010). The first registrar was a Mr Treunicht who was succeeded by a Mr R B van der Merwe. The latter registrar served the council for an extended period of time (Heydt, 2010). During 1956 Dr H Heydt was elected onto the board where he served as a dentist for the following 40 years. On his retirement from Council Dr Heydt was awarded their Bronze Medal for Distinguished Service. The DMB functioned as a statutory body of dental technology up until its transformation into the South African Dental Technicians' Council (SADTC) in 1979 as part of the implementation of the Dental Technicians Act of 1979 (Heydt, 2010).

It is noteworthy that all historical information regarding the DMB as well as the SADTC was contributed by dentistry. The above mentioned information could not be obtained from the SADTC itself. This poor historical recording is typical of the dental technology industry as well as being indicative of the significance technicians place on their development.

The South African Dental Laboratory Association (SADLA) was formed during 1946 and served as a representation of dental mechanicians in South Africa at that time. The first president of the SADLA was Mr H. Sharp-Mare (du Plessis, 2010). Later during the 1980s an attempt to form an association specifically for dental technician employees, namely the Federation of Dental Technicians (FDT), was undertaken but failed to get underway (Owen, 2010). The reason for the collapse of the FDT is unknown.

During 1998 yet another dental technician association was formed, namely the Dental Technicians Association (DTA). In order to unite dental technicians across

South Africa an amalgamation of associations was necessary and this was achieved in 2002 through the amalgamation of the SADLA and the DTS to form the Dental Technicians Association of South Africa (DENTASA) (Owen, 2010). The DENTASA is currently represented in five provinces around South Africa and is representative of dental technicians in South Africa (DENTASA, 2010). Although membership is not 100 percent representative of the qualified technicians in South Africa, no other association exists to represent technicians.

## 1.5    RATIONALE FOR THE STUDY

The origin of dental technology lies in a trade, as does that of the dental profession (Grobler, 1995). In the 1920s the scope of dental technological services consisted predominantly of the production of vulcanite dentures by craftsmen under the instruction of dentists (Grobler, 1977). Today dental technology has progressed from the training provided by dentists in the 1940s to the present day multifaceted qualification with a range of subjects, techniques and materials (South Africa, Dental Technicians Act 19, 1979).

Given this progression in professionalization, the relationship between dentist – technician should be of a professional nature rather than that of an "employer-employee" (Napier, 2004:709). Contrary to this view, however, and due to the history of the development of dental technology in South Africa, dentists have historically influenced the training and formulation of the profession (Grobler, 1977) and largely remained "in charge" (Meskin, 1998).

As an associated profession to clinical dentistry, dental technology is an unnoticed partner in the process of prosthetic dentistry (Christensen, 2005). The general public is unaware of dental technology as a profession or what this line of work entails. This lack of public information is not limited to South Africa but exists worldwide. It was recorded by the American National Association of Dental Laboratories (NADL) that 46 states in America have no legal minimum requirements for the performance of dental technology or the operation of a dental laboratory (Haden, Morr & Valachovic, 2001). Furthermore, only a small number of other countries including South Africa, Great Britain, Germany, Japan, New Zealand and Bermuda to name

some, recognise dental technology as a profession. In the remainder, certification to practise as a technician is neither available nor mandatory (Napier, 2004).

## 1.6    KEY RESEARCH QUESTIONS

1) Is dental technology, as it is currently constituted in South Africa, perceived to be a profession by dentists?

2) Is dental technology, as it is currently constituted in South Africa, perceived to be a profession by dental technologists?

3) Is dental technology, as it is currently constituted in South Africa, perceived as a profession by dental patients?

## 1.7    OVERVIEW OF THE DISSERTATION

Chapter two of this dissertation involves a discussion of the literature and the conceptual framework on which this study was constructed. The term 'profession' is discussed and aligned within the scope of this study. The processes of professional development as well as professional socialisation are considered. Dental technology is identified as a developing or marginal profession within this framework. The attributes of a profession as defined by Greenwood (1957) are discussed and considered with reference to dental technology.

The methodology of the study is addressed in chapter three. This is a post-positivist study undertaken in the interpretive paradigm. Qualitative data was generated through semi-structured interviews with three sample groups. The sample groups included six dentists, six dental technicians and six patients. A total of 18 interviews were conducted. Semi-structured interviews were chosen as an appropriate means of data collection in order to allow for the course of discussions to be directed by respondents. However, a predetermined interview schedule was used and discussions rarely deviated from the agenda presented. Ethical considerations as required by the Durban University of Technology were implemented. The findings of this study are discussed in chapter four. All three sample groups perceived dental technology, as it is currently constituted in South Africa, to be a profession. The term 'profession', however, was poorly understood by all three sample groups. Through

further discussion on the attributes of a profession as defined by Greenwood (1957), it was evident that dental technology is not perceived to encompass all of these attributes.

The conclusions and recommendations emerging from this study are presented in chapter five. This chapter suggests that dental technology can be considered a developing profession and as such, the potential future development of this field needs to be actively directed by industry.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1    INTRODUCTION

*Once upon a time the professions were populated by aristocratic sons who had the misfortune of being born second or third in line.  Unable to inherit the noble title and family estate, the next best option was to become a professional.  Today the professions continue to lure young people seeking social status and wealth.  However... being a professional is not, nor should it be, about privileges and rights.*

(Welie, 2004:602)

Professions have historically been held in high esteem by society and professionals are well respected individuals (Lautar, 1995; Freidson, 1984).  According to Welie (2004:529) "this label is cherished because it suggests special social, moral and political status".  Public respect, however, is not accredited because of the esteemed title of professional but because "a professional is expected to serve the interests of the client consistently and without regard to their own interests as a matter of conscience" (Mathewson, 2007:365).   Professions have been identified as occupations that perform services of significant social value through their distinctive knowledge and skill as well as their attitude of commitment and concern for these services (Freidson, 1984).  This public respect and esteem still holds true in today's social environment (Lautar, 1995).  In order to appreciate the term 'profession', it is necessary to define it.  The term profession has been defined in a number of ways with the commonly believed predominant feature being that of "an occupation requiring specialized knowledge and often long intensive academic preparation" (Allen, 2004:1112).

A variety of additions to this central thread include: "a paid occupation" (Pearsall, 2002:1141) and "training in the liberal arts or sciences" especially one of the academic professions, law, theology, medicine (Makins, 1995:1067) or architecture

(Crowther, 1992:716). These definitions are very broad in their description and should be more specifically defined. Hence, there are predominantly two conflicting views of what constitutes a profession.

In its broadest context, profession is used to indicate the opposite of 'amateur'. In this sense a professional is one who devotes all his/her time to a particular activity through which they derive a livelihood (Flexner, 2001). When considering this definition in the extreme, professions are seen as types of occupations that maintain a certain monopoly in order to exercise their privileged status for personal gain (Hafftery & Light, 1995).

The second, and more enduring, view is that professions are occupations that function in the public interest and therefore should be preserved (Hafferty & Light, 1995). It is stated by Gillis and Parker (1996:7) that "the designation of profession is therefore a social term earned as a result of achieving certain criteria. The essence of a profession reflects the central tenet that what is achieved is for the good of society". Professionals within a discipline "seek recognition from governments, who may pass professional legislation granting a group professional privileges (a protected market, the right to diagnose, the exclusive right to practise in a given field)" and public respect and patronage (Adams, 2004:2245). Although professionals derive financial gain from their profession, it is merely a by-product of their primary motivation (Gillis & Parker, 1996).

Traditionally, professionals were associated with 'white collar' administrators as opposed to non-professional technically skilled 'blue collar' workers. This is, however, no longer the case as technical skills are currently being practised by so-called 'white collar' workers as well (Lautar, 1995). Barber, cited in Lautar (1995:128), states that these emerging professionals are "usually salaried employees" working for "organisational or institutional bureaucracy in which intellectual skills are used for profit". Furthermore, these marginal professions encompass two of the major professional attributes, knowledge and service, to varying degrees (Lautar, 1995). Barber (1963:677) states that "it is the elite of an emerging profession that takes the lead in pushing for the advancement of professionalism in its occupational group and in claiming public recognition of its new

status". It is the leaders of an occupation that establish or strengthen a professional association. Larson cited in Lautar (1995) states that

> *Movements towards professionalism are aimed both at market control and collective social mobility, and furthermore at monopoly – monopoly of opportunities in a market of services and, inseparably, monopoly of status and work privileges in an occupational hierarchy.*

(Lautar, 1995:128)

The emerging or marginal professional groups are continually striving to become fully fledged professionals and to claim public recognition as such. It is typical; however, of these emerging professional groups that the occupational members are not homogenous with regard to the level of knowledge and the community orientation they possess (Barber, 1963). The rise of professions is regarded by Carr-Saunders, cited in Hafferty and Light (1995:134), as "an important source of standards, service, and moral authority in the modern world". This rise in professions, however, "constituted a silent war" against emerging professions by long standing professions in order to maintain the monopoly (Hafferty & Light, 1995:134). Battles for authority exist not only between professions but also within professions. America has seen its fair share of intra-professional conflict particularly within the medical field. Primary care disputes wage on between generalists and a variety of specialists. The aim is to secure the exclusive right to particular procedures and ultimately authority in the relative field of medicine (Hafferty & Light, 1995).

When considering the professionalization of dental technology, as it is currently constituted in South Africa, this research will attempt to establish where this field lies as a professional.

## 2.2   PROFESSIONALIZATION AND PROFESSIONAL SOCIALISATION

The majority of existing professions today have their origins as a trade. This includes a profession as highly regarded as dentistry (Welie, 2004). Grobler (1995:3) notes that "Jan van Riebeeck (1618-1677) was in fact the first dentist at the Cape.

Inducted into the Guild of Barber Surgeons he was qualified to draw teeth and let blood". **Figure 7** below is a depiction of barber surgery and the trauma of such treatment.



Figure 7. The tooth extractor by T. Rombouts (1597-1637) (Fotosearch, 2010)

From these humble beginnings, dentistry only received legal definition as a profession in the Cape approximately 250 years later, in 1891 (Grobler, 1995). **Figure 8** below depicts the formal schooling of dentists during this time.



Figure 8. Teacher with students in Dental School in the late 1800s by L. Tynaire (Fotosearch, 2010).

Likewise, dental technology as we understand it today has its origins as a trade (Welie, 2004). In South Africa we can trace the beginnings of dental technology back to the early 20th century (Grobler, 1977). Barber (1963:671) states, "There is no absolute difference between professional and other kinds of occupational behaviour, but only relative differences with respect to certain attributes common to all occupational behaviour". Professionalization from a trade to a profession occurs gradually as particular attributes of a profession distil in the relevant field of expertise (Greenwood, 1957). Welie (2004:529) notes that "given the large number of paid occupations that demand several years of advanced education and some kind of certification or licensing, today's liberal use of the labels 'profession' and 'professional' is undesirable".

It is suggested by Gillis and Parker (1996) that a particular sequence of developments occurs as follows.

> *First, a professional association is formed with explicit membership criteria and a title. Then a code of ethics is established. Next, political activity establishes legal codes for licensure and practice, concurrent with the development of educational facilities under the direct or indirect control of the association.*

(Gillis & Parker, 1996:8)

A variety of concepts defining a profession exists (Lautar, 1995). Abbott cited in Lautar (1995) prefers to define a profession through jurisdiction of professional skill and knowledge rather than a set of criteria or attributes. Further methods for defining a profession make use of professional attributes. Attributes commonly identified by Welie (2004:530) include, "theoretical knowledge obtained through extended and standardised education, demonstrated competence, high level of organization, codification of behaviour and altruism". Pavalko in Gillis and Parker (1996) had similar criteria which include,

> *an educational period of a theory or intellectual technique*
> *an educational period*

28

*autonomy*

*motivation*

*sense of commitment*

*sense of community*

*code of ethics and*

*relevance to basic social values.*

(Gillis & Parker, 1996:8)

A further list of criteria constituting a profession is offered by Hall which includes the following four attributes,

*full-time employment*

*extensive training specific to that particular field*

*the formation of a* professional *association*

*an established code of ethics.*

(Hall cited in Gillis & Parker, 1996:8)

Further combinations of the above mentioned lists of attributes are described by a number of authors including Barber (1963).

Modern models for evaluating professions, particularly the medical professions, such as suggested by Wynia et al. (1999), state that it is necessary to consider moral foundations of professions rather than a list of attributes or characteristics. During the 1960s the monopolizing of occupations coupled with evidence of professional egotism led to beliefs that professional ethics were a cynical scheme (Wynia et al. 1999; Hafferty & Light, 1995). Wynia et al. (1999:1612) further state that "throughout the 1970s and 1980s, claims that physicians were exploiting their occupational monopoly led to the use of antitrust legislation against physicians," which resulted in the idea of 'informed consent'.

By the 1990s those studying the professions became less cynically focussed on professional power. It was acknowledged that the self-regulatory power of professions, although disposed to exploitation, served a necessary social function

(Wynia et al, 1999). According to the model advocated by Wynia et al. (1999:1612), professionalism may be considered "as an activity that involves both the distribution of a commodity and the fair allocation of a social good but that is uniquely defined according to moral relationships. Professionalism is a structurally stabilizing, morally protective force in society". Unfortunately such morally protective forces in society occasionally fail the societies they serve, with devastating social effects. The restraining of core health care values in South Africa during the apartheid era is such an example (Wynia et al., 1999). It is evident then that professions protect vulnerable people as well as vulnerable social values, which are numerous. The model of professionalism described by Wynia et al. (1999) is constituted of three core elements as follows.

*First, professionalism requires a moral commitment to the ethic of medical service, which we will call devotion to medical service and its value. This devotion leads naturally to a public, normative act: public profession of ethics. Public profession of ethics serves both to maintain professionals' devotion to medical service and to assert its values in societal discussions. These discussions lead naturally to engagement in a political process of negotiation, in which professionals advocate for health care values in the context of other important, perhaps competing, societal values.*

(Wynia et al, 1999:1613)

This sentiment is shared by Welie (2004:600), who states that "professions are often defined in terms of seemingly arbitrary lists of responsibilities". Welie (2004) further defines a profession as follows.

*A profession has been defined in terms of its collective promise to apply its expertise – and hence power- for the good of the public and not to capitalize on the vulnerability of its patients or clients in an attempt to maximize its own interests.*

(Welie, 2004:600)

The HPCSA (2007:i) similarly defines a profession and professional responsibility as follows.

> *Practice as a health care professional is based upon a relationship of mutual trust between patients and health care practitioners. The term "profession" means "a dedication, promise or commitment publicly made". To be a good health care practitioner, requires a life-long commitment to sound professional and ethical practices and an overriding dedication to the interests of one's fellow human beings and society.*

(HPCSA, 2007:i)

Arguably, Greenwood's (1957) definition of the attributes of a profession is still, today, the most defining work on professionalization and, therefore forms the conceptual framework on which this research is based. Greenwood's theory has been broadly used to evaluate both existing and developing professions due to the range of basic criteria defining professionalization (Davenport & Dallaportas, 2009; Weiss, Spiro, Sherer & Korin-Langer, 2004; Linzer, Conboy & Ain 2003; Lautar, 1995). Furthermore, Greenwood's view does not assign specific significance, as do others, to a single attribute but rather presents a manifold approach. Although professionalization theorems assigning specific significance to a single attribute are well recognized in established professions, for the purpose of examining developing professions, such as dental technology, a broader model is more helpful (Lautar, 1995). According to Greenwood (1957) it is the quantity, rather than quality, of these attributes that define the profession.

Greenwood lists five distinguishing attributes that he considers are the basic tenements of a profession. They are

> *1. systematic theory*
> *2. authority*
> *3. community sanction*
> *4. ethical codes*
> *5. a culture*

Each of these attributes will be discussed in further detail in the following subsections.

Bernard and Walsh in Gillis and Parker (1996:8) describe professionalization as "a continuum on which the left is occupation or non-profession and the right end is profession". This is to say that "professionalism is a matter of degree" (Barber, 1963:672). According to Greenwood (1957), however, any occupation that does not encompass all five attributes to some degree cannot be considered a profession. Toren, cited in Lautar (1995:129), states that the semi-profession, then, "is an occupation which exists alongside the continuum because either one or more of the attributes are missing or not fully developed".

A further aspect of organisational professionalization is individual professional socialization. Professionalization can be considered the process through which a discipline becomes a profession and equally, professional socialization can be considered as the process through which an individual becomes a professional (Gillis & Parker, 1996). It is also suggested by Gillis and Parker (1996) that prior to any formal professional socialization through an educational setting; those seeking to enter the health care field already have a number of the attributes of a professional as part of their personal values. Welie (2004:599), however, warns that a profession is considered in the context of a collective social phenomenon as "society's trust in professions is not vested in the individual service providers but in the profession at large"

Bernard and Walsh, cited in Gillis and Parker (1996:8), describe professional socialization as "a dynamic process through which occupations change certain characteristics of their workforce. Steps are taken to define and identify this group by name, function, education, ethical standards as well as licensing and practise requirements". Gillis and Parker further described "the work attitude of a person who has attained professional socialization" as follows,

> *the use of the professional organization as a major reference*
> *belief in service to the public*

*belief in self-regulation*

*sense of calling to the field, and*

*autonomy.*

The discussion now moves to an in-depth consideration of Greenwood's five criteria and how these tenets of a profession are applicable to dental technology.

## 2.2.1  Systematic theory

The term systematic theory is used with reference to the comprehension of a body of theoretical knowledge used by professional occupations in relation to operational skills (Greenwood, 1957).  The debatable principal feature of a profession was previously identified as the tenure of superior skill.  To evaluate a level of skilfulness, however, is questionable as a number of non-professional, craft oriented occupations, often require a higher level of skill than do those of professional stature. Greenwood (1957:46) states that the crucial distinction between a profession and a non-profession is "the skills that characterize a profession flow from and are supported by a fund of knowledge that has been organized into an internally consistent system, called a body of theory".  Barber (1963:672) confirms this notion that the defining characteristic of a profession is a "high degree of generalized and systematic knowledge".  A professional then can be described as having a coherent understanding of the theoretical principles based on operational skills (Welie, 2004 and Friedson, 1984).  The preparation for a profession, therefore, requires extensive systematic theory, which is not highly valued by non-professionals.  One can make reasonable judgement of the level of professionalization through the theoretical literature available in any specific field of expertise (Greenwood, 1957).

Theoretical knowledge is best achieved through a formal education in "the existence of a long period of training and socialisation within the higher education system" (Weiss et al., 2004:287).  Professional learning facilities, generally in the form of universities, facilitate this theoretical education (Friedson, 1984).  Historically the most distinguishing feature of a profession was a university education.  This level of

education was generally only available to the wealthy, and those unable to attain such higher education were trained through apprenticeships (Lautar, 1995). Thus, the universities were not only responsible for substantive knowledge itself but also with maintaining current and continuing advances in professional knowledge (Barber, 1963). Greenwood (1957) states that theoretical knowledge is more difficult to master than operational procedures, the body of theory requires construction through systematic research. The origination of valid theory that provides a solid foundation for professional techniques is acquired through scientific methodology (Greenwood, 1957).

The ability of a specific discipline to contribute to the body of knowledge and theory development through research is significant for the development of professional status (Gillis & Parker, 1996). Sustained use of scientific methods reinforces the aspect of rationality as opposed to traditionalism (Parsons, 1939). Greenwood (1957:47) elaborates this point, "as an orientation, rationality is the antithesis of traditionalism. The spirit of rationality in a profession encourages a critical, as opposed to a reverential, attitude towards the theoretical system". This suggests that the profession should be prepared to discard any portion of its system; regardless of how time honoured it may be, for an approach confirmed to be more current and valid. Rationality creates group self-criticism and theoretical debate providing a need for evaluation and continual education by members of professional associations (Welie, 2004; Parsons, 1939). Barber (1963) further states,

> *Where the body of professional knowledge is changing very rapidly, the university professional school may take a direct role in promoting the 'adult' education of the members of its profession through post professional training courses, seminars and institutes.*

(Barber, 1963:674)

Technological professions allow for a division of labour between theory orientated and practice orientated individuals. This manifests itself in a profession through members entering the field of research and those choosing to practise the profession. Despite the fact that well integrated researchers within a profession

contribute towards the expansion of theoretical knowledge, the potential for this division to affect intra-professional relationships does exist. The resulting effect of this expansion is to lengthen the period of education required to enter into the profession (Greenwood, 1957).

For the purpose of this study it was necessary to consider dental technology with reference to Greenwood's definition of systematic theory.

A uniform system of education in dental technology internationally does not exist. In many countries, including America most technicians are still being educated outside of dental schools through in-service or apprenticeship type training (Christensen, 2005). However, in order to practise in the dental technology field in South Africa, a formal education is mandatory. According to Christensen (2002) technicians that receive a formal education have a solid scientific and theoretical background from which to make educated decisions. Currently two basic qualifications are offered at universities of technology (Bass, 2007). Philosophically, UoTs' academic focus centres on technology and attempts[8] to provide graduates with a sound theoretical basis coupled with the relevant practical skills. Universities of technology largely differ from the former technikons in that they offer a more knowledge based qualification as well as higher levels of education (Bass, 2010). The first of these qualifications is that of a three year diploma, which enables graduates to "work only as employees in dental laboratories" (Bass, 2007:6). Those qualified dental technicians wishing to become laboratory owners are required to complete a further one year postgraduate Bachelor's degree in Technology (Bass, 2007).

In addition to the bachelor's degree a masters as well as doctorate degree are available in South Africa (Bass, 2010). Very few dental technicians embrace education in dental technology further than a bachelor's degree. In fact since the introduction of the master's and doctorate degrees in 1997 only 11 masters, which include two Masters Certificates[9] achieved between 1979 and 1997, and one

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[8] The word "attempts" is used to indicate that this is a new philosophy and has as of yet no been conclusively confirmed.

[9] Referred to in Chapter 1 – History of Education in Dental Technology.

doctorate have qualified to date (The *Mercury*, 2008), out of approximately 528 bachelor's degree graduates from the same time period (Boshoff, 2010; Somers, 2010; Steyn, 2010).  It is worthy of mention that more that 50 percent of the postgraduate students are being generated by one UoT, namely the DUT (Refer to **Table 1** below).

Having identified the lack of motivation of dental technicians to engage in postgraduate studies, it is understandable that very few dental technicians enter the field of education or research as a profession in the pursuit of a practically based career.  Although there is just enough interest in dental technology education to maintain the current status quo at UoTs, there is very little research being generated in this field.  The only research in dental technology in South Africa is currently being generated in the UoTs with DUT being the main contributor (Bass, 2010).  Very little peer reviewed literary work is produced by dental technicians within South Africa.  This is, arguably, due to the lack of motivation of dental technicians with regard to the generation of knowledge through research.

**Table 1**.  Dental technology postgraduate students.

| Number of Graduating Students | DUT | CPUT | TUT | Total |
|---|---|---|---|---|
| Bachelors Degree of Technology | 169 | 190 | 169 | 528 |
| Masters Degree of Technology | 6 | 2 | 3 | 11 |
| Doctors Degree of Technology | 1 | 0 | 0 | 1 |
| Percentage of Postgraduate Students | 2% | | | |

In order to maintain a current level of education the Continuing Professional Development (CPD) point system was implemented within the dental technology

industry during 2009. According to the HPCSA the CPD point system has the following aim within the health professions.

> *Ethical practice of the health professions requires consistent and ongoing commitment from all concerned to lifelong learning to update and develop the knowledge, skills and ethical attitudes that underpin competent practice. This perspective protects the public interest and promotes the health of all members of the South African society.*

<div align="right">(HPCSA, n.d.:6)</div>

As early as 1979 reference to the implementation of CPD in order to raise the professional status of dental technicians was advised (Heffron, 1979). Bower et al. (2004:144) state that "through continuing professional development and modular training provision," it was envisioned that dental technicians would be able to increase their range of skills, even to the extent of denturism.

The system of continuing professional development (CPD) was introduced into dental technology in South Africa in 2009. This system is managed by the SADTC but largely implemented by the DENTASA. The CPD has been structured to comprise four categories as follows,

> *Academic non-measurable*
> *Academic measurable.*
> *Business Administration and Ethics.*
> *Technical measurable.*

<div align="right">(DENTASA, n.d.)</div>

In order for dental technicians to complete their annual registration with the SADTC, they are required to have accumulated minimum of 30 CPD points (DENTASA, n.d.).

Having defined systematic theory as an attribute of a profession, according to Greenwood (1957), the discussion now turns to professional authority.

### 2.2.2 Professional authority

Owing to extensive education in the systematic theory of a profession, a professional has the theoretical knowledge that sets him/her apart from the lay members of society.  According to Greenwood (1957) this fact is the foundation of the professional's authority.  Greenwood's work was largely influenced by Parsons (1939), who suggests that because of extensive education in the systematic theory of a profession, a professional has the theoretical knowledge that sets them apart from the lay members of society.

Authority divides the professional from the non-professional in the very patrons they serve.  The non-professional serves customers who choose, evaluate and judge the service they receive.  The professional, on the other hand, serves clients who are incapable of making these distinctions. A client trusts the judgement of the professional to make decisions for their well being (Greenwood, 1957).

It is noted by Barber (1963) that an important aspect of authority is autonomy.  Autonomy is granted to the professional with regard to matters in which they alone are experts or the authority (Barber, 1963).  This autonomy should be considered a responsibility rather than a right or privilege (Welie, 2004).  Parsons (1939:460) states that "professional authority is limited to a particular technically defined sphere.  Professional authority, like other elements of professional pattern, is characterized by specificity of function.  This is to say that any discipline acclaimed to be a profession is held to be an authority only in that particular field (Parsons, 1939).  Masella and Meister (2001) further state that professionals should be willing to acknowledge the limitations of their knowledge and expertise.  Greenwood (1957:48) states that "a professional dictates what is good or evil for the client, who has no choice but to consent to professional judgement".  According to Welie (2004) it is due to this consent to professional judgement that professions are required to self-assess through peer review in order to maintain suitable levels of service.

Professional authority is partially responsible for professionals' distaste for advertising, which would accredit potential clients with the ability to select from competing services (Greenwood, 1957).  Welie (2004) elaborates by stating that

public intra-professional competition suggests that some service providers are superior to others, which suggests to patients that not all professionals are equally trustworthy. Professional authority endows the profession with a monopoly of judgement, which developing professions aspire to acquire (Friedson, 1984). According to Greenwood (1957), the assumption of professional authority bestows the client with a sense of security.

The powers of professional authority are not without limits, however, but rather confined to those specific fields within which the professional has been educated (Greenwood, 1957). This quality of professional authority is referred to by Parsons (1939) as functional specificity. Functional specificity carries a number of implications, particularly to the bounds of professional knowledge (Greenwood, 1957).

> *The professional cannot prescribe guides for facets of the client's life where his theoretical competence does not apply. To venture such prescription is to invade a province wherein he himself is a layman, and, hence, to violate the authority of another professional group.*

> (Greenwood, 1957:48)

We now proceed to explore professional authority in the field of dental technology. There is an ongoing struggle between dentistry and para-dental occupations over issues such as professional authority, autonomy, expertise and professional status.

Those para-dental occupations, historically subordinate to organised dentistry, are currently striving to become independent from dentists' control and influence (Adams, 2004). Similarly, the dental hygiene discipline's striving to attain professional status is hindered by dentistry through legal restraints on licensure, education and scope of practice (Gillis & Parker, 1996). As with dental hygiene, the scope of dental technology has long been encompassed in the dental field, but has been delegated to relevant subordinate fields of dentistry in order to free organised dentistry to concentrate on the "more remunerative and complex" clinical aspects (Adams, 2004:2244).

The current occupation of dental technology then, has laid claim to a vacancy formally governed by dentistry but which has been abandoned (Adams, 2004). Adams (2004:2244) states that "because the jurisdictions claimed by various groups tend to overlap, or at least meet, there is frequent conflict between occupations over boundaries. According to Abbot, cited in Adams (2004) inter-professional conflict is not merely between the professions but involves appeal to third parties, including: state or legal system, public audience and the work place. Furthermore, Abbot, suggests that "organizational strength and power are also important factors in winning and claiming a jurisdiction" (Adams, 2004:2244). Dental technicians are widely believed to be the experts or authority in the field of dental technology (Christensen, 2005; McGarry & Jacobson, 2004; Andrus et al., 1990; Leeper 1979). This field is, however, not autonomous to dental technicians, but is internationally shared with organized dentistry (Christensen, 2005; Napier, 2004; Ganley, 2002).

In South Africa, it is legislated that registered dental technologists and dentists may own a dental laboratory. According to the Dental Technicians Act 29 (1) of 1979, only a dental technician contractor, dentist or clinical dental technologist may own a dental laboratory. Clinical dental technology or denturism, as it is also referred to, is a field of dentistry that is considered controversial in South Africa. Denturists consult directly with patients in need of dentures and provide both the clinical and manufacturing aspects of such services (Malherbe, 2009). Although the specific function of clinical dental technology is legislated in the Dental Technicians Act, it is currently illegal to practise as a denturist in South Africa. According to Malherbe (2009:2) denturism has not been instituted in South Africa because this practice may encroach on the field of organized dentistry and thereby end its monopoly. This field generally is believed to serve the poor, aged and otherwise disadvantaged communities (Malherbe, 2009). The ownership of a dental laboratory in the case of dentists and clinical dental technicians is conditional. The Dental Technicians Act 29 (3) of 1979 states that people in the above mentioned fields may own a laboratory and manufacture restorative prosthesis exclusively for patients attending clinics immediately associated with the laboratory.

On the other hand, dental technicians are exclusively bound to laboratory work and any contact with patients in the absence of a dentist is in contravention of the Act.

The Dental Technicians Act (27) (1) (b) of 1979, states that only dentists and dental technicians may repair or manufacture oral restorations that have been delivered to them by a dentist and which will on completion be returned to the dentist. This is to say that a dental technician shall have no work if a dentist does not choose to send such work to the technician.

Furthermore, Regulation 5. 2 (1) (l) of the Dental Technicians Act 19 of 1979 states that the following would be an act of omission:

> *Discussing or negotiating with a patient of a dentist the manufacture, repair or delivery of any artificial denture or other dental appliance or part of such artificial denture or appliance without such dentist being present.*

> (South Africa, 1979)

This is to say that dental technicians merely fulfil prescription as conveyed by dentists. Ganley (2002:15) supports the sentiment that "the lab technicians were receivers and fillers of prescriptions. They made what was asked for to the best of their abilities, given the information and the time constraints". Thus by implication, the Act, perhaps inadvertently, supports the notion that dental technology is not to be considered a profession as suggested by Greenwood. This being the state of affairs would suggest that dentists are in fact the authority in the field of dental technology which, as has already been established, is not the case. Hence, with consideration to what Greenwood (1957) describes as 'functional specificity' it could be said that dentists are invading the authority of dental technicians. It is not necessarily dentists, however, who are choosing to invade such authority but rather the Dental Technicians Act (1979), which maintains this long-standing state.

Considering that dental technology is not granted professional authority through legislation it would be reasonable to consider that dental technicians may then advertise. Greenwood, (1957), states that it is precisely for the reason of professional authority that advertising is disliked by professionals. However, advertising is an illegal practice in the field of dental technology in South Africa. This legislation is covered by the Act 19 of 1979 Regulation 5.3 (b):

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*tacitly permitting himself to be advertised directly or indirectly in any manner whatsoever with a view to his direct or indirect, immediate or eventual professional gain or procuring, sanctioning or acquiescing in the publication of matters commending or directing attention to his* professional *skill, knowledge, services or qualification.*

<div align="right">(South Africa, 1979)</div>

It is evident that legislation in dental technology is inconsistent and it remains questionable as to who is being served best by such legislation. Although dental technology is seen internationally as being the authority in this field, dental technology is not limited to dental technicians but rather shared with dentistry. The discussion now turns to community sanction.

### 2.2.3  Community sanctions

Greenwood (1957:48) states that "every profession strives to persuade the community to sanction its authority within certain spheres by conferring upon the profession a series of powers and privileges". According to Welie (2004:530) the phrase profession literally means "public avowal" or approval. It is not the privilege of an occupation to claim a professional status but rather that such status is granted by the public, which they profess to serve (Welie, 2004).

Attaining professional powers and privileges through community sanction is a highly desirable attribute (Dower et al., 2001). Greenwood states that,

*Specifically the profession seeks to prove: that the performance of the occupational skill requires specialized education; that those who posses this education, in contrast to those who do not, deliver a superior service; and that the human need being served is of sufficient social importance to justify the superior performance.*

<div align="right">(Greenwood, 1957:49)</div>

This attribute constitutes professional monopoly, which is achieved through conducting an organized campaign, by professional associations, to persuade the community that it will benefit greatly by conceding the monopoly (Greenwood, 1957). This notion of public approval is further demonstrated by Welie (2004:530) who states that "the public... enters into a kind of mutual agreement... with the professional, granting it such perks as a monopoly, above-average income and social status". Greenwood further notes that,

> *Every profession strives to persuade the community to sanction its authority within certain spheres by conferring upon the profession a series of powers and privileges.*

(Greenwood, 1957:48)

Among these powers and privileges granted a profession by the community is the power to control its educational facilities. Professional regulation of educational facilities is achieved through accreditation, and affords the profession the ability to regulate the number of schools, their location, curriculum and level of instruction. The profession also acquires control over admission into the profession. This can be achieved firstly, by gaining community sanction to issue professional titles through accredited educational institutes and secondly, by instituting a licensing system for screening those qualified to practise their profession. The receipt for licensing is, of course, only issued to those duly granted a professional title (Greenwood, 1957).

One of the most important privileges among professional privileges is that of confidentiality. In order for a professional to perform their duties efficiently the client is encouraged to divulge information they may otherwise have retained. Only a select few professionals enjoy this privilege, notably medicine and law (Greenwood, 1957). According to Greenwood (1957:49) "its very rarity makes it the ultimate in professionalization".

Another desirable professional privilege is its opposition to community judgement on the profession's technical issues. The profession does not accept or need community judgement as the perception is that the community is not qualified to

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pass judgement. Hafferty and Light (1995) express a more cynical notion for the lack of community judgment.

> *No attention was given to the way in which the enlightened paternalism of doctoring, which Parsons extolled, resulted in part from cultivating ignorance, helplessness, and a sense of incompetence in patients as techniques of social control*

(Hafferty & Light, 1995:134)

The profession thus, by consensus, sets professional standards based on the existing body of theory, which the lay community is presumed incapable of comprehending. A professional's performance is, therefore, judged by peers rather than the public (Greenwood, 1957).

The discussion now turns to community sanction in dental technology.

Dental technology is largely an invisible vocation. The general public is unaware of its existence and its function as part of the dental profession. Christensen (2005:654) states "Dental patients do not know who makes their crown, veneers, fixed prostheses and dentures; when they report for their seating appointment, the restorations simply appear from somewhere". This general lack of public awareness is internationally applicable (Christensen, 2005; Malherbe, 2008). Owing to this lack of public awareness, and more specifically approval, dental technicians do not hold the monopoly of dental technology, as confirmed in professional authority.

In South Africa, for reasons already discussed above[10], dental technicians are rarely in direct contact with dental patients in order to inform them of this aspect of dentistry. The transfer of information is solely dependent on the dentist. In an attempt to inform the general public of the function of dental technology, and as part of the Bachelor of Technology, Business Practice II syllabus at DUT, students are required to exhibit 'dental technology' at a shopping mall. The public attending these

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[10] Refer to Professional Authority.

exhibitions is largely unaware of the existence or function of dental technology as part of the dental team. Even this public professional advertising is, however, restricted in legislation. According to Act 19 of 1979 Regulation 5.2. (1)(r), any dental technician would be in contravention of the act through the,

> *publishing under or above his name in the lay press any articles on dental technology or dentistry, addressing any audience in this respect, whether directly or in any filmed, taped, duplicated or other transmitted form, broadcasting on the radio or television service or otherwise communicating with the public or a section thereof on dental technological or dental subjects without the previous permission of the council.*

(South Africa, 1979)

The terms under which educational institutions may operate are regulated in the Act and compliance is monitored by the SADTC. The Act also regulates under what terms a technician may be registered in order to practise the profession of dental technology. However the SADTC is not exclusively made up of dental technicians but includes dentists as part of its committee (South Africa, 1979). Educational and curriculum decisions are made by individual institutions and approved by the SADTC. The dental technology schools are independent of the dental schools owing to their geographical locations. The only interaction the learners have with dentists during their educational training at DUT is through the departmental clinic. In my experience as a newly graduated technician from DUT this contact is very limited.

According to Christensen (2005:654) "few technology programs are located in dental schools, and technology students must seek programs in non dental environments. This separation does not encourage interaction of technicians and dentists". McGarry and Jacobsen (2004) concur with the sentiment that owing to the absence of laboratories within dental schools, a lack of educational opportunities for dental as well as dental technology students exists. Students are consequently unable to observe the clinical or laboratory procedures associated with dentistry and thus are unable to evaluate their contribution to the restorative process.

According to McGarry and Jacobson, (2004:222) "this lack of experience in evaluating…results in poor dentist/dental technician relations". Integrating the dental technology curriculum with that of dentistry would foster better inter-professional relationships from the most fundamental level. Furthermore dental technology students would have more contact with patients. This interaction would improve public information as well as give students a sense of responsibility with regard to restorations manufactured as part of their training (Christensen, 2005). McGarry and Jacobson (2004:224) further state that "independent programs also do not have actual clinical cases for technical training. The tuition necessary to support such training programs is high and not easily recovered by new graduates." Graduates are usually "disappointed at the entry level salaries because, though they are knowledgeable, they are not yet productive in the commercial environment. Today, dental technology programmes are managed and administered by dental technicians. However this was not always the case.

The first head of Dental Technology at Technikon Natal was a dentist and dentists have over time had major influence over dental technology training by acting as moderators and examiners at all the training institutions (Bass, 2010). The SADTC, which is the governmental regulatory body of dental technology, also functions in the regulation of the education of dental technology in South Africa through the Dental Technicians Act (1979). The SADTC further licenses dental technicians for practice and regulates the practice of the profession (Dental Technicians Act, 1979). As dental technicians do not serve the public directly, no information is available concerning the aspects of confidentiality or community judgment in respect of community sanction.

Dental technology is not free from technical service judgement from dentistry or the community; neither may they choose to act in the best interest of the patient. Community judgment is currently facilitated through the ethical issue of informed consent during the consultation process. According to Orr and Curtis (2005:1568) "the term 'informed consent' is used in tort[11] law with respect to the process by which

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[11] Latin for 'twisted'

a patient is appraised (informed) of the nature and risks of a proposed treatment... and then accepts a treatment plan (consents)". Informed consent entitles the patient to select a treatment plan, which they deem suitable for their own personal needs. According to the HPCSA (2007:1) "patients must be given sufficient information in a way that they can understand, to enable them to exercise their right to make informed decisions about their care".

Having defined community sanction as an attribute of a profession, according to Greenwood (1957), the discussion now turns to ethical codes.

## 2.2.4 Ethical codes

As the community is able to grant professional monopoly so it is able to revoke such monopoly in professions choosing to abuse community vested authority. Revoking professional authority, however, may be the extreme as all professions have an inherent regulative code that requires ethical behaviour (Greenwood, 1957). Professional ethical codes exist both formally; in the form of written codes, and informally; as an unwritten professional consensus (Parsons, 1939). Through commitment to its ethical codes a profession is able to retain community confidence, in the absence of which a monopoly could not be maintained (Greenwood, 1957).

> *A monopoly can be abused; powers and privileges can be used to protect vested interests against the public weal. The professional group could peg the price of its services at an unreasonably high level; it could restrict the numbers entering the occupation to create a scarcity of personnel; it could dilute the calibre of its performance without community awareness; and it could frustrate forces within the occupation pushing for socially beneficial changes in practices.*

> (Greenwood, 1957:49-50)

It is necessary for the professions to exhibit self-control through internalized codes of ethics as well as through professional groups and government (Barber, 1963). While all occupations possess self regulatory codes, those of professionals are more explicit, systematic and binding; with greater public service orientation. Two specific

professional relations are uniform among all professions, those between the professional and client and that with colleagues. In dealing with the client, the professional is to remain emotionally neutral, providing service to all those who request it regardless of differentiating factors (Greenwood, 1957).

This element of professionalism is described by Parsons (1939) as 'universalism'. Parsons (1939) also describes an aspect of 'disinterestedness' in the professional's relationship to the client. In contrast to non-professionals, disinterestedness in professionals indicates less motivation in self interest but rather motivation in the interest of public service (Greenwood, 1957).

> *The ethics governing colleague relationships demand behaviour that is co-operative, equalitarian, and supportive. Members of a profession share technical knowledge with each other. Any advances in theory and practice made by one* professional *is quickly disseminated to colleagues through the* professional *associations. The proprietary and quasi-secretive attitudes towards discovery and invention prevalent in the industrial and commercial world are out of place in the professional. Also out of place is the blatant competition for clients which is the norm in so many non-professional pursuits.*
>
> (Greenwood, 1957:50-51)

Although intra-professional competition does exist, it is highly regulated and should be based on operational skills or contribution to theory (Greenwood, 1957). Within a profession, professional colleagues should support each other and refrain from jeopardizing the authority of colleagues. Those colleagues in a professional environment, whose authority is threatened, should aim to be restored (Greenwood, 1957). Freidson (1984:14) confirms this notion: "Another traditional custom that helped to preserve professional solidarity was the avoidance of public and formal criticism of colleagues' competence and ethics".

The ethical codes of a profession are maintained by its members through self-discipline. Self-discipline exists either formally or informally. Informal discipline is achieved through the pressure colleagues place on one another in the form of

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consultation and referral practices. A professional will refer a client to a colleague who may have more time or expertise to better serve the client's needs. As professional ethics disapprove of aggressive competition and advertising, consultations and referrals comprise the primary basis of work to professionals (Greenwood, 1957). According to Greenwood (1957:51) "the consultation- referral custom involves professional colleagues in a system of reciprocity, which fosters mutual interdependence".

Formal discipline is exercised through professional associations, which have the power to criticize, reprimand and if necessary to bar offenders. Remaining in good standing with respective professional associations provides justifiable rationality towards compliance (Greenwood, 1957).

The attribute described above by Greenwood (1957) as ethical codes is now related to the field of dental technology.

Formal regulatory codes in dental technology in South Africa are predominantly administered at governmental level through the SADTC. Although there is a professional association, namely the DENTASA, it is not a statutory body and holds very little regulatory powers over the profession. Support of the DENTASA among technicians has increased dramatically over the past five years despite the historical poor support of technicians of professional bodies (Morris, 2009). Similarly, through informal conversations with dental technicians who wish to remain anonymous, it has been suggested that very little informal ethical code regulation is implemented through pressure between professional colleagues. Although no official literature with regard to the intra-professional relationship between dental technicians exists, anecdotal evidence suggests that their interactions are more than just friendly completion (Andrus et al., 1990). Andrus cited in Andrus et al. (1990:13) comments: "As the dust settles in the fight for keeping old and getting new business" colleague relationships continue to degenerate. This battle for business is still raging on in South Africa today.

The inter-professional relationship with dentists also leaves much to be desired. This opinion is further explored by McGarry and Jacobson (2004).

*Interactions [with dentistry] placed dental laboratory technicians in a subservient role... Regardless of the benevolence of dental professionals, the stature afforded dental laboratory technicians has been insufficient to create a sustainable professional career model.*

(McGarry & Jacobson, 2004:221)

Bormes cited in Andrus et al. (1990:10) further states, "Unfortunately, the relationship between dentists and technicians who are characteristically more regressive/passive has not changed much over the last 10 years". It was also noted by Ganley (2002:15) that until the early 1980s the dentist–dental technician relationship could typically be described as "a one-way street" – this being from the dentist to the technician. This style of inter-professional relationship is still relevant in South Africa today.

It can be concluded that dental technology possesses ethical codes. These codes are predominantly formally instituted through the SADTC and to a significantly lesser degree informally through professional consensus. Both inter- and intra-professional relationships are of poor ethical standards. However, according to Greenwood's (1957) definition of ethical codes, this attribute is evident in dental technology.

### 2.2.5 Professional culture

A professional culture is used as a collective term to describe the values, norms and symbols composed, and cherished in a profession, through professional interaction (Greenwood, 1957). Professions network through a number of formal and informal groups. Three chief formal groups exist, extending from which are a number of informal groups based on a number of affinities (Greenwood, 1957). The formal groups are

*institutional settings through which professionals perform their services,*

*educational and research centres to expand talent and fund of knowledge, and*

*professional associations to "express consciousness-of-kind" by professional members*

<div align="right">(Greenwood, 1957:51)</div>

It is through these professional organisations, traditionally, that self-regulation on a formal level has been practised. Disciplinary action on members of the profession could result in expulsion from the organisation and the loss of associated privileges (Feidson, 1984). Interaction by professional members through these organisations creates a unique social composition referred to as a professional culture. A professional culture consists of the "values, norms and symbols" (Greenwood, 1957:52) as well as the 'career concept' (Greenwood, 1957:53) of the profession. The central concept of professional culture is identified as the career concept. The term career is only used in association with professional occupations and is in essence a life calling to good works. The career concept is further described by Greenwood (1957:52) as the social values of a professional group.

> *The social values of a professional group are its basic and fundamental beliefs, the unquestionable premises upon which its very existence rests. Foremost among these values is the essential worth the service which the professional group extends to the community.*

The service provided by the profession is considered a social good and the community would be the greatly afflicted without it. Coupled with concepts of professional authority and monopoly is the force of group value. This is to say that the professional group is immeasurably wiser than the general public regarding service related matters. The service monopoly of a professional group consequently generates social progress (Greenwood, 1957). Greenwood (1957) again discusses the concept of rationality with reference to professional value. Rationality is the commitment to objectivity by a profession regarding theory and technique. This denotes that no theoretical or technical knowledge is considered sacred or unchangeable merely because it has a history of approval and use (Greenwood, 1957).

Greenwood (1957:52) states that "the norms of a professional group are the guides to behaviour in social situations". In brief, there are behavioural norms comprising every situation likely to occur in professional life.

> *The symbols of a profession are its meaning-laden items. These may include such things as: its insignias, emblems and distinctive dress, its history, folklore, and argot [jargon]; its heroes and its villains; and its stereotypes of the professional, the client and the layman.*

(Greenwood, 1957:52)

The discussion now turns to considering professional culture as part of dental technology in South Africa.

A professional culture in dental technology in South Africa is predominantly created through professional associations rather than institutional (service providing setting i.e. hospitals) or educational (research centres) settings. As dental laboratories in South Africa are almost exclusively privately owned, minimal scope for the development of a professional culture through institutional settings (service providing setting) exists. The setting in which dental technicians provide their service is generally individualized. Similarly, for reasons already discussed under subsection 'Body of theory', no educational settings (research centres) involving dental technology, other than the UoTs, currently exist and this leaves little scope for cultural development in this aspect.

Dental technology associations in South Africa have had a long and troubled history[12]. These professional associations have historically been a greater source of division rather than unity and as such have been poorly supported. The dental technology association that has gained the most support over recent years is DENTASA (Morris, 2009). An increasing interest in interaction through this association is reflected in the number of attendants to DENTASA's Annual General Meeting (AGM), which increased significantly from 70 attendants in 2005 to 421

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[12] Refer to History of Dental Associations in South Africa in Chapter 1.

attendants in 2009 (Morris, 2009). Predominant cultural features of this growing professional association include, the AGM, regular regional meetings, hosting educational training and lectures, and implementing the CPD point system.

Having defined a professional culture as an attribute of a profession, according to Greenwood (1957), the discussion will now turn to the concluding comment of chapter two.

## 2.3   CONCLUSION

When evaluating the professionalization of an occupation with regard to the above mentioned attributes it is necessary to consider the quantity of attributes present rather than the quality.   As non professional occupations also possess several attributes of a profession to varying degrees, it is the professions that encompass all attributes (Greenwood, 1957).

The attributes identified, in this chapter, to define a profession are

1. systematic theory
2. professional authority
3. community sanction
4. ethical codes and
5. a professional culture.

Having considered the five attributes of a profession as suggested by Greenwood (1957) and the position of dental technology within this framework, we are now able to investigate to perceptions of dentist, dental technicians and dental patients with regard to this field.

We now proceed to chapter three.

# CHAPTER 3

# RESEARCH METHODOLOGY

## 3.1    INTRODUCTION

This study was conducted in an interpretive paradigm through the generation of qualitative data.  Qualitative data was generated through semi-structured interviews with dentists, dental technicians and dental patients.  For the purpose of this study the sample of dentists and dental technicians who participated in the study was required to have five years' work experience in their relative fields. In addition only dental patients who had recently, during 2007 to 2009, received prosthetic dentistry were considered for the study.  Sampling is a central consideration in this study and a detailed explanation is offered later in this chapter for the sample choice.

The research paradigm and methods of data collection through which this study was conducted, are discussed in detail in this chapter.  A number of methods of sampling were employed for the purpose of this study.  These methods are identified and described, and the motivation in support of these methods is discussed.  Ethical considerations are also taken into account through the course of this chapter.

This chapter is concluded with a discussion on the trustworthiness and limitations of the study conducted.  Trustworthiness is considered through evaluation criteria, which are described and discussed.

## 3.2 THE RESEARCH PARADIGM

The nature of an inquiry is defined for the researcher through the research paradigm. Paradigms can be refined to comprise three components, these being ontology, epistemology, and methodology (Cohen, Manion & Morrison, 2007). It is suggested by Hitchcock and Hughes cited in Cohen et al. (2009: 5) that "ontological assumptions give rise to epistemological considerations, these in turn, give rise to methodological considerations, and these, in turn, give rise to issues of instrumentation and data collection". Each of these components; ontology, epistemology and methodology; will be briefly considered below.

The ontology of an inquiry is the essence of "the social phenomenon being investigated" (Cohen et al., 2009:7). As such, the question is raised whether social reality is "external to individuals – imposing itself on their consciousness from without – or is it the product of individual consciousness?" (Cohen et al., 2009:7). This question is at the heart of, what is described by philosophy as, the 'nominalist – realist' debate. The nominalist believes that it is the individual consciousness that gives meaning to reality while, in contrast, it is the opinion of the realist that reality exists independently of the individual consciousness (Cohen et al., 2009). Having defined and understood ontology we now continue with an understanding of epistemology.

Epistemology is described by Burrell and Morgan in Cohen et al., (2009) as the foundation of knowledge and how one relates to it. When knowledge is considered rigid, objective and material, it requires of the researcher to subscribe to 'methods of natural science'. Knowledge which is considered, rather, to be unique and subjective, will require the researcher to employ interpretive methods. The former can be considered to be the positivist paradigm and the latter the post-positivist paradigm (Cohen et al., 2009). The nature of the ontology and epistemology will indicate the corresponding methodology, which is subsequently considered.

Methodology is defined as by Collins and O'Brien (2003:220) as: "The application of principles, practices and procedures to a problem, project, course of study, or given discipline". It is evident that methodology provides a foundation for the research at

hand and directs the researcher with regard to the relevant paradigm (Cohen et al.*,* 2009). Thus we are now in a position to consider the different paradigms in more detail.

There are four distinctive paradigms used in research today. These are the positivist, interpretive, constructionist (Terre Blanche & Durrheim, 2006) and critical paradigms (Neuman, 2000). Each one of these paradigms has its "own set of philosophical assumptions and principles and its own stance on how to do research" (Neuman 2000:63). These four paradigms can be narrowed down to form two general paradigms: positivist and post-positivist. These two groups are largely related to quantitative and qualitative data generation respectively (Cohen et al., 2009).

The positivist approach can be broadly defined as the paradigm of the natural scientist (Neuman, 2000). The purpose of such research is to establish and record laws on human behaviour as well as to enable humans to predict and control their environment (Neuman, 2000). Research analysis of the positivist is expressed as laws or 'law-like' generalisations established in relation to natural phenomena (Cohen et al., 2009). This method of conducting research is referred to as quantitative research, which uses predetermined categories and standardised measures to make broad and generalised assessments (Cohen et al., 2009). Terre Blanche et al., (2006:272) describe quantitative research as that which "makes sense in situations where we know in advance what the important variables are, and are able to devise reasonable ways of controlling and measuring them". Quantitative research then is an objective, logical and observed process (Denzin & Lincoln, 2003). Objectivity can be defined as the "existence of a world independent of consciousness (Collins & O'Brien, 2003:247). Polkinghorne cited in Denzin and Lincoln (2003) expresses a comparable notion.

> *The objective realm is independent of the knower's subjective experiences of*
> *it… In the splitting of reality into subjective and objective realms, what can be*
> *known 'objectively' is only the objective realm. True knowledge is limited to*
> *the objectives and the relationship between them that exist in the realm of*

*time and space. Human consciousness, which is subjective, is not accessible*
*to science, and thus not truly knowledge.*

(Denzin & Lincoln, 2003:217)

In rejection of the positivist stance that human behaviour is regulated by 'universal laws', the post-positivists prefer to perceive a social world that is understood from the perspective of individuals (Cohen et al., 2009). As such the "social researcher chooses from alternative approaches to science" (Neuman, 2000:63). A number of paradigm subcategories distil from the post-positivist approach, including: critical, interpretive (Neuman, 2000), constructivist (Terre Blanche & Durrheim, 2006) and naturalism (Onweugbuzie, 2002). The post-positivist paradigms are generally referred to as the qualitative methods of research (Neuman, 2000) Qualitative research typically does not make use of standardized procedures, commonly found in quantitative research methods (Breuer, Mruck & Roth, 2002).

For the purpose of this research the interpretive paradigm will be further considered. Neuman (2000) describes interpretivism as follows:

*Interpretive researchers study meaningful social action, not just the external*
*or observable behaviour of people. Social action is the action to which people*
*attach subjective meaning: it is activity with a purpose or intent... [The action]*
*acquires meaning among people who share a meaning system that permits*
*them to interpret the action as a socially relevant sign or action.*

(Neuman, 2000:71)

The ontological belief of research in the interpretive paradigm is that no one social reality exists but rather a number of realities (Bailey, 2007). According to Guba and Lincoln cited in Bailey (2007:53) " the social world is not an entity in and of itself but is local, temporarily and historically situated, fluid, context-specific, and shaped in conjunction with the researcher". This subjective view recognizes that humans are incapable of being totally objective as each individual is situated in a reality constructed by subjective experiences (Carpenter & Speziale, 2007)

## 3.3    POSITIONING THIS STUDY IN A RESEARCH PARADIGM

According to Wildemuth (1993) it is vital that the researcher, considering the study at hand, selects a method based on the question concerned.  The ontology of this research is that the experiences of the participants are real and valid.   The epistemology is that these experiences can be understood through thoughtful interaction with participants.   This interaction is conducted through a qualitative, particularly interpretive, methodological approach (Terre Blanch & Kelly, 2002).  Therefore, for the purpose of this research an interpretive paradigm was employed.  Interpretivism is the study of "people's subjective experiences of the external world", which utilizes interviewing or observation of participants in order to gather data (Terre Blanche & Durrheim, 2006:7).

According to Bailey (2007:53) "research undertaken with an interpretive paradigm in mind focuses on social relationships, as well as the mechanisms and processes through which members in a setting navigate and create their social worlds".  The interpretive paradigm was selected for this research as the perceptions of specific groups with regard to professionalization of dental technology were considered.  The interpretive paradigm makes use of qualitative methods of research.  With this in mind, it is desirable to acquire a greater appreciation of qualitative research.

Qualitative research is defined by Denzin and Lincoln (2003:4) as that which "involves the studied use and collection of a variety of empirical materials…that describe routine and problematic moments and meaning in individual lives".  When considering qualitative research, the "subjectivity of the researcher is intimately involved" and "guides everything from the choice of topic that one studies, to formulating hypotheses, to selecting methodologies, and interpreting data" (Ratner, 2002:1).  According to Durrheim (2006:47) "qualitative methods allow the researcher to study selected issues in depth, openness, and detail as they identify and attempt to understand the categories of information that emerge from the data".   As discussed in Neuman (2009) the researcher is required to actively spend time with each individual forming part of the study, as well as consider, in detail, transcripts resulting from resulting conversations.  This data is used "to acquire an in-depth understanding of how [participants] create meaning in everyday life" (Neuman,

2000:71). Durrheim, (2006:286) further states that the qualitative researcher aspires to "make sense of feelings, experiences, social situations, or phenomena as they occur in the real world, and therefore wants to study them in their natural environment".

It can be concluded that this research is a post-positivist study undertaken in an interpretive paradigm and generating qualitative data. It is necessary, here, to highlight the key research questions investigated in this study.

## 3.4    KEY RESEARCH QUESTIONS

As noted in Chapter One, the key research questions which orientate this study are:

1) Is dental technology, as it is currently constituted in South Africa, perceived to be a profession by dentists?
2) Is dental technology, as it is currently constituted in South Africa, perceived to be a profession by dental technologists?
3) Is dental technology, as it is currently constituted in South Africa, perceived as a profession by dental patients?

## 3.5    COLLECTION OF DATA

### 3.5.1  Collection of qualitative data

The major objective of qualitative research, particularly in the interpretive paradigm, is to collect data in the context in which the information is understood or valued. The researcher, then, is required to enter the research environment and engage the research participant in a receptive and compassionate manner (Durrheim, 2006). The collection of qualitative data was conducted through semi-structured interviews. As conversations are a natural form of human interaction, semi-structured interviews are well suited to the interpretive approach (Kelly, 2006). Interviewing gives the researcher the opportunity to interact intimately with the research participants so as to gain insight to their thought and feelings (Durrheim, 2006). The most widely used interview process is that of the semi-structured interview (Kelly, 2006). During semi-structured interviews the researcher engages in dialogue with the interviewee rather

than simply posing a list of question (Bailey, 2007).  It is stated by Kirkwood cited in Cohen et al., (2007) that each participant will describe a phenomenon in a particular way.

Semi-structured interviews allow for open conversation guided by a list of predetermined questions[13].  This allows the interviewer to adapt the interview according to the responses of the participants rather than adhering to a rigidly structured list of questions (Kelly, 2006).

During the design of the interview schedule it is necessary to consider the research objectives.  The questions posed should adequately reflect what the researcher is trying to discover.  This process may be initiated through specifying the variables being measured (Cohen et al., 2009).  For the purpose of this study the variables are outlined through the use of a theoretical framework.  The interview questions were based on the theoretical framework chosen to orientate this study.  The theoretical framework serves to form a link between the questions and the implementation of the study (Kaniki, 2006).  The theoretical framework utilized for the purpose of this study is Greenwood's distinguishing attributes of a profession, which are: "(1) systematic theory, (2) authority, (3) community sanction, (4) ethical codes and (5) a culture" (Greenwood, 1957:45).  The discussion now turns to an explanation of the process through which data was generated.

The questions posed to each of the sample groups were similar in nature.  The questions, in general, were answered without elaboration to the topics introduced. The discussions with dentists as well as patients were notably shorter than those with dental technicians.  The shorter duration of interviews with dentists may have been, predominantly, due to their professional time constraints.  Interviews for patients and, perhaps to a lesser degree, for dentists may have been shorter due to a lack of knowledge or exposure to dental technology or aspects thereof.

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[13] Refer to Annexures 4, 5 and 6.

### 3.5.2  Sampling to generate qualitative data

It has been stated by Polit and Hungler (1995:277) that "we all come to conclusions about phenomena based on exposure to a limited portion of those phenomena". This process is formally known to researchers as sampling.  Sampling is a practice whereby a portion of the population is selected in order to represent an entire population (Polit & Hungler, 1995).   The most pertinent consideration in the evaluation of a sample is its 'representativeness' of the population (Polit & Hungler, 1995).   A representative sample would reflect the views of the "population about which the researcher aims to draw conclusions" (Terre Blanche & Durrheim, 2002:44).  Acquiring a sample that is representative of the population is particularly relevant in interpretive research (Cohen et al, 2007).  This representativeness is generally achieved through random sampling (Durrheim, 2006).  It is important at this point to consider the sample that formed part of this research.  Three sample groups were selected, consisting of dentists, dental technicians and dental patients.  Within the process of completing a prosthesis, the interaction of three essential parties is involved namely; the patient, the dentist and the dental technician.  Dental patients have been selected as opposed to members of the general public in order to gain an understanding of perceptions of dental technology by those members of the public who have personally been served by this field.   Thus in order to establish perceptions with regard to professionalization of dental technology, it is significant that all three groups were included as part of this study.  Having determined the persons to be interviewed, it is, now, necessary to consider the sample size.

Sample size is dependent on the type of study and length of interview and should be considered along with the idea of theoretical saturation (Cohen et al., 2007). According to Polit and Hungler, (2005:299) the "sample size is largely a function of the purpose of the inquiry, the quality of the informants, and the type of sampling strategy used".   Therefore, sample size should be considered with regard to informational needs (Polit & Hungler, 2005).  Theoretical saturation or 'sampling to redundancy' is achieved when no new data is introduced with each additional case (Kelly, 2006).  Redundancy can be accomplished with a comparatively small number of cases, provided that the information from each participant is of sufficient depth (Polit & Hungler, 2005).  Kelly (2006:289) further suggests that at the point of

theoretical saturation "there is a sense that the theoretical account is nearing a complete and adequate form". This suggests that recommended sample sizes should be used as a preliminary guide with the concept of theoretical saturation. According to Kelly (2006:289) "six to eight data sources" are adequate based on interviews that are several hours in length and "ten to 20" data sources for those shorter in length.

As noted earlier, in order to ensure representivity in this study three groups were sampled. These groups comprised dentists, dental technicians and dental patients. As interviews were approximately 25 to 35 minutes in length, each group was be made up of six participants, totalling 18 individual participants. Considering all the groups together, the longest interview was 49 minutes long and the shortest interview was approximately 13 minutes in duration. See **Table 2** for the duration of interviews for each respective group.

**Table 2**. Interview durations

| Group: | Dentists | Dental Technicians | Dental Patients |
|---|---|---|---|
| Maximum time in minutes | 36:11 | 49:26 | 44:07 |
| Minimum time in minutes | 15:39 | 17:01 | 12:52 |
| Average time in minutes | 24:26 | 35:39 | 25:52 |

The use of several sample groups allowed for data triangulation (Kelly, 2005). Data triangulation involves the collecting of information in a variety of methods or sources (Durrheim, 2005). Triangulation allows the researcher to gain a better understanding through viewing the data from different perspectives (Kelly, 2006). This enables the researcher to gain an "in-depth understanding of the phenomenon in question (Denzin & Lincoln, 2003). Bailey (2007:77) states that triangulation may be further

ensured through the collection of "data from respondents who occupy different social locations or are likely to have divergent views".

This study was limited to registered[14] dentists and dental technicians with at least five years experience and members of the public who have had prosthodontic treatment in KwaZulu-Natal. A list of registered dental technicians in KwaZulu-Natal was obtained from the South African Dental Technicians Council (SADTC). The list obtained from the SADTC had been, however, poorly maintained leading to incorrect and outdated information. A further list of dental technicians in KwaZulu-Natal was obtained through the Dental Technicians Association of South Africa (DENTASA). Although this is a voluntary body, the increase in membership during 2009 as well as the annual update of records makes this an ideal source of reliable information (Morris, 2009). These lists were amalgamated to form a comprehensive list from which to establish the sample. A list of dentists in KwaZulu-Natal was sought from the Heath Professionals Council of South Africa (HPCSA), South African Dental Association (SADA), and The Board of Health Care Funders of Southern Africa. Ultimately the list of dentists was obtained from MedPages, which is a voluntary medical directory for South Africa. The MedPages records were utilized owing to the lack of cooperation or poor data capturing in formal records from the HPCSA, SADA and The Board of Health Care Funders of Southern Africa.

The method of sampling used to acquire a random sample is known as 'simple random sampling'. Although this method tends to be laborious, it is the most basic of the random sampling methods. This method is preferred for its non-bias selection method, allowing each element in the population an equal and independent chance of selection (Terre Blanche & Durrheim, 2002; Polit & Hungler, 1995).

The lists obtained for the sampling of dentists and dental technicians are referred to by researchers as 'sampling frames' and each individual in the frame as an element (Terre Blanche & Durrheim, 2002). For the implementation of simple random

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[14] Registered with the HPCSA and SADTC respectively

sampling, the sampling frames were arranged alphabetically. Elements were numbered consecutively in descending order. A table was randomly constructed according to each sampling frame. The numbers on the table were randomly paced and did not follow chronological order (Terre Blanche & Durrheim, 2002; Polit & Hungler, 1995). Therefore three tables resulted, one for each sample group i.e. dentists, dental technicians and dental patients. A number was randomly selected as a starting point from each table. Further selections were made using a predetermined pattern of selection. This method of selection ensured that each element had an equal chance of selection and eliminated prejudice selection. The table number selected corresponded with an element on the respective sampling frame (Terre Blanche & Durrheim, 2002). The numbered participant was then personally invited to participate in the study. This was repeated till the desired number of participants was achieved.

A list of patients in KwaZulu-Natal who had received a restorative prosthesis, produced by a dental laboratory, was obtained from private dentists. Unfortunately only one dentist was willing to co-operate with providing such information. As it was not possible to obtain comprehensive listings of every element in the population, who had recently received prosthetic dentistry, the remainder of the patients were therefore sought via alternative sampling methods (Polit & Hungler, 1995).

A combination of 'purposive sampling' (Terre Blanche & Durrheim, 2002) and 'nominated or network sampling' (Polit & Hungler, 1995) was utilized to acquire the sample group. It is noted by Terre Blanche and Durrheim (2002:114) that purposive sampling occurs where the "researchers handpick the cases to be included in the sample on the basis of their judgment of their typicality or possession of the particular characteristics being sought". This form of sampling is commonly used to access knowledgeable people. There is little benefit in randomly selecting a largely ignorant population (Terre Blanche & Durrheim, 2002). Members of the public were therefore canvassed to establish their suitability and willingness to participate in the study. Reluctant or unsuitable individuals, who had been identified in anticipation, where asked to refer or nominate an individual whom they believed would be appropriate to participate in this study. Nominated sampling entails the identification of informants who identify possible participants who qualify for inclusion in the study

(Terre Blanche & Durrheim, 2002.).This method of sampling is commonly used to locate people who are difficult to identify (Polit & Hungler, 1995).

Possible participants were invited telephonically to participate in the study.  A letter providing information and soliciting willingness to participate as well as consent to participate[15] in the study were distributed at interviews (Cohen, Manion & Morrison, 2007; Wassenaar, 2006).

> *The standard components of consent are (a) provision of appropriate information, (b) participants competence and understanding, (c) voluntariness in participating and freedom to decline or withdraw after the study has started, and (d) formalisation of consent, usually in writing".*

(Wassenaar, 2006:72)

Voluntary participation was required and all participants were assured of confidentiality.  Furthermore, participants were free to withdraw from the research at any time (Wassenaar, 2006).  All participants acknowledged their desire to participate in the research by signing the consent forms provided.

### 3.5.3  Analysis of qualitative data

Interview data was recorded using an 'Olympus' digital voice recorder.  Recordings were used for data transcription.  A variety of criteria for evaluating qualitative research through interpretive practice is available (Denzin & Lincoln, 2003).  The analysis of qualitative data begins with identifying themes, and relationships between themes in the data (Terre Blanche & Durrheim, 2002).  Transcribed data generated through this study was analysed to identify themes.  This form of analysis is referred to as thematic content analysis (Durrheim, 2006).  Themes were orientated around the theoretical framework chosen for this study.  These were:

1.    *systematic theory,*

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[15] Refer to Annexure 1, 2 and 3.

2.    *authority,*

3.    *community sanction,*

4.    *ethical codes and*

5.    *a culture.*

<div align="right">(Greenwood, 1957:45)</div>

## 3.6    ETHICAL CLEARANCE

In order to conduct this study, ethical clearance was required.  To this end, an ethical clearance questionnaire, as part of the G186, was completed and submitted.  The faculty research committee was satisfied that the research was ethically sound. To this end an ethical clearance certificate[16] was issued on 4 May 2009.

## 3.7    TRUSTWORTHINESS

### 3.7.1  Understanding trustworthiness

Trustworthiness can be used synonymously with validity.  According to Collins and O'Brien (2003:364), the trustworthiness of research "refers to the credibility or persuasiveness of an account".  Validity refers to the trustworthiness or credibility of data and has historically been used to assess quantitative research methods (Collins and O'Brien, 2003).When used to assess qualitative methods validity has been described by Terre Blanche and Durrheim, (2002) as follows.

> *"Validity, however, is not defined in terms of the extent to which the operational definition responds with the construct definition, but by the degree to which the researcher can produce observations that are believable for her or himself, the subjects being studied and the eventual readers of the study".*

<div align="right">(Terre Blanche & Durrheim, 2002:46)</div>

Validity with regard to qualitative research is further described by Winter cited in Cohen, Manion and Morrison (2007:133) as expressed through the "honesty, depth,

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[16] Refer to Annexure 7.

richness and scope of data achieved, the participant's approach, the extent of triangulation and the disinterestedness or objectivity of the researcher".

Lietz, et al., (2006:444) state that "trustworthiness is established when findings as closely as possible reflect the meaning as described by the participants". Lincoln and Guba cited in Bailey (2007) state that trustworthiness is expressed by how readily the reader can believe or trust the research. According to Bailey (2007:181) "the concept of trustworthiness possesses an embedded set of evaluative criteria, closely related and interdependent: credibility, transferability, dependability, and conformability.

The credibility of a study implies its believability. Credibility can be judged through appropriate methods of data collection and analysis as well as accurate representation of data in the final manuscript. Transferability is measured in the depth of detail relayed with regard to the research setting and is reflected by the varying degrees of "experience, awareness and knowledge of the reader" (Bailey, 2007:182). Lincoln and Guba cited in Bailey (2007:184) describe dependability in research as that which "requires internal consistency among the core elements of the research project – research questions, data collection, analysis and conceptual understanding". Owing to the subjective nature of the social sciences the researcher is required to replace objectivity with conformability, "which requires that findings be supported by data" (Bailey, 2007:184).

Trustworthiness does, however, not occur without diligence and the systematic use of defined procedures (Lietz et al., 2006). A number of factors may threaten trustworthiness on the part of the researcher or that of the participant. According to Lietz et al., (2006:444) "in order to manage these threats to trustworthiness, qualitative research must engage in a variety of strategies in order to describe research findings in a way that authentically represent the meaning as described by the participant"

### 3.7.2  Trustworthiness of data generated by this study

As trustworthiness is largely linked to qualitative research it will be used as part of this study to evaluate data.  In order to merit trustworthiness a number of aspects have been considered and provided for as follows.  The evaluation criteria, as described in Bailey (2007), were considered during the course of this research in order to ensure trustworthiness.

Pilot interviews were conducted within each sample group to asses the effectiveness of the interview schedule.  This was necessary to ensure that the interview process was answering the research questions on hand.  A pilot interview serves to highlight possible problems with the proposed interview schedule (Terre Blanche & Durrheim, 2002).  According to Cohen et al., (2007:341) pilot interviews have "several functions, principally to increase the reliability" and validity of the research.

A representative sample of the dental prosthetic process, which is dentists, dental technicians and patients, formed part of the study.  Triangulation through several different data sources was conducive to the reliability of a study (Silverman, 2008; Terre Blanche & Durrheim, 2002).  Silverman (2008:121) further states that "by having a cumulative view of data drawn from different context, we may…be able to triangulate the 'true' state of the affair by examining where the different data intersects".

Trustworthiness was further ensured through the accurate representation of data transcription.  Although recordings were of a high standard, inconsistencies between recordings and transcriptions were present and therefore required correcting.  This was achieved through thorough examination of transcripts in combination with responses.

### 3.8    LIMITATIONS

The trustworthiness of a study may be threatened by external influences.  Identifying and controlling these external factors will result in valid and believable conclusions (Durrheim, 2006).  According to Cohen et al., (2007:133) "threats to validity and reliability can never be erased completely; rather the effects of these threats can be

attenuated by attention" throughout the research process. There are two potential limitations to this study. The first limitation may be that the dentists may not be forthcoming with information regarding their professional relationship with, or personal feelings towards dental technicians due to the researcher's position as a dental technician. Any negativity during interviews may however be seen as a positive indication of the dentist's view of the professional standing of the dental technology profession and, thus, be regarded as beneficial to this study. Dentists were urged to be honest and open regardless of this.

Secondly, patients may not have any knowledge of dental technology. To be certain patients were providing relevant data, the role of dental technicians in the dental restorative processes was established. Furthermore only patients who had received a prosthesis produced in a dental laboratory would be considered for interviews.

## 3.9    CONCLUSION

This chapter discussed and described the research paradigm used to conduct this study. Distinction was made between qualitative and quantitative research. This study was identified with the post-positivist paradigm and more specifically the interpretive paradigm. Qualitative data was generated through semi-structure interviews.

Three sample groups, consisting of: six dentists, six dental technicians and six dental patients, were interviewed. It total 18 interviews were conducted. The appropriate sample size and sampling methods were discussed and motivated.

Possible limitations were outlined and acknowledged, and measures taken to ensure trustworthiness were discussed. Ethical considerations and clearance have been discussed. Informed consent forms were signed by all participants in the study. It can therefore be believed that this study is ethically acceptable.

In closing, trustworthiness was defined and the trustworthiness of this study was established. The subsequent chapter covers the findings and discussion with regard to the data collected and analyzed here within.

# CHAPTER 4

# FINDINGS AND ANALYSIS

## 4.1    INTRODUCTION

Analysis of the data generated from this research resulted in the identification of the following themes and sub-themes.  These have been listed in **Table 5** below and thereafter individually discussed in detail.

Themes were identified on the basis of the conceptual framework chosen for this study.  The identification of such themes did, however, remain a subjective activity as determined by the researcher.  An effort was made to consider data in conjunction with the conceptual framework as suggested in literature.  In support of the discussion of themes, relevant quotes from the data were used.  Interview data was transcribed verbatim and used as such during discussion.  The names of interviewees have, however, been changed to ensure anonymity.

The data generated and discussed within this chapter provides answers to all three key research questions[17].

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[17] Refer to section 1.7 on page 22.

**Table 3**.  Themes and sub-themes.

| Theme | Sub-theme |
|---|---|
| 1.  Although dental technology is perceived to be a profession by dentists, the term profession was poorly understood. | 1.1. Dentists felt that they did not have enough knowledge on the body of theory of dental technology to pass comment but felt that it was adequate. (Systematic theory)<br><br>1.2. Dentists believed dental technicians to be the experts in the field of dental technology. (Professional authority)<br><br>1.3. Although dentists felt that the public were more aware of cosmetic processes available, the public were still largely unaware of the role of dental technology in the dental restorative process. (Community sanction)<br><br>1.4. Dentists felt that ethics in regard to dental technology largely orientated around business and colleague relationships.  From their experiences they felt dental technicians behaved ethically. (Ethical codes)<br><br>1.5 Dentists considered a professional culture to be a poorly defined attribute in dental technology and rarely exhibited in the profession. (Professional culture) |
| 2.  Although dental technology is perceived a profession by dental technicians, the term profession is poorly | 2.1. Technicians believed that an adequate body of theory existed in dental technology but that it needed to be related to the operational skills more comprehensively.  (Systematic |

| | |
|---|---|
| understood. | theory)

2.2. Technicians felt that they had the most expertise with regard to dental technology. (Professional authority)

2.3. It is held that the general public are largely still uninformed with regard to the roles of dental technicians as part of the dental team. (Community sanction)

2.4. Technicians felt that although ethical codes, both formal and informal, do exist in dental technology these codes were carried out by individuals to a level of their own desire. (Ethical codes)

2.5. A professional culture is a growing concept among dental technicians and is largely expressed through professional interaction with the DENTASA. (Professional culture) |
| 3. Although dental technology was perceived a profession by dental patients, the term profession was poorly understood. | 3.1. Patients had no knowledge on the body of theory of dental technology. (Systematic theory)

3.2. Patients felt that dental technicians had the most expertise with regard to dental technology. (Professional authority)

3.3. Dental patients were aware of the role of dental technology through knowledge of someone who is a dental technician or through consultation with the dentist. The general public, however, were largely believed to be |

| | uninformed. (Community sanction) |
| --- | --- |
| | 3.4. Patients only have an understanding of dental technology ethical codes through consultation with a dental technician, which is against the Dental Technicians Act, and believed such contact to be of benefit to their treatment. (Ethical codes) |

## 4.2    ANALYSIS AND FINDINGS

**Theme 1: Although dental technology was perceived to be a profession by dentists, the term profession was poorly understood.**

All dentists felt that dental technology was a profession in its own right.  When asked what would constitute a profession a variety of attributes were given.   Those attributes considered to be definitive of a profession included; a high level of skill, a qualification, ethical behaviour and people skills.   The attributes where discusses individually or in combination by dentists with only one dentist mentioning all of the attributes together.

> *Number one, [a professional] has to have a very high level – a certain high level of skill, number one, and that you're only going to get through initial education and then by keeping your skill levels up as much as you can.  The other thing that is important is you have some sort of people skills as well*
>
> *[DP5]*

Dentists interviewed could only identify three of the five required attributes by which professionalism is judged. Greenwood postulated that in order for an activity to be considered a profession it is necessary for all five attributes, as identified by him, to be present (Greenwood, 1954).  The attributes recognized by dentist in this study were; systematic theory, professional authority and ethical codes.   Nevertheless, despite not acknowledging all the attributes of a profession as identified by Greenwood, they understood dental technology to be a profession.

> *I would consider it to be a* profession *because it's a sector that actually provides a specific function*                                                                      *[DP1]*

Arising out of dentists understanding of dental technology as a profession each of the sub-themes, as identified in this study, will now be discussed in detail.

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**Theme 1.1.  Dentists felt that they did not have enough knowledge on the body of theory of dental technology to pass comment but felt that it was adequate. (Systematic theory)**

The systematic theory, also known as the body of theory, as described by Greenwood (1957) is used with reference to the comprehension of a body of theoretical knowledge used by professional occupations in relation to operational skills.  It is within this context that this section is considered.  Newly qualified dental technologists generally work in an established dental laboratory for a period of time prior to opening a laboratory of their own.  Owing to this practice, as well as preferred continued use of established laboratories by practising dentists, many dentists do not come into contact with newly qualified technicians.

> *It's difficult to say how – what they're like as they're coming out of training at the moment because I haven't worked with a newly qualified technician.*
>
> *[DP5]*

With this considered and coupled with the lack of exposure to dental technology training institutions, dentists felt that they were insufficiently informed to pass judgement on the body of theory of dental technology.  They did, however, feel that because of their experiences with their current technicians the body of theory, instilled through the educational system, must be adequate.

> *I can't comment too much on [the education].  It must be good because the technicians I use give me good results*                             *[DP4]*

Only one dentist felt that dental technicians were not adequately trained.  He indicated that he practised in an area dominated by illicit laboratories. He also alleged that the legitimate laboratories in the area employed unskilled labour.  This may be the reason for his experiences with inferior service.

> *I think there can be a lot of improvement to [the dental technology education]. I would say mostly maybe with the quality of work that is forthcoming.  I would think that is the most important point.  Also with [technology] you find we're [lagging] quite far behind in comparison to the Western countries.   [DP6]*

A body of theory within professions is achieved through systematic research (Greenwood, 1957). In order to determine the comprehensiveness of the body of theory within dental technology, dentists were asked if they believed research in dental technology would be of value to the profession. Because the general trend among technicians was to acquire the business aspects of dental technology as quickly as possible, dentists were largely unaware of any research being conducted in this field in South Africa.

> *Probably, not that I know of [any research]. In fact I didn't even know that you could go into a Masters and all these things … until now, because most of the guys actually, from what I know of dental technicians, is that they get into, this thing, practice and once they're there they [go about] about making money*
>
> *[DP1]*

All the dentists interviewed did, however, believe that research would be valuable to the dental technology and dentistry industries.

> *Any research that's successful here, in theory should be available to the dentists in this country, [and will be] easier, quicker, cheaper than any, you know, advanced technology that comes from overseas. [DP5]*

One dentist suggested that research is only valuable to a profession if it is disseminated among the professionals. This may be a valid indication of poor information, with regard to dental technology research throughout dentistry, as a result of a lack of distribution of such research to industry.

> *You know, all research is important. All extra study is important. I think [there is] value in it. The question is how do you translate that value to the individual. I mean if you are doing a master's degree, how do you translate your activity to the individual, general dental technician [DP3]*

Another aspect of the body of theory of a profession is maintaining a level of education that is current and in keeping with modern developments (Barber, 1963). This is a common practice among health professionals and is formally carried out through the Continuing Professional Development (CPD) point system. The CPD

point system was recently, in 2009, introduced for dental technologists. Dentists were asked what their views were on the newly instated CPD in dental technology. Dentists generally felt that this concept was good in theory but would not necessarily result in maintaining an appropriate level of education.

*CPD doesn't mean you're going to get a better technician. It's very easy to just go to a set of lectures and sit on your backside and walk out and earn twenty CPD points. I think the idea is good, but whether it is the way of getting technicians to improve their skills, I don't know.* [DP5]

Ultimately the group of dentists interviewed had two conflicting points of view with regard to CPD. Half of the dentist had a negative view of CPD and the other half had a positive view. Those who felt the CPD point system is valuable to dental technology believed it would maintain a current level of education in the profession.

*I think it's a very good idea... I think this is one way [of keeping a current education] because you get an old technician who is stuck in his practice and who is continuing in whatever he has learnt previously, so if they're going to be constantly updated of course it's going to benefit the dentist and the patient at the end of the day.* [DP6]

One dentist felt it was a worthy introduction into dental technology first and foremost because dentistry is 'subjected' to CPD.

*I think that's actually a good thing. Okay, firstly we are subjected to it [and thus keeping] up to date with current trends and current happenings in, basically, the world.* [DP1]

The dentists that had a negative view of the implementation of CPD had several concerns with regard to the system. They believed that professionals interested in staying abreast of new developments would do so willingly. An individual cannot be forced to learn. Their concern was not with keeping up to date with ones profession but rather the implementation of such CPD.

*The implementation is lousy, right, because in the end people are just going into it for the points, so I mean all it is, you buy those journals, you answer the question, but you're not really learning anything from that, it needs to be more hands-on.* [DP4]

One dentist indicated that he found the implementation of the CPD, as currently practised in South Africa, insulting to his professional integrity.

*You know it's a helluva difficult thing and, to me, CPD is the wrong way to go. You can't force a person to go to learn something. It would be far, far better, as used to be in the olden days, we didn't have CPD points, where you went to a congress and you attended the lectures you wanted to benefit from and you walked away from that congress having learnt something, rather than having to go and sit through lectures where you've had to sign the book like a school kid and you've been forced to go, just so that you can walk away and say, oh I'm legal, I've got my number of CPD points.* [DP5]

Another dentist felt that CPD was implemented in a profession for the financial benefit of a few at the expense of many.

*I think it's been more a money-making scheme than anything else. I've always – um, I've got two journals [that] I subscribe to. I've always kept up with my journals and even before this CPD thing came in I made a point of doing one or two courses a year to keep up with the latest trend, but maybe it isn't a bad thing for the people who aren't prepared to keep up with the latest of, I think. But ja, if you ask me now, from day one it's been a money-making thing for certain people in the field who just go around from town to town or city and give these talks for which they are helluva well paid.* [DP2]

In conclusion dentists indicated that dental technology did include an acceptable body of theory. Although they had little contact with newly qualified dental technicians as well as the dental technology training institutes, through experiences with their current technicians, dentists believed dental technology to be of a sufficient educational standard. Dentists were largely unaware of the existence of post

graduate studies in dental technology and the research generated through such studies, but felt that if such research was being conducted it could only benefit the field of dental technology as well as dentistry.  Maintaining a current level of education is valued by dentists but not all dentists valued the CPD point system. The discussion now turns to the perception of dentists with regard to professional authority in dental technology.

**Theme 1.2.  Dentists believed dental technicians to be the experts in the field of dental technology. (Professional authority)**

Professional authority is based on the acquirement of theoretical knowledge by professionals, which sets them apart from other professions and the lay members of society (Greenwood, 1957).  Although the field of dental technology is not exclusive to dental technicians but rather shared with dentistry, dentists believed dental technicians to have the most expertises with regard to this field.

> *I would say, yes, that dental technologists certainly are the best at doing those type of things.* [DP2]

Some dentists indicated that achieving a pleasing restorative result required the combined expertise of both the dentist and the technician.

> *It depends on how good your technician is, isn't it?  It also depends on the dentist.  The technician can't make a good crown from a crappy impression, so it is a combo.* [DP5]

One dentist, however, implied that dental technicians were merely the manual labour component of dentistry.

> *Expert, this thing, doesn't necessarily mean you need to be producing.  [The dentists] had education and [they] had studied and [they] had listened to it, but it's like – how can I say it – uh, the same thing could be applicable to a person that's an engineer that's um, actually doing some sort of building – he's not necessarily mixing the cement and all these things but his ideas and stuff that actually go there to determine what needs to be done, so there are similar sort*

*of things that [the dentist] doesn't necessarily have to produce it, but he adds value in terms of his research, in terms of processes and all those other things, so [the dentist] will be the expert... so he doesn't have to be physically involved in actually making the thing.*                                          *[DP1]*

This sentiment is shared by Mclean, Culp and White (2009: 52) who plainly state that the dentist-technician relationship is synonymous with that of an "architect/builder relationship".   Interestingly, although believing that a subservient relationship was desirable, DP1 held a controversial view that dental technicians should be allowed personal contact with the patients.   In this way the technician would take more responsibility for the manufactured appliances as well as carrying a monetary risk if the patient failed to pay.   In so doing, dentists would maintain control but relinquish responsibility.

*What I'm saying is that let the technician become responsible for the product... So overall, for the payments and just being responsible, why should the dentist be, this thing, whereas you do your part, you sort out what you do, you deal with the patient.  If there is a problem with the prosthesis itself, much as [the dentist] adapt it and stuff, but if it's something that's totally missing, the patient should have direct contact with this thing, rather than [the dentists] taking the flak for that aspect.*                                          [DP1]

When dentists were questioned further as to their views on where someone who is not an expert in a particular field should be allowed to practise that profession, they indicated very strongly that this would be unacceptable and an invasion of another professions authority.

*Never!  Well, if you are not qualified to do it, you haven't learnt how to do the job; you should never be allowed to do it.*                                          *[DP5]*

*Absolutely not!  I don't think anybody – I mean a dental technician is a* profession*, it has its own calling, it is closely related to dentistry, and I think, you know, I don't think anybody who does not have sufficient knowledge about dentistry and dental technology should practice the* profession*.*
                                          *[DP3]*

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One dentist felt that it might be acceptable to perform tasks which one is not qualified to perform, provided that the persons receiving the service were informed of the provider's lack of experience.

> *I suppose if you get away with it, you get away with it, but uh, I don't think it's fair to the person that you, to your client, to your patient, right.  Uh, at least give them the choice, tell them you know what, I think I can do this for you but I've never done it before, right, so do you want to give me – are you willing to give me a chance to do it?  Some people actually would be willing to give you the chance.* [DP4]

Dentists also indicated their concern for auxiliary dental professions such as dental technicians assuming a clinical role in dentistry.

> *No, I don't think [it's acceptable] – they aren't trained and qualified to do that type of thing.* [DP2]

However it was felt that technicians were not the only auxiliary profession illegally practicing dentistry. Dentists were similarly concerned with the dental hygienist profession.

> *There's a couple of people we know who are qualified as hygienists who are working as dentists, now those people should be barred, they should never be allowed to work because they are not qualified.* [DP5]

One dentist also indicated that due to the aesthetical nature of modern dentistry coupled with individual patient preferences, dentistry and dental technology more specifically are no longer free of community judgement.

> *What I think looks good in a patient's mouth, the patient doesn't necessarily think [looks good] and the technician, I think, should be aware of the fact that he might sit in the laboratory and have done a beautiful bridge from three to*

*three[18] that he thinks on the model looks fantastic, and when we do it in a try-in and the patient doesn't like it, then the technician also has to understand that the patient's view is also important.* [DP5]

Greenwood (1954) argues that professions should not advertise their services. Dentists interviewed held differing opinions on advertising in the dental technology industry. They believed that professional advertising was acceptable only in terms of providing public information and insisted that such advertising should clearly state that technicians may not serve the public directly. Otherwise, advertising in dental technology could be perceived as a means of soliciting business.

*As with dental surgeons, dentists as well, you find when it comes to* professionalism*, when it comes to advertising; there are rules and regulations how to go about it. I don't know whether you are aware, or you have seen recently, there have been a few instances where dental labs have advertised as well. Advertised in the sense that they've put prices to certain procedures that can be done – you know we're doing something, we're doing a crown at R600, that sort of thing, which I think is totally unethical, right, so those are the sort of things that I think, you know, public should be made aware about. As I said, I mean, looking at cost factors these days, we know approximately, okay, this is the cost of the crown, you're using proper material to fabricate that, now when someone comes and does it at a quarter of the price, there has to be a catch somewhere, which means he's using some sub-standard materials as well, and you're basically putting that into the patient's mouth without the patient's knowledge.* [DP6]

Therefore, it can be concluded that despite being legally allowed to practise dental technology, dentists believed dental technicians to be the authority within this field. Dentists strongly indicated their disapproval of assuming the role of another profession and showed specific concern with regard to those illegally practicing dentistry. Dental hygienists and dental technicians were identified as culprits in this

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[18] "Three to three" is dental slang meaning a six unit anterior bridge.

regard.  It was suggested by dentists that dentistry as well as dental technology is no longer free of community judgement.  Dentists further indicated their disapproval of advertising within dental technology to solicit business.  The discussion now turns to the perceptions of dentists with regard to community sanction of dental technology.

**Theme 1.3.  Although dentists felt that the public were more aware of cosmetic processes available, the public were still largely unaware of the role of dental technology in the dental restorative process. (Community sanction)**

Community sanction, which can also be referred to as public approval, is used to describe the process whereby professional authority is granted to an occupational group by the public it serves (Greenwood, 1957).  It is necessary to bring to the reader's attention that an intended distinction between dental patients and the general public was noted.  It might be considered that dental patients, due to personal interaction with dentistry, are relatively more informed than the general public.  It was believed by dentists that the general public are becoming somewhat more aware of dental cosmetic process available today.  This is generally due to the ever-increasing popularity of cosmetic reality television.

> *That's actually a double edged sword these [make-over] programmes, because the patients come in and they want to know about aesthetic dentistry, six to eight crowns in the front, veneers, that's where they come up with all these terms, so in that respect its actually very good...      [DP4]*

The general public, however, are still largely unaware that dental restorations are manufactured by dental technicians.

> *No, no certainly are not.  You know a lot of my patients come in and ask me if I make the crowns or the false teeth... so it is certainly the general perception is helluva bad.                                              [DP2]*

Dentists elaborated further to suggest that this poor public information is not confined to dental technology but exists throughout the dentistry industry.

*The average man in the street does not know the difference between a technician, or a therapist or a dentist, right – even in the dental profession you have this problem. We get people that are dental therapists that put a board outside that says 'Dental Practitioner' and the average Joe that's walking past is going to think 'Dentist' when he sees 'Dental Practitioner', and he goes in there and he gets root canals done and he gets crowns done by someone that is not qualified.* [DP4]

Although public information regarding knowledge of the role of dental technology was generally considered to be poor, most dentists felt that their patients are adequately informed as a result of their personal instruction during consultation.

*I'm a great, great believer, before I do any work, I will sit down and explain to the patient exactly what I'm planning on doing and if it is a big case I'll get my lab technician involved in the whole planning phase of it, and he will come in and sit in with the patient while we're talking about it so he can see exactly what we are planning on doing and what is needed, so yes, it's important that he is involved in the whole thing, ja, and that's the way I inform my patients about what we're doing.* [DP2]

One dentist felt that if dental patients were not adequately informed it might be because of the patient not receiving adequate information during consultation. Certain dentists' perceptions that 'time is money' resulted in patients not receiving adequate procedural explanations. Dentists believed that explaining complex procedures is time consuming and that their time could be better spent seeing other patients and, consequently, improving profit margins.

*No, I don't think it's true [that the public are well informed]. They don't understand that there's a large amount of work that goes into the manufacture of a particular thing. You know, firstly it's partly because of that the dentist can't because he's too busy. It is, its maybe too – what do you call it – technique sensitive to explain.* [DP3]

One dentist noted that poor patient information during consultations was wide spread in the industry and that this had resulted, in certain quarters, in a poor public image of dentistry.

> *Based on the patients that have come in from other practitioners, I don't know whether I should be saying this, but no, they're not, right. I get patients that come in, they've got crowns in their mouth and they don't even know they've got a crown in their mouth. It doesn't happen to everyone, but it's a few practitioners that are giving the rest of us a bad name* [DP4]

Some dentists also raised concerns about the depth of information disseminated to the public as well as with whom the responsibility lay to provide such information. Partial or incomplete information could cause more harm than good and information sources might have their own agenda or personal gains in mind.

> *A little knowledge is a dangerous thing and you don't want to end up having arguments with your patient, some guy who thinks he knows that a certain type of porcelain is better than another type of porcelain, you don't want to get into an argument with those guys, you know, but I do believe people should understand that the advantages of maybe having a chrome cobalt over a plastic denture, that the chrome is more long lasting but whether that education should come through the dental practitioner or whether it should come as a general knowledge thing through the newspaper, through magazines or what I – I think possibly through the* profession *would be a better way of educating, but I'm quite sure patients can be properly educated through a proper advertising campaign* [DP5]

From the above it can be concluded that the general public are becoming more aware of cosmetic dental procedures through the popularity of cosmetic make-over shows. However, the public are largely still unaware of the role of dental technology within these processes. Most dentists believed that their patients are well informed through the clinical consultation. Poor patient information was identified as originating through a lack of time during consultation coupled with the technical nature and terms of dental technology. Dentists believed that a nonbiased and

holistic approach to public education was necessary. The discussion now turns to the perceptions of dentists with regard to the ethical codes of dental technology.

**Theme 1.4. Dentists felt that ethics in regard to dental technology largely orientated around business and colleague relationships. From their experiences they felt dental technicians behaved ethically. (Ethical codes)**

Professional ethical codes exist both formally; in the form of written codes, and informally; as unwritten professional consensus, and through commitment to which a profession is able to preserve community confidence (Greenwood, 1957). As dental technicians do not work directly with the public, dentists believed that there are fewer ethical codes applicable to dental technology. Dental technology is believed to require ethical codes through business conduct as well as colleague relationships.

> *You see the aspect of ethics will come in when you do have contact with the patient. Other than that if there's no contact, [your] ethics will be – lie in terms of actually how you run your business.* [DP1]

Dentists interviewed in this study considered that the technicians that they worked with conducted themselves ethically but believed that there were no ethics of behaviour relating to patients as technicians are not legally allowed to consult with patients.

> *Well, you see ethics again is quite difficult because the technician, his contact with the patient is very, very minimal, so there is not an ethical level there. There is definitely an ethical level between the technician and the practitioner and, generally, with the technicians that I've worked with, and I'm going back a long time, 31 or 32 years, most technicians have had a good ethical relationship with me.* [DP5]

However the above view was not unanimous. One dentist indicated that dental technology is conducted unethically in South Africa. Particular concerns were raised with regard to unqualified persons illegally assuming the role of a dentist.

*Well at present I think [ethical practices are] very low, if I can put it that way. If you find, okay personally, my association in this area, I found lots of dentists, unfortunately, dealing with labs which are not registered, using sub-standard materials, uh, patients have informed me of people who are operating where there's no need for a dentist. The patient goes directly to this guy operating from a garage or operating from a container, and who makes the dentures for them, who makes whatever needs to be done for them, and that I feel is totally, totally unethical, you know.*        *[DP6]*

It was also felt by a couple of dentists that the formal ethical codes, instituted by the SADTC, where poorly regulated and enforced. When dentists were asked if the formal ethical codes where being adhered to, it was noted that ethical codes are poorly practised and that the responsibility of adhering to the formal ethical codes should be observed by dentists as much as by technicians. It was further suggested that an appropriate advertising campaign to inform the public of acceptable oral health service standard would assist with curbing unethical behaviour.

*I would [say] definitely not, definitely not. You see first and foremost, uh, it should [be adhered to by] the dentist himself. Lots of dentists, unfortunately, are dealing with unregistered labs as well, maybe to save money, you know that sort of thing, especially with the private patients, but with the medical aids they do require a lab invoice etc. from a registered laboratory but as I said, when it comes to private patients, lots of them, because it's cheaper than using a registered, someone who's got no overheads, operating from his back room or garage, so a lot of emphasis is on the dentist himself, and what I think should be done, there should be more public awareness in my opinion, via the media, informing people, informing the public, this is what is basically currently happening, and these are the drawbacks, these are the disadvantages of using someone who is unregistered, these are the things that can happen to you.*        *[DP6]*

Another dentist felt that it was not only the SADTC which was not fulfilling its regulatory role but also the HPCSA. Particular reference was made to the illegal activity regarding discounting and the inadequate handling of cases in this regard.

*In South Africa, no. Because, ultimately from this – in [a] way the HPCSA is partly to blame as well. The thing is that for years this thing of [discounting between] dental technicians and dentists has been going on. If there was such strict or such... policing or lines of communication, these things would have been resolved a long time ago.* [DP1]

An ethical issue that was raised during discussion concerning ethics was that of discounting of professional services. The practice of discounting in dental technology is a contentious issue. Discounting on services fees as a means of attaining new business or retaining old business is a common practice in this field. A host of ethical considerations accompany this practice, including: poor workmanship, the use of inferior materials to maximise profits lost by discounting, disregard for colleagues by taking their business from them, the employment of unqualified labour and unfair treatment of staff.

*He had opened up practices and then he was... undercutting prices and all.* [DP1]

One dentists indicated that he believed his technicians to conduct themselves ethically beside the fact they he knew that he was, at one point, receiving a discount which was illegal.

*Um, well, my experience yes, that all the chaps I've dealt with have been ethical in their lines. I know there was this big story about them taking like them giving us a certain amount off if we paid them sooner and I – as soon as this whole thing came up both of my lab technicians came up and said listen, I can't [give discounts anymore], if you want to take your work elsewhere, so be it. So no, the chaps I've been involved with have been ethical, ja, no hassle.* [DP2]

The latter part of this quote suggests that dentists might believe that if they are not offered a financial incentive, in order not maintain or commence a business relationship with technicians; it would be acceptable to shop around for the cheapest rather than best quality service available. This would be considered acceptable

practice in the business world but the very nature of professions dictates that the professional's priority is to the service they provide to the community and not to their profit margins.

Two further ethical concerns were broadly voiced by the interviewees. These concerns were with reference to patient consultation and illicit laboratories. Although dentists felt that patient consultation with technicians, within the bounds of the law and in conjunction with a dentist, were of benefit to the patient, it was very clear that any contact that bypassed the clinical aspect of dentistry was considered highly unethical.

> *Well, [technicians] can't treat a patient but I mean my technician will come in here and assist me in taking a shade. If we've got a problem he will come and he will assist me. If we've got a problem with a denture and where the patient is not happy, one will often get the technician in for the patient to try and explain to the technician. It's very difficult sometimes for me to relay to a technician what my patient says either on the telephone or on a piece of paper, so there is a certain amount of it, but there's no ways should the technician fit a crown, no ways should a technician fit a denture or do the bite or – that's not his work.* [DP5]

It was also evident that even within acceptable patient consultation with technicians there was concern that technicians might approach patients outside of a clinical context, in order to illegally canvas for work.

> *You calling a technician in to examine a patient for a chrome denture for argument's sake and then you find that the technician contacts the patient and says, you know what, come to me privately, I'll make the denture for you. That's a no-no, right. The contact with the patient has to be, for want of a better word, I'll say supervised, but obviously we're not talking – a technician's not a child, you don't really have to monitor them, but it needs to be done in conjunction with the dentist, right.* [DP4]

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Notwithstanding the above, dentists indicated that they were in favour of, and allowed technicians to perform some clinical functions, predominantly that of determining the correct shade for restorations. Although this was technically not permitted by law, dentists believed that ethical considerations were not infringed by allowing technicians to determine the correct shades even if it meant that the patient was to visit the dental laboratory for such a practice to occur. They believed that in allowing technicians to take shades the patients are being better served. Whilst this might be true, it also shifts a measure of clinical responsibility from the dentist to the technician, which, in itself, could encourage technicians to take additional liberties with patients as was alluded to, for example, above. Furthermore the service of shade taking is expected by dentists, and provided by technicians, to be free of charge despite the expertise offered and loss of time incurred by the technician whilst out of the laboratory.

> *I actually send my patient to the dental technician's rooms, so it is an open thing.* [DP3]

> *If a technician has contact with a patient, it allows them to get better shade guides, or take shades better.* [DP4]

Only one dentist felt strongly that there was no justification for the technician to come in contact with a patient for any reason. This dentist was of the opinion that dentists are professionals within their field and should provide all related professional services.

> *No... The dentist is a professional so the onus should be on him to match [the shade] or do whatever is necessary.* [DP6]

During the course of the conversation regarding the topic of illicit dental laboratories it was evident that this area was surrounded by much uncertainty. It was not certain if these are in fact; qualified technicians posing as denturists in registered laboratories, qualified technicians posing as denturists in illegal laboratories or illegally trained technicians branching off on their own to assume the role of both the dentist as well as the technician. It was also not clear how these illicit laboratories

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maintained their clientele or material and equipment supplies. It was suggested that dentists, dental technicians and well as dental supply companies might all have had a hand in generating and supporting this trade.

> *You find [an unskilled person] who maybe has worked for a registered technician or for a lab for a period of time, so he gets some experience. He knows how to make a denture, he knows the various processes that are involved. Of course he may not understand the theory behind it... That's why I say maybe they're working in collusion with someone, maybe with the dentist, that's why I say dentists could be involved as well. I feel you know, the dentist could be ordering some of the materials for them... So there again I think the Dental Technicians Society should keep in very close contact with the manufacturers – with the suppliers themselves and the suppliers also need to display a certain amount of ethics and, you know, inform, 'this guy is ordering so much of stuff'.* [DP6]

Several of the dentists stated that they had concerns about the service rendered to patients through contact with illicit laboratories. Besides the adverse effects poor workmanship might have on the patient's health a further concern is the use of inferior quality materials to produce restorations in order to cut costs. Dentists believed this to be unethical and a disadvantage to the patient.

> *I get patients that come in here and they tell me they've had dentures made at the technician. That's not right. They don't have denturists in this country, so they're not trained to do that, right. That's a big thing, the dentures that they make from there.* [DP4]

> *We do have patients that come and ask you, you know there's a guy in [a suburb[19]], he's not a dentist but he's a this thing, if you go there and see him for about 800 bucks you're getting your denture... It's all about the money, right, the cost structure.* [DP1]

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[19] Suburb name withheld to ensure anonymity.

One dentist went so far as to state that he found the conduct of illicit laboratories 'repulsive'.

> *The main thing that I want to emphasise is the back door guys.  That is something which I find very repulsive, not from the financial point of view, but from a patient point of view.  At the end of the day the patient should be exposed to the best treatment that is available*                   *[DP6]*

When dentists were asked if they knew if the laboratory with which they were working was a legitimate registered laboratory owned by and employing qualified technicians, they gave a mixed response.  One dentist felt that it was his duty to ensure the validity of the laboratory and technicians he was working with.

> *As with any business, when you're indulging in business dealings with someone I think it is very important that you do your background research as well.  If you don't then, of course, it's foolish of you... Check that that person is a qualified dental technician and then only you deal with them, and the lab is registered.*                                *[DP6]*

It had, however, not even occurred to others to check up on the legitimacy of the laboratories operations and they took it on good faith that their dealings were lawful.

> *In fact I've never even though about checking up whether my technicians are legitimate or not, but I'm certain they are.*                   *[DP4]*

The inter-professional relationship between dentists and technicians has historically been contentious and is one that cannot always be described as having been ethical. This study indicated that this relationship shows signs of improvement. Dentists generally indicated a great appreciation for the role of dental technicians in the successful outcome of prosthetic restorative dentistry.

> *I think the relationship between dentists and the technician is as close as a tongue and the saliva.  One cannot function without the other.*       *[DP3]*

*It's not a boss-employee relationship, that's definite. It's more of an equal thing. A dentist can't function without a technician... When you get a good result and the patient tells you thank you and refers other people to you, it's not only because of you do it's because – in fact its more because of what the technician did*                                                    *[DP4]*

*Where I feel it helps is that at the end I don't get all the glory of the work that is done. If we end up with a really nice size bridge that they are helluva happy with, it's as much his work as my work and I often have my patients phoning me up, and say hell, that's it, that's a nice sized job you've done.*    *[DP2]*

This sentiment is shared by Heffron (1979: 303) who states that "it should be possible to take a technician into surgery to indicate special problems or needs, and to show him the end result of some particular masterpiece in which he has played a part".

There was, however, an indication that dentists might still consider dental technicians in a subservient role. The dentists interviewed were fully cognisant of the pressure on technicians to maintain a good working relationship with the dentist to protect their income.

*I think that's part of the relationship that I have with the technician as much as anything else. I mean if he came in here and didn't conduct himself professionally, he'd get a kick in the arse and he wouldn't get any work. It's as simple as that... I've got to be able to turn round to my technician and say that crown's no good, remake it. He mustn't then turn round to me and say no, no, you know.*                                                    *[DP5]*

Zinner (1999: 421) further encourages dentists to "make sure that the laboratory understands that if the work is not up to standard, no fee should be charged. If a remake is required because of the technician's error, a fee should also not be charged". In a study conducted in America it was found that 76 percent of dentists received their laboratory remade cases at no charge (Gregory, 1995). This would suggest that 76 percent of all errors occurred within the laboratory, a fact that would

be disputed by technicians who hold diametrically opposite views.  The cause of errors is generally unknown and responsibility for such should be equally shared by both the dentist and the technician.  This is evidently not the case and it is the technicians who ultimately take sole responsibility in such cases.

Thus dentists limited ethics as practised by technicians to how technicians conducted themselves professionally.  In addition, they also believed that a technician's ethics could be judged by how they conduct their business.  Therefore, this study determined that dentists believe dental technology in South Africa to be conducted ethically.  Furthermore, dentists perceived that the formal ethics for dental technology is poorly regulated and enforced by the SADTC, particularly with reference to issues such as discounting, consulting with patients and illicit laboratories.  The informal ethics of dentist-technician relationships were identified as being interdependent and technicians valued for their contribution.  Dentists did, however, indicate that they still considered dental technology in an inferior role to dentistry.  The discussion now turns to the perceptions of dentists with regard to the professional culture of dental technology.

**Theme 1.5.  Dentists considered a professional culture to be a poorly defined attribute in dental technology and rarely exhibited in the profession. (Professional culture)**

A professional culture is used as a collective term to describe the values, norms and symbols composed, and cherished in a profession, through professional interaction (Greenwood, 1957).  Dentists did not have a clear understanding of the concept of professional culture.

> *It's a difficult question; I don't really even understand what you mean?*
>
> *[DP5]*

After further discussion dentists concluded that this attribute was not evident within dental technology and thus rarely exhibited.

> *Maybe there should be but I don't think there is right now*        *[DP6]*

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**Conclusion of Theme 1**

It may be concluded that from the data obtained from the dentist interviews that all respondents perceived dental technology, as it is currently constituted in South Africa, to be a profession. However, upon further discussion with relation to the attributes of a profession as described by Greenwood (1957), dentists did not perceive dental technology to include all of the distinguishing attributes. The attributes identified as being present in dental technology include; body of theory, professional authority and ethical codes. In contrast, those attributes considered to be lacking are community sanction and professional culture. Thus dentists do not fully comprehend what constitutes a profession.

**Theme 2.  Although dental technology was perceived to be a profession by dental technicians, the term profession was poorly understood.**

All dental technicians believed that dental technology is a profession in its own right. When asked what would constitute a profession a variety of attributes were given. Those attributes considered to be definitive of a profession included; an above average income, an academic qualification, ethical practices, an expert in their field, autonomy, public service and an elevated status.  The attributes where discussed individually, or in combination by technicians.  None of the technicians mentioned all of the attributes together which indicated that they do not have a comprehensive understanding of what constitutes a profession.  The general understanding of the respondent was that a profession should include the attributes of education and public service.

> *Anybody that's studied in a specific course to give a service to the public*
>
> *[DT2]*

However, the exact antithesis of a profession was also perceived as defining a profession.  This aspect was an above average income.

> *Someone who makes a lot of money.*                    *[DT1]*

Only one technician came close to defining a profession when measured against Greenwood's (1957) attributes of a profession.  This technician admittedly used an internet search to investigate the meaning of the term profession after he agreed to be part of the research study.

> *Basically a* professional *person is somebody that's obtained a degree in their specific field and they work from a specific knowledge base.  They're like skilled in a specific area, um, most* professional*s I know belong to a* professional *body that regulates ethics, morals, whatever*          *[DT3]*

Dental technicians indicated only three of the five required attributes.  The attributes identified were; systematic theory, professional authority and ethical codes.  No reference was made to community sanction or professional culture.  It has been

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established that in order to be considered a profession according to Greenwood's definition, as well as for the purposes of this study, it is necessary for all five attributes to be present. In spite of this dental technicians believed dental technology to be a profession.

DT3 noted that although they believed dental technology to be a profession it is not officially considered a professional vocation by the banking industry in South Africa.

> *When I did my Business [Practice] assignment at tech, um, it was quite a surprise to actually go to a bank and then learn that... they don't consider it a* professional *vocation. Um, so it's not recognised as a* professional *vocation, but I think it should be* [DT3]

Although only three of the five attributes of a profession were referred to as desirable professional qualities by dental technicians, all technicians, nevertheless, considered dental technology to be a profession. Each of the sub-themes will now be discussed in detail.

## Theme 2.1. Technicians believed that an adequate body of theory existed in dental technology but that it needed to be related to the operational skills more comprehensively. (Systematic theory)

The systematic theory, also referred to as body of theory, as described by Greenwood (1957) is used with reference to the comprehension of a body of theoretical knowledge used by professional occupations in relation to operational skills. It is within this context that this section is considered. The consensus among technicians was that dental technology had an acceptable body of theory, which dental technicians gain through a diploma or degree at a university of technology.

> *Having been out of the system for a long time, it's a bit of a difficult question to answer. But I would say, judging by the people that are actually in positions in Technikons, okay from what I know of them and having met them around and so on, I would say that the standard is actually pretty good.* [DT6]

> *I think it's good. I do think it's quite good* [DT5]

It was, however, indicated that although the body of theory was adequate it was not necessarily being comprehensively integrated with operational skills. They stated that newly qualified dental technology students were not able to conduct dental technology operations at an industrial level.

> *I actually feel it's excellent, I do. Um, theory wise I think – I don't think we could actually do more than what we do at tech, but in terms of practise, practical, I'm for the apprenticeship kind of thing, you know. I know students do [in-service training] like for two weeks or like a month. I don't think that's sufficient because there's a huge gap between what we do at tech – the ideal situation – and [industry]* [DT3]

> *They must do more in-service training. The theory is necessary, yes, but [the students] at Technikon are given a day or two to setup a [full denture]. Okay. They get a day or two to make a bite block at Technikon. But when they get into industry they need to produce a bite block in 10 or 15 minutes, and that they are unable to do when they get here.* [DT4][20]

> *But it needs to be out in the field because, you know, the stuff that you're getting at tech is very uniform and basic, um, so I think that that year that you have out in a lab is very important. It's very, very important. And to see the social structures that develop in the labs and all the rest of it, I mean, it's very important to have that.* [DT5]

A minority of technicians interviewed stated that the theoretical component of dental technology is not as relevant as practical training and thus demonstrated a lack of understanding as to what constitutes a profession. They believed that manual dexterity proficiency is all the predominant education that a technician needed.

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[20] All DT4 quotes translated into English. Original quotes in Afrikaans.

*You don't go there to learn the theory and the mathematical sums and the chemical reactions of – who gives a toss?  If you can't make teeth you're not a dental technician.*                                                *[DT1]*

The body of theory is achieved through systematic research (Greenwood, 1957).  In order to determine the comprehensiveness of the body of theory, dental technicians were asked if they believed research in dental technology would be of value to the profession.  All, but one, of the technicians immediately stated that they did not feel it would benefit them personally and so had little interest in research.

*No. In my personal opinion, no.  I think it's a waste of time and money.*
*[DT1]*

*No, sorry.  Look, I didn't enjoy studying... if there's nothing for me at the end of it, I can't warrant doing another year of studying.*                *[DT5]*

*Difficult question...  Career wise, I don't think it's going to make a difference, not in this country.*                                                *[DT6]*

One technician indicated that they were not even aware that research was being conducted in South Africa through postgraduate studies. It was also believed that if such research was being conducted it was not being disseminated adequately among the profession.

*So I didn't even realise that people were still doing their masters, and then you don't hear about anything ever being published or anything, so, ja, it hasn't got enough exposure.*                                                *[DT5]*

On further discussion on the subject of research and some deliberation by the technicians, they thought that research might well benefit the field of dental technology.

*Yes, I suppose it could be of value*                                *[DT4]*

*Well obviously it's going to help uplift the perception of what we have available.*                                                                *[DT6]*

Only one technician indicated with certainty that research in dental technology could only be of value to the profession if it benefited the industry economically.

> *Yes. Because there's things like material that you can go into, for instance... I think in this country we don't have enough people producing materials and equipment, just as examples – it all gets imported, and there's import tax and it costs a lot of money, so if there's people that's prepared to do a master's degree – I've been thinking I should have done that, but we didn't have it when I was studying*            *[DT2]*

Another aspect of the body of theory of a profession is maintaining a level of education that is current and in keeping with modern developments (Barber, 1963). This is a common practice among health professionals and is formally carried out through the Continuing Professional Development (CPD) point system. The CPD point system was introduced into dental technology in 2009. Dental technicians were asked what their views were on the newly instated CPD in dental technology. Dental technicians generally felt that this concept was good in theory and would have a positive impact on dental technology provided it was implemented adequately.

> *I think that's an excellent idea.*            *[DT3]*

> *It's a good thing. Because you – like us technicians that are in the countryside, we aren't always able to attend courses. You don't always get exposed to new technologies, so I think it's a good thing. I think it is a necessary thing. They must just implement it correctly*        *[DT4]*

> *It is good, but I think it can be a bit of a pain. If it works, it's going to be a fantastic system.*            *[DT5]*

One technician viewed CPD negatively, stating that he was keeping up to date with new technology through his own initiative. This sentiment is shared by dental technicians around the world (Milan, 2006)

*I feel it's a pain in the arse. I mean I've been in the* profession *now for basically 20 years, I've picked up a lot of experience, I've gone on courses, and I mean I keep myself up to date with things.* [DT2]

Concerns were raised by the technicians that this system, if not implemented with consideration, could put the smaller laboratories at a disadvantage financially.

*Obviously we're a bigger lab, so I've got staff that can cover for me if I need to go on a course for a day or a morning, but a little one man lab that has to earn his points can't just close up shop for a day, because he's got nobody. That's where I can see a difficulty come in.* [DT6]

Milan (2006) further states that commercially employed dental technicians prefer to attend local courses

*I mean I get the e-mails from DENTASA or whatever, and its – there's one meeting in Cape Town, there's a meeting in Jo'burg, there's a meeting in Pretoria and there's XYZ points. There's nothing in Durban, so I've got to get on an aeroplane, I've got to take off days of work, I've got to fly to Cape Town, get accommodation in Cape Town – it's going to cost me 3, 4 grand to go and attend a meeting for half an hour and get 3 points, and to me that's, that's bullshit* [DT1]

*But it also, the time – I've got to take time off from my lab, because a dental technician doesn't work 8 to 5, so if I go on a course I've got to – I actually lose money as well, so that factor also comes in. We don't make the same amount of money as dentists, so if we have to have the same amount of points and the same amount of costs, it's going to hurt us a lot as well, so maybe they must just look at it to lower the points as well, so that it's not such a hell of a lot of points to gather every year.* [DT2]

Technicians also found the concept of computer assisted learning packages advantageous (Milan, 2006), a concept yet to be fully comprehended in South Africa as part of CPD.

*Or guys like us, they should [make CPD points available] via the internet.  For a guy in Johannesburg or Durban, he can just go on a course, but for me to go on a course and leave my work for five days, must stay off for how many days, I must pay the hotel fees, costs and all those things, so it can be very expensive.*                                                    *[DT4]*

These concerns are not limited to dental technicians in South Africa but rather shared with those in other parts of the world (Milan, 2006).  A further concern was that the training offered needed to be of educational value not merely a sales pitch.

*I think that instead of the, um, suppliers or – what do you call them – manufacturers of products, instead of them doing the courses, or running the course, I think tech should actually get involved, or universities that have a dental technology department should get involved*                    *[DT3]*

*They just wanted to sell their product, so it was like having a get-together and somebody – a salesman wants to sell his things...  And then it costs me money and I've got to travel to Jo'burg and pay 4 grand to get 5 points or whatever and then listen to a salesman, for instance.*                    *[DT2]*

It can be concluded that dental technicians perceived an adequate body of theory within dental technology to exist.  Although technicians believed that the education received in dental technology educational facilities was sufficient, they indicated that it needed to be more comprehensively intergraded with industrial operational skills.  Some technicians also indicated that a higher practical, rather than theoretical, application exists within dental technology and this should be reflected within these qualifications.  Technicians did not perceive any personal benefit that would merit conducting research through post graduate studies but thought that there might be benefit, in research, to the profession.  Maintaining a current level of education through the newly instated CPD point system within dental technology was regarded favourably by technicians provided the system is implemented to serve all technicians without bias.  The discussion now turns to the perceptions of technicians with regard to professional authority in dental technology.

**Theme 2.2.  Technicians felt that they had the most expertise with regard to dental technology.  (Professional authority)**

Professional authority is based on the acquisition of theoretical knowledge by professionals, which sets them apart from other professions and the lay members of society (Greenwood, 1957).  All dental technicians, without exception, believed that they are the best qualified personnel to perform dental technological services.  When asked this question they replied:

> *I'll say technicians.*                                                [DT3]

> *A technician will have more expertise.*                               [DT4]

> *I would say definitely dental technicians.*                           [DT6]

The practice of dental technology is not exclusive to technicians but shared with organised dentistry.  Other than those fields not formally trained in dental technology but legally allowed to practise dental technology, these services are being conducted illegally by unqualified labour.  When technicians were questioned whether it was acceptable for an unqualified person to assume the role of a professional, they indicated very strongly that this would be unacceptable and an invasion of another professions authority.  They forcefully and directly answered:

> *No!  No of course not*                                               [DT1]

> *No!  They're not trained to*                                         [DT6]

> *Not unless they've studied for the four years, or five years, whatever it is that*
> *it takes.  Um, there's got to be that [distinction].*                [DT5]

It was broadly stated by technicians that although dentists were legally allowed to own a laboratory as well as practise dental technology, they did not have the appropriate training, experience or time to do so.  This opinion is shared by McGarry and Jacobson (2004:115) who state that "in the past, dentists were required to master different levels of laboratory procedures as part of their clinical education;

however, the requirements have been reduced significantly to an exposure experience versus competency".

*Well, they do, but they shouldn't be allowed to* [DT1]

*Because the dentists, from what I know now, the courses are more, um, inclined towards clinical work… I'll give you an example. Um, in terms of partial dentures – chrome partial dentures, dentists don't indicate what designs they want, because they don't have – I mean they don't have the knowledge – but they seem to rely on the technician* [DT3]

*They don't really study dental technology. They've got a short course or whatever, but I mean if you look at a dental technician, four years of studying... That's why I get upset as well when dentists try to tell us how to do the work or whatever... Because it – eventually that goes into some patient's mouth and you want the best person that's qualified to do the job, to do it... [Dentists have] almost got a … how can I say it … a wild card or a free ticket to start doing things like that, where they don't have the expertise, and I've seen it before where a dentist would start doing things like that and it becomes a total mess, so unless they went and extra – did a course in dental technology – they shouldn't do it, just as I shouldn't go and do... a dentist's work.* [DT2]

*We've got a [dentist], who does his own set-ups, and he only sends them to us to process, and there's no way I would allow those to go into a mouth. He thinks that he has years of experience, he's saving himself on his lab fee costs, but it just – I don't know, I have a problem with those going into a patient's mouth. And I mean, he's not qualified to do it. During their five-year degree or whatever it is, I mean how much time do they actually spend in a lab?* [DT6]

This sentiment is consistent with that of Napier (2004) who states that just as dental technicians entrust the clinical aspects of dentistry to the knowledge of dentists so to

dentists should entrust the laboratory aspects of dentistry to the knowledge of dental technicians.

One dental technician raised the issue of advertising. He believed that it should be acceptable for a dental technician to advertise in their personal capacity, not only to solicit business but also to provide public information. Dentists, in contrast, believed it is only appropriate to advertise in dental technology as a means of providing public information.

> *I mean we should be able to advertise. Like dentists can advertise, why can't we? Why can't we put an ad in the paper and say we only use the best materials, blah-de-blah-de-blah, um, there should be more media – I mean the man on the street, the patient in this country is ignorant. They don't know what options are available*                              *[DT1]*

From the above it can be concluded that dental technicians considered themselves to be the authority within dental technology. Although dentists are legally allowed to practise dental technology, technicians strongly indicated their disapproval of dentists or any other profession assuming the role of a profession in which they do not have expertise. It was further indicated by a technician that advertising within dental technology to solicit business as well as providing patient education should be favourably considered. The discussion now turns to the perceptions of technicians with regard to community sanction in dental technology.

**Theme 2.3. It is held that the general public are largely uninformed with regard to the roles of dental technicians as part of the dental team. (Community sanction)**

Community sanction, also referred to as public approval, is used to describe the process whereby professional authority is granted to an occupational group by the public it serves (Greenwood, 1957). It is necessary to bring to the reader's attention that an intended distinction between dental patients and the general public is noted. It might be considered that dental patients, due to personal interaction with dentistry, are relatively more informed than the general public. It was broadly understood by

technicians that the general public are still largely unaware of the role of dental technology in the dental restorative process.

> *[Dental technology] is really actually an unknown profession amongst the general public.* [DT4]

Technicians felt that it was the impression of the public that dental restorations are still made by the dentists.

> *Some people still believe, you know, the dentists are the ones that are manufacturing [restorations]* [DT3]

> *Most patients in this country think the dentist makes it and if he does a good job they give him a bottle of whisky.* [DT1]

Technicians also indicated that, in their experience, the general public that were aware of dental technology have gained this understanding through personal contact with a technician in a social context.

> *Not that many people know what a dental technician is unless they know another dental technician who's been through the whole explanation before. I don't think a lot of people know.* [DT5]

> *No, unless they know somebody.* [DT1]

Some technicians indicated that poor public information was not limited to dental technology but rather existed throughout the field of dentistry. It was the sentiment of technicians that the public have little clarity regarding all aspects of the field of dentistry in general.

> *The public is badly informed and that's why sometimes they walk into a dentist, they get bad treatment, and they still don't know better* [DT2]

> *Most of the time when I tell people that I'm a dental technician they think I'm a nurse. They think I'm a dental nurse.* [DT5]

One technician felt that patients were slowly becoming more informed through the clinical consultation process. An important question was also raised as to how much information is required by a patient with regard to making oral health care decisions. According to the HPCSA the patient has a right to information in order to give their informed consent. An acceptable depth and level of the information given to the patient is, however, poorly defined.

*I think the last couple of years people have become more aware of the fact that the technicians are doing it, okay, because the dentist obviously informs them that this work will go to the technician... How much would a patient want to know about where the restoration is coming from? I mean, that's a question you need to ask as well.*        *[DT3]*

Technicians felt that it was the responsibility of the dentists to inform the patient about the role of the dental technician as well as the options available to the patient at the consultation. It was broadly believed that this was not being done adequately due to time constraints during the clinical consultation.

*The dentist, as they've got the only contact with them, it has to be their responsibility.*       *[DT6]*

*[The dentist] doesn't inform the patient, he just says you want a denture; I'll make you a denture. He doesn't tell them there's options. They don't.*
      *[DT1]*

*I suppose it would have to be the dentist because he's the one that they're in contact with most of the time. I mean, what with the dental technicians not being allowed to advertise their labs or anything, I mean how else are you supposed to get the public to know of you and what you do? We don't work directly with the public, so the only way for the public to know who a dental technician is, is for the dentist to happen to have mentioned it... You know, dentists are all about getting them in and getting them out, and you know, dentists are always running late. It's not like they've got time to sit and chit-chat about where they're going to be sending their work to, and what's going to be done with it.*       *[DT5]*

It can be concluded that dental technicians felt that the general public are largely unaware of the role of dental technology within dentistry and might still believe this role is fulfilled by dentists. Technicians did, however, indicate that some dental patients who were aware of the dental technology field might have been informed through their consultation with the dentists or via social contact with a dental technician. Dental technology regulations regarding advertising and patient contact limit the possibility of technicians providing public information, therefore technicians felt that it was the responsibility of the dentist to inform patients, despite the time constraints they might experience during consultations. The discussion now turns to the perceptions of dental technicians with regard to ethical codes in dental technology.

**Theme 2.4. Technicians felt that although ethical codes, both formal and informal, do exist in dental technology these codes are carried out by individuals to a level of their own desire. (Ethical codes)**

Professional ethical codes exist both formally; in the form of written codes, and informally as an unwritten professional consensus, through commitment to which a profession is able to preserve community confidence (Greenwood, 1957). It was broadly believed that although ethical codes, formal and informal, do exist for dental technology individual technicians pay scant regard to them and conducted themselves as ethically as they see fit.

> *You can be [unethical] and still get a diploma. It doesn't mean because you've got a diploma or a degree, a B.Tech with honours, it doesn't mean that you're not [unethical].* [DT1]

> *Ja, because people have their own sets of morals, I would say. It comes down to a moral issue.* [DT6]

When asked if dental technology has formal written ethical codes one technician commented that such a code would not affect the conduct of technicians.

> *I don't think it would make a difference... By the time they're adults the people have got their own ideas about what they think is ethical and what isn't. Um, it*

*might make a difference but I think, unfortunately, that your ethics are taught by your parents when you were a child and taken through with you, so I think getting them at tech and telling them that this is what dental technicians are supposed to and not supposed to do, I think is too late, as far as ethics go.*

*[DT5]*

The most predominant informal ethical issue indentified in dental technology was poaching another technician's clients

*The informal ethics would be not poaching on somebody else's work.*

*[DT3]*

*Well I think like not trying to undercut, not trying to steal each other's dentists.*

*[DT5]*

Formal ethics are believed to be structured through the SADTC and it is believed that this made the ethical rules the Council's responsibility.

*Well I think it is, ja I think [the SADTC] is probably the only source.  [DT6]*

*It's the Council's responsibility because they make up the rules      [DT2]*

Technicians in general felt that the SADTC was not fulfilling its mandate in respect of enforcing ethical standards. Many technicians appeared to be frustrated with the current administration of the SADTC.

*The Dental Technicians Council in this country does nothing for the* profession*, it's just a joke                                            [DT1]*

*The other thing is Council says that they are watchdog for the people, to protect the public...  I mean Council's just a figurehead there, I mean they don't come into labs, they have all these rules and regulations about certain criteria about labs, the space you should have and this and this, and they do nothing, absolutely nothing...  You have somebody that's there that's, you know, just sitting there collecting money.  That's my opinion, you know, and um, well a while back there were a few investigations but they didn't follow up*

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*on that... Council is defunct – Council is defunct, they're just collecting our money.* [DT3]

It was also indicated that technicians resented having dentists on the Dental Technicians Council.

*There's dentists trying – dentists that's interfering – like on our council, I think there's a dentist telling us what to do and what not to do. We don't have somebody on their council telling them, listen here, you're unfair with us or whatever. They shouldn't have a dentist on our council, interfering, or just looking after the dentist part of whatever. There shouldn't be a dentist in our council.* [DT2]

Formal ethics that were commonly discussed as being poorly adhered to in dental technology included, discounting to solicit business, patient contact, posing as a denturist, employing unqualified labour and illicit laboratories. Discounting to solicit business was of the greatest concern and frustration among technicians.

*It has a very bad effect because then all the lab owners are constantly trying to undercut each other and that – they now come where all these illegal labs come in because people are constantly bringing the* profession *into disrepute because, you know, this one's trying to undercut that one and the prices are getting lower and lower and lower, and for all the legal labs that are out there that are doing decent work, it ends up taking work away from them … especially if the dentists are in on the whole thing as well, you know.*
[DT5]

*Oh, definitely that people were trying to discount. They were offering discounts and all sorts of things. That, unfortunately, is the nature of business, but obviously now times are harder. It demeans the* profession*, definitely. You know when you're trying to keep things on a* professional *level and we've got all this nonsense going on, I mean it demeans the whole level of the* profession*, that's going against what you're trying to achieve.* [DT6]

*That's what happens, that's what normally happens, because I know there's a couple of dentists that send their work to Durban at the moment, from here, and that's because a guy from Durban came here and offered discounts... It puts a bit of pressure on [the relationship], depending where you go. If I go to a new [dentist], while I'm talking to him I know that's in the back of his mind and he's waiting for something like that to come out in a conversation before he'll say yes, ja, I'll send work to you, otherwise he's going to just listen to me and say bye-bye.* [DT2]

It was evident that although denturism is illegal in South Africa it is being practiced by some technicians. This begs the question of how those who break the law could consider themselves to be ethical.

*Denturism. Uh, lots of labs actually do that. Then also in terms of repairs, people come straight to the technician and why I feel it's, you know, it's not ethical is because we don't have the knowledge to notice whether a patient has any kind of carcinoma and you know, if they go a dentist he'll probably pick it up and by coming to us, we wouldn't, and then we – and how ethical is that – we're not looking out for the best interests of the client at that time, or the patient at that time, so that's an ethical issue.* [DT3]

*Then [the dentist] sends the patient here, I take the impressions, I'll make the denture from start to finish and charge him for it, but cash price which is half of the medical aid price and that excludes my materials, my alginate my impression material. I don't get paid for my time, I don't get paid for my expertise, nothing, but I can do – I'll make – I can make a better set of dentures than any dentist in this country and I'll challenge any dentist to prove me wrong.* [DT1]

The topic of patient contact in a clinical context was raised by technicians; it occurred on a regular basis and often with the knowledge and approval of the dentist.

*If it's like a big job or if there's something that's difficult about the whole thing, the bite or whatever, I'll go and have a look if the dentist wants me to. I'm*

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*open with them and say to them if they've got the slightest problem with colour or whatever, I'll come and sort it out, because it's easier for me to go and make sure the shade is right if they battle with it, than to do the job over.*

<div align="right">*[DT2]*</div>

*Because we see patients all the time for shades. I think we went to the surgery twice and [the patient has] come here.*     *[DT5]*

A further explanation as to the value of patient consultation is offered by Oborn (2008), who states that the value lies in gaining an understanding of the clinical situation as well as ascertaining the patients desires.

Two further topics were highlighted during discussions with technicians. These were the issues of employing unqualified labour to function as qualified technicians as well as illicit laboratories. It was noted that the former seemed to set off the latter.

*You get laboratories employing people off the streets to sweep the floor and then they make the coffee, and three weeks later they're making bite blocks and a month later they're doing full-full set-ups. Now that's not ethical, but they do, because you have to because you can't make money, like me, doing everything by the book. You don't make money; you get nowhere so the only way to make money is to mass-produce and to rip off your staff.*    *[DT1]*

*A guy was working in a crown and bridge lab there, he was just casting impressions and stuff like that, and he came back two years later from Durban, and he said to me, I've been doing inlays, crowns, full metal crowns and stuff in Durban. I'm not in the mood to work in Durban any more, have you got a job for me. This is my salary I want. And he showed me what he can do, but it's against my whole –it goes against the grain of the whole thing to employ someone like that.*     *[DT4]*

*You know its apprenticeships somewhere along the line that have happened and these people have gone out and thought well, I can do that. And then you know, you must see some of the work that comes out of these places. It's so bad it's unbelievable.*     *[DT5]*

The use of inferior materials by technicians in prosthetic restorations is considered to be unethical.

> *I can take one topic of ethics like the materials that you use, for instance. I make sure that I use materials that's the best that I can get and I don't use materials that are going to rust or things like that, or whatever... I try to get a good product with everything that I work with. You know the results at the end of the day is going to be better* [DT2]

A further concern was that the use of inferior materials is seen as a means of increasing profits.

> *[Dentists] want to make as much money as they can, so if a lab is using cheap shit, they can whack, they can double, triple, the price and that's all they care about in this country – most dentists* [DT1]

Moreover, what constitutes acceptable materials for restorative procedures is not regulated in South Africa. Technicians believed that this responsibility should rest with the SADTC.

> *I mean there's no quality control that Council does – actual Counci,l I don't know what their function is* [DT3]

As part of ethics within a profession, Parsons (1939) describes the aspect of 'disinterestedness'. In contrast to non-professionals, disinterestedness in professionals indicates less motivation in self interest but rather a greater interest in serving the public (Greenwood, 1957). This aspect seemed to be lacking in dental technology and is superseded by individualism, as technicians appear to be largely financially motivated.

> *It's all about money – they will rather employ two or three guys like that rather to employ a fully qualified guy.* [DT4]

> *Professionalism is money – if you make money, you're respected and that's how the world works I'm afraid* [DT1]

A further ethical aspect related to disinterestedness is that of colleague relationships. This aspect is poorly contended with in terms of employees and, as has already been mentioned within this section, in support of fellow technicians.

> *When we were at tech and doing our year's in-service training, we got paid like slaves.  We worked like slaves and we were paid like slaves, which was wrong, so, so wrong.  When I think about it now, I never, ever should have done that, never ever.  I used to sit in [name withheld] Centre in Smith Street or West Street until seven, eight o'clock at night, finishing dentures.  No one cares.  You know, they didn't care and you got your thousand rand a month and when I worked out how much money I was bringing in, it made me even more mad*                                                    *[DT5]*

> *Everybody wants to save money, cut costs, and I think that's where we fall short...  Council regulates salaries, but they just give you a minimum salary, so the number of years of experience doesn't count... and lab owners want to, you know, keep the costs as low as possible, so they pay you as low as possible*                                                             *[DT3]*

> *You don't make money, you get nowhere so the only way to make money is to mass-produce and to rip off your staff.*                              *[DT1]*

Disinterestedness was also lacking in the relationship between colleagues.  It was evident that technicians are willing to disregard the welfare of their colleagues for their own personal gain.

> *If you're giving a [dentist] a hard time because he owes you money and you phone the [technician], so I phone the [technicians] and tell them this [dentist] owes me money, 'can you help me?'  [The technicians] don't care.  They will do [the dentists] work, don't worry about it.*                      *[DT4]*

The inter-professional relationship between dentists and technicians should also be considered.  Technicians had a varied response to the dentist-technician relationship status.  A minority of technicians did appreciate some of their clients.

*We have a dentist – we have one dentist that is amazing.  His preps are like works of art.  They really are.  If I could sit every other dentist down in front of him and get him to teach the rest, my job would be a cinch.*          [DT5]

The general perception of technicians was that dentists could be unreasonable in their work request and did not have an appreciation of what is required of technicians in order to fulfil their orders.

*Like time wise with work and things and you think 'jus', how can somebody expect me to have that crown finished tomorrow, and give it to me today, with a bridge, it's like crazy.  It's as if they don't understand that it takes time to make the thing...  They expect things to be done too quickly or they don't think of the dental technician*                                                   [DT2]

*So when [patients] rush in and say: my son's getting married on Saturday, could I have a new set of teeth by tomorrow? – No, because they just have no idea.  And unfortunately, because stuff, um, has become so competitive, the dentists will put pressure on you to try and do that*                     [DT6]

One technician even expressed animosity towards dentists in general.

*Because [dentists are] greedy bastards, they want to make as much money as they can*                                                                               [DT1]

From the above it can be concluded that technicians understand professional ethics in terms the ethics legislated in the Act as well as informal behavioural ethics that they believed were relevant to conducting themselves within the industry.  Formal ethics were understood to be instituted through the SADTC, which is currently not fulfilling its function.  The two dentists serving on the SADTC were considered with suspicion by dental technicians and their presence was deemed redundant.  Among the formal ethical issues raised were; discounting to solicit business, patient consultation, denturism, employment of unqualified labour and illicit laboratories.  Technician's predominant informal ethical concerns centred around the poaching of clients by their colleagues.  The concept of disinterestedness was believed rather to be replaced with the concept of individualism through financial gain by individuals

within dental technology. This sentiment resounded within dental technology professional relationships. Individual technicians' prioritising personal financial gain was considered to result in the poor treatment of staff as well as disregard for the welfare of colleagues. The dentist-technician relationship is also strained, with technicians considering their occupational position to be prescribed at the inclination of dentists. The discussion now turns to theme 2.5.

**Theme 2.5. A professional culture is a growing concept among dental technicians and is largely expressed through professional interaction with DENTASA. (Professional culture)**

A professional culture is used as a collective term to describe the values, norms and symbols composed, and cherished in a profession, through professional interaction (Greenwood, 1957). Dental technicians generally did not understand the term 'professional culture'. Through their conversations however it became evident that there is the beginning of a developing professional culture through DENTASA.

> *If it wasn't for DENTASA membership that you have to go out and pay over and above everything else, I wouldn't even know about it.*      *[DT1]*

> *On a professional level, we're headed in the right direction, having gone to the [DENTASA] AGM for the last three years, it's definitely on the up. Definitely. It's actually very exciting.*      *[DT6]*

Some technicians, however, still did not seem to perceive the value for interaction through professional associations. There was an indication that they were only willing to participate if it was compulsory to do so.

> *I know there're other organisations as well, like DENTASA I think it is..., but it's not compulsory to belong to that.*      *[DT3]*

It can be concluded that dental technicians are beginning to value interaction through professional associations and thus identify a professional culture, particularly through the DENTASA. This sentiment, however, was not unanimous.

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**Conclusion of Theme 2**

It may be concluded from the data obtained through the dental technicians interviewed that all respondents perceived dental technology, as it is currently constituted in South Africa, to be a profession. However, upon further discussion with relation to the attributes of a profession, as described by Greenwood (1957), technicians did not perceive dental technology to include all of these attributes. The attributes identified as being present in dental technology include; body of theory, professional authority and ethical codes and professional culture. In contrast, the attribute considered to be lacking is community sanction. Thus dental technicians do not fully comprehend what constitutes a profession.

**Theme 3. Although dental technology was perceived to be a profession by dental patients, the term profession was poorly understood.**

All dental patients believed that dental technology is a profession in its own right. When asked what would constitute a profession a variety of attributes were given. Those attributes considered to be definitive of a profession included; a qualification, experience, reliability, etiquette or code of conduct and keeping patients informed. The attributes were either discussed individually, or some attributes were discussed together by patients, however, none of the patients mentioned all of the attributes together. The one attribute those patients valued most was being kept informed.

> *Its good manners, hey, and I think he should also explain. He is a* professional *in his job, he's a – he should actually have explained to me that this person is coming in and this is what he's going to do, what is going to be done, and just don't assume that, you know, we know.* [P5]

> *I think a professional – his code of conduct is very important, how he conducts himself. This is if you're called* professional*, then conduct in a* professional *way, and a good liaison with the client is very important... This is something a* professional *- something* professional*s are open and frank. Mainly I find that its doctors saying they've got this hard, better than thou attitude which is does not go down well with the actual poor patient. So they conduct themselves on a level that the patient can understand. When he communicates, he must communicate on the level of the patient. Don't use big long words they don't understand. Communicate at their level.* [P4]

> *Well they have – number one he knows what he's doing; number two that he's seriously reliable; number three that he explains to you what's happening. I think that's, in this day and age, very important.* [P6]

Dental patients indicated only three of the five required attributes. The attributes identified were; *systematic theory,* professional *authority* and *ethical codes*. It has been established that in order to be considered a profession according to Greenwood's definition, as well as for the purposes of this study, it is necessary for

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all five attributes to be present.  In spite of this, dental patients believed dental technology to be a profession.

> *It is a profession, yes.*                                    *[P5]*

> *Yes, it has to be [a* profession*].  Because it's something that you have to study for a reasonable length of time and it's something that is very technical.  You know, so, you know, you can't – it's not a labourer's job.*          *[P6]*

> *Of course it's a* profession*, because to make those things and to get the accuracy and to get those things, as far as I see it, it's a very important* profession*, because the [dentist] says do something, you've got to have the actual technician who's the* professional *who's going to make the thing for you.*                                        *[P4]*

Although only three of the five attributes of a profession were referred to as desirable professional qualities by patients, all patients considered dental technology to be a profession.  Each of the sub-themes will now be discussed in detail.

## Theme 3.1.  Patients had no knowledge on the body theory of dental technicians.  (Systematic theory)

The systematic theory, also referred to as body of theory, as described by Greenwood (1957) refers to the comprehension of a body of theoretical knowledge used by professional occupations in relation to operational skills.  It is within this context that this section is considered.  Although patients felt that in order to be considered a profession a qualification was required, and besides considering dental technology to be a profession, patients had little knowledge of the body of theory of dental technology, which dental technicians gained through a diploma or degree at a university of technology.

> *No, I don't know – I don't know what their training is at all.*          *[P3]*

This body of theory is achieved through systematic research (Greenwood, 1957).  In order to determine the comprehensiveness of the body of theory, patients were asked if they believed research in dental technology would be of value to this field.  It

was broadly believed by patients that research in any field, including dental technology, would be beneficial to that field as well as the public it serves.

> *Yes, because they're doing masters and they obviously specialising in a certain topic and they're bringing about research that's good for people, that's information that we need to know, that we didn't know.* [P5]

> *To improve your knowledge of any subject on an on-going basis, and the masters actually improving and making your research and finding out and to investigate the potential growth is essential to anybody* [P4]

Another aspect of the body of theory of a profession is maintaining a level of education that is current and in keeping with modern developments (Barber, 1963). This is a common practice among health professionals and is formally carried out through the Continuing Professional Development (CPD) point system. Dental patients were asked what their views were on the CPD in dental technology. Although dental patients generally were not aware of the CPD concept, they, after being explained the rudiments of CPD, felt that it was good concept.

> *I never thought about it for [dentistry], but I think about it now I would... I would think that that is quite necessary.* [P3]

> *Yes, I do believe that they should go for a catch-up, like any* profession*... That's very important that you do, to stay ahead.* [P2]

One patient believed that the CPD concept would only hold value in dental technology through adequate implementation.

> *It's how it's carried out. You can allocate the points in order to balance the points into the various categories, so that when it's across the board, its measure becomes meaningful.* [P4]

It can be concluded that patients had no understanding of the educational training of dental technicians despite valuing a qualification within professions. Patients believe that research is of value to the field of dental technology and the public this field

serves.  The concept of CPD was largely unknown prior to the interviews but considered necessary within dental technology once understood.

**Theme 3.2.  Patients felt that dental technicians had the most expertise with regard to dental technology.  (Professional authority)**

Professional authority is based on the acquisition of theoretical knowledge by professionals, which sets them apart from other professions and the lay members of society (Greenwood, 1957).  All dental patients, without exception, believed that dental technicians had the most expertises with regard to dental technology.

> *I would expect a* professional*, the technician to make it.*          [P3]

> *Oh no, I'd go to a dental technician – the dentist who would probably call in a dental technician.  Because they are the best in their field.*          [P2]

When patients were questioned further as to their views on whether someone who is not an expert in a particular field should be allowed to practise that profession, they indicated very strongly that this would be unacceptable and an invasion of another professions authority.

> *No, not without the proper training*                    [P3]

> *No!  Because I think this is where the biggest problem crops up today, that you get these non-professionals going into a field, doing things with a bit of knowledge, and a bit of knowledge is a dangerous thing, because they haven't had the training they need to make sure it's done properly.  [P4]*

One patient noted that she was not entirely certain as to whether it was acceptable to assume the role of another profession in which one had not been trained.  She indicated that she was aware of an unqualified technician posing as a denturist and felt that, due to reports of his service, his conduct might be acceptable.

> *Well, this is a difficult one, because there's a guy that I know that worked in – in making teeth for many years, he only had a matric, down the road and he's now no longer with that dental company, but he's doing it in his back yard for*

*half the price, right, and everybody's going to him, and they seem to be happy, and I went to this* professional *[dentists] – I'm not happy, so how do we weigh this now?* [P5]

Patients indicated their concern of professionals assuming the role of another profession within the medical field and strongly voiced their disproval.

*You have these people that are doing these tummy tucks and so on and these girls –women that have been to [the doctor] to have breast implants and then they didn't work, and the man who's a GP did it, put the implants in upside-down, the holes never closed up, the nipples were in the wrong place, butchered scars, tummy tucks that have got welts that – keloids, you know, like that, no, no, no, no.* [P2]

*I was reading this article in this morning's paper about GPs who are doing plastic surgery and seriously messing up these women. So – and they're saying because they're doctors they can do this. They can't do it. And that's what I'm saying – because you're a dentist doesn't mean you can make these things. If a guy needs a leg he doesn't go his GP if he's lost his leg for whatever reason, he goes to the guy whose job it is.* [P6]

*Again, it's got to be somebody that's been trained, and specifically... Like doctors, they do their own prescribing. I know, I believe it's their job to diagnose; the chemist is the one who should make up the medicine, each one to his own* profession*, as they say. You can't be - a Jack of all trades, is master of none. The dentist is to treat, it's not to make up the prosthesis, he should take imprints and go to the [technician] that's studied it, developed and understands what he's doing and has the knowledge to make sure what's available* [P4]

The patients believed that only dental technicians were capable of performing dental technology procedures proficiently. They perceived that their dentists held a similar opinion. One dentist was quoted as saying that he was pleased with the result of a temporary crown that he had produced.

*[The dentists] said to me; "oh gosh, this [temporary crown] is good"* [P3]

It was further suggested by P3 that this statement resulted in an understanding that dental technology was not a field in which dentists perceived themselves to have expertise.

*Was the first time that I realised how they look up to [dental technicians] – you know that it's something that you don't see as something that they can do*

[P3]

According to Greenwood (1957) a non-professional serves customers who choose, evaluate and judge the service they receive.  The professional, on the other hand, serves clients who are incapable of making these distinctions. A client trusts the judgement of the professional to make decisions for their well being (Greenwood, 1957).  This sentiment seems to be out-dated as patients indicated that they wanted to be informed, by the professional, of the treatment options available so that the patients themselves could make decisions based on their own best interest.

*Not any longer, no I don't believe they're doing the best and I think we should be explained [to] these days, that's how it should be.* [P5]

Patients further indicated that their lack of knowledge with regard to dentistry in general resulted in suspicion of the practitioners' intentions as well as unhappiness on receipt of the invoice.

*I think a lot of unhappiness comes out of the fact that you don't – you don't know what's involved and is expected, you know.  And, and then you don't even know what questions to ask, because you have so little information, you know, and when you're sitting there in pain and you've got a whole gap, you just want to fill the gap or whatever, but afterwards you think about it and you think ah, you know, was that necessary....  And when its put to you it's, you know, if you've got medical aid left over then let's just take it out.  Is that aesthetic or is that medical, you know.  You don't actually know whether... you should believe the [dentist]* [P3]

It was also indicated by patients that advertising through the media would be considered an appropriate means of providing public information.

> *I don't think that the dental* profession*, that they've been very good at publicising [the roles of the dental team]... I think that they've all got a vested interest in it, you know.  I mean even if they just ran, every now and again, articles in the magazines*                                    [P3]

From the above it can be concluded that those patients who have had prosthetic treatment believed dental technicians to be the authority within the field of dental technology.  Patients strongly indicated their concern for those who are not qualified in a field to practise in such a field, particularly within the medical professions.  The concept of an absence of community judgement within professions was regarded as redundant as patients favoured the modern stance of informed consent.  Furthermore, patients believed that they should be informed about the options available to them through appropriate publicity.

**Theme 3.3.  Dental patients were aware of the role of dental technology through knowledge of someone who is a dental technician or through consultation with the dentist.  The general public, however, were largely believed to be uninformed. (Community sanction)**

Community sanction, also referred to as public approval, is used to describe the process whereby professional authority is granted to an occupational group by the public it serves (Greenwood, 1957).  It is necessary to bring to the reader's attention that an intended distinction between dental patients and the general public is noted.  It may be considered that dental patients, as a result of personal interaction with dentistry, were relatively more informed than the general public.  It was broadly believed by dental patients that the general public were still largely unaware of the role of dental technology in the dental restorative process.

> *Generally, I would say no.  I think the general population think dentists do it, you know*                                    [P4]

*Absolutely not! Well I don't know anybody who's ever mentioned a dental technician in their lives.* [P6]

Patients indicated that they, personally, had become aware of the role of dental technology in the dental restorative process through personal contact with a technician socially.

*I had a friend whose husband was a dental technician* [P2]

*Only because I know somebody who does that type of work.* [P3]

A further means of information with regard to the role of dental technology was provided through clinical consultation with the dentist.

*[My current dentists] is the first [dentist] that explained to me the whole thing that was going on* [P4]

*[My dentist] would have said I'm sending it to the guy who makes it, so, you know, it's not like it was a secret or anything like that.* [P6]

Throughout the interviews, patients made comments indicating that they did not have a comprehensive or confirmed understanding of dental technology.

*Not really, no. Well basically when they – this is what I think. They take a moulding of your mouth... From my experience, and from there obviously whatever moulding they do, it gets sent through to the lab where they do the crown that has to be – ja, that's my understanding of it* [P1]

*I think I do. My idea is that they are the people behind the scenes who have the specific skills in order – and the tools and the – you know in order to make those specialised operations as it were, okay.* [P3]

*Yes, I think they work hand-in-hand – [the dentists] can even help [the technician] get clients that way. I mean, he would build a better clientele. Instead of you going to two stops, its one stop. Am I right – you do things in the one room?* [P5]

When patients were asked if they felt they were adequately informed about dentistry and treatment or restorative procedures available to them, they generally felt that they were poorly informed.

> *There's this expectation that you know why you're there and that it's such a big process and really all you know is that you're paying a hang of a lot more for the work... I think that the dentist thinks that [the other practitioner is] going to explain it and the orthodontist and dental technician probably thinks that the dentist is going to explain, but they sort of like send you off and say no, you know you need to go to the orthodontist for this work.* [P3]

> *No, they take for granted – that's what they do, they take it for granted [that you understand the process].* [P5]

One patient indicated that she felt so poorly informed that even if she were to be given options in terms of dental care she would not be informed enough to make a decision.

> *I don't know, so I think we do trust [the dentists to do what is best], you know. So would I have liked more options? I think even if he gave me the options I don't think I'm informed enough to have known any other than to go with what he was suggesting, to tell the honest truth.* [P3]

Another patient felt that she was adequately informed by her dentist and indicated that she was very appreciative of his effort to keep her informed.

> *Well he – what my dentist does, and I have to give him credit, I mean especially if there are large bills at the end of it – he writes you a letter and tells you what your options are. He does that and what the costs are going to be and he will say to you, you can have a – let's say the inlay – this one will cost that... and um, so on, so he's quite good that way.* [P6]

In conclusion, it was noted by patients that although they believed the general public to be poorly informed with regard to the role of dental technology, they themselves had been informed predominantly through the consultation process or social

interaction with a technician. They did, however, indicate that they did not feel adequately informed with regard to dentistry in general. The discussion now turns to the perceptions of dental patients with regard to ethical codes in dental technology.

**Theme 3.4. Patients only had an understanding of dental technology ethical codes through consultation with a dental technician, which is against the Dental Technicians Act, and believed such contact to be of benefit to their treatment. (Ethical codes)**

Professional ethical codes exist both formally; in the form of written codes, and informally; as an unwritten professional consensus, through commitment to which a profession is able to preserve community confidence (Greenwood, 1957). Although patient clinical consultation is prohibited in the Dental Technicians Act 1979, patients had had such contact with technicians.

> *The technician was there, whether he's working in the back at that practice or whether he just happened to be there that day, and he came in and he [took the tooth shade] and, as far as I can remember, he said no, lets rather go [with] the other one [shade].* [P2]

> *There's a young white lady [technician] that came on, did the measurement, did the [shade].* [P5]

It was broadly believed by the patients that such contact was of value to the restorative process.

> *I think it was very beneficial to me that the technician was there.* [P2]

> *That specific interaction, I thought was very good, because it made – helped me make a decision. Which route to go. If he hadn't done that, I would have been told the doctors end, he could have conned me – he could have said, oh ja, I've got to go this route, it's going to cost you R35000 instead of going this would cost you R8000. I made the decision myself based on what information was given by both the dentist and the technician.* [P4]

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Another ethical issue that was raised, as mentioned in 3.2 on page 136, by one of the patients was that of illicit laboratories. This practice, however, was not regarded as offensive.

From the above it can be concluded that, contrary to The Act, dental patients have had clinical consultation with dental technicians. This interaction was held to be of value to the patient's dental treatment. The, currently illegal, practice of denturism was raised and considered as unobjectionable.

**Conclusion of Theme 3**

It may be concluded that from the data obtained through interviews with dental patients, all respondents perceived dental technology, as it is currently constituted in South Africa, to be a profession. However, upon further discussion with relation to the attributes of a profession as described by Greenwood (1957), patients did not perceive dental technology to include all of these attributes. The attributes identified as being present in dental technology included body of theory and professional authority. In contrast, the attribute considered to be lacking is community sanction, ethical codes and professional culture. Thus dental patients did not fully comprehend what constitutes a profession.

This study now concludes with a discussion on the research finding in chapter five.

# CHAPTER 5

# CONCLUDING DISCUSSION

## 5.1    INTRODUCTORY REMARKS

This study investigated the perceptions of dentists, dental technicians and dental patients in respect of determining the professional status of dental technology in South Africa.    Semi-structured interviews were conducted with participants in KwaZulu-Natal.  The participants consisted of dentists, dental technicians and dental patients.  It is significant to note that the participants were entirely representative of the dental restorative process, thus providing creditable results which are reflective of the state of the industry and the subject matter of this study.

This study referred to three key research questions and provided evidence in answering these questions.    The study investigated whether dentists, dental technicians and dental patients perceived dental technology, as it is currently constituted in South Africa, to be a profession.    In order to determine the professionalization of dental technology it was necessary to trace its history and development.  It was evident that throughout history the formation and development of dental technology worldwide was influenced by dentistry and this fact has largely influenced the industry as we know it today.

Professions can be evaluated according to the number and extensiveness of professional attributes present within the occupation.  The conceptual framework under which this study was undertaken was aligned to that of Greenwood (1957). Greenwood described five attributes of a profession which he stated all need to be present if an occupation was to be classified as a profession.  These are,

1)  systematic theory,
2)  professional authority,
3)  community sanction,
4)  ethical codes and
5)  a professional culture.

Dental technology is a relatively new occupation, arguably having its origins in the 20th century. Therefore, the attributes suited to developing professions were considered. This study concludes with a discussion on the findings as generated by this research in respect of each of the attributes. The discussion ends with formulating recommendations for the dental technology industry.

## 5.2    DISCUSSION AND FINDINGS

Through consideration of the attributes of a profession, as described by Greenwood (1957), this study concluded that dental technology, as it is currently constituted in South Africa, can be considered to be a developing profession. Despite this finding, dental technology was initially perceived to be a profession by dentists, dental technicians and dental patients. It was apparent, however, that the term profession is poorly understood by participants when considered with reference to established concepts on professions. According to Cerevo cited in Lautar (1995) the 'folk concept' of a profession could be considered. This implies that that which the public considers a profession is a profession. The public, however, formulates its own opinions as to what it considers to be a profession. These opinions are based on social perceptions and do not necessarily consider the academic attributes of what constitutes a profession. Thus the recognition of professions will change with time and location. Through further consideration of dental technology within the conceptual framework, provided by Greenwood (1957), and as discussed by interviewees it is evident that certain attributes of a profession are absent in the field of dental technology. Each of Greenwood's (1957) attributes and how they relate to the dental technology industry as well as the interviewee perceptions regarding these attributes will now be individually discussed.

### 5.2.1  Systematic theory

The dentists and dental technicians had definite opinions on systematic theory as it relates to dental technology. Dental patients, on the other hand, had little knowledge as to what constituted systematic theory and consequently had little to offer.

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Both dentists and technicians believed dental technology to have adequate levels of knowledge (body of theory) gained through the current educational system. Technicians strongly argued the need for a more comprehensive integration of what is being taught at educational facilities, with the operational needs of the industry. They believed that too great an emphasis was placed on theoretical knowledge whilst the practical aspect prepared students poorly to function adequately in the industry. A minority of technicians further indicated that a higher practical, rather that theoretical, application existed within dental technology and should be reflected within the educational training. Ironically if this were to happen then dental technology would become more difficult to classify as a profession when compared to Greenwood's contention that in order to be classified as a profession the occupation should have a sound taught theoretical base.

An acceptable body of theory is gained through a profession generating systematic research and thus elevating the knowledge base of the profession. The need for a profession to generate original research was highly regarded by dentists as well as dental patients but viewed as trivial by dental technicians. Technicians did not perceive any personal benefit in conducting research but thought that there may be benefit, in research, to the profession. This disregard for the generation of knowledge through research was expressed with reference to post graduate studies, which is the only form of research in dental technology in South Africa at present. Considering that professional conduct calls for altruistic service to the public, this egotistical approach to research does not assist in the facilitation of the future professional development of dental technology.

In order to maintain a body of theory within a profession in is necessary that professionals continually up-date their education. Gaining high-level cognitive knowledge through systematic theoretical research is a requirement of a profession as a basis for the profession to claim professional authority. This is formally accomplished within professions through the CPD point system. The newly instituted CPD point system was regarded as beneficial by dentists, dental technicians as well as dental patients to dental technology. The dentists and dental technicians did, however, indicate concern about the implementation of such a system. Some dentists believed the formally instituted CPD point system to be

insulting to their professional integrity. They believed that it was insinuating that dentists needed to be policed in order to get them to remain abreast with current affairs within their profession. They further felt that this system was predominantly concerned with generating money rather than providing education. Similarly, technicians had concerns about the financial burden this system would place on their businesses, particularly on those smaller and more remote laboratories. They believed that careful consideration of the implementation of this point system needed to be done so as not to disadvantage such laboratories. The discussion now turns to drawing conclusions on the professional authority of dental technology.

### 5.2.2 Profession authority.

Dental technicians were believed to be the authority within the field of dental technology by all three sample groups, despite this shared privilege with dentistry. According to McGarry and Jacobson (2004:224) "the dental laboratory industry has taken a leading role in providing both clinical and laboratory education to dentists, as well as providing the most sophisticated dental restorations". This current state of affairs is, however, strongly discouraged by McGarry and Jacobson (2004:220) who state that "the dentists must remain the repository of laboratory skill and knowledge. They state that the laboratory industry should not become the authority on laboratory procedures".

The intense disapproval of assuming the authority of another profession was again shared by all three sample groups. Dentists showed specific concern with regard to those fields presenting as dentists, particularly dental hygienists and dental technicians. Meskins (1998:1070) recorded the sentiment of dentists as being that "God made dentists to do dentistry – no one else!" Technicians, in turn, indicated their disapproval of dentists or any other persons assuming the professional authority of dental technology. It was noted by Leeper (1979) 30 years ago that even then dentists did not have the time, equipment or expertise to produce restorative prosthesis. The authority of dental technicians within this field is confirmed by McGarry and Jacobson (2004)

*The educational and economic imbalances of the past now are being reversed with dental technologists being the most knowledgeable members of the dentist/dental laboratory technician partnership in the area of laboratory techniques, instrumentation and materials.*

(McGarry & Jacobson, 2004:221)

The concern to dentistry is then how does this role reversal affect the future dentist/dental technician interface and more specifically "will dental technologists become manufacturers or allied health professionals or will the dental technology industry become a direct-to-the-customer business?" (McGarry & Jacobson, 2004:221).

The primary reason for this decline in laboratory based knowledge and skill among dentists is believed by Christensen (2004; 1995) to be rooted in dental education.

*Dental educators have eliminated most dental [laboratory] subjects from dental school curricula, assuming this area would be delegated to dental technicians. The result is that most dentists know little about laboratory technology. They have received minimal laboratory technology instruction in dental school and have had meagre or no hands-on experience after graduation.*

(Christensen, 1995:115)

This opinion is shared by McGarry and Jacobson (2004:115) who state that "in the past, dentists were required to master different levels of laboratory procedures as part of their clinical education; however, the requirements have been reduced significantly to an exposure experience versus competency". According to Samuels (2010) a similar situation exists within South Africa. The extent of the educational overlap between dentistry and dental technology is considered to be between 25 and 30 percent. This time is admittedly dedicated predominantly to theoretical principles rather than practical applications. The practical applications undertaken include; prosthetics, orthodontics, cast crown and bridge restorations and specialized maxillofacial appliances (Samuels, 2010).

Dentistry still, however, believes that it has sufficient skill in dental technology to own or manage a dental laboratory. Considering that in order to own a dental laboratory in South Africa a dental technologist would have to complete a four year B-Tech Degree, the amount of time dentists dedicate to dental technology during their education would not even justify the equivalent of a dental technology diploma. Yet dentists are legally allowed to own a laboratory in South Africa. McGarry and Jacobson (2004:222) further accentuate the point that dentists assume the role of "evaluator or supervisor of laboratory procedures" but this role is undermined by "insufficient experience to gain competency as a supervisor".

Unfortunately, in place of the dental laboratory, dentists increasingly choose to make use of computer-aided design/computer-aided manufacture (CAD/CAM) machinery to produce oral restorations (McGarry & Jacobson, 2004). The concern for dental technology here is that not only are dentists producing these restorations but it is evident that dental assistants are being trained to serve in this role. According to Mclearn et al., (2008:53) CAD-CAM systems "effectively automated some of the more mechanical and labour-intensive procedures involved in conventional fabrication of a dental restoration, allowing the dentist, dental assistant or technician to create functional dental restorations". Furthermore, courses are regularly offered, in producing oral restorations, for dental assistants wanting to "maximise their chair side assistance" (Mclearn, et al., 2008:53).

Equally, patients indicated their concern for those who unjustifiably assume professional authority, particularly within the medical professions. The concept of professional authority is considered in conjunction with the lack of community judgement and the practice of advertising. Professional authority enables a professional to make decisions on behalf of the patient who, due to a lack of knowledge, is considered incapable of choosing a service provider or making relevant decisions. It was proposed by dentists, technicians and patients that dentistry, and specifically dental technology, is no longer free of community judgement. This long standing concept has been replaced with the modern concept of informed consent. According to Friedson (1984:7) "the average consumer is capable of evaluating much more specialized technical information today than was the case yesterday, but as this capability has grown the quantity and quality of

specialized knowledge has also increased".   Freidson (1984) further states that professional monopoly is constantly under threat owing to the increasing level of education of the general public.   This results in a more cynical and challenging stance towards professions previously considered with admiration.

Although patients may have less understanding of medical procedures involved in dental treatment for them to make judgements, the increasing cosmetic treatments requested by patients are judged according to individual preferences (Welie, 2004). However, Welie (2004:676) argues that "ugliness is not a medical indication; it does not necessitate medical treatment...   By definition, dentistry does not qualify as a profession when and to the extent that the interventions performed are purely elective instead of medical indication".   Nonetheless, patients today believe that they should be provided with all relevant information in order to make treatment decisions for themselves.

Furthermore, the practice of advertising as a means of disseminating information as well as to solicit business from the public is favoured by technicians and patients but viewed rather contemptuously by dentists.   Despite their disapproving view of advertising within dental technology, dentists, who are considered as established professionals, are themselves allowed to advertise (Welie, 2004).   Considering that dental technicians are, legally, not the exclusive authority within the field of dental technology as well as the developing professional state of dental technology, and that dentists are allowed to advertise, it would seem reasonable that dental technicians should be allowed to advertise as well.   But this is not the case. Christensen (2001) further argues that advertising within dentistry is both misleading to the public it is meant to serve as well as detrimental to dental professionalism, as it suggests that one professional is more trustworthy than another.

The discussion of professional authority can be concluded by considering the view of Adams (2004) who believes that organized dentistry is trying to maintain the current state of dentistry to protect their professional authority, jurisdiction, and status. Central to the conflicts between dentistry and dental technology is authority.   Adams (2004:2244) notes that "in these jurisdictional disputes, organized occupational

groups strive to convince their audience that their claims to authority are the most credible". The discussion now turns to community sanction.

### 5.2.3 Community sanction

The general public are broadly believed to be poorly informed about the role of dental technology within the field of dentistry. This view of poor public knowledge exists despite the public becoming increasingly aware of dental restorative processes available. It was indicated within all three sample groups that the public might still believe that the role of dental technology is fulfilled by dentists. Dentists, technicians and patients stated that patient information regarding dental technology was generally, but not consistently, disseminated during the consultation process. Dental patients as well as technicians further felt that some patients who were aware of the role of dental technology have become informed as a result of social interaction with a technician. Technicians, however, predominantly believed that dental patients are still poorly informed about the function of dental technology. Patients further indicated that they do not feel adequately informed with regard to dentistry in general.

According to Christensen (2002), misunderstanding about oral needs among patients can be attributed to the lack of patient education concerning those procedures necessary to maintain oral health as opposed to those procedures that are elective in nature. Patients agreeing to elective procedures, which they have been led to believe were absolutely necessary, results in patient dissatisfaction and mistrust. Christensen (2005) encourages dentistry to address, as well as encourage, the recognition of dental patients' rights to information regarding the nature and origin of prosthetic restorations.

The origin of poor patient information is largely believed to be rooted in time constraints during consultation coupled with the technical nature and terms of dental technology. Despite such constraints it was believed by all interviewees that informing patients is the responsibility of dentists. It was further suggested that advertising as a means of providing public information would be appropriate. Barber (1963:678) states that as part of professionalization, occupations "will engage in a

program of public information about the 'professional' services it provides and the 'professional' standards of community orientation it maintains".   Although being opposed to advertising to solicit business, dentists agreed that a nonbiased and holistic approach to public education in dentistry is necessary.   The discussion now turns of professional ethics.

### 5.2.4  Ethical codes

Professional ethics within dental technology is present both formally and informally. Dentists believe dental technology ethics to be limited largely to collegial relationships as well as business interactions and, as such, they believe that dental technology is conducted ethically.  The predominant informal ethical issue raised by technicians was that of intentionally attempting to gain the custom of another technician.   Formal ethics are believed to be instituted through the SADTC.   Both dentists and dental technicians indicated that formal ethics of dental technology as instituted by the SADTC are poorly regulated and enforced, particularly with reference to issues such as discounting to solicit business, patient consultation, denturism, employment of unqualified labour and illicit laboratories.

It is significant that interviewees from all three sample groups discussed illicit laboratories as well as patient consultation.  Most dental patients have had clinical consultation with dental technicians.  This interaction was considered of value to the patient's dental treatment. It is recommended by Christensen (2002) that dental technicians should be returned to the clinical environment.   He stated that technicians have specific knowledge of "incisal guidance, midline, lip positioning, parallelism of incisal plane with eye pupils, colour, contour, gingival relationships, height of implants and whatever seems to be pertinent for treatment success" (Christensen, 1995:177).   Christensen (1995) further states that an improved quality of service is provided to the patient when the technician is involved clinically. Furthermore heightened respect and knowledge generation and transfer occur between the dentist and technician during this style of working relationship.

The currently illegal practice of denturism through illicit laboratories was raised and considered as unobjectionable.  Illicit dental laboratories and surgeries have been

operating throughout modern dental history (Heffron, 1979; Fee, 1974). Statistics provided by Bower et al. (2004) indicate that there were approximately 10,000 dental technicians in the United Kingdom, of which up to 70 percent are unqualified workers. Fee (1974:12) states that

> *the fairly low level of financial remuneration, especially for employees, led some to supplement their earnings by working directly for the public in contravention of the dental Acts. Having no investment in education, no overheads and no tax, their charges were considerably less than those of dentists*

It may well be worth considering why the public are choosing to use the services of illicit laboratories. Insight is offered by Welie (2004:678).

> *If oral health care services are beyond the financial means of many people in need, the social contract is violated. Why should the public abide by a contract with a group of service providers who have collectively promised to be altruistic but who charge so much that few members of the public can afford the service?*

A number of illicit laboratories in operation in KwaZulu-Natal were suggested by the data generated for this study. The data suggests that that the current dentist technician ratio is significantly lower than originally thought. From **Table 4** below it is evident that compared to the recorded number of dentists and technicians currently practising in KwaZulu-Natal the ratio of actual dentists per technician is significantly lower. The number of technicians as compared to dentists, in KwaZulu-Natal, resulted in a ratio of 1:8. This is to say that for every one technician in a laboratory there should be eight dentists sending work. The technicians interviewed were questioned as to the number of technicians in the laboratory and the number of dentists they serviced. This result can be seen in the table below. According to the interviewees the actual ratio of technician to dentist in KwaZulu-Natal is 1:3. This then suggests that more than half the dentists in KwaZulu-Natal are not accounted for.

**Table 4**.  Ratio of Technicians to Dentist.

|  | Technicians | Dentists | Technician: Dentist |
|---|---|---|---|
| **KZN** | 67 | 530 | 1:8 |
| **Interviewed** | 16 | 50 | 1:3 |

Whether these services are being outsourced to other provinces, fulfilled in-house or entrusted to illicit laboratories is currently unknown.  This is, however, a cause for concern and should be further investigated in order to improve the services rendered to the public as well as assist the dental technology industry in KwaZulu-Natal in reclaiming business lost.

The exact antithesis of professionalism is 'individualism' which "is irreconcilable with community welfare" (Barber, 1963:670).  Barber (1963:670) further states that "business was, and it remains, of course, the vital centre of individualism both in creed and practice."  The concept of disinterestedness in dental technology is replaced with the concept of individualism.  Individual technicians are more interested in personal financial gain than acting in a manner which benefits the industry and ultimately the public it serves.

The sentiment of individualism is also present within dental technology professional relationships.  Professional relationships should be approached altruistically.  However, both inter-professional as well as intra-professional relationships in dental technology were considered to be wanting.  Individual technicians' prioritise personal financial gain, which results in the poor treatment of staff as well as disregard for the welfare of colleagues.  An example of this is technicians freely, without conscience, appropriating or attempt to appropriate each other's clients.

Although dentists identified the dentist-technician relationship as being interdependent and technicians as valued for their contribution, dentists did indicate that they still considered dental technology in a subservient role to dentistry.  It has

been noted by Malherbe (2009) that the relationship between organised dentistry and auxiliary dental professions in most countries has, historically, been no less than ambivalent, but more customarily, hostile and antagonistic. McGarry and Jacobson (2004:226) suggest that "dentistry also needs to create a climate of cooperation between dentists and their colleagues in dental laboratory technology to provide the public with the quality dental services they deserve".

Dental technicians indicated their dependence on dentistry and generally considered this relationship with apprehension. This sentiment is shared by Bormes cited in Andrus et al. (1990).

> *Unfortunately, the relationship between dentists and technicians who are characteristically more regressive/ passive has not changed much over the last 10 years. The laboratories are still plagued by the same problems of poor payment, unclear prescriptions and less-than-ideal impression*

(Andrus et al., 1990:10)

In order to best serve the patient, it is necessary for dentists and technicians to have a harmonious working relationship. This is, however, frequently not the case (Leeper, 1979). The fault however does not fall entirely on the dentists and the fault of the technician is deep rooted. Leeper (1979:89) gives an account of the faults of technicians, which is universally relevant. Some of the actions in question are highlighted as follows: "promoting fast service, cost and credit, the exclusion of proper consideration of design, materials and technique; neglecting self-improvement through attendance at appropriate meetings and courses [and] stressing price as a means of getting business". These traits are all uncharacteristic of a professional and ultimately maintain dental technology in an inferior position. The discussion now turns to professional culture.

## 5.2.5 Professional culture

The concept of a professional culture is currently present and increasing within dental technology. Dentists did not have a clear understanding of the concept of a professional culture but stated nonetheless that this attribute is poorly defined within

dental technology and thus rarely exhibited. Technicians, however, have identified a growing professional culture through interaction with professional associations, particularly DENTASA. This sentiment, however, is not unanimously held. Central to the concept of professional culture is the career concept. The term career is only used in association with professional occupations and is in essence a life calling to good works (Greenwood, 1957). This is to say that a professional will have an altruistic desire to serve the community. The career concept is integrated with the concept of disinterestedness which has formerly been discussed[21].

It can be concluded that dentistry and dental technology have separated further over the past century. It is evident that mutual education and training with regard to laboratory technology within dentistry have drastically decreased. Christensen (1995:117) feels that "the result has been less than optimum service for the public... We belong to the same profession. We provide services for the same patients. We need mutual education, clinical observation, knowledge and, most importantly, respect". Furthermore, through commitment to ethical codes a profession is able to retain community confidence, in the absence of which a monopoly could not be maintained (Greenwood, 1957). Dental technology in South Africa needs to adopt a professional attitude towards the valuable service it provides to the community.

## 5.3    RECOMMENDATIONS

Resulting from this study the following recommendations are offered to the dental technology industry. A number of these suggestions may only have validity depending on the level and direction of development preferred by the dental technology industry.

It is necessary, first and foremost, for the dental technology industry to identify and define the framework of their practice in the future. This is to say that if dental technology is to become an established profession, as it is currently perceived to be, an appropriate professional framework should be established. Dental technicians

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[21] See page 157 paragraph 1

would need to undergo professional socialization in order for professionalization to occur within the field of dental technology. Throughout this process, professional attributes must be adopted by each dental technician. Dental technology may well wish to remain within its current position of professionalization or formally establish a business status, thus declining all professional powers, privileges and status. This, however, does not indicate that there is no room for improvement. Hence, an appropriate business, or semi-professional, framework should be defined and implemented.

The discussion now moves to consider the recommendations arising from this study in respect of each of Greenwood's (1957) attributes, thus providing direction to move the dental technology profession closer to where it can be considered a professional industry as defined by Greenwood.

### 5.3.1 Systematic theory

The body of theory provided by training institutes needs to be more comprehensively integrated with operational skills in order to adequately prepare dental technicians for industry. The application of theoretical training through an in-service training period within the qualifying year, as practised by other professions, may effectively accomplish this end.

The dental technology industry needs to place more significance on the body of theory, provided through the training institutes, as well as the systematic research through which this theoretical knowledge is generated. As systematic theory is the fundamental basis of professionalism, establishing this attribute is essential to future professionalization of dental technology.

The CPD point system should cater for small and physically remote dental laboratories situated in rural South Africa. An educational programme suited to all four disciplines and presented by educationally sound presenters should also be developed. Furthermore, the number of points allocated per year should also reflect the current level of professionalization and income of dental technicians in comparison to those of other established professions.

### 5.3.2  Professional authority

The training of dentists should reintroduce an appropriate level of laboratory, theoretical and practical training within the dental curriculum in order to justifiably maintaining the responsibility of dental technology laboratory practice.

Patient's right to information should be upheld.  In order for patients to give informed consent it is first necessary for patients to be informed.  An appropriate level of information provided to patients within dentistry should be formalized by the HPCSA as well as the SADTC, where necessary, to ensure consistency.

Advertising rights, equal to those in dentistry, should be made available to dental technology.

### 5.3.3  Community sanction

It is necessary for the greater dentistry industry to launch an advertising campaign through which the general public are made aware of the different members of the dental team and what their functions are within the dental team.

Furthermore, dental technology should launch an advertising campaign through which dental patients are informed of the variety of restorative techniques and material available to them.  It should include the pros and cons of each treatment as well as the expected number of consultations and general fee structure. Not only would such a campaign serve to enlighten the community about the services offered in dental technology, it would also serve the purpose of generating greater volumes of work and thereby reduce the practice of technicians engaging in illicit work to supplement their income.

The dental technology industry would do well to provide career orientation presentations at high schools throughout South Africa.  Not only would this inform the younger generation of the role of dental technology in the oral health team, but it would also aid in recruiting students with a greater appreciation of the field prior to entrance into the course.

### 5.3.4 Ethical codes

The formal ethical codes provided through the SADTC should be revised to more accurately reflect those ethical codes indicative of professions. Furthermore, the SADTC should take appropriate measures to fulfil the role with which it has been entrusted and monitor the ethical behaviour of the industry.

The extent of illicit laboratories should be further investigated and corrective action should be taken. In addition, the presence of such laboratories is indicative of a much needed clinical as well as restorative service, otherwise lacking, in the disadvantaged communities. Dentistry should make altruistic decisions about how this social need can be responsibly addressed.

Dentistry should decide if the clinical responsibilities, which are currently being fulfilled by dental technology such as the taking of shades, can be confidently maintained. If so, dental technicians should be adequately reimbursed for these services. If not, these services and the associated responsibilities should be limited exclusively to dentists.

The fostering of ethical professional relationships within dental technology, as well as organized dentistry, is necessary to further develop the understanding of this attribute within the industry.

### 5.3.5 Professional culture

Dental technicians need to actively and unreservedly participate in dental technology associations in order to further develop and deepen the professional culture of dental technology. Furthermore the cultivation of a culture of interest, beyond the general running of business, in dental technology is essential to such development.

In order to ensure that those entering the field of dental technology are endowed with the career concept, educational facilities should include an ethical test as part of the aptitude testing process and provide further ethical instruction during the course of study, as with other professions.

## 5.4    FINAL REMARKS

In conclusion, through the use of an evaluation of the attributes of a profession as defined by the conceptual framework that formed the basis of the study, it has been established that dental technology cannot be considered a fully fledged profession. This finding is consistent with that determined by other investigations within longstanding professions (Welie, 2004).

When establishing whether a profession fully meets all the requirements to be considered a true profession, deficiencies will always be present. This is due to the progressive nature of attaining a professional status, which is developed over time (Welie, 2004).  This study has indicated that dental technology in South Africa is a relatively new profession, having its professional roots dating back to its formation in 1945.  The only noteworthy transformation during this time was the institution of the Dental Technicians Act of 1979, which legislated that the training of dental technicians was to be vested in institutes of higher learning.

Thus, dental technology, as it is currently constituted in South Africa, can be defined as a developing profession, which places this occupation somewhere along the continuum between a fully fledged profession at one end and a business at the other (Toren cited in Lautar, 1995).  Hence, the dental technology industry must decide on its future and whether there is a desire and belief that dental technology must attain full professional status. Therefore, the onus now lies with industry to choose between the two ends of the continuum and consider the direction that it believes that the industry should follow.

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# ANNEXURES

# Letter to Request Participation In Masters Research.

I am currently completing my Masters degree in Dental Technology at the Durban University of Technology.  The achievement of my Masters requires me to complete a research dissertation.  I am doing research with a sample of dental technicians, dentists and members of the public who have received prosthodontic treatment to establish the professionalization of the dental technology industry.  The title of my research is **"PERCEPTIONS OF THE PROFESSIONALIZATION OF DENTAL TECHNOLOGY".**

The purpose of this study is to establish if dental technology, as it is currently constituted in South Africa, is a profession.  Through gaining knowledge of the professionalization of dental technology it is hoped to identify poorly defined attributes of the profession and provide useful information to the dental technology industry and the public in order to further achieve professionalization.

I am requesting that you allow me to interview you as part of the research.  I will need to interview you once for approximately 45 minutes.  Interviews will be recorded and recordings will be used for data transcription.  At the end of the study the recordings will be disposed of.  Participants will remain anonymous at all times unless you specifically wish to be named.  Data collected will be used exclusively for the purpose of this study and will not be rendered to any other person for any reason.  If you choose to withdraw from the research at anytime, you will be free to do so.  Upon your withdrawal, data that may have been gathered through your participation will be destroyed.

Please note that my research has been approved by the research committees of the Department of Dental Sciences and the Faculty of Health Sciences.  My supervisors during the course of this study are Mr. G. Bass and Mrs K. Young, and should you require further information concerning this study, you are welcome to contact them at the Durban University of Technology.

| | |
|---|---|
| Mr. G. Bass | Mrs. K. Young |
| M.Ed (Higher Education), B.Comm, | Associate Director: Department of Human |
| NHD: Dental Technology (Status) | Resource Management |
| Deputy Dean: Faculty of Health | 031 373 6799 |
| 031 373 2033 | |

**Please complete the below and return in the addressed envelope provided.**

I am willing to participate in Miss Skea's research into the professionalization of dental technology. I understand that final participants will be selected on a random sampling basis.

**Name:** _____     **Contact:**_____

**Address:**        _____

_____

**Signature:** _____     **Date:** _____

(Should you agree to participate in this research you will be asked to sign the attached letter at the interview.)

**Researcher:**

| | |
|---|---|
| Miss Denise Angela Skea | Tel:    031 373 2044 |
| Department of Dental Sciences | Cell:   0829227071 |
| Mansfield Campus | Fax:   0866171374 |
| Durban University of Technology | |
| P.O. Box 1334, Durban, 4000 | |

**Consent To Participate In The Research Study**

To be completed immediately prior to interview

1) I agree to participate in Miss Skea's research concerning the professionalization of dental technology.

2) I understand that Miss Skea will interview me and record my views.

3) I accept that the results of the research will be used towards a Master of Technology degree through the Durban University of Technology.

4) I understand that I will remain anonymous throughout the report unless I wish to be named.

5) I understand that on conclusion of the research the data collected will be discarded.

6) I understand that I am entitled to withdraw from the research at any time and that my contribution to the research will be discarded.

7) I agree that the research process has been fully explained to me.

**Name:** _____

**Signature:** _____    **Date:** _____

Please indicate if you wish to be acknowledged by name in the research report.

(Please tick appropriate box)

| | |
|---|---|
| **YES** | |
| **NO** | |

**Researcher:**

Miss Denise Angela Skea
Department of Dental Sciences
Mansfield Campus
Durban University of Technology
P.O. Box 1334
Durban
4000
Tel:     031 373 2044
Cell:    0829227071
Fax:     0866171374

## 1. Dentist Interviews

1.1. What attributes do you believe a profession should exhibit?

1.2. Do consider dental technology to be a profession? Please qualify your answer.

1.2.1. What is your view on the current educational training of dental technology?

CPD

Post grad

1.2.2. Which profession do you believe to have the most expertise in the manufacture of oral prosthesis? Please qualify you answer.

Anyone else

1.2.3. How are patients/public informed of the origin of oral restorations and prosthesis?

2.6.3.1. Are patients/public adequately informed? Please qualify your answer.

1.2.4. What are your views on the ethical aspects on dental technology?

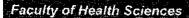1.2.5. Which aspects of dental technology, if any, exhibit a professional culture?

**2.  Dental Technician Interviews**

2.1.  How many dentists utilize your services?

2.2.  What attributes would you use to define a profession?

2.3.  Do consider dental technology to be a profession? Please qualify your answer.

3.3.1.  What is your view on the current educational training of dental technology?

Do you consider postgraduate studies (M-Tech or D-Tech) to hold any value to dental technology?

What is your opinion of the newly instated continual professional development (CPD) points system?

2.3.2.  Which profession (dentist, dental technician or other) do you believe to have the most expertise in the production of oral restorations and prosthesis? Please qualify you answer.

Should another profession, other than that which has the most expertise, be instated to produce such restorations? Please qualify your answer.

2.3.3.  How are patients/public informed of the source of oral restorations and prosthesis?

2.6.3.1. Are patients/public adequately informed? Please qualify your answer.

2.3.4.  What are your views on the ethical aspects (Formal-written and Informal-unwritten) on dental technology?

2.3.5.  Which aspects of dental technology, in any, exhibit a professional culture? Networking (industry, education, organisation – values, norms and symbols)

**3.    Patient Interviews**

3.1    Have you recently had a dental prosthesis?

3.2.    How many different prosthesis have you had?

3.3.    Have any of these been remade and if so what was the reason offered?

3.4.    Do you know who made the prosthesis?

3.5.    Can you tell me what the role of dental technology is in dentistry?

3.6.    What would consider being attributes of a profession?

3.6.    Do you consider dental technology to be a profession? Please qualify your answer.

3.6.1.    What is your view on the current educational training of dental technology? CPD, Post Grad

3.6.2.    Given a choice, who would you prefer to make your prosthesis? Please qualify you answer.
Anyone else

3.6.3.    Before gaining your prosthesis what did you know about dental technology? (Community Sanction)

3.6.3.1. Did the dentist explain the role of dental technician as part of the dental team?

3.6.3.2. Do you think you should have been better informed?

3.6.3.3. Are you satisfied with your prosthesis?

3.6.4.    Are you aware that the commercial visitation to a dental technician is a violation of dental technology legislation?

3.6.4.1. Have you had clinical contact with a dental technician?

3.6.4.2. Did your experience with the dental technician support the legislative notion forbidding contact?

3.6.5.    Please describe your experience of the interaction between yourself and the technician.

3.6.5.1. Do you believe it was professional? Qualify your answer.

D U R B A N
UNIVERSITY of
TECHNOLOGY

# ETHICS CLEARANCE CERTIFICATE

| Student Name | Ms D A Skea | Student No | 20503025 |
|---|---|---|---|
| Ethics Reference Number | FHSEC 014/09 | Date of FRC Approval | 04 May 2009 |
| Qualification | Master's Degree in Technology: Dental Technology | | |
| Research Title: | Perceptions of the professionalisation of Dental Technology | | |

In terms of the ethical considerations for the conduct of research in the Faculty of Health Sciences, Durban University of Technology, this proposal meets with institutional requirements and confirms the following ethical obligations:

1. The researcher has read and understood the research ethics policy and procedures as endorsed by the Durban University of Technology, has sufficiently answered all questions pertaining to ethics in the DUT 186 and agrees to comply with them.
2. The researcher will report any serious adverse events pertaining to the research to the Faculty of Health Sciences Research Ethics Committee.
3. The researcher will submit any major additions or changes to the research proposal after approval has been granted to the Faculty of Health Sciences Research Committee for consideration.
4. The researcher, with the supervisor and co-researchers will take full responsibility in ensuring that the protocol is adhered to.
5. **The following section must be completed if the research involves human participants:**

| | YES | NO | N/A |
|---|---|---|---|
| ❖ Provision has been made to obtain informed consent of the participants | ✓ | | |
| ❖ Potential psychological and physical risks have been considered and minimised | ✓ | | |
| ❖ Provision has been made to avoid undue intrusion with regard to participants and community | ✓ | | |
| ❖ Rights of participants will be safe-guarded in relation to:<br>  - Measures for the protection of anonymity and the maintenance of Confidentiality. | ✓ | | |
| - Access to research information and findings. | ✓ | | |
| - Termination of involvement without compromise | ✓ | | |
| - Misleading promises regarding benefits of the research | ✓ | | |

14/05/09
DATE

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DATE

14/05/09.
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08/03/2010
DATE

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