Development of a quality management system framework for dental assisting education in South Africa

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DECLARATION OF CANDIDATE

1. I know and understand that plagiarism is using another person's work and pretending it is one's own, which is wrong.
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DECLARATION

I, Tufayl Ahmed Muslim, hereby declare that this dissertation represents my own work, and that all the references, to the best of my knowledge, are accurately reported. This work has not been submitted for any other qualification.

Signature

10 April 2014
Date

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"And as we let our own light shine,
we unconsciously give other people
permission to do the same,"
Nelson Mandela, Father of our nation.

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- My Creator and Lord, Allah الله (SWT) the most beneficial, the most merciful, in whose hands my destiny lies.

"On the playing field of life there is nothing more important
than the quality of education"
President JG Zuma

ABSTRACT

There has been a call from society for both the provision of a quality education and for a quality "student" who can contribute to the economy and citizenry of South Africa. It therefore makes sense for any educational structure to develop and adopt, strategies and systems in order to meet these new calls, and to provide technologically relevant education that will meet the demands of modern society. This has led to a renewed need for consistency, conformity and quality within higher education. Concerns about students' capabilities have been raised, and have led to questions about the accountability of higher education institutions. A quality management system framework may ensure that these higher education structures are able to deliver a quality education to their external and internal customers. This research investigated the current quality management systems used in dental assisting both locally and world-wide, and then developed a quality management system framework to suit South African conditions.

An action research study, using data gathered from a purposive census sample, and data obtained by means of a mixed-method approach, was conducted in two phases. A preliminary study (Part A) was conducted amongst the four South African dental assisting education programme providers and deficiencies in the quality management systems of these programmes were identified. The preliminary work (Part B) in this study consisted of a comparative analysis of the quality management systems of a convenience sample of dental assisting education providers in twenty countries. Both good practices and deficiencies in practices were identified. A further review of the literature identified possible solutions to improve the quality of the dental assisting education programmes, and was used as the foundation for the development of the Dental Assisting Higher Education – Quality Management Framework (DAHE-QMF).

The results of the preliminary study - the comparative analysis and the literature review - revealed that the development and implementation of a quality management system framework for dental assisting in South Africa could lead to an improvement of the standards of training, and thus the competence of the student. The framework will be presented to the four programme leaders at the four Universities of Technology that offer dental assisting education for their consideration of partial/total adaptation of the framework.

Keywords: dental assisting, education, higher education, quality management framework, South Africa

GLOSSARY

Accreditation : The certification, usually for a particular period of time, of a person, a body an institution as having the capacity to fulfil a particular function within the quality assurance system set up by SAQA or the HPCSA.

Audit : The process undertaken to measure the quality of products or services that have already been made or delivered.

Core learning : That compulsory learning required in situations contextually relevant to the particular qualifications.

Critical Cross-field Outcomes : Critical Cross-field Outcomes (CCFOs) refer to those generic outcomes that inform all teaching and learning. For example CCFOs may include working effectively with others as a member of a team, and/or collecting, analysing, organising and critically evaluating information.

External customer: An external person, body or structure that is a beneficiary of the services or product of a particular organisation.

Exit Level Outcomes: The outcomes to be achieved by a qualifying learner at the point at which he or she leaves the programme leading to a qualification and achievement of which entitles the learner to a qualification.

Outcome: Contextually demonstrated end product of the learning process.

Provider: An education and training body (institution/organisation company, centre, collaborative partnership, or consultancy) that delivers learning programmes that culminate in specified NQF standards or qualifications and manages the assessment thereof.

Qualification : The formal recognition of the achievement of the required number and range of credits and other requirements at specific levels of the NQF determined by the relevant bodies registered by SAQA.

Quality Assurance: The process of ensuring that the degree of excellence specified is achieved.

Quality Audit: The process of examining the indicators which show the degree of excellence achieved.

Quality Management Systems : The combination of processes used to ensure that the degree of excellence specified is achieved.

LIST OF ABBREVIATIONS AND ACRONYMS

DAHE - QMF	Dental Assisting Health Education - Quality Management Framework
HEIs	Higher Education Institutions
HIV	Human Immuno-Deficiency Virus
HPCSA	Health Professions Council of South Africa
ISO	International Organisation for Standardisation
NQF	National Qualifications Framework
PDCA	Plan-Do-Check-Act
PMS	Performance Management System
PPE	Personal Protective Equipment
QC	Quality Circles
SPSS	Statistical Package for Social Sciences
SWOT	Strengths, Weaknesses, Opportunities and Threats
TQM	Total Quality Management
TLA	Teaching, Learning and Assessment
UoTs	Universities of Technology

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CHAPTER 1

Introduction

CHAPTER 1

Introduction

1.1 Introduction to the study

This chapter will introduce some background to the research area, and will also delineate the purpose of the dissertation. Additionally it will define the research area, state the objective of the dissertation and reveal its delimitations. Finally, this chapter will describe the structure of the dissertation.

1.2 Background to the study

Higher education in South Africa has undergone significant changes and reconstructions in the years since 1990, with new challenges in terms of student numbers, student composition, funding challenges, resource challenges, political interference and professional body intervention (De Jager and Nieuwenhuis, 2005:251). There has been a call by society for both the provision of a quality education and of a quality "student" who can contribute to the economy and citizenship of South Africa. Therefore, it is essential that any educational structure develop and adopt a quality management framework (QMF) in order to meet these new calls, and to provide technologically relevant education, that will enable students to become productive and proud members of society.

Thus, the purpose of this study is to develop a QMF for the Dental Assisting education programme which is located within a higher education institution. Since the advent of democracy in South Africa in 1994, both the Health Sector and the Higher Education Sector in South Africa have been forced to undergo a change in their manner of operation. Within the Health Sector there has been a move to ensure that all health workers are qualified and registered with a regulatory registration body. The Dental Assistants' Association of South Africa (DAASA) also called for the registration of dental assistants, and the professionalization of the occupation. Within the Higher Education Sector there has been an array of amalgamations, mergers and even the closure of some higher education institutions (HEI's). Technikons became Universities of Technology (UoT's) with a shift in the focus of

these UoT's. Prior to 2002 there was no regulatory body that ensured that dental assistants were suitably qualified and registered as professionals (HPCSA, 2006).

Many dental assistants received on-the-job training and had no formal qualification, or undertook self-study through correspondence colleges. With the advent of the Health Professionals' Council of South Africa (HPCSA) which implemented a register for the registration of dental assistants, within the Board of Dental Therapy and Oral Hygiene, it has become compulsory for new dental assistants to gain a qualification from one of the four accredited Universities of Technology (previously technikons) in South Africa. Grant (1994) points out that professional bodies exist to protect the public against unqualified non-professionals, and that these professional bodies also function with the intention of protecting the public from the malpractices and negligence of qualified professionals. Grant (1994) adds that routine - rather than the deviant - practices of healthcare professionals are now subject to scrutiny and regulation. This has led to a need for consistency, conformity and quality within the dental assisting academic programme delivery structure. Hence, the need for a quality management framework that would ensure that these higher education structures are able to deliver a quality education to the external and internal customers of dental assisting education. Quality management models have proved to bring about quality improvements in various sectors, including education, and would be an ideal platform from which to launch quality improvement initiatives.

1.3 Statement of the problem

Quality in education is becoming more important as human resources play a key role in a competitive world environment (Mashhadi et al., 2008:338; Bisguard, 2007:65; De Jager and Nieuwenhuis, 2005:251; Hanushek, 2005:1). Hanuchek (2005:5) writes that good quality education plays a key role in economic growth and development. Economic and social pressures are driving higher education institutions into an environment where the input from academics is not the only factor in the determination of quality of education (Mashhadi et al., 2008:338, Joseph et al., 2005:66).

With the change in designation from technikons to Universities of Technology in 2004, dental assisting education has had to evolve in order to subscribe to the ideals of a University

of Technology. These ideals include practical, job-orientated industry-based training and the quality management of educational programmes (Reddy, 2008:27). Whilst attempts have been made by educationalists to introduce industrial concepts such as Total Quality Management (TQM) and the European Foundation of Quality Management (EFQM) models into higher education in the late 1980s, these were not met with much success as these attempts were mostly related to administration rather than to the academic component (Venkatraman, 2007:92, Joseph et al., 2005:66).

For many countries the issue of quality in education has been at the forefront of the drive towards improved economic standards and stable governance (Wang and Wu, 2007: 1). Should the study not be conducted, and the resultant quality management system framework that is proposed not be implemented, overall standards and the quality of dental assisting training in South Africa could either remain stagnant or decline, placing further burdens on South Africa's already strained health-care services. Pick et al. (2000:ii-iv) states that one of the pillars of South Africa's Primary Health Care-driven health services is that there is provision for a package of primary health care (PHC) services for all South Africa's inhabitants. Pick et al. (2000:ii-iv) writes that a major problem that has arisen out of this is the provision of health personnel to deliver these service, and it is recommended that some of these services be rendered by workers who are at a different professional level (mid-level workers). Dental assistants, I would suggest, are ideally placed to address some of these health personnel shortages, especially in the field of oral health education and preventive dentistry.

With an increase in the risk of the human-immuno virus (HIV) transmission via dental treatment (via dental instruments and patient contact) it has become a key role of the dental assistant to ensure that effective and appropriate instrument recirculation procedures are complied with (Jaffe et al., 2004:27). A critical question that needs to be answered in this study is can the use of a quality management framework tool improve the quality of dental assistants and the service that they render to society. The development of a quality management framework for dental assisting training will ensure that effective training in instrument recirculation procedures occurs as the dental assistant would have received high quality training. This high-quality training may also serve to assist in reducing the risk of HIV exposure to both staff and patients. This could lead to an overall improvement in the health status of the community.

1.4 Aim

The aim of this study is to develop a quality management framework (QMF) for dental assisting education programmes at UoT's in South Africa.

1.5 Objectives

The objectives of this study are to:

- Determine existing deficiencies in quality management, and the current quality management principles pertaining to dental assisting education in South African and selected international dental assisting education institutions
- Determine the knowledge, attitudes, and perceptions of dental assisting academic staff towards the implementation of a quality management system framework for dental assisting education in South Africa and selected international countries
- Develop a quality management system framework (QMF) that would lead to continuous improvements in the quality of South African dental assisting education.

1. 6 Delimitations/hypothesis/assumptions/scope

This section will outline the delimitations of the study, the hypotheses, the assumptions and the scope of the study.

1.6.1 Delimitations

The main limitation of this study was that the four UoT's operate within different management and operational contexts. This is due to the political, geographic, historic and cultural situations of these institutions, the student numbers, and the range of dental and academic qualifications of the staff. Another delimitation is that there are only four institutions accredited to deliver dental assisting education in South Africa, thus providing a small data base.

1.6.2 Hypotheses

Dental assisting education in South Africa will improve if a QMF is developed and adopted for the dental assisting programme.

Dental assisting education in South Africa will not improve or remain stagnant in the quality of its offering if a QMF is not developed and or adopted for the dental assisting programme.

1.6.3 Assumptions

The higher education institutions that provide dental assisting education desire to improve the quality of the education that they provide, and will be willing to implement some, if not all, aspects of a QMF.

1.6.4 Scope

The scope of the study is to gain an understanding of the development of dental assistants (that is their education and training), and of the quality issues related to this development, as well as to gain an understanding of quality and quality management as applicable to dental assistants training. The four UoT's that are accredited to offer dental assisting education in South Africa will be surveyed in the first phase of the preliminary study. Thereafter, an overview of the quality management systems used in the training and/or accreditation of dental assistants in twenty randomly selected international countries will be undertaken in order to ascertain their quality assurance and management practices. A survey of those countries that are found to have a QMF in place will then be conducted.

1.7 Outline of the study

This dissertation will compromise of the following chapters:

Chapter 2: Literature review

A comprehensive review of the literature will be used to establish the current status of quality management of dental assisting programmes nationally and internationally. The study will attempt to demonstrate an understanding of the principles associated with quality management in education, and to dental assisting in particular. Thus the study will establish a theory base from which to develop a quality management system framework for dental assisting.

The concept of Total Quality Management (TQM) will be discussed and assessed with the intent of adopting its principles into a QMF specific to dental assisting education. The chapter will continue by introducing the TQM approach and describing its components.

Chapter 3: Design of research and methodology.

An overview of the research methodology will be presented beginning with a description of the research method. The research determines how the research is designed. Then there will be some discussion about whether this investigation is qualitative, quantitative or mixed. The purpose of the study will be restated and the research questions relating to the development of a quality management framework for dental assisting education will be outlined. The target population, instrumentation and the procedures to be utilised will be outlined. The methods used to maintain the validity and reliability of the study will be discussed.

Any assumptions that have been made, and the scope and delimitations of the study will be outlined. Then the data collection and information gathering methodologies of this study will be clarified. The results of the preliminary study will be presented and discussed. A comparative analysis of the quality management systems of the dental assisting programmes of twenty countries will be conducted. This is to determine the strengths, weaknesses, opportunities and threats (SWOT) that these programmes offer. Additionally the preliminary work would be used as a basis to identify the deficiencies in the provision of a quality dental assisting education programme. These results, together with the results of the preliminary study, will be used to develop a quality management framework for dental assisting education in South Africa.

Chapter 4: Development of QMF

This chapter will start with an introduction of the cornerstones of a TQM model, and continue by outlining the processes followed in the development of the TQM model. Findings will be summarized and the researcher will discuss and provide in-depth explanations and clarifications to provide convincing arguments for the adaptation / non-adaptation of the quality management framework that has been developed. The developed framework will then be presented and discussed. The process of implementation will also be discussed. Recommendations for post-implementation analysis and evaluation will then be made.

Chapter 5: Discussion, conclusion and recommendations.

This chapter will consist of recommendations and suggestions for quality improvement. The researcher will provide a summary of the research done and the findings thereof. This chapter is based on what has been discussed in the literature review, the analysis of the findings and recommendations made for future research into the area of quality improvements in dental assisting education in South Africa. The chapter will also look at whether the research meets its expected aims and objectives.

1.8 Chapter Summary

This chapter began with an introduction to the study and then provided more information on the background, research questions, aims and objectives, delimitations, hypothesis, assumptions and scope of the study. This was followed by a précis of what each chapter would entail. This chapter provided an outline of the need for a QMF, specific to the discipline of dental assisting, by outlining the problems facing the quality of dental assisting education.

CHAPTER 2

Review of the literature:

Quality in higher education

CHAPTER 2

Review of the literature: Quality in higher education

2.1 Introduction

Reading through the literature enables one to increase one's breadth of subject knowledge, examine methodology previously used, and be able to select which research methods could be employed (Briggs and Coleman, 2007:69), as well as developing the theoretical framework for the quality management framework that will be developed in this study. This literature review will present an array of literature encompassing definitions, concepts and theories pertaining to quality, quality management and higher education. Such literature will form the basis of the study, as it will provide a theoretical framework for the construction of this study.

2.2 Theoretical frame of reference

The literature survey is of TQM philosophies and the comparative analysis of TQM adoption in industry versus higher education. The reason for undertaking this review is to establish the theoretical and practical background that would serve as the basis for this study. In this study an analysis of TQM is undertaken, and the various critical factors noted are taken into account in the development of the proposed QMF. These factors include, inter-alia, a review of existing educational practices, the principles and cornerstones of TQM and the barriers to TQM implementation. The results of this analysis will lead to the development of a QMF that adopts Deming's concept of Plan-Do-Check-Act (PDCA) cycle (Johnson, 1993:36) for implementing continuous improvements into higher education programmes and institutions.

The specific theoretical problem of this study is to develop a quality management framework which takes into account the changing social and political milieu of post-apartheid South Africa. The need for quality to be applied to education has been outlined by many authors such as Brochado (2009:174), Mashhadi et al. (2008:338), Eagle and Brennan (2007:44), De

Jager and Nieuwenhuis (2005:251) and Joseph et al. (2005:69) and this need is of great significance to the dental assisting profession, in terms of the provision and delivery of a high-quality education by Higher Education Institutions (HEI's).

The Murray Committee, in its Higher Education Australia Report (1992: 8) forwarded the view that it is primarily and essentially the responsibility of higher education institutions to ensure that their students are well taught by sufficiently well-trained teachers.

Green (1994:18) points to the need for the development of a framework that clearly articulates the relationship between the criteria used to provide a quality education, and the various quality assurance and quality management techniques that are available.

2.3 Quality

In order to understand the purpose of this work it is vitally important to understand and define the term "quality," to understand this/these definition(s) in the context of higher education. This understanding will lead to a key understanding of the role of quality in higher education. This must be done with special reference to dental assisting education. The author will commence by providing a definition of "quality". An understanding of the definition of quality will lead to the identification of possible deficiencies in the provision of structured and quality-assured dental assisting education in South Africa.

2.3.1 Definition of quality

In the context of quality there are numerous definitions, but a unique all-encompassing definition continues to remain elusive. The ideas of quality were originally developed in the 1930s and 1940s, and the main proponent of quality was the American statistician W. Edwards Deming (Johnson, 1993:36). Deming rose to prominence in the world of quality, because of his efforts in helping post-war Japan become world economic and productivity leaders in quality and quality management (Lindsay, 2011: 7; Bisgaard, 2007:665; Sallis, 1996:15).

The word "quality" has been derived from the Latin word *qualis*, meaning "what kind of". Whilst there are numerous and varied definitions of quality, a single all-encompassing

definition has still not been formulated. Whilst the various gurus provide their own individualistic definitions pertaining to their areas of interest, none have come up with a universally accepted definition.

Many individuals have, over the years, made substantial contributions to both the theory and practice of quality management (Bisgaard, 2007:665). Amongst the more prolific and well-known contributors to quality management are W. Edwards Deming; Joseph M. Juran; Philip B. Crosby; Kaoru Ishikawa; Walter A. Shewhart; and Genichi Taguchi (Bisgaard, 2007:665). Some of the definitions proposed by these quality management proponents of quality include:-

- "The lack of quality is the losses a product imparts to the society from the time the product is shipped" (Genichi Taguchi).
- "Quality should be aimed at the needs of the customer, present and future" (Edwards Deming).
- "Fitness for use" (Joseph Juran).
- "The degree to which a set of inherent characteristics fulfils the requirements, needs or expectations that are stated, generally implied or obligatory" (ISO 9000:2005).
- "Quality is a state in which value entitlement is realized for the customer and provider in every aspect of the business relationship" (Mikel Harry, Six-Sigma Academy).

Each of these definitions come from different perspectives and emphasizes varying issues, with most of these definitions being aimed at products and services, not education per se. Smith and Smith (2007:355) contend that there are many definitions of quality, and that consensus on the definition cannot easily be reached. Other definitions proposed by various authors and organisations, as outlined by Smith and Smith (2007:355) include:-

- "Quality equals customer satisfaction" (IBM Computers).
- "The degree of fitness and purpose and function" (Oakland).
- "The totality of features and characteristics of a product or service that bears on its ability to satisfy the stated or implied needs" (British Standards Institution) (BSI) (1991).

The lack of a consensus definition becomes even more pronounced when one seeks a definition for quality with special reference to quality in higher education. Shejwalkar (1999) as defines quality as being a dynamic and positive idea that is ever-changing in order to meet changing customer needs. The Australian Higher Education Council (AHEC) in its report entitled Achieving Quality (1992: 6) quotes Ball as stating that education courses that are presently being offered are unlikely to be appropriate for business and industries needs in the near future. This is of particular relevance to higher education, which is in a constant state of flux, with research-led teaching and learning continuously changing the landscape of higher education.

Whilst most of these definitions are applicable to consumer goods and services they may be of little value to the definition of quality as applicable to higher education. Therefore the definition of quality in the higher education context needs to be made explicit. This will allow for a clearer understanding of how "quality" in dental assisting education is perceived, and allow for dental assisting education providers to strive towards meeting these expectations.

Quality in education is vital. In order to ascertain what "quality" in education is, one would have to adopt a certain defined standpoint, as there are many definitions of quality. So too are there many quality management systems available. Whilst the literature abounds with information and studies on quality in education and quality management models, a thorough search of various databases such as PubMed, and Nexus, as well as a search of books and journals, reveals scant literature relating to the quality management of dental assisting education.

Although the various institutions that offer dental assisting training may have institutional quality assurance mechanisms in place, there is a need for an individual, discipline-specific quality management framework (QMF) for dental assisting. This QMF would take into account the discipline-specific idiosyncrasies of the dental assisting profession in South Africa.

Dental assisting in South Africa was previously an occupation in which formal training was not a requisite. In 2005 the Health Professions Council of South Africa (HPCSA) fulfilled its statutory requirements in ensuring that all dental assistants must now be qualified, and

registered, with the Professional Board of Dental Therapy and Oral Hygiene of the HPCSA. This necessitated a need for the quality of training offered by the Universities of Technology to be reviewed. The purpose of this study is to extend the literature on service quality into higher education. This literature review will thus seek to focus on the following areas:

2.3.2 Definition of quality in higher education

The definition of quality in the context of higher education differs from those definitions applied to consumer goods and services. An understanding of the dimensions of quality needs to be clarified. Cartright (2007:289); Eagle and Brennan, (2007:44); and Anderson (2006:161) all affirm the need for quality in higher education, and maintain that quality plays an important role in higher education. Anderson (2006:166) mentions that quality in education is a topical issue for all academics, and that every stakeholder plays a pivotal role in quality assurance, and quality improvement.

Eagle and Brennan (2007:47) outline several stakeholders who have a primary interest in quality in higher education, and lists these as the state and its citizens, employers, students and their parents as well as lecturers, professors and university managers. All these stakeholders need to work together in ensuring that the quality of education is always at its pinnacle, as there is internal and external pressure to ensure improved quality and value for money (Smith and Smith, 2007:334-335). In doing so, education of the highest possible level of quality can be provided.

2.3.3 Quality dimensions

The researcher would suggest that quality in education has a different set of dimensions to that of quality in the manufacture of goods and services. It is essential to understand how these dimensions will affect the quality of provision of dental assisting in higher education. Some of the dimensions relate to reliability, performance, maintainability, environmental impact, appearance and flawlessness, safety and durability. Unique to the dimension of quality in education is the dimension of service quality (Arpin; 2007:10).

Ziethamal et al. (2003) as suggests that consumers do not perceive quality in one-dimensional ways but rather base their perceptions on a multitude of factors. Parasuraman et al. (1985:163) identifies five specific dimensions of quality that are applicable to the service

sector, and that are equally applicable to education. These dimensions ensure and enhance the ability of the education sector to perform or deliver the promised service dependably and accurately, and are listed below:-

- Reliability: Delivering on promises
  Reliability is seen as being the most important determinant of perceptions of service quality amongst consumers.

- Responsiveness: Being willing to help
  This is the willingness, attentiveness and promptness in dealing with customer requests, questions, complaints and problems.

- Assurance: Inspiring trust and confidence
  This refers to the knowledge and courtesy of employees, and their ability to instil trust and confidence in the customer.

- Empathy: Treating customers as individuals
  This relates to customers receive caring, individualised attention and being made to feel unique and special.

- Tangibles: Representing the service physically
  Tangibles are the appearance of physical facilities; equipment; personnel etc., and provide a "physical representation" of quality.

When attempting to understand quality in education one must initially understand what the final product of quality in education is, and who the customers of education are. In his seminal book *Total quality management in education* Sallis (1996:20-21) contends that there is difficulty in describing the product of education using terminology such as "the supply of graduates," and that this terminology is problematic as the education system then appears to become a production line. This is in conflict with the principles of pedagogy which view the student as an individual personality. However the education guidelines do allow for the alignment of these principles and terminology (Sallis; 996:21). The point that Sallis (1996:21) puts forward is that for a product to be subjected to a quality assurance process

there are certain requisites to be met; for example, the source of the raw material must be specified, the raw material must undergo a standard process, and the output must be as per pre-determined and pre-defined standards. Thus, education does not easily meet these requirements.

In institutions that allow open enrolment access to students, or do not conduct intensive student selection processes, there is difficulty in controlling the input (the students) and thus the output is also affected. Gray (1990) states that "human beings are notoriously non-standard, and they bring into educational situations a range of experiences and opinions". This can cause problems for quality control as each student's experiences may influence their perceptions of quality.

With this difficulty of viewing education as a product, the alternative is then to view education as a service. However, this poses further questions as the definition of quality of education as a service poses its own challenges. Ziethaml et al. (2003:143) found that inherent differences exist between goods and services. It is therefore imperative, at this stage, to make the distinction between a product (which is the result of a process) and a service (which is generally intangible and occurs at the interface between supplier and producer) as these basic and fundamental differences between the two have a major influence on the manner in which their quality can be assured (ISO9000:2005, 11).

2.3.3.1 Product quality

The eight dimensions for product quality, as defined by Garvin (1984) are reflected and defined in a table as Appendix 1. They are reliability, performance, features, conformance, durability, serviceability, aesthetics and perception. Whilst some of these dimensions are important to quality, all these dimensions may not be equally applicable to the provision of higher education in South Africa.

2.3.3.2 Service quality

Service quality is a subjective concept based upon personal opinion, and is thus more difficult to describe than product quality. The cause of poor service quality is usually as a result of employee behaviour or attitude (indifference, lack of care) and not because of defects in raw materials, components or the manufacturing process (Sallis; 1996:22). Services differ from production in a number of important areas, with the major differences being that with services there is direct contact between the provider and the final consumer. Arpin (2007:7) lists and outlines some of the characteristics of a service as follows:

- Intangibility
  Services, unlike products, often cannot be felt or seen.
- Heterogeneity
  Services are produced by humans and no two services are precisely the same.
- Simultaneous production and consumption
  Services are sold first, and then produced and consumed simultaneously.
- Perishability
  Services cannot be stored, saved, resold or returned.

Quality of a service, and in this dissertation the service being education, is therefore seen as the difference between consumers' expectations of service and perceived service. If the service received exceeds the expectations then the quality is seen as satisfactory. Conversely if the quality of the service rendered is deemed unsatisfactory if the consumer's perceived expectations are not met. Here too lies the problem of individual perceptions of quality. Whilst one student who does not have high expectations may view the education received as being of an acceptable level and of good quality, another student with high expectations may view the education received as being of a mediocre and unacceptable level.

2.4 Quality in higher education

Whilst the definition and concept of quality in general is difficult to define it becomes even more difficult to construct a definition of quality as related to education. Mukhopadhyay (2005:18) forwards Shejwalkar's (1999:19) definition of quality as "a dynamic and positive idea, it has endless possibilities of evolution and unfolding, making it an endless journey with a deliberate purpose and design and not necessarily a destination". Thus quality in education is forever changing and is a "dynamic, rather than a static, concept" Sallis (1996:13) mentions that quality has both absolute and relative connotations, and that in the context of the elitist, "absolute" definition, quality is when a product/service is of the highest possible

standard which cannot be surpassed. Quality in the context of the potentially egalitarian "relative" definition is when quality is viewed as measuring against a specification or it must 'fit a purpose,' and that the product / service must meet with the customer's needs, satisfaction and beyond (Bisgaard, 2007:668).

Harvey and Knight (1996) claims that there are different conceptualizations of quality in education. These can be grouped into five distinct but interrelated ways of thinking and understanding. These groups are outlined by Harvey and Knight (1996) and are viewed as being;-

- exceptional (being distinctive, exceeding very high standards and passing a set of required standards
- as perfection (or consistency – a zero defect approach and a quality culture)
- as fitness for purpose (fitting the customer specifications, mission-based fitness for purpose and customer satisfaction)
- as value for money (through efficiency and effectiveness) linked with accountability and emphasis on performance indicators
- as being transformative as education is an on-going process that includes empowerment and enhancement of the customer

Mukhopadhyay (2005:19) concluded that quality can be any (or all) of the following: perceptual; both process and product; exceptional; perfection; fitness for purpose; value for money; transformative and relative - not absolute.

Mukhopadhyay (2005:20) states that whilst quality in education must meet some of the ideas quoted above, it must be viewed with reference to some of the undermentioned goals which have been highlighted by the authors who presented them in their seminal works on quality management:

- Excellence in education (Peters and Waterman, 1982)
- Value addition in education (Feigenbaum, 1983)
- Fitness of educational outcome and experience for use (Juran and Gryna, 1988)
- Conformance of education output to planned goals, specifications and requirements (Crosby, 1979; Gilmore, 1974)
- Defect avoidance in education process (Crosby, 1979)
- Meeting or exceeding customers' expectations of education (Parasuraman et al., 1985)

When defining the concept of 'quality of education' one has to take into account the individual's goals in the larger context of society's needs (Mukhopadhyay; 2005:23) and that these goals and needs of education determine education programme's content and processes. Quality in education lies in meeting the expectations of the customer; namely the student, parents, the state, employers. De Jager and Nieuwenhuis (2005:253) define quality in education as "demanding a process of continuous change by systematically and collectively evaluating and refining the system, practices and culture of education institutes in order to meet the needs of its customers". Almost pivotal in any definition of quality in education is the student who, as the 'customer,' is the consumer of educational services and is thus central to the definition of quality in higher education.

Quality improvement is a continuous, active and responsive process (Venkatraman, 2007:95) that considers:

- Strategic objectives, targets, priorities and strategy statements, and key supporting plans of the higher education institution
- Processes to support the achievement of these objectives, targets and initiatives
- Mechanisms put into place to monitor progress toward planned objectives, targets and priorities
- Outcomes that are to be achieved
- Improvements that need to be made to continually improve the quality of the higher education institutions activities

The understanding gained from the literature on the concept of 'quality of education' thus serves to inform the researcher on what the customers of education requirements are, and these will be taken into consideration in the development of the dental assisting QMF.

2.4.1 The customer in higher education

Venkatraman (2007:92) states that customer satisfaction is central to TQM, and these higher education institutions need to understand the needs of the students as customers, not only in the present, but even a few years after they graduate, so that they could alter and align their educational programme offerings according to the dynamic student education requirements. This will ensure that their students make a positive contribution to future society by being able to meet the demands for skilled, qualified and competent employees.

Consideration must be taken that students are not "products," but rather that education is the product. It is essential to include students in the quality assurance and improvement processes of HEI's. Lindsay (2010:286) writes about Ishikawa's Quality Circles approach wherein the grassroots participants (students) are included in the formulation of quality programmes. A quality circle is a small group of work people who analyse and solve quality-related problems in the workplace and present these solutions to management writes Lindsay (2010:286) and it is critical to include our customers (students) in this quality circle.

A customer is "anyone being served, and maybe internal and/or external, and is the starting point of quality" (Sahney et al., 2004:154). In education the customers include students, academics, society and other interest groups. However Venkatraman (2007:96) points out that whilst many TQM advocates have chosen the student to be the customer, and thus the focus of attention, it is often an oversimplification as education has a number of products with courseware and students being the products and graduates being the outputs. Venkatraman (2007:96) states that the customers of education play a crucial role in deciding whether or not an educational institution is providing a quality service, and further claims that it is essential to have a clear idea of who is "ascribing the attribute of quality" to education as consumers' perspectives of quality in higher education are not always identical. Thus it is vital for institutions to have an idea of who are the consumers of their products. This is in order to be able to understand what quality is, and then implement plans on how to improve quality based on this understanding of who their 'customers' are, and what their needs are. Students are the primary customers, (Eagle and Brennan; 2007:47) and there are a myriad of other role-players are also secondary customers.

Owlia (1996:172) reports from his seminal study that, of the different customers of higher education, students were given the highest rank; with the employers, society, faculty and family being ranked in descending order. Higher education institutions do not exist in isolation and co-exist with, and are interdependent of, other national and international institutions and communities. These external stakeholders act as valuable and important influences on the goals of higher education. Quality can be defined as that which best satisfies these customers' needs, and therefore an understanding of the needs, wants and expectations of the customers of higher education is essential. Sallis (1996:25) proposes that there are a number of customers of education, these being tabulated below:-

Figure 2.1: The Customers of Education

Education (value added to learners)	=	the service
The student	=	primary external customer or client
Parents/governors/employers	=	secondary external customer
Labour market/government/society	=	Tertiary external customer
Lecturers/support staff	=	internal customers

Source: Adapted from Sallis (1996:25)

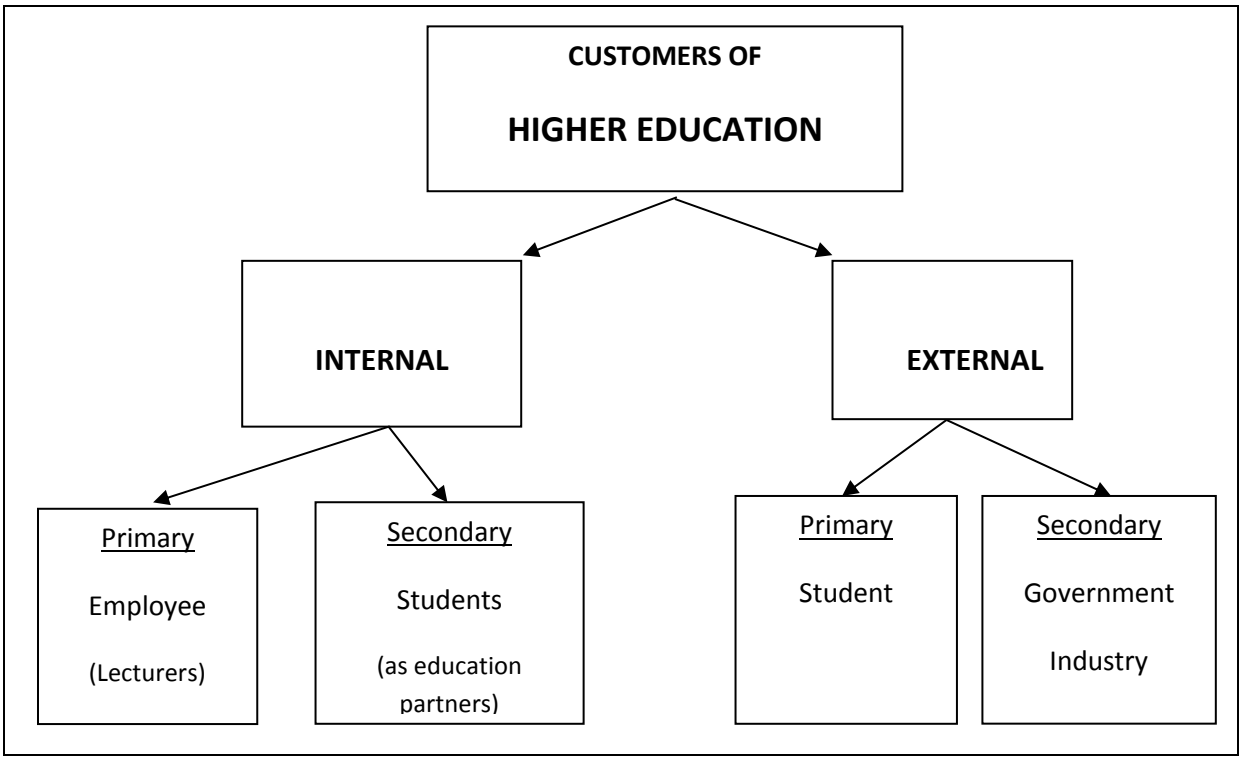
Sahney et al. (2004:153) concurs with Sallis (1996) but adds to the categories of higher education customers, thus:

- external (students, employers, the community at large, taxpayers, the state, other educators from different institutions)
- internal (other lecturers, service department staff).

An alternate view that is advocated by the influential authors Kanji and Tambi (1999:131) is that the student acts in one of three roles - customer, processor and further supplier - in keeping with Juran's (1974) concept of "internal customer". Kanji and Tambi (1999:131) also state that the customers of higher education can be classified into either primary or secondary groups, based on their location (internal/external) as well the frequency of contact and interaction that the student has with the institution. The relationship of customers of higher education can be illustrated in the following diagram.

Students in higher education pose a dilemma for the higher education sector as they are both the end product and the customer (Eagle and Brennan, 2007:47). Rhodes (1999:36) states that the adaptation of a student-centred focus is the cause of some of education's most serious management problems. Michael et al. (1997:67) argues that both authors were uncomfortable with the notion of the customer (student) being always right, because they believe that the short-term wants of the student (passing courses), as opposed to the long-term gains (actual teaching, learning and growth), would not necessarily lead to an improvement in the quality of education.

Figure 2.2: Customers of Higher Education



Source: Adapted from Kanji and Tambi, (1999:131).

The various stakeholders of higher education have different quality perspectives and these are indicated in the following table:

Table 2.1: Stakeholders of Higher Education

Stakeholder Group	**Quality Perspective**
Funding bodies and society at large.	Value for money, return on investment.
Current and prospective students.	High standards in order to gain an advantage in future employment.
Employers.	Competencies of graduates should meet industry needs.
Academics and administrators.	Consistency, recognition of, and respect for, the challenges of educating a diverse student body.

Source –Srikanthan and Dalrymple, 2003:37.

2.4.2 Factors affecting quality in higher education institutions

Owalia and Aspinwall (1996:108) propose that there are seven educational processes that affect quality in a higher education institution. These are:

- Design of programmes of study
- Delivery and management of programmes of study
- Assessment of students
- Service support of programmes of study
- Guidance and support of students
- Admissions
- Recruitment, appraisal and development of staff.

An understanding of the roles of the various customers of education will enhance the value of the developed QMF, as the needs and wants of these various customers will be considered in the QMF development.

2.5 Total quality management

An understanding of what TQM is, and how TQM could have a role to play in higher education is essential. TQM is a management process and a set of disciplines that are coordinated and managed in order to ensure that the organisation consistently meets or exceeds customer requirements (Töremen and Karakus, 2009:30). TQM can be defined as a set of management philosophies focusing on achieving quality and as a set of guiding principles that are intended to meet or exceed the expectations of various external and internal customers that are party to the higher education system (Venkatraman, 2007:93). Feigenbaum, who is credited with being the originator of the term TQM, defines TQM as being the impact that the model (TQM) has on quality organisation-wide (Sahney et al., 2004:146).

TQM offers no insight or blueprint on how to change a higher education institution so that it can achieve higher results, but it creates an environment in which people can develop the ability, knowledge, motivation, and opportunity to improve as people begin to work together more effectively, and this arguably leads to improvements in quality (Johnson, 1993:1).

TQM originated in the manufacturing sector, and the application of TQM principles to education is seen as a way of making the higher education sector more relevant, accountable and responsive to the needs and demands of its internal and external stakeholders (Eagle and Brennan, 2007:44; Wang and Wu, 2005:6; Mukhopadhyay, 2005:38).

Many education institutions have turned to TQM for the same reasons that businesses have. These reasons are the escalating numbers of students, a lack of consistent leadership style, an increasing need for accountability of higher education institutions to its external and internal customers, and changing attitudes towards higher education institutions, (Ford, Joseph and Joseph 1999:14). Burr (1993) has described six principles 'common to all manifestations of TQM' and describing TQM as a concept based on the two concepts of planning and communication.

Thus the underlying theme of TQM is the provision of maximum customer satisfaction, through the involvement of people at all levels and in all functions. Quality assurance (used for the detection of defects) is a form of controlling quality and maintaining quality standards. TQM, when used for continuous improvement is seen as being an extension of quality assurance, with the emphasis being not only on managing quality at input and process points but in the development of a quality culture amongst all employees (Mukhopadhyay, 2005:28; Sallis, 1996:20). Whilst the three quality concepts (quality control, quality assurance and total quality) differ in their definitions they play a key and inter-linked role in TQM. Whilst the philosophy of TQM is based on large-scale application, TQM is accomplished practically by a series of highly practical, small incremental projects that seek to improve quality. The Japanese have termed this approach "kaizen" (step-by-step improvement) states Sallis (1996: 29). These small projects act as the building blocks and foundation for larger projects aimed at improving quality.

2.5.1 The "kaizen" approach

The Japanese term 'kaizen' means gradual and never-ending improvement in all aspects of life and involves a series of small-step improvements on existing processes and/or systems by all those personnel involved in utilising these processes and/or systems (Lindsay, 2010:349).
A typical structured approach to "kaizen" improvements, as suggested by Lindsay (2010:349-351) encompasses the following steps:-

Table 2.2: Structural steps to "kaizen" improvement.

Step	Task
1.	Define area for improvement
2.	Analyse and select appropriate problem
3.	Identify causes
4.	Plan counter measures
5.	Implementation
6.	Confirmation of result
7.	Standardisation

Source: Lindsay, 2010:349-351

An understanding of the process of TQM thus enables the researcher to gain a clearer understanding of the TQM process application in the QMF model development.

2.6 TQM in higher education

TQM, when applied to different industries, has different meanings and processes, and these need to be adjusted or adapted to suit higher education. A review of TMQ in higher education will be undertaken in order to highlight these differences, so that they could be considered in the dental assisting education QMF development process.

Sahney et al. (2004:149) writes that the TQM philosophy and TQM theories have attracted many theorists, and that a number of theoretical and empirical studies have been conducted to ascertain whether TQM is a suitable concept for implementation in higher education. Sahney et al. (2004:151) concur that the philosophy of TQM originated in the manufacturing industry and could easily be adapted to suit the educational context. TQM in education is multi-faceted, and differs greatly in both its application and relevance in comparison to TQM in the manufacturing industry (Sahney et al., 2004:149). TQM in education covers all aspects of academic life, whereas TQM in the manufacturing industry is directed towards the reduction of defects in the manufacturing of goods and services (Sahney et al., 2004:149).

TQM in education follows the general definition of excellence, and "fitness of educational outcome, conformance of education to output - planned goals, specifications and requirement" of the higher education sector (Sahney et al., 2004:145). Wang and Wu (2007:3) argue that "education quality" is not the same as, and should not be mistaken for,

'teaching quality'. Scrabec (2000:298) postulates that in order to realise the benefits of TQM in education, a different TQM model to that used in industry needs to be developed. This model should take into account the unique nature of the higher education landscape. Scrabec further writes that the model should be 'recipient driven' and 'recipient focussed,' with the focus of the TQM model being on improving the quality of the output (education) so that the output is in alignment with the evolving and dynamic needs and demands of the consumer (internal and external customers).

There are numerous quality management systems that could be adapted from industry for use in higher education. These include the ISO9000/2008 Quality Management System; the Deming Prize; The South African Excellence Model (although not in use) (SAQA, 2001:8). Various other models such as SERVQUAL; the Evans and Lindsay model; The Malcolm Bridge National Quality Award (MBNQA); the European Foundation for Quality Management model (EFQM); the Holistic and Humanistic Quality Management (H^2QM); Baldridge Education Criteria and the ISO 9000 model. These, amongst others, can be utilized to improve and maintain quality in education (Wang and Wu, 2007: 2; Chau, 2004:56).

The quality management proponents, such as Deming (1986) and Juran (1986) developed various quality management models and the philosophy of TQM is one of these models. Oakland (2004:227) viewed TQM as being an approach that was aimed at improving the effectiveness and flexibility of a business enterprise in its entirety, and some definitions in this context include that TQM is a management philosophy, that it is based on the organisation's culture and is a management system. Another quality expert, Dr Ishikawa of Japan, is cited by Lindsay (2010:110) as defining TQM as being the control of quality in the management of all services, business and human beings resulting in the overall product being of the highest quality.

It should be noted however, that TQM is not a quick fix strategy that could be easily implemented, nor does TQM guarantee that improvements will occur. The success, or failure, of the implementation of the TQM model is dependent on the active acceptance, and participation, of all the key role-players and stakeholders in higher education. Thus TQM, as applied to education, is multi-faceted, and a conceptual model that lacks a single homogenous application framework.

Internationally, substantial interest in TQM in higher education has emerged due to pressure from the internal and external stakeholders who called for quality education that would meet their demands (Sahney et al. 2004:146). Venkatraman (2007:92) reports that some higher education institutions have, in an attempt to enhance their customers' perceptions of quality, turned to the adaptation and implementation of TQM systems, especially in the field of curriculum reform. Mukhopadhyay (2005:45) identifies TQM as offering significant potentialities for higher education in the following three ways:-

- Firstly, TQM offers a justification and a technique for the continuous search for quality and excellence
- Secondly, it develops a willingness and culture for change and thus organisations become more flexible and responsive
- Thirdly, TQM makes qualitative shifts on positive decision-making.

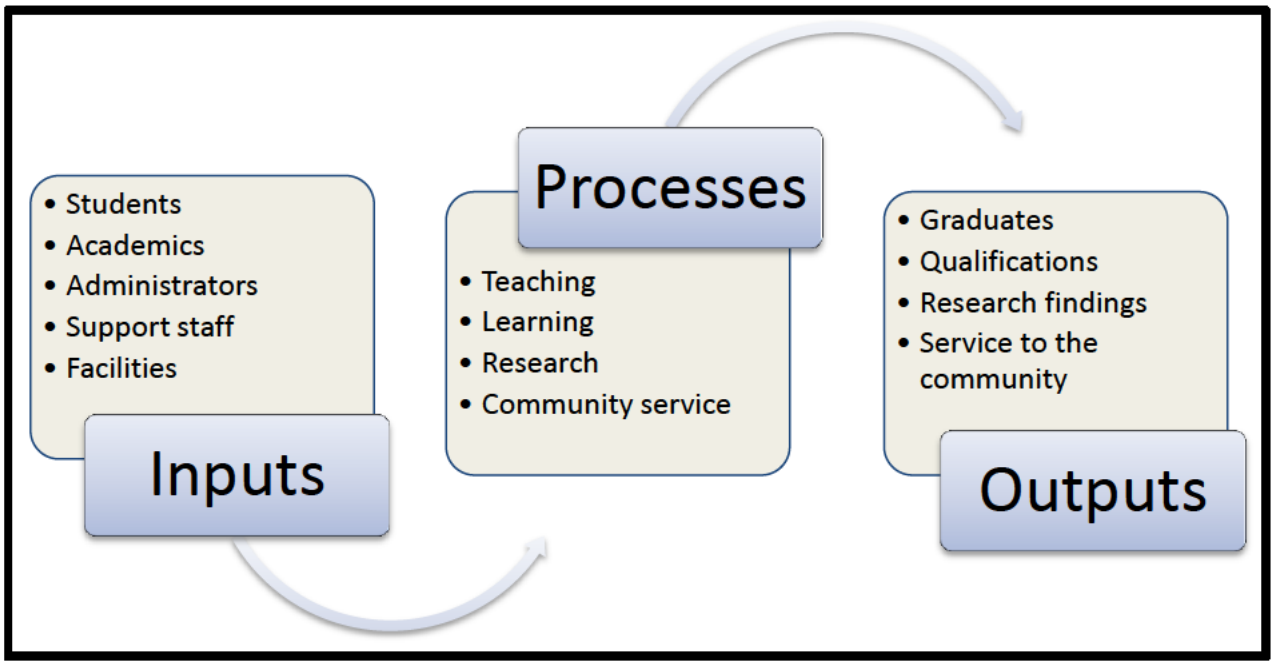
Having taken other models into consideration, this study will focus on TQM and its application to higher education, so as to improve the quality of dental assisting higher education.

2.6.1 Education as a transformation system / production process

Part of any QMF is that it has to look at the potential benefits of a QMF to an education system. The literature will be reviewed in order to ascertain what these potential benefits are, and how they can be incorporated into the developed QMF.

The transformative view of quality is that quality improvement is the result of change for the better (transformation) of processes and systems (Harvey and Green, 1993:24). Johnson (1993: 6) defines the system as the nature of functions or activities within an organisation that work together to achieve a shared aim. Systems theory is defined by Sahney et al. (2004:150) as being a way of thinking about, or understanding, any dynamic process and comprising of three components – inputs, processes and outputs - as illustrated in the table that follows:-

Table 2.3 – Systems Theory



Source: adopted from Sahney et al. (2004:150).

The outputs (diplomats and alumni, industry) provide feedback (communication) into the system (inputs) and this feedback is used to make improvements to the system. This makes the system (higher education) more responsive to changes, and to the needs and demands of the internal and external customers. Lewis and Smith (1994:67) explained the process management model in a similar manner, but referring to inputs as resources from the external environment (the physical environment, organisational culture and people; and the transforming process) and as being those work activities that process these inputs by adding value to them by converting these resources into outputs which are both tangible and intangible.

Harvey and Green (1993:24) argue that quality can be thus considered as a transformative process as transformation involves a change from one state to another. In education this transformation often involves "cognitive transcendence with the provider doing something to the customer rather than just doing something for the customer." Therefore the service that the lecturer provides to the students differs greatly from the service that a service provider of tangible services, for example a hairdresser, would provide.

It can be deduced from the literature that the provision of dental assisting education aims to transform a student from being a resource into becoming a critically thinking, productive member of society. The QMF developed in this study will seek to ensure that such transformation takes place.

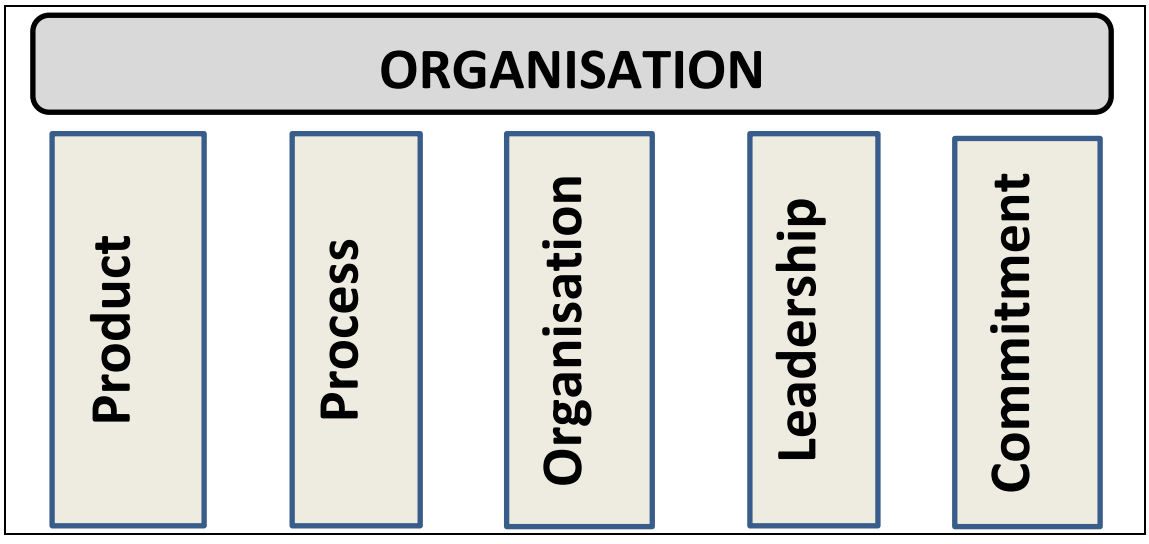
2.7 Principles and pillars of TQM

The success, and/or failure, of TQM hinges on its principles, which serve to guide the TQM process. It is essential to establish what these factors are, and to include them in the developed QMF, as this will serve to ensure a successful QMF model. These principles are outlined by Venkatraman (2007:100) as being:-

- Customer focus and customer-driven quality
- Leadership, involvement of role players, adoption of a process approach, adoption of a systems approach to management, commitment to continuous improvement
- Adoption of a factual approach to decision-making
- Establishment of mutually beneficial relationships and partnership development, internally and externally.

The 'Five Pillars' of TQM have been described as being product, process, organisation, leadership and commitment. These pillars are reflected in Figure 4, and Creech (1994: 7) writes that each pillar is dependent on the other four, and that if one pillar is weak then all the pillars become weak, with the resultant failure in the maintenance and improvement of quality standards within the organisation.

Figure 2.3: The Five Pillars of TQM

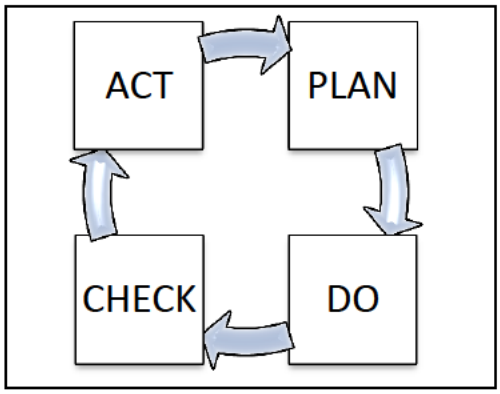


Source: Creech (1994: 7)

Harris (1994:67) states that there are three generic approaches to TQM. These being, a customer focus approach; an staff focused approach and a service-agreement focus approach. Harvey and Green (1998:23) argue that TQM reflects a 'soft systems' approach that evolves out of existing processes and includes two concepts; a notion of quality as transformation, and quality as fitness for transformation and purpose.

Srikanthan and Dalrymple (2002: 1) argue that an approach to TQM implementation in higher education must be organisation-wide in order to be successful and it must use past experience and failures as a point of departure. Deming utilises a diagram, referred to as the Deming Cycle / Shewhart Cycle to graphically illustrate the four continuous cyclic action steps that are required in order to achieve a task and this is considered to be a methodology in the frame of TQM references.

Figure 2.4: Deming Cycle



Source: Deming, W. E. (1986). Out of crises. Cambridge. Massachusetts

The cycle begins at the *Plan* stage. There are various cardinal principles of TQM (as cited by Mukhopadhyay, 2005:33-34) which were enunciated by the various quality management proponents (Deming, Juran and Crosby). These are tabulated, and then briefly explained in Appendix 2.

Deming's efforts in the transformation of the Japanese managerial culture led to the identification of his 14 points, which outline effective ways that an organisation could operate. Deming is of the view that at all the role players have to work towards a collective target, based on specific principles that provide a method for overcoming barriers on the path to quality in higher education (Deming, 1986:11). These 14 points call for the removal of

barriers to achieving quality through the use of statistics which are used to help identify and reduce product and process variations, and in management accepting responsibility for quality failures as they are responsible for, and own, these processes (Sallis, 1996:48-49).

Like Deming, Juran calls for the achieving of quality through working within a system of organisations, and that management needs to manage for quality. Crosby mentions that for a zero defect approach to be adopted organisations must develop an attitude that is intolerant of defects (Mukhopadhyay, 2005:35).

The ever-increasing importance of the role of management is highlighted by the evidence in the tables (appendix 2), and Juran uses his 85/15 theory, which is based on the Pareto Principle, to illustrate that 85% of organisation's failures can be attributed to management failures, whilst only 15% of these failures can be attributed to the roles and influences of individuals (Najafabadi et al., 2008:24). Eagle and Brennan (2007:45) list the basic principles of TQM, as applied to higher education, as being:-

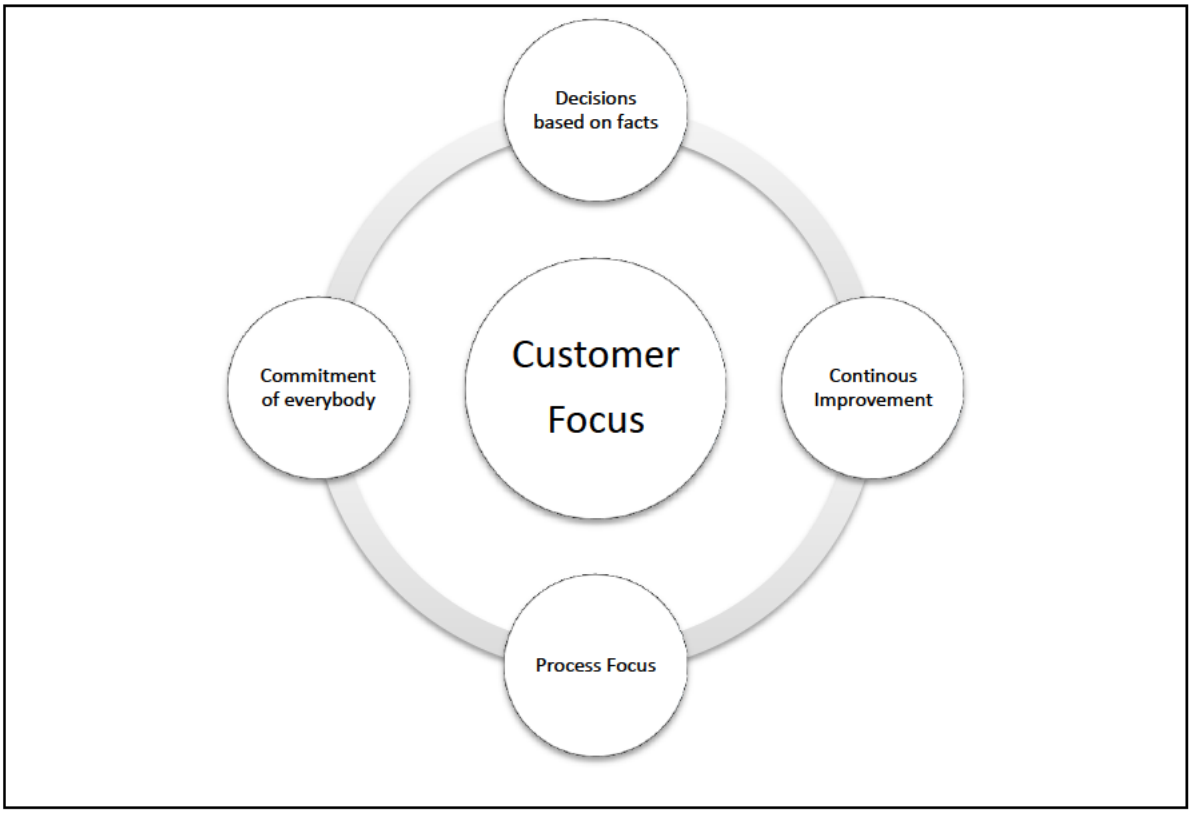
- *Delight the customer* – Being the best at what matters the most to customers, and being able to continuously evolve so as to maintain the ever-changing needs of customer satisfaction.
- *People-based management* – Knowing what to do, how to do it, and getting feedback on performance. Involvement and commitment to customer satisfaction are important ways to generate this.
- *Continuous improvement* – Continuous improvement or incremental change is the aim of those wishing to move towards quality.
- *Management by fact* – knowing the current performance levels of services in the customer's minds and of all workers is the first stage of being able to improve.

Whilst these principles are generic to both education and industry they are of great significance to education in that education does not have a tangible end-product, yet the "product" of education requires, and demands, constant compliance with the basic principles of quality, as outlined above.

2.8 Core values of TQM

The core values of TQM need to be identified, as they play a critical role in the development and implementation of a QMF for dental assisting. Najafabadi et al. (2008:24) notes that Deming (1986) proposes "14 Points" that need to be followed in order to achieve TQM. These include, but are not limited to, employee empowerment, gathering and use of statistical data and promoting unity and change. Total Quality Management recognises the role of both students and the education system (academics, administrators, management). The South African Qualifications Authority (SAQA) outlines some of the core values of TQM as being leadership, policy, people management, resources, customer and people satisfaction and its impact on society and Najafabadi et al. (2008:24) lists five (5) core values of TQM and these are reflected in Figure 6:-

Figure 2.5: Core Values of TQM



Source: Najafabadi et al. (2008:24)

Najafabadi et al. (2008:24) describes these core values as follows:-

- Customer focus - the higher education institution must know exactly what the internal and external customers' needs are, and being able to predict what these needs will be in 3-5 years' time, and strive towards fulfilling these needs. It is important to note that internal customers (employees) are also considered as being a priority. The as happy and motivated employees are essential to effective and efficient customer services being rendered, and are critical to the success or failure of an organisation.
- Decisions based on fact – the decisions made by top management must be based on facts, data and statistics and not just on observations. Systematic data collection methods that encompass needs, requirements, reactions, and opinions of customers and society are necessary in order to obtain the necessary data to make these decisions.
- Process – process in an institution is 'a set of inter-related activities which are repeated over time,' with some well-defined inputs such as information material that will be transformed, through the utilisation of resources, into outputs the forms of goods and services, and in the case of higher education into education for the student .

Three kinds of processes have been identified by Najafabadi et al. (2008:24). These are:-

- Main processes – the proper fulfilling of the requirements of external customers that are demanding the product, production and distribution. In the case of higher education this would involve meeting society's demands for an appropriately trained and competent workforce.
- Support processes - focus on providing the resources for main processes in order to satisfy internal customers. In the case of higher education this will involve ensuring that adequate and appropriate support services such as psychological counselling and in-service training are available.
- Management processes - focused on making decisions to organisational targets with the aim of improving aspects in other processes. All decisions made by higher education structures should be aimed at facilitating the quality improvement and quality goals of the higher education institution.

- Continuous improvement – quality of goods and services need to be continuously improved because the quality demanded by internal and external customers is always increasing. New technologies are being added, and in education the way teaching and learning occurs is also rapidly changing due to technology. Examples are the introduction of web-based learning and teaching, the use of games in learning and teaching, the introduction of smart-board technology into the classroom.
- Continuous improvement reiterates the importance of improving products, services, processes and methodologies with minimal and fewer resources, whilst at the same time incrementally improving quality on a continuous basis. This calls for the participation and involvement of all role-players, from grass-root level staff to top management, students, government, to play an active role in ensuring the provision of quality goods, services and education.

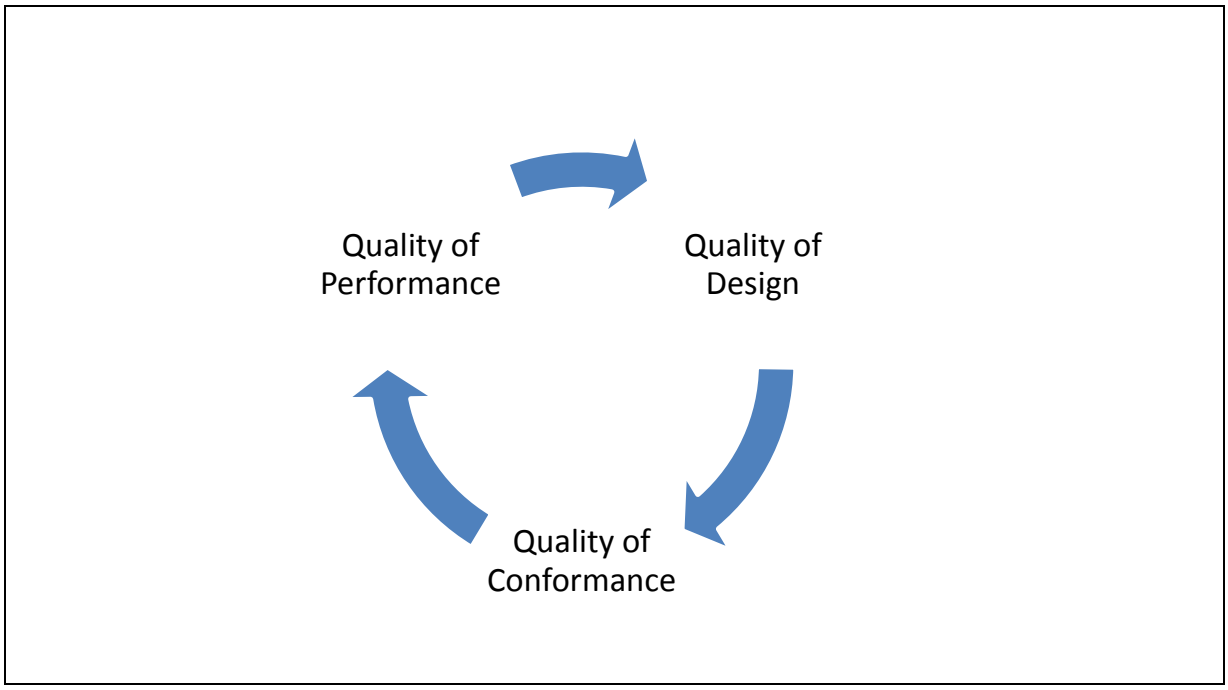
2.9 Parameters of TQM

Basic parameters of quality can be grouped into three areas: quality of design, quality of conformance and quality of performance. Mergen et al. (2000:347) who educationalists, define these concepts as applicable to education as being:-

- Quality of design: deals with determining the characteristics of a product and, in the case of education, the product is the curriculum.
- Quality of conformance: deals with how well the education system (uniformity and dependability) conforms to the design requirements.
- Quality of performance: deals with how well university products (the education, graduates) are perceived and accepted by the customers (students).

The QMF that this study proposes to develop will utilise this framework in its development, and this is illustrated schematically in Figure 7:-

Figure 2.6: Parameters in TQM Development



Source: Mergen et al. (2000). Quality management applied to higher education.

2.10 Benchmarking as a quality tool in higher education

Benchmarking is a process in which the best practices of organisations and institutions are uncovered, analysed, adopted and implemented (Kettunen, 2010:34-36). It is essential to identify, from the literature, the existing benchmarking practices in dental assisting education. This will allow the researcher to evaluate the developed QMF, and serve as a control for QM initiatives in dental assisting. Najafabadi et al. (2008:30) describes benchmarking to be "the act of imitating, and innovation in learning, from others." Benchmarking is part of many higher education institutions systematic review of higher education programmes and academic activities (Kettunen, 2010:36).

Goal setting, which is usually done internally and with an internal focus, often fails to meet customer expectations because customer expectations are constantly and rapidly changing. Customer expectations and demands are usually based on the standards set by those who are perceived to be leaders in education provision. Students, internal customers and external customers often expect the standards of a particular institution to be at the same level with those of these "gold-standard" institutions (Steyn, 2000:16). Gold-standard institutions are

those institutions that are perceived as being at the pinnacle in terms of quality, and are the institutions that other institutions and customers look up to as being the best of the best.

Therefore institutions have aligned their standards to those of these gold-standard institutions in a process known as benchmarking. Lewis (1993:190-194) and Camp and DeToro (1999:12) suggests that a 10-step process for conducting a benchmarking exercise/investigation that would enable a higher education institution to benchmark their standards against the gold standard and best practices that have been set by other institutions. This 10-step process is illustrated in Appendix 4**.**

It can be seen that benchmarking is an essential process in each QMF, and benchmarking is done in order to ensure continuous improvement in the quality of higher education institutions, especially when compared with other higher education institutions nationally and internationally. By undertaking benchmarking, the institution will ensure that they are perceived by internal and external customers as being providers of a quality education. This will assist in attracting internal and external customers with the associated increases in funding, income and knowledge-wealth, which could then be used to further improve quality in the institution.

2.11 Benefits of TQM for higher education

TQM can lead to tremendous improvements and benefits for higher education institutions. (Houston, 2007:3). Benefits such as improved teambuilding and teamwork, improved focus on customer satisfaction, improved role player involvement (Venkatraman, 2007:97). There is also sufficient evidence to indicate that this improved role player involvement leads to an improvement in the work ethic and morale of academic and support staff with the resultant improvement in quality (Venkatraman, 2007:92). Janpen et al. (2006: 1) suggests that TQM is a mind-set and a set of continuous and incremental improvement processes for individuals, groups and even entire organisations. He further suggests that TQM is an organisational culture that is dedicated to training, continuous improvement and improving levels of customer satisfaction. De Jager and Nieuwenenhuis (2005:258) list some of the potential benefits of TQM as:-

- Continuous and sustained organisational improvements
- Increased levels of external satisfaction

- Tangible and significant cost savings (of approximately 5-10% of operating costs of the institution)
- Focus on the importance of interdisciplinary teams with faculty and administration
- A new way of managing the organisation which promotes organisation-wide congruence, accountability and involvement
- Improvements in employee morale, commitment and motivation.

Hale et al. (1989:94) argues that besides the benefits listed above perhaps the most important benefit of TQM is that it has the potential to make work more satisfying and rewarding, and remaining so in the long term.

Mehrotra (1996:15) refers to Dr William Gasser's (1990) translations of TQM principles into suggestions for a very productive learning environment. This occurs by ensuring that there must be a warm, supportive learning environment; students should be asked to do only useful work; perform at their best; and be able to assess their own work (self-assessment) and to improve on it.

2.12 Requirements for TQM in education

In order to implement a TQM model in higher education it is essential to understand, via research, the needs of internal customers (students) and external customers such as employers (Spanbauer, 1995:520) and to be able to accurately forecast these needs into the near future. The feedback from students and internal and external customers' needs to be addressed so that shortcomings could be identified and improvements put into place to remedy these shortcomings (Spanbauer; 1995:520). He further writes that another requirement for the implementation of TQM in education is that higher education institutions must ensure that they make the most effective and efficient use of limited resources. This is to ensure that they provide their customers with the best possible education in terms of technology, infrastructure, teaching methodologies and support systems; and that the qualities of these are constantly and continuously improved. This will also include the provision of sufficient funding, staff development, equipment and infrastructure upgrades and provision of a competent and efficient administrative staff component.

Finally, there must exist motivation on the part of all stakeholders, but more especially management, as it is management who become the initiators of TQM in higher education Spanbauer (1995:520). Other requirements that are complimentary to the implementation of TQM in higher education would include the need for competitive benchmarking; focus on the customer as being the first priority; visionary leadership, a culture of wanting to improve; and finally a dynamic champion within the higher education institution who is willing to assume control and to initiate the TQM process, and work tirelessly to ensure the successful implementation of TQM within that specific higher education institution (Spanbauer, 1995:520). Whilst this list of requirements is not exhaustive, it does form the basis of the list of requirements that are necessary for successful implementation of TQM within higher education institutions. It is thus essential that these requirements are investigated when the dental assisting QMF is developed.

2.13 TQM implementation in dental assisting

Houston (2007: 4) suggests that the implementation of TQM is a complex business and that every aspect of TQM needs to be properly researched before implementation. In order to obtain optimum benefits of TQM there are six critical areas in which research is required and which would lead to a wider and deeper understanding of TQM. These areas are: - quality culture; management systems; tools and techniques; education and training; technology solutions; and the implementation process. For TQM to be successfully implemented, total commitment is required from all involved - administrators, academics and students. The provision of education and training to these role-players about the TQM model is paramount to the success of TQM implementation in education (Atkinson, 1990:13).

A four-step cycle, based on the Deming Cycle, was put forward by Deming in 1982 (Chien, 2007:212) and consists of the following steps:-

- Step 1 – Plan – document and establish measurable objectives
- Step 2 – Do – execute the plan and collect required data and information
- Step 3 – Check – analyse data qualitatively and quantitatively
- Step 4 – Act – obtain correct action and assess the future on a regular basis

It must be borne in mind that TQM is not a simply a system that, when implemented, will correct all the quality deficiency issues that dental assisting training and education faces in

South Africa, but affords a valuable platform from which quality improvement measures can be launched.

2.14 TQM models

There are many TQM models available, and a review of the existing models is essential to underpin the QMF that is being developed in this study. Wang and Wu (2007:3-4) describe a model as being a simplified description of a complex entity or process and that it is a representation of a "set of components of a process, system, or subject area, generally developed for understanding, analysis, improvement, and/or replacement of process". Thus a TQM model, based on Wang's definition of the term model, would be a description and representation of a set of principles as well as components of a management system that is designated for creating, maintaining, and improving the quality of products and services manufactured or offered. Wang highlights that a TQM model should provide the functions of understanding, analysing, educating, and assessing the practice of TQM within an organisation or sector. The three proponents of quality managements systems (Deming, Juran and Crosby) have written on various aspects of quality as applicable to the manufacturing sector, which can easily be applied to the service sector (Lindsay, 2010:7-11). These models are discussed below:

2.14.1 Deming's philosophy of quality/ Deming's Theory

Appendix 3 illustrates Deming's Theory. Deming (1986) sees that the problem of quality lies primarily with management and is concerned with the failure of management to plan ahead. Deming's famous theory in 14 points (see Table 3, Appendix 3) places an emphasis on prevention rather than cure. Deming mentions that the most crippling disease which prevents many organisations from adopting quality as a management objective is a lack of consistency of purpose, linked to short-term thinking (Sallis, 1996:39). Deming proposes a system of individual performance management appraisal schemes, as it is based on a system of measurable outcomes. Often these outcomes provide a misleading view of what is important in the process as employers begin to concentrate on what is important for gaining a good performance rather than developing pride in their work. This view is therefore in conflict with higher education's lecturer appraisals and performance management systems, which

seeks optimal performance and quality improvement in all facets as part of the core duties of employees of higher education institutions.

2.14.2 Juran's project management – Strategic Quality Management

Appendix 3 illustrates Juran's project management – Strategic Quality Management concept. Another proponent of quality is Juran, who also believed that most management decisions are caused by management failures (Sallis, 1996:46), as has been described above. Juran's rule of thumb (based on his 85/15 theory) is that 85% of organisations quality problems are as a result of poorly designed processes, and thus 85% of the problems lay with management as management controls 85% of the systems in an organisation (Sallis, 1996:46). Juran attributes the remaining 15% of organisations failures to operational staff, and in response Juran developed the three-part Strategic Quality Management (SQM) process approach wherein staff at different levels makes unique contributions to quality improvement (Sallis, 1996:46). Senior management makes strategic decisions; middle managers make operational decisions and the workforce is responsible for quality control (Sallis, 1996:46). In higher education senior managers set out the institution's vision and mission, priorities and policies (Sallis, 1996:47). Faculty and departmental heads are responsible for quality assurance and individual lecturers exercise quality control through the design and study of programmes so that they conform to the needs of students (Sallis, 1996:48).

2.14.3 Philip Crosby's 14-steps to quality

Appendix 3 illustrates Philip Crosby's 14-steps to quality. Crosby (1979) has proposed that the savings from quality improvement programmes pay for these improvement programmes, and that all errors, failures and defects can be eliminated (notion of zero defects). Such a quality management system has its appeal to higher education in that, if it can eliminate failures and especially student failures, and at the same time pay for itself then this QMF becomes irresistible (Sallis, 1996:46). However the application of the notion of zero defects in education may not be valid, as students are individuals with individual learning needs and characteristics. Crosby (1979) suggests that senior management communicate their commitment to quality by means of a quality policy statement and build on this commitment by forming a quality improvement team, which in turn will establish and drive quality.

2.15 Barriers to TQM in higher education

Whilst the literature suggests that TQM can bring about a range of continuous improvements and a multitude of benefits to higher education institutions, there are numerous barriers that may prevent the successful implementation of TQM in a higher education institution. Venkatraman (2007:92) identifies some of these barriers as:-

- A lack of leadership - management should be willing to initiate change and provide the necessary resources to achieve this change, as TQM is a strategy that should be embraced by top management. Management should encourage, support and actively engage in TQM implementation in all aspects of management and at all levels
- "Middle management muddle" - middle management plays a pivotal role in spearheading the TQM process and if middle managers do not clearly understand their role they may not let employees take responsibility for TQM, with disastrous results
- Misunderstandings of participation - employees may be resistant to change, and may feel that TQM model has been forced upon them, and that their autonomy and academic freedom may be affected negatively. Many higher education institution employees may feel that TQM is adding unnecessary layers of bureaucracy and increase the amount of work that has to be done, and this results in resistance to the TQM model implementation
- Scepticism about adopting TQM in education - role players may, especially after the failure of TQM in many industries, be sceptical about adopting TQM in higher education
- Obsession with process – poor process design (curriculum design) could lead to quality failure or maybe unsuitable to certain academic systems and procedures. Bureaucracy may also hamper TQM implementation
- Failure to include the customer - if internal and external customers have not been informed of, and bought into the TQM process, they may be resistant to its acceptance and implementation.

2.16 Causes of quality failure in higher education

An understanding of the causes of quality failure in higher education is essential if they are to be successfully tackled and overcome. In developing the dental assisting QMF, the researcher will have to recognize these causes identified in the literature and seek to avoid them. Koch (2003:328) found that in the USA almost 66% of higher education institutions that adopted TQM had abandoned the TQM process within five years. The major reasons advanced for the rapid abandonment of TQM by these higher education institutions included a failure to place emphasis on the bigger picture that the institution is a part of society and not a sole enterprise operating in isolation to its environment and (Meirovich and Romar, 2006:325).

The second major cause of failure of TQM in higher education advanced by Meirovich and Romar (2006:325) is that academics are not responsive to TQM as many of them felt that their academic freedom was being impinged upon. This was so because many academics felt that they must be allowed the freedom to practice their disciplines in the manner that they see fit, and to conduct their academic work free of political, financial or other forms of interference. This is in contrast with the principles of TQM, which seek to reward performance for meeting or exceeding certain predetermined criteria. Another reason advanced by Meirovich and Romar (2006:325) is that there is a marked failure to define what exactly TQM is, and how it is to be implemented within the higher education institution. This leaves role-players uncertain of their role, and this contributes to a lack of participation and/or a willingness to participate in the TQM model implementation.

Deming (1986) distinguishes between ‘common’ and ‘special’ causes of quality failure in higher education He distinguishes common causes as being attributable to systems failures that are internal to the processes in higher education whilst special causes of failure produce non-random variations within the system and are external to the system (Sallis, 1996:43). Common causes of quality failure in education are multiple and varied, and can include poor curriculum design; unsuitable and poorly designed infrastructure (buildings, equipment, facilities); poor working environments; inappropriate and non-functional systems and procedures; lack of resources; insufficient staff development programmes (Sallis, 1996:43). These failures can be “cured” through the removal of the causes; through the

removal/improvement/re-specification of systems and procedures; and through a management instituted change in policy.

The failure to adhere to, or follow, rules and procedures are some of the special causes of quality failure and may be the result of misunderstandings; communication failures; lack of motivation; lack of skills on the part of educators and managers; poor attitudes and inappropriate equipment (Sallis, 1996:44). These causes need to be identified by management, who have the authority to address them and to correct them whilst bearing in mind that the redesigning of the system or new policy formulation is often not required to correct the defect, writes Sallis (1996:45). Deming (1986) postulates that the majority of problems cannot be blamed on individuals, but rather on poor management or inadequate management systems, and that the responsibility for the identification and resolution of these causes of quality failure lie solely with management, and this responsibility appropriation is one of the cornerstones of TQM (Sallis, 1996:45-47). Ali and Zairi (2005:12) cite Crawford and Shutler (2005) as having identified the following five causes of quality failure in higher education institutions:-

- Weak students (poor inputs)
- Lack of focus in teaching system (poor service delivery)
- Lack of attention paid to performance standards and measurements
- Unmotivated staff (internal customer satisfaction)
- Neglected student skills (quality potential)

Chapman and Adams (2002:57) suggest that achieving high quality is an elusive target, and thus improving quality in higher education can never be fully achieved. They also suggest that the desire for high quality is often capped by a lack of resources. Another factor that they identify as contributing to the failure of quality in higher education is that in the process of raising quality some people lose certain resources that they previously enjoyed access to, and as a result become obstacles to quality improvement, because they view quality improvement as being secondary to what they value (Chapman and Adams, 2002:58).

2.16.1 Demographic and economic contextual influences

Higher education does not operate in isolation from its external environment, and the ability of institutions to develop and improve their higher education systems is strongly influenced

by, and dependent on, demographic and economic factors (Chapman and Adams, 2002: 7). Variations in demographics of student populations in South Africa, especially post-apartheid, have resulted in increasing numbers of students seeking admission into higher education institutions. This has resulted in greater demands being placed on the resources of higher education institutions. The economic changes that occurred in South Africa in the last twenty years has resulted in more employment for certain previously disadvantaged sectors of the population. This meant that previously disadvantaged people have more money for education and health care, and this has led to an increased demand for dental health care, and thus an increased demand for dental health professionals and dental assistants to service this demand.

2.16.2 Teaching and learning

Quality teaching implies that the required quality learning is taking place, and that educators are continuously adjusting their teaching, lecturing, supervision and assessment practices so as to keep up with the latest trends and technological advances in education. Lecturing staff need to demonstrate that their teaching practices are innovative and varied. They also need to demonstrate that they utilise a wide variety of teaching methods and materials so as to ensure that they deliver a high-quality teaching and learning experience to the internal and external customers of higher education (Sallis, 1996:46). Improvements in the quality, efficiency and equity of higher education depend on the nexus of teaching and learning factors (Chapman and Adams, 2002: 9). These factors can be influenced by a number of variables, some of which (funding, lecturer-student ratios) may be beyond the control of the stakeholders of higher education. Lecturer and teaching quality, and the quality issues surrounding lecturers and lecturing, curricula, higher education governance and management all have a powerful influence on student performance (Meirovich and Romar, 2006:328). In order for a higher education institution to be regarded as a quality institution there are certain characteristics that it has to comply with. These characteristics, as suggested by Chapman and Adams (2002:16) are tabulated in Appendix 5.

2.16.3 Key factors in achieving quality

There are numerous factors that need to be taken into account in order to achieve quality. These include, amongst others:-

- Development of a mission and vision - all educational organisations should develop their own mission and vision. The vision should be translated into meaningful and achievable objectives and action plans.
- Promotion of a quality culture within the organisation - all internal and external customers of higher education institutions should be aware of, and work towards, achieving quality.
- Implementation of a process-based approach – all activities of higher education institutions should be aimed at achieving and maintaining quality. The Deming Quality Cycle has been found to be an ideal approach for implementing continuous improvements in higher education.
- Designing performance measures - management of higher education institutions should identify or develop a system for monitoring student performance, lecturer performance, financial performance, institutional performance and management performance.
- Establishment of a quality control unit - the responsibility of a quality control unit of higher education institutions should be to monitor and maintain a system that ensures that standards are maintained, continuously improved, and that statistics obtained are used to improve quality within the institution.

With these factors in place an effective TQM model could result in considerable and continuous improvements to the higher education sector (Venkatraman, 2007:98).

2.16.4 Lecturers and lecturing

Lecturers' performances are inevitably reflected in student performance. Lecturers need to be educated in pedagogical skills. A need exists for lecturers to either receive in-service training or further professional training on a continuous basis in order to keep up with the latest trends and developments in pedagogical methods such as web-based teaching and learning. Recruiting well-qualified lecturing, administrative and managerial staff can lead to improvements in attaining and maintaining quality teaching and learning. These lecturers, administrators and managers must be provided with effective, relevant and on-going training so that quality can continuously be evaluated and improved (Chapman and Adams, 2002: 44). Lecturers also need to be afforded the autonomy that they require in order to make certain ground-level quality improvement decisions. Lomas (2007:406) postulates that if lecturers

are given this autonomy they could become more accepting of quality improvement initiatives.

2.16.5 Curriculum

Chapman and Adams (2002:20-37) suggest that the curriculum specifies the content, sequence and pacing of what should be taught in each course, and the curriculum is usually designed at institution level. They also suggest that one of the simplest and least expensive actions to improve quality would be the implementation and adaptation of a national curriculum through a national instructional strategy prepared by all stakeholders, with input from administrators and educationists.

This national curriculum would include a set of guidelines and action plans related to the use of instructional time and the development of instructional materials. Other strategies suggested by Chapman and Adams (2002:20-37) include the development and dissemination of effective learning and assessment materials such as textbooks, the development of a valid and reliable examination system that is not labour intensive, and the establishment of national guidelines and standards of quality for all, as national standards are potentially significant for improving teaching and learning. Lomis (2007:406-408) comments that quality initiatives often tend to concentrate on content rather than processes, and this may lead to curriculum content failures. He called for curriculum benchmarking to concentrate on consistency and conformity within the curriculum, and not on reducing or removing creativity and criticality, as these are key elements of university education, and are being stifled. This lack of creativity and criticality also goes against the South African education sector's concept of Critical Cross-field Outcomes (CCFOs). These CCFOs concepts reveal that learners should gain certain competencies; with the ability to critically analyse information, and knowledge, being one of these competencies. The United Nations Education and Schooling Curriculum Organisation (2000) recognizes that a curriculum should also provide for individual differences, and have a local-based content as well.

2.16.6 Education governance, management, and school organisation

Management roles need to be redefined, with a move away from routine administration to instructional leadership, stimulating and monitoring innovations, generation of understanding and utilization of information on interventions in progress, and responses to

the emergence of new priorities (Chapman and Adams, 2002:50). All these factors, that play a vital role in any academic programme, will be incorporated in the planning and design of the dental assisting QMF.

2.17 Policies and strategies for improving education quality

Effective policies can be developed at all administrative and functional levels for the purposes of maintaining and improving higher education quality. This is the basis of any QMF, and would serve as one of the cornerstones in the development of the dental assisting QMF in this study. Hofman et al. (2008:281) recognises the need for effective policies that would lead to an improvement in the quality of education provision.

2.18 Strengthening research, innovations and development.

The need for dental assisting education to be research-led is often hindered by the lack of a research component within the dental assisting education fraternity, as the dental assisting course is at a National Qualification Framework Level Five (certificate level). Higher education institutions have various policies encouraging research, innovation and development but these are often not complied with by dental assisting lecturers, for a variety of reasons. Therefore it is critical for dental assisting academics to be engaged in research that can be applied to the dental assisting curriculum and education, so that research-informed teaching and learning can occur. Dental assisting academic staff also need to initiate, and partake in, quality improvement research, and can also encourage university and classroom-level experimentation, in an effort to improve the quality of teaching and learning.

2.19 Conclusion

It is evident, from this extensive literature review, that the entire concept of quality cannot be afforded a single, all-encompassing definition but rather is a concept that has multiple contextual meanings. It is therefore essential to understand the different meanings, as perceived by the various role-players, and that different stake-holders (internal and external customers) have different perceptions of what quality is, and should be. It is also evident that the principles of TQM, which are of business origination, can easily and successfully be applied to higher education. The factors highlighted by the literature review will be incorporated into the dental assisting quality management system framework that will be developed during this study.

CHAPTER 3

Methodology and Research Design - Preliminary Work and Comparative Country Analysis

CHAPTER 3

Methodology and Research Design - Preliminary Work and Comparative Country Analysis

This chapter presents the design and methodology selected for this study in order to meet the research objectives. It provides an outline of the layout of the dissertation and highlights the tools selected and utilised, presents the preliminary work and introduces the main work of this research.

3.1 Introduction

The purpose of this study is to develop a quality management system framework for the dental assisting education programmes in South African higher education institutions. Early evidence, as indicated in the literature review, shows that the correct and effective implementation of a quality management system framework within the dental assisting education training programme will have significant benefits in terms of improved education programme quality. This chapter will provide an overview of the steps taken to gain an understanding of the current situation regarding quality management and quality improvement in dental assisting education programmes at South African higher education institutions. This chapter outlines and explains the methods of research design and the research methodology used in this study.

3.2 Methodology

Historically, there are two broad approaches to research: qualitative and quantitative (Green and Thorogood, 2010:6-38; Laher, 2009:101).

Quantitative research has been described by Offredy and Vickers (2010:80) amongst others, as being the formal, objective and systematic process of obtaining quantifiable information about the research area that is presented in a numerical form, and that has been subjected to statistical analysis. Quantitative research investigates research involving amounts and quantities, and a measurement of variables (Leedy and Ormrod, 2010:94). The purpose of

the quantitative research approach is to seek explanations and predictions that will generalise to other persons and places. In so doing a "better understanding of complex situations that could establish, confirm or validate relationships, or lead the development of generalizations that could contribute to existing theories, and in so doing gain a better understanding of complex situations" (Leedy and Ormrod, 2010:95-135).

Qualitative research approaches aim to seek explanations, make predictions and answer questions in a real world setting (Leedy and Ormrod, 2010:135). It seeks to understand more about a phenomenon, rather than just measuring it, and also allows for an understanding of the perspectives of the participant (Green and Thorogood, 2010:6-38).

Offredy and Vickers (2010:77-104) offer the following definitions and classifications of the numerous research approaches that could be used. These include several sub-methodologies within the two main methodology groups; which are quantitative and qualitative methodologies.

Within the quantitative paradigm the different types include:-

- experimental research
- quasi-experimental research
- descriptive research
- correlational research
- survey research

Within the qualitative paradigm the different types include:

- Ethnography
- Grounded theory
- Phenomenology

The researcher evaluated the different research approaches available in terms of their potential strengths and weakness, as applicable to this study. An overview of this study is necessary in order to understand the rationale behind the choice of research approaches that will be used. Phase One of the preliminary work for this study assessed the current situation regarding quality management of dental assisting education in South Africa.

Phase Two of the preliminary work was conducted in two parts. Part A of Phase Two was a desktop analysis to identify the quality management practices utilised in dental assisting education in other countries. Part B of Phase Two was a questionnaire survey of those countries that have been identified as having a QMF for dental assisting education. The preliminary work for this study will be discussed later in this chapter.

This study utilises a quantitative approach in Phase One of the preliminary work, as this approach allows the researcher to gain an insight into the current quality management situation within dental assisting education. In Phase Two of the preliminary work the researcher sought to ascertain the quality management practices for dental assisting education internationally. Here the qualitative and the quantitative research approaches were utilised. These approaches allowed for the thematic analysis of the data obtained, and for an understanding of the situation as it exists in the real world. This research therefore used the mixed methods approach, which is a combination of quantitative and qualitative research approaches (Green and Thorogood, 2010:42; Singh and Naidoo, 2010). Triangulation is a technique that facilitates the validation of data through cross verification from two or more sources, and refers to the use of more than one research method in a study (Green and Thorogood, 2010:47). Triangulation will occur when the results of both the preliminary work (quantitative work) and the study (qualitative and quantitative work) are combined and where one result informs the other. By utilising this mixed-methods approach the researcher was able to obtain an in-depth understanding of quality management systems and influences in the South African and international dental assisting higher education context.

3.3 Scope of the study (and delimitations)

The preliminary work (Phase One) was conducted within the dental assisting programmes of the four (4) accredited South African Universities of Technology that offer dental assisting education. These are the Cape Peninsula University of Technology (CPUT); the Central University of Technology (CUT); the Durban University of Technology (DUT) and the Tshwane University of Technology (TUT). The delimitation of this preliminary work was that the small number of institutions that offer dental assisting training in South Africa (n_1=4); and an academic staff component of twelve.

The second phase of the preliminary work was a comparative analysis of the quality management systems of the dental assisting programmes offered in twenty countries and a survey of those countries found to utilise a QMF. The delimitation here was that a small number of countries were reviewed, and this may not have provided a true reflection of international trends in quality management practices of dental assisting education programmes.

3.4 Study design

There are various methods of research design that can be utilised. These include extended literature reviews, surveys and action research (Hofstee, 2006:119). Extended literature reviews provide an overview of the scholarship in a particular field (Hofstee, 2006:121). The survey style of enquiry focuses on a representative probability sample from a defined population by means of the research instruments such as a questionnaire, and is cross-sectional in its design (Crabtree and Miller, 1999: 4). This study utilised extended literature reviews, a survey-based research design and action research.

A combination of designs, based on literature reviews and surveys (questionnaires) were utilised in order to ascertain the existing practices and reality (ontic nature) of quality management practices within dental assisting programmes at South African higher education institutions. This choice was made because the use of the extended literature review also enabled the researcher to better evaluate the current state of practice within the quality management of dental assisting education in South Africa and internationally. It also helped to generate new ideas and approaches to quality management in dental assisting education in South Africa. The second design tool used in this study was a survey-based questionnaire. This was utilised in order to elicit quantifiable information from a limited number of individuals (Hofstee, 2006:127).

3.5 Study population and sample size

A study population is the entire group or whole unit from which results of an investigation can be inferred (Darby and Bowen, 1980:75). Offredy and Vickers (2010:80) describe a study sample as being a group of people who have been selected as being representative of the target population as a whole. The choice and size of the study sample depends on the

purpose and objectives of the study, and the nature of the population under scrutiny (Rampa, 2005:110). The population of Phase One of this study consisted of the dental assisting programme leaders of the four Universities of Technology that offer dental assisting education in South Africa. Whilst the study population is small (*n*=4) it is the census (total) of the dental assisting education provider institutions. After completing the initial phase of the preliminary work the second phase, a comparative analysis and survey of the QMF of dental assisting programmes, was done with a study population of twenty countries (*n*=20).

3.6 Sampling techniques and sample selection

There are various types of sampling techniques referred to including probability and non-probability sampling (Leedy and Ormrod, 2010:205-221). Probability sampling specifies that each segment of the population will be represented, unlike in non-probability sampling where it is not possible to specify or forecast which elements of the population will be represented in the sample. In probability sampling the components of the sample are chosen from the study populations through the process of random selection, which means that each member of the population has an equal chance of being selected.

There are three common forms of non-probability sampling which are, convenience sampling, quota sampling and also purposive sampling (Leedy and Ormrod, 2010:205-221). Convenience sampling (accidental sampling) utilises whichever research subject that is available. Quota sampling, a variation of convenience sampling, selects research subjects in the same proportions as those found in the general population (Leedy and Ormrod, 2010:205-221). Purposive sampling, which is also known as judgemental sampling, chooses a selection of people to include in the study (Offredy and Vickers, 2010:139). In purposive sampling the research subjects are selected for a particular purpose, or because they possess certain characteristics, and is appropriate to certain studies for a variety of reasons (Leedy and Ormrod, 2010:212).

Purposive sampling refers to explicitly selecting research participants who are likely to generate appropriate and useful data that could contribute to the development of theory and knowledge (Green and Thorogood, 2010:118). The aim of sampling is to maximise the

opportunity of producing enough data to answer the research question. Purposive sampling allows for this generation of representative data that can be effectively used (Green and Thorogood, 2010:123). This study utilised the purposive sampling technique, because it included all the relevant study subjects.

Offredy and Vickers (2010:139-141) describe convenience sampling as being where people are included in the study because they happen to be in the right place, at the right time, and because the researcher has access to them. Although considered to be a weak approach because of the increased risk of bias. Offredy and Vickers (2010) argue that convenience sampling is still an acceptable form of sample selection.

In Phase One of the preliminary work, the research participants were specifically selected as they were the providers of dental assisting education in South Africa, and are thus the target population. In the comparative analysis of twenty countries, (phase 2) a convenience sampling technique was used. These countries were selected because they had websites pertaining to dental education and dentistry, for example regulatory or non-regulatory dental bodies.

3.7 Data collection

Singh and Naidoo (2010) suggest that there are various methods of collecting data, such as through the use of surveys, questionnaires or interviews. Survey-based data collection methods involve the use of a questionnaire or interviews which can either be structured or unstructured. Questionnaires enable information to be elicited at a low cost and in a written form. Questionnaires can consist of either open-ended type questions, closed-ended type questions or a combination of the two (Neutens and Rubinson, 2010:114). Questionnaires are a form of structured interviews where all the subjects are asked the same question (Hofstee, 2006:132-133).

Data in the first phase of the preliminary work was gathered through the use of questionnaires, which are written form of questioning (Thomas, 2009:173). Questionnaires are versatile tools and in this study the questionnaire contained both closed-ended type of questions and a single open-ended type question, in an attempt to allow subjects the opportunity to provide a more open and discursive response (Thomas, 2009:174).

Open-ended type questions are questions that allow for the participant to answer in their own words, whilst close-ended type questions are questions that provide fixed-alternative answers which may be "yes" or "no" answers; or a range of answers from which to choose. In open-ended questions no potential answers are provided. Participants can thus respond in their own words. The advantage of using open-ended questions is that the answers are not provided and the participant is allowed to respond to the question creatively and in detail. Disadvantages of open-ended type questions include difficulty in coding and analysis, they are time-consuming for participants; the participant may experience difficulty in understanding the questions and thus the provision of irrelevant data may occur (Neutens and Rubinson, 2010:117).

Close-ended questions are questions wherein the participants' answers are given a restricted list of potential responses from which to choose. Some of the advantages of using close-ended type questions include the ease of completion for the participants; responses that can be easily coded and analysed; the number of irrelevant responses is reduced; and the risk of ambiguity is removed. Disadvantages of using close-ended type questions are that incorrect responses may be given by uninformed participants since they are given a restricted list of potential responses of which none may be applicable to the particular participant (Neutens and Rubinson, 2010:115).

In the second phase of the preliminary work data was gathered through website visits and e-mail correspondence to the dental regulatory bodies in the selected countries.

3.8 Validity and reliability

Validity is the degree to which the instrument measures what it is supposed to be measuring and reflects the true meaning thereof (Leedy and Ormrod, 2010:29; Thomas, 2009:109). All assessments of validity are subjective opinions based on the judgement of the researcher. (Leedy and Ormrod, 2010:29). Validity, as outlined by Leedy and Ormrod (2010:29) takes different forms such as:

- Face value – the extent to which, on the surface, an instrument looks like it measures a certain characteristic

- Content validity – the extent to which an instrument is a representative sample of the content or area being measured
- Criterion validity – the extent to which the results of an assessment instrument correlates with another related measure
- Construct validity – the extent to which an instrument measures a characteristic that cannot directly be observed but is assumed to exist

With regard to face and content validity, the questionnaire in this study was assessed and pre-tested by an experienced researcher, prior to being administered, to ensure that the content was both meaningful and appropriate. The content validity of the questionnaire was thus assessed in order to determine the extent to which the questionnaire met with the requirements of the study.

Reliability is the consistency with which a measuring instrument yields a certain result if the subject does not change (Leedy and Ormrod, 2010:29). Babble (1998) states that reliability is a matter of whether a particular technique, applied repeatedly to the same object, will yield the same results each time. Bell (1995) states that reliability explains how measurement methods resist against unwanted effects, and that the reliability of interviews and questionnaires depends on personal status, comfort factors, and formulation factors. Najafabadi et al. (2008:48) further stress that an effective way to reach higher reliability is to choose appropriate, error-free, accurate and understandable questions that would lead to gaining effective information and data. Reliability is synonymous with repeatability or stability, and a result that is consistent over time is regarded as being reliable (Thomas, 2009:116). Leedy and Ormrod (2010:93) state that there are several forms of reliability that could be utilised in research studies. These include:

- Interrater reliability – the extent to which two or more individuals evaluate the same product/performance and give identical judgements
- Internal consistency - the extent to which all of the items within a single instrument yields similar results
- Equivalent forms reliability – the extent to which two different versions of the same instruments yields similar results

- Test-Retest reliability – the extent to which a single instrument yields the same results for the same people on two different occasions

The internal consistency reliability form was utilised during this study and the same questions were administered to the research participants in a similar manner, with the intention of yielding similar results. After the validity and reliability studies were completed, the final version of the questionnaire was printed and administered.

3. 9 Questionnaire design

Before the questionnaire was administered its validity was analysed, and this process will be discussed later in the chapter. The questionnaire was designed to elicit information about the quality management practices of the four UoT‘s offering dental assisting education in South Africa and of institutions offering dental assisting education in other countries. The questionnaire was designed around seven thematic areas, based on the seven dimensions of a quality management system (UNICEF, 2000:32-43). These dimensions were included in the questionnaire and are thematically grouped as follows:

- Programme management and operation
- Curriculum design, content and organisation
- Teaching, learning and assessment
- Student support and guidance
- Learning resources
- Quality assurance and enhancement
- External evaluation

The formulation of the content of the questionnaire was informed by the literature review (Rampa, 2005:130-139; UNICEF, 2000: 32-43; Willis and Taylor, 1999:999-1002;
Kanji, 1991; 207-211). Development and finalisation of the questionnaire was undertaken with the assistance of a senior lecturer in quality management, as well as a statistician who advised on the validity of the questions/responses from a statistical viewpoint in order to ensure that the responses from the questionnaires would be appropriate. These external measures were undertaken in order to increase the validity of the instrument.

3.10 Analysis of the data

There are a number of data sources that can be utilised namely: primary, secondary and tertiary data. Primary data sources are drawn directly from the current investigation or study, and have not been analysed or interpreted by someone else. Secondary data are based on primary data that has already been analysed and interpreted, and are relevant to the current study (Hofstee, 2010:51). This study used primary data in the first and second phases of the preliminary work, and secondary data in the second phase of the preliminary work. After data had been collected it needed to be assembled and analysed in order to make it useful. Data can be assembled and analysed in a number of ways, depending on whether it is qualitative or quantitative data. In this study the quantitative data will be presented in the form of graphs, tables and/or charts. The data collected can be analysed using both inferential and descriptive statistics.

Green and Thorogood (2010:177) argue that data collected can be analysed using a variety of data analysis methods, such as thematic content analysis. They state that in this type of approach the research areas are grouped into recurrent or common themes and that is a useful and allows for the easy summary and analysis of the participant's answers.

The qualitative data gathered in this study was analysed using thematic content analysis. This is a data analysis process whereby the data are classified into themes. The use of these themes allowed for the identification of deficiencies that may exist in the quality management practices of dental assisting education in South Africa and in other countries. The data then underwent a deeper framework analysis which is known as mapping and interpretation, and a key tactic that was employed was the use of diagrams and tables to understand the relationships between the variables (Green and Thorogood, 2010:213).

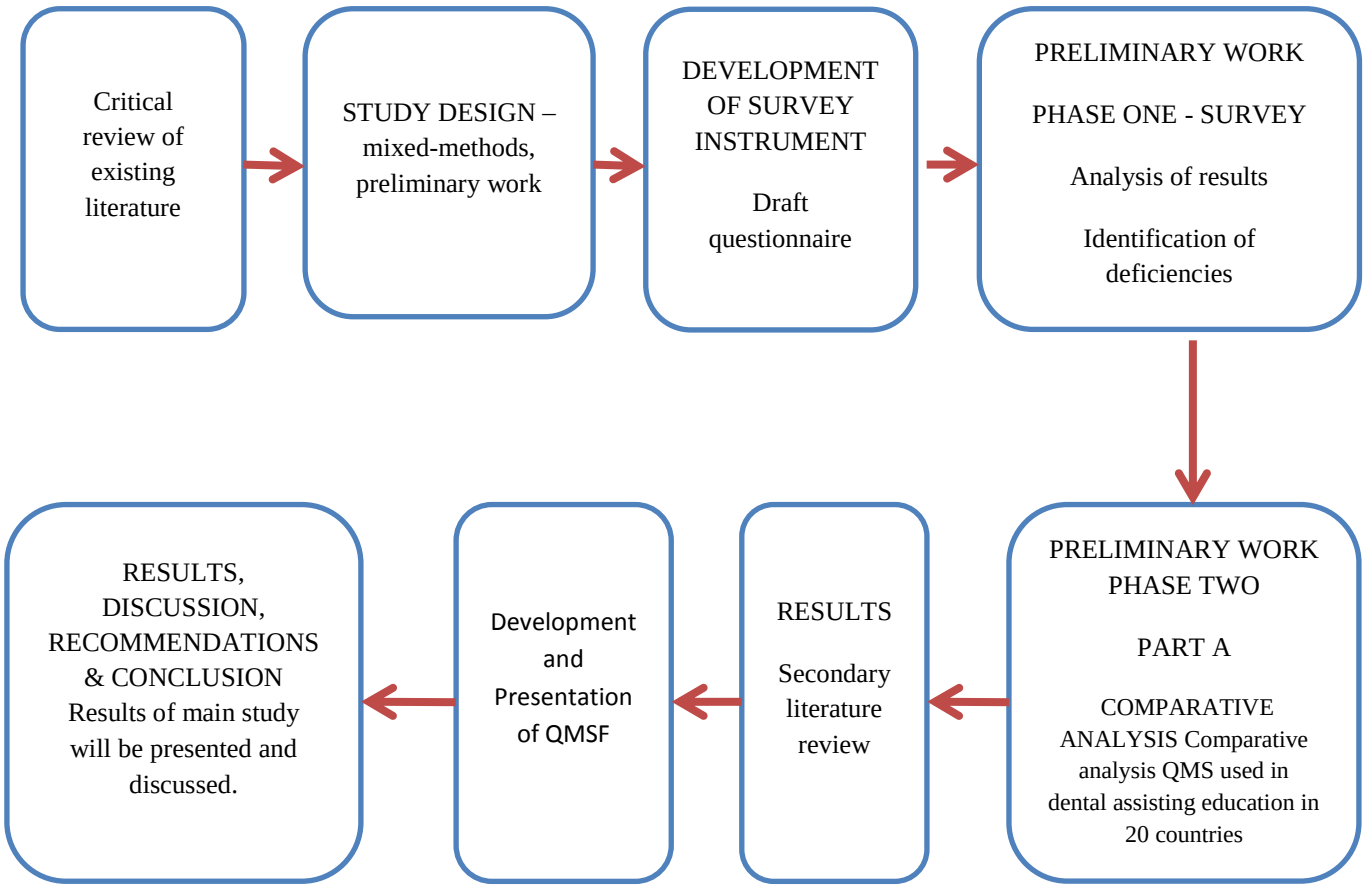
Green and Thorogood (2010:213) argue that the overt aim of framework analysis is to develop strategies on the basis of thematic analysis that will lead to change or improvement. In this study that change was the development of a QMF that could lead to improvements in the quality of dental assisting education in South Africa.

The data that the research participants forwarded during the preliminary study was gathered and analysed. The responses from these dental assisting programme leaders were then used to develop and modify a quality management system framework.

A comparative analysis of the quality management system used by the participants was then carried out and further deficiencies were identified.

Results of the preliminary work indicated certain deficiencies in the quality management of dental assisting education programmes, and this necessitated a secondary literature review to address the deficiencies that were highlighted in the preliminary study. A flowchart of the study is reflected in Figure 8 below.

Figure 3.1: Flowchart of research design



Source: Developed by the researcher

3.11 Preliminary work

Preliminary work looks at the feasibility of the study and attempts to allow for an understanding of the current position of the research area that is being studied (Hofstee, 2010:52-54). The preliminary work in this study was undertaken in two phases. Phase One consisted of a questionnaire survey of four UoT's. This phase of the preliminary study also looked at the dental assisting academic staff's attitudes, knowledge and perceptions towards the implementation of this developed QMF, and attempted to predict its possible success or failure, and potential improvements.

The aim of Phase One of the preliminary work was to identify salient issues from participants and to use this knowledge to contribute in the development a quality management system framework for dental assisting education, Due to dental assisting being recognised as a formal qualification only in the last century, both in South Africa and internationally, there has been little or no research carried out in the development of a quality management system (QMF) specifically tailored for the provision of dental assisting education. Quality of education is becoming increasingly important, and is playing an ever-increasing role in a world-competitive environment (Owlia and Aspinwall, 1996:161). Reddy (2006:46) reports that "cooperative learning, curriculum review, change and development" in UOT's must be continuously monitored and reassessed. The preliminary work (Phase One) determined the status of quality in dental assisting education and identified deficiencies that existed within the quality management of the dental assisting academic programmes in South Africa. This phase also established the current quality management principles, philosophies and practices adopted in dental assisting training in South Africa.

Phase 2 (Part A) was a desktop review (internet search) of the QMF used in dental assisting education in twenty countries (Part A) and thereafter a survey of the countries identified as using a QMF in dental assisting education was undertaken (Part B).

An analysis of the QMF and practices of the UoT's in this study revealed the deficiencies that existed between the practices in the UoT's deficiencies. Further literature was reviewed in the areas identified. This informed the development of the quality management framework.

3.12 Results and discussion of preliminary work

The results of the questionnaire and comparative analysis of the QMF used in dental assisting education in the four South African and twenty international countries will be presented in the following sections.

3.12.1 Results and discussion of preliminary work – Phase One

Primary data was collected using self-administered questionnaires distributed to all programme leaders of the dental assisting programme in the four Universities of Technology in South Africa. It took nine weeks to complete the data collection, with a 75% response rate (n_2=3). The questionnaire comprised of one (1) open-ended type question and fifty (50) close-ended type questions in seven sections, namely:-

- Programme management and operations
- Curriculum design, content and organisation
- Teaching, learning and assessment
- Student support and guidance
- Learning resources
- Quality assurance and enhancement
- External evaluation

The detailed results are presented as tables and figures in Appendix 8 (page 147), and a summary of the discussion is presented in the sections below.

3.12.2 Results and discussion of preliminary work - Phase Two - comparative analysis of the quality management systems used in dental assisting education in other countries.

The second phase of the preliminary work consisted of an analysis of the quality management systems used in dental assisting education programmes in twenty countries (Part A). Part B was the administration of the questionnaire, (see Appendix 7) to dental assisting education providers in those countries who are found to utilise a quality management framework in their education programmes.

Primary data was collected using the same self-administered questionnaire (Part B) that was administered to South African UoT's, and these were e-mailed to dental assisting education providers in the six identified countries. Reminders were sent out fortnightly over a period of two months, and it took twelve weeks to complete the data collection, with a 50% response rate (n_4=3). The results of this comparative analysis, which is independent of Phase One of the preliminary work, are presented in the following sections.

3.12.2.1 Overview of comparative country analysis

The quality management practices of twenty countries were reviewed, and comparatively analysed, in order to identify if a QMF was in use, and the up-to-date relevance of the QMF in use. A brief summary of this comparative country analysis is reflected in this section, with a detailed analysis being presented as Appendix 9 (page 158).

3.12.2.2 Study population

The convenience sampling technique was used in selecting the countries that made up the study population. Between two-to-five countries per continent were selected (n_5=20). These countries were selected because they had websites available on the internet that were in the English language and pertained to dental education. The internet is a powerful medium for information transmission. This information is often very new and recent and could include documents, policies, media statements, discussion papers, information about organisations and their personnel as well as other so-called "grey literature" (Mouton, 2001:35-36). Additionally this information is easily accessed via the website. Higher education websites contain information that is useful to scholars. This includes policies such as plagiarism, quality assurance, and links to other institutions and scientific sites (Mouton; 2001:36).

Hofstee (2006:104) writes that a problem with using websites is establishing the quality of the information, as this is often only as strong as the institution behind it. This study used the websites of the dental associations and education providers to seek information about their education practices and/or to obtain contact details for key stakeholders so that more information could be sourced. This researcher chose only to gain access to basic information about the QM systems used by the institutions and to gain the details of stakeholders from whom further information was obtained. In this study the quality of the information obtained from the websites was verified by sending questionnaires to the institutions, and gaining

responses directly from the primary stakeholders who are responsible for dental assisting education.

3.12.2.3 Country analysis

A brief analysis of the quality management systems used in dental assisting education in twenty countries will be outlined, grouped thematically under the categories of continents. Refer to Appendix 9 (page 158) for a comparative analysis of the QMF in use by these countries.

The websites of the twenty countries' dental assisting education providers were accessed. Some websites contained very little information, and therefore the dental bodies and dental assisting training providers were contacted via e-mail to enquire if they had a functional QMF for dental assisting education, and if so was this QMF specific to the organisation or one of international standards such as the ISO QMF. From the analysis of the twenty countries it was evident that only six countries (30%, n_3=6) utilised a QMF for dental assisting education (see Appendix 9, page 158). This absence or lack of a current QMF in 85% of the participating countries reveals deficiencies in the use of a QMF for dental assisting education. An e-mail questionnaire was sent to the contact person of the dental assisting education provider in those countries that were identified as having a QMF for dental assisting education (Australia, Canada, Singapore, Honk Kong, the United Kingdom and the United States of America). Further e-mail reminders were sent fortnightly over two months to the six countries (n_3=6). Only three responses were received, indicating a response rate of 50%. The results of the responses to the questionnaires are presented in Appendix 9 (page 158). A review of the websites which was conducted in February 2012 indicated that only three countries (Australia, USA and Hong Kong) used the International Standards Organisation (ISO) ISO 9001:2008 (requirements of a quality management system) and complemented by ISO 9004:2009 (how to make a quality management system more efficient and effective) which is currently the latest version of the QMF in use.

Three countries (Canada, UK and Singapore) used out-dated QMF in the quality management of their dental assisting programmes. The analysis of the six countries revealed deficiencies in the quality management of their dental assisting programmes. This reinforces the need for dental assisting education to have a current and relevant QMF. Whilst South Africa does not

have a specific QMF for dental assisting education there are mechanisms and organisations in existence such as the HPCSA, the Higher Education Quality Council and South African Quality Authority that ensures the quality of dental assisting education.

Table 3.1: Summary of QMF used in twenty countries.

COUNTRY	QMF USED
Egypt Sudan Tanzania Libya Nigeria Cuba Brazil Thailand India France Germany Saudi Arabia New Zealand United Arab Emirates (UAE)	No QMF.
USA	Total Quality Management system of quality management.
Canada	The dental assisting profession in Canada uses the ISO 9002 QMF, which is an outdated system. Dental practices that subscribe to this QMF are used to train dental assistants.
Hong Kong	The Hong Kong University has a comprehensive QA system in place for all academic programmes, which was developed in-house to suit the institution).
Singapore	Singapore Quality Award (SQA) Business Excellence Framework, which is an outdated system.
United Kingdom (UK)	ISO 9002 quality management tool, which is an outdated system.
Australia	AS/NZS ISO 9001:2008 quality management system.

Source: Developed by the researcher

3.13 Research findings

An analysis and evaluation of the responses received from the participants, via the questionnaire, was done and will be reported and briefly discussed in the following sections. Both The South African and international institutions participated in this study, and for ease of reference they have been referred to as in the table below:

Table 3.2: Reference to Study Participants

Participant Category	Study Population (in numbers)	Referenced as…
South African UoT's that were selected to participate in the study	4	(n_1=4)
South African UoT's that participated in the study	3	(n_2=3)
International institutions that were selected to participate in the study	6	(n_3=6)
International institutions that participated in the study	3	(n_4=3)
International institutions that were part of the South African study population	20	(n_5=20)

Source: developed by the researcher

3.13.1 Programme management and operations

The participants were asked a number of questions pertaining to the QMF that could be used in both the dental assisting programmes and the higher education institutions. These questions were asked in an attempt to determine whether a need existed for the development of a dental assisting quality management framework. All local participants (n_2=3) and international participants (n_4=3) answered that they have a QMF in place for the academic component of educational programmes. All South African and international participants indicated that they have a dedicated Quality Assurance / Promotion Unit in place. This is in keeping with the literature, which reflects that all higher education institutions should/must have a higher education institutional quality assurance policy and quality assurance unit in place (Lomas, 2007:405).

Two South African participants (n_2=3) and all international participants (n_4=3) stated that there was a QMF in place specifically for the academic component of the dental assisting programme, whilst one South African participant (33.33%) indicated that they did not have such a system in place. All local and international participants indicated that there was a QMF in place for the administrative component of educational programmes. One local institution (33.33%) and all three international participants have a QMF in place specifically for the administrative component of the dental assisting programme, whilst one local institution did not. The third local institution indicated that they did not know if there was a QMF in place specifically for the administrative component of the dental assisting programme within their institution.

These questions were asked in an attempt to understand whether a need existed for the development of a dental assisting QMF. It is evident from the results, and from an analysis of the responses to the questionnaires, that whilst a quality assurance policy is in place within the institutions there was not a specific quality management system in place by which departments could operate.

3.13.2 Dental assisting staff management, consultation and participation in decision-making processes.

Eagle and Brennan (2007:44) place emphasis on the need for programme staff (academic and support) to be involved in decision making that leads to quality improvement. All participants indicated that employees partake in Faculty/departmental planning sessions and team-building exercises. One South African and all international participants (n_4=3) indicated that they were involved in decision-making processes regarding the dental assisting programme management (in terms of student numbers and resource allocation). Although dental assisting staff partakes in decision-making processes at faculty and department level there is some disparity in their participation in programme management decisions at faculty level. This can be corroborated by referring to the results in Figure 16 of Appendix 8 (page 147).

The importance of staff participation and buy-in at managerial level and as the initiators and motivators of quality management efforts, is vital to any quality improvement initiative (Lindsay, 2010:165). Collins and Smith (2006) and Pfeffer (1998) have consistently demonstrated the link between human resources and

organisational success, and have identified training and development as one of seven practices of highly successful organisations. He theorises that there is a strong correlation between increased training and development, and improvements in productivity and quality. The QMF that will be developed in this study will take cognisance of these arguments, and incorporate training and development into the model.

Collins and Smith (2006:122) have found that 'commitment-based' human resource practices facilitate social climates of trust and cooperation, which lead to improved performance. Kaplan and Norton (1996) found that higher education institutions have recognised the need for high-commitment human resource practices, and the necessity for addressing employee's training and development needs. Training and development needs to be driven at a school and faculty level as employees value the effectiveness of these local divisional arrangements in meeting their local teaching and learning needs. Collins and Smith (2006:122) state that this leads to positive customer relations because employees are willing to take more effort and deliver outstanding customer service.

The dental assisting quality management system framework will take cognisance of these identified gaps and will provide for full participation of all staff in any decision-making, team-building, training and human resource development and staff empowerment initiatives.

3.13.3 Quality assurance at institutional level

Quality Assurance (QA) from an education perspective has been described as the internal and external control, monitoring and evaluation mechanism that is used to ensure that the education delivered by higher education institutions is maintained to a high standard (Abukari and Corner, 2010:196). All international participants (n_4=3) indicated that there is a QA policy in place, and that the QA policy is applied. Two South African and two international participants indicated that they saw a need for a QMF to be developed specifically for dental assisting, whilst the remaining one local (n_2=3) and one international participant (n_4=3) indicated uncertainty as to the need for a QMF to be adopted for dental assisting.

University quality assurance departments have been formed with the task of implementing internal quality control procedures, and overseeing and advising on matters such as

validation, programme reviews, student feedback, quality monitoring and external examiners (Lomas, 2007:403). These QA departments have QA officers assigned to them. These departments are also responsible for identifying and disseminating good practices in their universities and these measures are designed to ensure and enhance quality of teaching and learning, administration and institutional governance (Lomas, 2007:404). One South African participant (33%) indicated that they did not have a dedicated faculty based QA officer, whilst the remaining two South African and three international participants indicated that they had these officers in place. The literature calls for the active involvement of quality assurance officers in any educational programme (Nair, 2010:155) and this will be taken into consideration when developing the dental assisting QMF.

3.13.4 Quality assurance circle

Calabrese (2003) states that continuous improvement and the implementation of change is difficult, especially in higher education institutions, because of persistent opposition to change on the part of many academics and administrators. Kettunen (2010:35) concurs that quality circles should comprise of all role-players (internal and external customers) and this may assist in eliminating some of this opposition to change. He also shows that student participation in the quality management and assurance of a higher education programme is essential and non-negotiable. Participants were asked if there was a quality assurance circle in place in the dental assisting programme at their university, and if "yes" then did this quality assurance circle include students? This question was asked in an attempt to ascertain the level of student (customer) involvement in the quality management of the dental assisting programmes investigated. Two local and all three international participants acknowledged that they have quality assurance circles in place, and that students do have representation in this forum. This practice of having QA circles, with student involvement, will be included in the QMF for dental assisting.

3.13.5 Location, facilities and equipment

Participants were asked questions relating to their institutions location, facilities and equipment. These questions were asked in order to ascertain if the environment (geographic, spatial and physical) was conducive to excellence and quality in teaching and learning. All three international and two South African participants indicated that their institutions were located in an ideal location (proximity to transport, safety) whilst the one South African participant (n_2=3) indicated that their institution is not located in an ideal location.

Abukari and Corner (2010:200) argue that the "sources of quality" (factors that lead to the provision of a quality education) include the physical condition and availability of the higher education institutions' resources. Ndirangu and Udoto (2011:210) report that numerous research findings show a significant link between student achievement and the quality of learning facilities provided to support educational programmes. These authors also state that, although difficult to quantify, there is a broad consensus among researchers in education that quality educational facilities have a positive impact on student motivation and achievement, as well as academic staff performance. Ndirangu and Udoto (2011: 211-213) further report that physical infrastructure facilitates innovative teaching and learning, and provides an environment for "thriving intellectual pursuit". In order for any quality improvement to occur the geographic, spatial and physical environments must be conducive to such improvements. All South African (n_2=3) and international (n_4=3) participants were satisfied that their facilities (buildings and equipment) are of an acceptable and suitable standard.

Abukari and Corner (2010:200) argue that other "sources of quality" include the physical location and safety and security of the higher education institutions' resources. Joseph et al. (2005:22) conducted research in a higher education institution in the United States of America and found that students ranked campus safety as being the most important factor in students' perceptions of what makes a quality institution. Other factors, which were rated on a score of 1-15 (with the most important being 15 and the least important being 1) that contributed greatly to students perceptions of quality in higher education were:-

- Location of higher education institution (score – 4.6)
- Clean, spacious, well-equipped classes (score - 4.1)
- Approachable academic staff (score - 4.7)
- Approachable administrative staff (score – 4.6).

Abukari and Corner (2010:201) state that the physical condition, and availability or lack of the higher education institutions resources could be a source of a quality hindrance, and that whilst the staff may be willing to provide a quality education they may be hampered by the lack of resources. The lack of physical infrastructure such as lecture rooms; laboratories; teaching and learning equipment such as data-projectors; and means of transport could negatively affect the effectiveness and efficiency of both academics and administrators. All South African (n_2=3) and international (n_4=3) participants reported that they were satisfied with the physical, structural and pedagogical resources that were made available to them.

3.13.6 Benchmarking

Kettunan (2010:34) reports that benchmarking occurs as part of a comparison phase following a self-evaluation intervention with the intention of improving the quality of education programmes that are offered by institutions. Kettunan (2010:35) cites authors such as York (2002) and Bellingham (2008) who stated that subject benchmarking is part of the systemic review of higher education in many countries, and part of a periodic QA process. Benchmarking can be a useful tool for seeing and accepting the changes that must be made because the higher education institutions activities have been compared with those of other higher education institutions. Benchmarking consists of two components: the search for benchmarks and the search for best practices. Benchmarks consist of quantitative research where statistics and other information is important, whilst best-practices benchmarking consists of the self-evaluation of competencies and activities (Kettunan, 2010:36).

The South African UoT's were asked if they had benchmarked themselves against other UoT's locally and internationally, in keeping with the principles of quality assurance and quality promotion. Benchmarking is essential in any QMF as it allows for an institution to align itself to national and international best practices and standards (Kettunan, 2010:34). Two-thirds of the local participants indicated that their institutions had benchmarked themselves both nationally and internationally, whilst none of the international participants had undertaken any benchmarking exercises. At a South African level this degree of benchmarking is encouraging, and the need for such benchmarking to occur on a regular basis will form part of the dental assisting QMF.

3.13.7 Curriculum design, content and organisation

Curriculum design, content and organisation are vital aspects in ensuring that the quality of dental assisting education improves. A curriculum design that encourages and promotes quality is mandatory, with Houston (2008:66) stating that all three aspects (curriculum design, content and organisation) are critical to quality improvement efforts. The content of curricula materials across all disciplines of higher education institutions needs to be structured in such a way that it meet the needs of the students and those of internal and external customers (Abukari and Corner, 2010:219). These internal and external customers of education are identified by Houston (2008: 63-67) and are illustrated in Figure 9. All these different customers work together with the aim of providing, or purchasing, a product. In the case of the student the product will be an education. Houston (2008: 63-67) illustrates that these customers of education provide a product to society, that is an educated citizen, the state (government) and the global market. He shows that curriculum design, content and organisation needs to meet the requirements of both internal and external customers of higher education.

In order for changes to occur in curriculum design, content and organisation, a transformative approach and process needs to occur at a number of levels (Venkatraman; 2007:97). Lomas (2007: 404) concurs that a transformative approach to ensuring quality would occur at three levels: subject level, institutional level and at individual lecturer level. At the individual lecturer level, quality enhancement would occur through the strengthening, augmenting, boosting, elevating or improving existing practices. Teaching and learning has always been the domain of academics with each department or faculty organizing their activities in a manner that they find to be appropriate. In higher education poor curriculum design could lead to a quality failure in education programme provision, if the curriculum is not engaging with the relevant learning processes (Venkatraman, 2007:98).

Figure 3.2: The university, its environments and those it serves

SOURCE: Houston, D. 2008. Rethinking quality and improvement in higher education. Quality Assurance in Education, 16 (1):63-67.

Abukari and Corner (2010:195-196) state that the quality of teaching and learning is broadly determined by how this teaching and learning succeeds in meeting the higher education institutions vision and mission. They also state that teaching and learning activities need to be tailored to meet the QA outcomes of higher education. It should be noted that the dental assisting training programme is subjected to the Health Professions' Council of South Africa (HPCSA) professional board accreditation, and that the HPCSA dictates to the dental assisting education provider what they regard as an acceptable standard of education that would allow graduate students of the dental assisting education programme to register with

the professional body in order to obtain registration with the professional body. Veiga et al. (2011:54) state that although QA and accreditation systems have been in operation for a number of years there are limited studies on the effect of these processes on the quality of teaching and learning. Joseph et al. (2005:68) postulate that it is imperative that higher education institutions actively monitor the quality of services that they offer and commit to continuous improvement. The results reveal that there are deficiencies that need to be addressed in order to enhance quality, and cognisance of this will occur in the QMF for dental assisting education.

It is of concern that two South African (and two international institutions are not willing to adopt a national curriculum. This is also of concern when it has been noted that two South African (n_2=3) and no international institutions (n_4=3) have undertaken benchmarking exercises, yet are unwilling to adopt a national curriculum, (in terms of content and curriculum organisation) that could ensure uniformly high standards. The deficiencies identified as a result of asking these questions indicate the need for a quality management system that will eliminate these deficiencies.

3.13.8 Teaching, learning and assessment

Effective teaching, learning and assessment practices are essential to the customers (students) of higher education, and many students are concerned with these three areas. These students view the quality of the education, and the provider, through an appraisal of these three factors (Houston; 2008:65). The results of the preliminary study reveal that two South African and two international institutions monitor the effectiveness of their teaching, learning and assessment (TLA) practices through a review of pass/fail rates and also use student/peer and lecturer evaluations. One South African (n_2=3) and one international institution (n_4=3) based the effectiveness of their TLA practices on the number of students achieving distinctions and marks in higher percentage brackets.

Brown (2011:197) states that the effectiveness of teaching, learning and assessment needs to be monitored to ensure quality improvement. He also states that efforts need to be directed to improving the standards of teaching, learning and assessment through innovative pedagogical practices. Brown (2011) also recognised the importance of foregrounding teaching and learning as a QA measure, and proposed that universities focus more closely on

ensuring that lecturers have the capacity to teach effectively, or be afforded the opportunity to be trained in pedagogical methods. Employees have to be afforded the opportunity to empower themselves through workshop, conference and course attendance, and this is an essential feature of the QMF for dental assisting.

Al-Issa and Sulieman (2007:68) argue that students, and especially freshmen (first-entry students) do not have the knowledge or experience to evaluate the multi-dimensionality of teaching, and that students ratings of lecturers are often influenced by non-instructional factors, for example, lenience, physical attributes etc. The dental assisting QMF will recognise the argument that student evaluation is influenced by non-structural factors, and that this is an ineffective system, and proposes the use of a performance management system (PMS) to assess the quality of teaching in the one-year duration dental assisting education programme.

3.13.9 Student support and guidance

Participants were asked questions pertaining to whether staff and student views are taken into account by management. Participants were also asked about the provision of administrative support, as well as the provision of support and guidance to students. Two local participants reported that their views were not solicited by management. Student input was considered to a large extent by all local (n_2=3) and international (n_4=3) participants. There is a need for adequate support from staff and students in order to ensure customer satisfaction, and quality improvement (Mukhopadhyay, 2005:127).

Joseph et al. (2005:69) states that higher education institutions spend large sums on the recruitment of students and also lose a sizeable percentage of these students. He also says that research indicates that while the cost of recruiting students may be several times the cost of retaining them, many higher education institutions administrators do not fully engage with student retention and student dropout reduction efforts. By actively monitoring the expectations, needs and preferences of students' higher education institutions can design and offer appropriate student guidance and student support systems that could increase student retention and decrease student dropout rates. Therefore it is critical for management of higher education institutions to take into account students' views, in order to ascertain whether there are service gaps in the expectations that exist between the service provider and

the receivers of the service across the spectrum of higher education institution services, both academic and administrative (Joseph et al., 2005:69). The results of the survey, as indicated in Appendix 8 (page 147), and discussed above indicate shortcomings in these areas, and these will be addressed in the dental assisting QMF.

3.13.10 Learning resources

The provision of learning resources could have a positive effect on pass rates (Ndirangu and Udoto, 2011:217). The lack of adequate library resources could negatively impact on the university's ability to perform consistently at a high standard. All South African (n_2=3) and international participants (n_4=3) indicated that there a handbook for the programme and that there are course descriptions informing students of the regulations and requirements. Two local (n_2=3) and all international institutions (n_4=3) have developed a dental assisting-specific range of teaching and learning resources.

Ndirangu and Udoto (2011:217) state that university library and information resources are crucial in supporting teaching, learning and research, and that the quality of library services needs to be discussed under three sub-headings:

- Quality of books and online resources
- Quality of support services
- Quality of the learning environment

The quality of support services and the quality of the learning environment is discussed separately in this study. The quality of books and online resources in not part of this study, however, adequate provision of library and information resources is necessary for effective teaching and learning to take place, and for academic staff to ensure that effective delivery of the curriculum to their students occurs (Ndirangu and Udoto, 2011:217). The lack of adequate library resources could negatively impact on the university's ability to perform consistently at high standards. The results reflected in Appendix 8 (page 147) indicate some deficiencies in learning resource provision, and these will be addressed in the QMF development. \

3.13.11 Quality assurance and enhancement

It is essential that service providers fully embrace the concepts of TQM and QMF implementation in order to ensure its successful implementation (Nair, 2010:147). When asked "Will you implement a QMF if one is developed especially for dental assisting?" one South African and two international participants responded positively that they would, whilst the remaining two local and one international participant indicated uncertainty. The implementation of a QMF can be successfully undertaken, and this can be assured in a variety of ways – from top management buy-in through to the provision of information and training sessions for lower management level and ground-level staff (Morley, 2003:67). Two local (n_2=3) and one international participant (n_4=3) identified management resistance as a possible barrier in QMF implementation, and only one local participant (n_2=3) identified dental assisting programme staff as a possible source of resistance. None of the local (n_2=3) or international institutions (n_4=3) identified student resistance as a factor in QMF implementation.

When asked what obstacles to QMF implementation were envisaged at a personal level all local (n_2=3) and one international participant (n_4=3) indicated workload; two local and no international participants (n_4=3) indicated time, and two local and one international participant (n_4=3) expressed concern about staff numbers. One local and one international participant indicated that student numbers were an obstacle, and no participant suggested a lack in their personal capacity. The developed QMF will address these concerns through the provision of education to staff and by ensuring senior management buy-in. These factors will form part of the implementation strategy of the dental assisting QMF.

The developed framework will also address these concerns through the provision of education to staff, and by ensuring senior management buy-in. The dental assisting QMF also calls for senior management to be the drivers of the QMF.

3.13.12 External evaluation

A critical part of any quality management model is the use of external consultants and auditors to review the QMF, and to make suggestions and criticisms of existing practices, with a view to improving them (Jie and Idris, 2009:7). Participants were asked questions pertaining to the use of external examiners, moderators and alumni in order to determine the extent of use of such persons in QA practices. Two of the local (n_2=3) and one international participant (n_4=3) indicated that they did not make use of external examiners and moderators in tests and examinations, nor in the conducting of quality inspection visits. External examiners are appointed by being head-hunted in two local and one of the international institutions. One local (n_2=3) and two international institutions (n_4=3) were uncertain of how external examiners are appointed. However all local and international institutions indicated that they use past students to provide QA feedback.

Abukari and Corner (2010:199) argue that the quality of programmes can be determined by various methods, including through the use of internal and independent external examiners who evaluate levels, standards of questions, and marking and mark allocation. These external examiners may include national accreditation boards. Joseph et al. (2005:66-67) state that one of the primary concerns with internal evaluation is that outside consultants might be precluded from the quality assurance process. The dental assisting QMF will thus incorporate the use of external moderators and examiners as part of its core structure.

3.14 Identified deficiencies

Following a review of the preliminary work, the following deficiencies and shortcomings have been identified in the quality management of dental assisting education, both in South Africa and internationally:

- Lack of a QMF aimed specifically at addressing the unique needs of dental assisting education provision
- Obsolete and outdated QMF used by certain dental assisting education providers
- Lack of a QMF for the administrative and academic components of dental assisting education provision
- Lack of management support and input
- Lack of training and human resources development

- Lack of quality management officers / facilitators
- Lack of customer (student) involvement and participation in the quality management processes of the dental assisting education programmes
- Lack of appropriate and adequate teaching and learning infrastructure
- Lack of national and international benchmarking
- Need for curriculum reform in design, content and appropriateness
- Need for an appropriate performance management system
- Lack of adequate administrative support for staff and students
- Need to eliminate barriers to the implementation of quality management principles (management / workload / staff levels)

The QMF will seek to address each of the deficiencies highlighted in the preliminary work, the main study, as well as from both the literature reviews.

3.15 Conclusion

The analysis of the quality management knowledge, attitudes and practices of dental assisting education providers, both in South Africa and internationally, indicate a need for a QMF to be developed for dental assisting education provision. Of the twenty international countries analysed only six (30%) have a quality management system in place, of which four are outdated. One country uses TQM; one uses a self-developed QMF; two use the ISO 9001:2008 system; and two utilise the ISO 9002 system. Thus the need for a QMF for dental assisting education is indicated. This study aims to close this identified deficiency by developing a QMF for South African dental assisting education. This framework will seek to address the deficiencies identified by the preliminary study, in an attempt to develop a quality management framework that will lead to an improvement in the quality and standards of dental assisting education in South Africa.

CHAPTER FOUR

Main study

Development of a Quality Management Framework

CHAPTER FOUR

Development of a quality management framework

The introduction of this chapter contextualises the purpose for developing a quality management framework for this study. This takes into consideration the various factors that contributed to the development of the QMF. The Dental Assisting Higher Education Quality Management Framework (DAHE-QMF) that will emerge through this study will be described. This will be followed by descriptions of the proposed implementation and the review process of the DAHE-QMF through the use of performance management tools.

4.1 Background to the development of the quality management framework developed in this study

This section contextualises the purpose for developing a QMF for dental assisting education, as well as the cornerstones upon which the framework is developed are outlined.

Johnson (1993: 2) found that quality management principles, when correctly applied, will result in quality improvement. Widrick et al. (2002:1-8) postulates that the use of a formal QMF would be beneficial to continuous quality improvements. The development of the DAHE framework in this study is based on the deficiencies identified by the preliminary work, which indicated that there was no specific QMF especially designed for use in dental assisting education. From literature, the generic TQM and QM models and frameworks that existed needed to be modified in order to become suitable for implementation within the dental assisting higher education structure of South Africa. Therefore, this study proposes the development of a unique quality management framework which, with suitable contextual adjustments and modifications, can be applied to dental assisting higher education programmes across South Africa, and even world-wide. The framework draws upon the intellectual cornerstones of TQM, based on Deming's philosophy.

These cornerstones, as cited by Johnson (1993: 6) are:

- Knowledge and understanding of systems
- Knowledge and understanding of psychology (that is, how people respond to motivation)
- The theory of knowledge
- An understanding of the use of statistics and data (so that all decisions and changes are made based on accurate data).

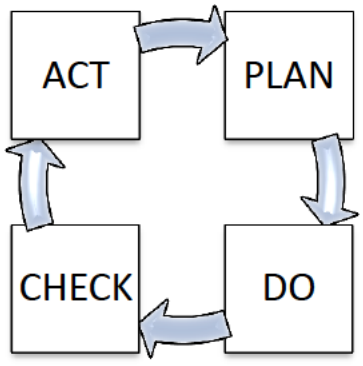
These cornerstones will be the foundation upon which the DAHE-QMF developed in this study will be based.

4.2 Factors contributing to the development of the DAHE-QMF in this study

This section takes into consideration the various factors that contributed to the development of the DAHE-QMF; it discusses the central strategy used, and the fundamental principles that guided the development of the QMF. This section also discusses the vehicles which could be used to implement the DAHE-QMF.

Deming (1986) developed a set of fundamental guiding principles for a customer-focused quality management system (refer to Appendix 2), and adapted these principles to the manufacturing industry in an attempt to ensure that continuous incremental improvements - for example the kaizen approach - occurred (Lindsay, 2010:349). The Plan, Do, Check, Act (PDCA) cycle was developed by Deming (1986) and will be the central strategy used in the QMF that will be developed from this study.

Figure 4.1: PDCA Cycle



Source: Deming, W.E. (1986).

These principles were applied successfully to industry at both a macro-level and a micro-level (Deming, 1986). Based on literature reviewed in chapter two, it is evident that these principles can be adapted to higher education. Moreover, Sahney et al. (2004:153) and Steyn (2000:12) suggest that the PDCA cycle needs to be implemented in the institution at both macro-level and micro-level. Therefore, at a macro-level, the implementation of the developed QMF will involve strategic and operational planning and management processes and, at the micro-level, implementation of the developed QMF will occur during programme accreditation reviews, programme quality reviews, and at all opportunities that avail themselves to the possible implementation of any quality improvement initiatives.

Spanbauer (1993:525) is of the view that the operational plans of management (macro-level) and all the departments and divisions (micro-level) in the institutions should aim to encourage inter-department collaboration and participation as they work towards a common vision and mission in developing and implementing a QMF. This is corroborated by Stensaasen (1995:587) who proposes that the barriers that exist between departments should be reduced or eliminated in order to enhance quality improvement in higher education institutions.

This DAHE-QMF proposes that another vehicle that could be employed to implement the PDCA cycle is the advisory board. Advisory boards should be made up of institutional employees, industry and alumni (Mahapatra and Khan (2007:207-211). These boards could play a key role in quality improvement in the developed QMF. The Health Foundation (2010:33) found that advisory boards often have a 'helicopter view' of the education programme, and that they share responsibility for management and quality improvement. Advisory boards are altruistic by nature, and they should work towards improving quality and ensuring that this occurs, as they are not hindered by other strategic objectives such as the implementation of cost-cutting measures. Such measures could include, for example, reducing equipment purchases or increased lecturer-student ratios. They can provide vital input to the dental assisting programmes on a range of issues such as reviewing current industry standards and postulating on future industry requirements. They also advise on possible quality improvements in management; administration; curriculum development and teaching, learning and assessment methods (Mahapatra and Khan, 2007: 207-211). The researcher suggests that this could ensure that current industry requirements, skills and trends are considered and implemented in the training provided.

4.3 The development of the DAHE-QMF for this study

This section outlines the four phases for the development of the framework. An analysis of the data obtained from both the pilot and the preliminary questionnaires identified certain deficiencies in the quality management of the dental assisting education programmes. These deficiencies will also be presented and have been considered in the development of the framework.

The work of Deming (1986) and of Srikanthan and Dalrymple (2005:74-80) were used as a basis for the development of the QMF in this study. The development of the framework occurred in, the following phases:-

- Review of the literature
- Field survey
- Development of the QMF
- Presentation of the developed framework

A comprehensive review of the literature, as well as the deficiencies identified in the preliminary work, as indicated in chapter three of the study, informed the development of the framework. Prior to the development of the framework the researcher, via a review of both the pilot and preliminary questionnaires, performed an analysis of inputs (human resources, capital, buildings, teaching equipment, learning resources), processes (curriculum development; teaching, learning and assessment practices), outputs (qualified students, improved pass rates, improved quality practices), and customers (students, employers, the state).

This analysis provided the study with the necessary data that enabled the recognition of potential deficiencies within the process system, which could have significant consequences for dental assisting education. Some of the more common deficiencies that have been identified from an analysis of both the preliminary and pilot questionnaires include:-

- The absence of a QMF for dental assisting
- A lack of management support for the proposed implementation of a QMF
- A lack of employees buy-in to the implementation of a QMF.

Each of the identified deficiencies was considered, and a proposed solution was designed and incorporated into the developed framework. This proposed framework will be a non-prescriptive framework based on four (4) criteria, which will be discussed later in the study, and on eight (8) fundamental guiding principles, as outlined below. In the developed QMF these serve as the foundation pillars and the relationship of these guiding principles is illustrated in Figure 11. These eight guidelines have been adopted and adapted from the ISO 9000:000 standards, and have been adapted to suit the South African dental assisting higher education sector. The proposed framework is dynamic, and takes into account the unique institutional, student and employee diversity and challenges faced by the four Universities of Technology that offer the dental assisting programme.

Figure 4.2: Fundamental guiding principles for the DAHE-QMF.

DAHE-QMF
1. Process Management
2. Customer focus and satisfaction
3. Continuous improvement
4. Total employee involvement and empowerment
5. Corporation teamwork and a systems approach
6. Feedback Mechanisms / PDCA
7. Data-based decision-making
8. Quality chain reaction

Source: Developed by the researcher.

Each of these eight fundamental guiding principles will be discussed in detail below.

4.3.1 Process management

This section discusses the value of process management, and its effects on quality improvement.

All activities of the higher education institution managed as processes should add value to both internal and external customers (Spanbauer, 1995:522). Srikanthan and Dalrymple (2005:80) state that service delivery revolves around designing and improving processes, and the setting up of supporting structures to manage them. In order for this to occur, suitable structures must be put into place. These would include structures such as management, training and other policies such as teaching and learning policies and finance and funding policies; physical instructional changes; and the provision of psychological services to assist in mind-set changes (such as change management services). Owlia and Aspinwall (1998:105) identified seven educational processes which affect quality in a higher education institution. These are:-

- Design of programmes of study
- Delivery and management of programmes of study
- Assessment of students
- Service support of programmes of study
- Guidance and support of students
- Admissions and entrance standards
- Recruitment, appraisal and development of employees

An analysis of the data from both the preliminary and pilot questionnaires, as outlined in chapter three, revealed deficiencies in the seven educational processes that affect the quality of education. The DAHE-QMF will seek to ensure that these deficiencies are addressed, and that the type of relationships between the processes and the effect of this relationship on quality is conducive to continuous quality improvement. The researcher proposes doing this through the use of a three-point scale representing - “strong,” “medium,” “weak” - as suggested by Welsh and Day (2002:19) that would be utilised by all employees, at predetermined intervals. Welsh and Day (2002:19) state that this will allow for a review and understanding of the current perception of the quality situation within the higher education institution in the areas of the seven education processes that have been previously mentioned.

Initially this would occur on a quarterly basis, as recommended by Welsh and Day (2002:20-21) and progressing to bi-annual reviews after the first year of implementation of the DAHE-QMF. This would occur within the different sections and sub-sections of higher education institutions to assess the differing quality levels within each process. The statistics and data received from these results will inform the basis for further continuous improvement of quality improvement actions.

4.3.2 Customer focus and satisfaction

This section discusses the role of customer satisfaction in the quality improvement process in dental assisting education programmes.

Spanbauer (1995:520) postulates that all efforts by the role-players should be directed towards one goal which is customer satisfaction. Thus it is vital to utilise number of different types of quality improvement strategies in the DAHE-QMF. The goal of customer satisfaction was deemed to be the driving force in the development of the DAHE-QMF as it was deemed that all quality improvement measures be directed at improving customer service satisfaction levels. These improvements may be either incremental (evolution), stabilising (the reduction or elimination of defects), or breakthrough (jump start) in their application; and when used individually or in combination can lead to improvements in the quality of customer service. It is often the role of management to initiate these improvements, and for all role-players to actively participate, contribute and strive to fulfil these quality improvement efforts (Spanbauer, 1995:522).

In considering the review above and the data from the questionnaires, there is limited participation by ground level higher education employees in management structures and processes (as noted in chapter three), and hence the DAHE-QMF requires that all customers (internal and external) participate in decision-making through structures such as quality circles (discussed later in the chapter).

Customers are acutely aware of their pivotal role, and effect, in quality improvement, and Anderson (2006:161-164) suggests that the failure to include all customers in quality improvement decision-making could lead to negative outcomes when the quality improvement measure is implemented, due to a lack of commitment to the quality

improvement measure by lower-level employees who were not included in the decision-making process and those who feel aggrieved.

4.3.3 Continuous improvement

This section discusses the role of continuous improvement in the quality improvement process in dental assisting education programmes.

Lindsay (2010:349) writes about the Japanese term "kaizen" meaning as previously explained gradual and never-ending improvement in all aspects of life, and explains that this involves a series of small-step improvements on existing processes and/or systems by all those personnel involved in utilising these processes and/or systems. The DAHE-QMF proposes that continuous quality improvement occurs by ensuring total customer involvement. This is outlined in the following section.

4.3.4 Total employee involvement

This section discusses the need for total employee involvement and outlines how by educating, and thus enabling employees, they could contribute to the goal of continuous improvement in dental assisting education.

Stensaasen (1995:590) insists that it is everybody's responsibility to improve quality in HEI's. Spanbauer (1995:590) postulates that lasting and significant changes will not occur unless all HEI's employees are directly and actively involved in bringing about the desired changes that facilitate improved quality. Furthermore, he mentions that all role-players need to ensure that they actively fulfil their roles in order to continuously identify areas within their scope of practice where they could improve, and take the necessary steps to ensure that this information is brought to management's attention so that it could be evaluated and implemented.

Srikanthan and Dalrymple (2005:74) mention that whilst middle and upper management initiate change, ground-level role-players make a valuable contribution to improving quality within the organisation. For this study, all role-players in all departments of the higher education institution will be included and empowered in terms of training which will be

provided for in the QMF that is being developed in this study, so that they all can make a positive contribution to improving quality within South African higher education institutions.

Spanbauer (1995:527) found that, in any quality HEI, employees are the most important resource, and that they should receive maximum training in order to empower themselves to contribute to the improvement of the quality of the institution. Stensaasen (1995:589) is of the view that empowered employees tend to become more productive, efficient and effective in their work. This is corroborated by the UNICEF Report (2000:17) which recognises the need for, and importance of, effective human resource training in a quality conscious system so that every employee will be able to understand their role as, and act as, quality control experts and initiators of quality improvement and change.

The data obtained from the questionnaires in this study showed deficiencies in dental assisting employees as being able to access training, conference attendance and other empowerment initiatives (refer to Appendix 8). Hence this framework acknowledges the importance of self-empowerment, and seeks to ensure that all role-players are provided with adequate information, training opportunities, tools and equipment, technology responsibility, financial support, and time to support such empowerment. This is evident in the didactics component of the DAHE-QMF which calls for the continuous professional development of employees and for management to facilitate such improvement efforts. The training towards empowering employees could occur within the organisation or through external experts/consultants. These external training experts/consultants may be required to provide specialised training in areas such as problem-solving techniques, statistical analysis, and team building.

4.3.5 Systems approach and teamwork

This section discusses the role of systems teamwork and its importance to internal and external customers. It also looks at the use of the systems approach in quality improvement in higher education institutions.

Johnson (1993:6) describes a system as being a network of functions or activities within an organisation that work together towards a shared goal. In higher education the various components within an institution, such as administration, the academic sector, and the student

support sector make up the education system. The UNICEF Report (2007:17) notes that for employees to understand the mission and vision of their institution and their work unit goals, they need to become experts in all flows and work processes within the system. Johnson (1993: 8) mentions that all members within the system (HEI) must continuously expand their knowledge of the structure and functioning of the system and how work flows between these sub-systems. Employees also need to understand and appreciate that the quality of their work affects internal and external customers. They also need to learn how to be part of the quality circle and how to effectively work as part of a team; how to motivate others to improve quality; and how to use statistics and data to identify areas within the workplace that may require quality improvement. Employees in a system must continuously develop their knowledge of their jobs, and of how they may improve their work processes, which is noted as Deming's philosophy of profound knowledge (Johnson, 1993: 8). The UNICEF Report (2000: 16) suggests that whilst diversity is a key component of any attempt to improve quality within the organisation, it also accepts the systems approach, which states that interaction is critical to achieving synergy.

It can be gleaned from the literature above that all the role-players will need to have an understanding of how the other members operate within their sub-systems, and this will lead to an enhanced understanding of the holistic nature of the educational institution. This will allow for the opportunity of providing alignment of beliefs and lead to an understanding of the interdependence of the different sub-systems which make up the higher education system.

The DAHE-QMF takes into consideration that the various role-players possess vast knowledge about how these systems operate. Collectively, all role-players must become competent and knowledgeable in all fields, and by utilising this advanced knowledge gained from experience within their sub-system, and projecting this knowledge onto others, all role-players become competent and are able to effectively undertake roles within all sub-system competently and in a quality assured manner. Therefore, this knowledge can be harnessed to, and for, the benefit of internal and external customers and as part of service provision.

4.3.6 Feedback mechanisms

This section discusses the use of feedback mechanism (feedback loops) to ensure quality improvement. The role of the PDCA learning cycle in the DAHE-QMF will also be discussed.

The UNICEF Report states that a feedback mechanism (feedback loop) is necessary to ensure that the quality improvement data and quality improvements that have been suggested via the quality evaluation needs to be filtered to those employees at the ground level. This will afford ground-level employees the opportunity of using this information to suggest, and institute further quality improvement initiatives as they will also be in a position to provide management with information, suggestions and further data (feedback) that could lead to additional quality improvements. This is known as the feedback cycle (UNICEF, 2000: 16-17).

The DAHE-QMF acknowledges that feedback loops are fundamental to continuous improvement, and that the higher education institutions could use feedback methods, statistics, data, work analysis, and surveys as a learning mechanism to improve their practices. The feedback loop in the DAHE-QMF occurs through the Plan-Check-Do-Act (PCDA) cycle, and is described in the next sections.

4.3.6.1 Plan

Deming wrote that planning is the foundation of the whole cycle of quality management (Johnson, 1993:36). The framework developed in this study appreciates the importance of including the planning process within the design and implementation of the QMF. It also notes that planning should also be initiated from the ground level, and should not be directed by senior or executive management only. Hoyle (2007:37) wrote that leaders exist at all levels in an organisation, and not only at the top. He further writes that leaders at all levels share the same customer-focus, and that a failure to include low-level workers in decision-making structures could lead to an unhappy, demotivated and dissatisfied workforce. This could result in the failure of any quality improvement initiative. Decisions that stand the test of time and that are more successfully implemented are those that have been made by those employees who are most directly affected by the decision. These are the ground-level employees. This is because these ground-level employees accept ownership and

responsibility of the decision to solve the problem, and focus on creating value for their customers and derive satisfaction from their work.

This QMF calls for those who are employed at ground-level, and who are directly involved in the higher education processes and sub-systems, to play an active role in any planning process as it is ultimately they would be expected to fulfil these plans. Ideally, such planning should be done utilising a team-based approach, and should later be escalated to management for consideration, adaptation and implementation, this is consistent with Hoyle (2007:38).

4.3.6.2 Do

Srikanthan and Dalrymple (2005:77-80) state that at the onset, a pilot-phase quality implementation process should take place on a small-scale, within a few departments, and be assessed, refined, redesigned and then re-implemented on a wider scale or even abandoned. The DAHE-QMF provides that, once plans are formulated, they would be carried out on a trial basis, and during this pilot-phase, constant monitoring would be undertaken, data collected and comparisons made against the desired outcomes. If required, the piloted QMF would be adjusted, redesigned, or abandoned in an attempt to achieve the desired outcomes. Any quality improvement initiative should utilise a quality management framework as part of a quality improvement plan (ISO 9000:000). The quality management initiative should then be implemented according to the QMF. The process of implementing the QMF using the five-phase approach, and of evaluating the QMF using the various evaluation tools is outlined in the following sections.

4.3.6.3 Check

On completion of the pilot programme, an evaluation of the QMF needs to be conducted. This evaluation of a QMF requires an examination and critical analysis of the results achieved from data-analysis of the evaluation. This suggestion is in accordance with Johnson, (1993:36). For this study, results will include quantitative data, and qualitative feedback from the role players at ground-level. Johnson (1993:37) supports the idea that the data should be measured and checked against pre-established desired outcomes to ascertain whether the quality improvement intervention has had any impact on quality improvement, and whether expectations were met. He further writes that, after these assessments have been

done, a decision has to be made whether to revisit planning or to implement the quality initiative on a wider scale. Thus, DAHE-QMF would be implemented using the five-phase approach, and the effects of the pilot programme on other sub-systems will also be assessed to ensure that these changes do not outweigh any benefits.

4.3.6.4 Act

When it has been decided to implement the developed QMF, there may be minor changes that need to be made to components of the framework in order to adapt it to the HEI, based on an analysis of the data collected and the individual needs of the HEI. Thereafter the plan (framework) is implemented and regularly evaluated and monitored by the collection of statistics and other data in order to ensure that quality improvements occur constantly and consistently.

4.3.7 Data-based decision making

Effective decisions are based on an analysis of data and information (Hoyle, 2007:31). This data is obtained scientifically and needs to be reliable and valid. These facts are then used to make informed, objective and factual decisions, which will be used in planning any quality improvement initiative. An example of this data driven decision making process would be where employees inform management, via a data-collection instrument (questionnaire) that they are not adequately trained in certain areas. Management can then, based on this data, provide the necessary training courses, and in so doing achieve the aim of increased productivity and improved quality. This section discusses the role, and effect of how data-based decision-making can contribute to quality improvement in the DAHE-QMF. In this study these data-based decisions will be made by senior management, with low-level employee and management input, in order to improve quality in the dental assisting higher education programmes. Holly (2007:43) writes that a factual approach, rather than an emotional or opinionated approach, leads to improved decision-making.

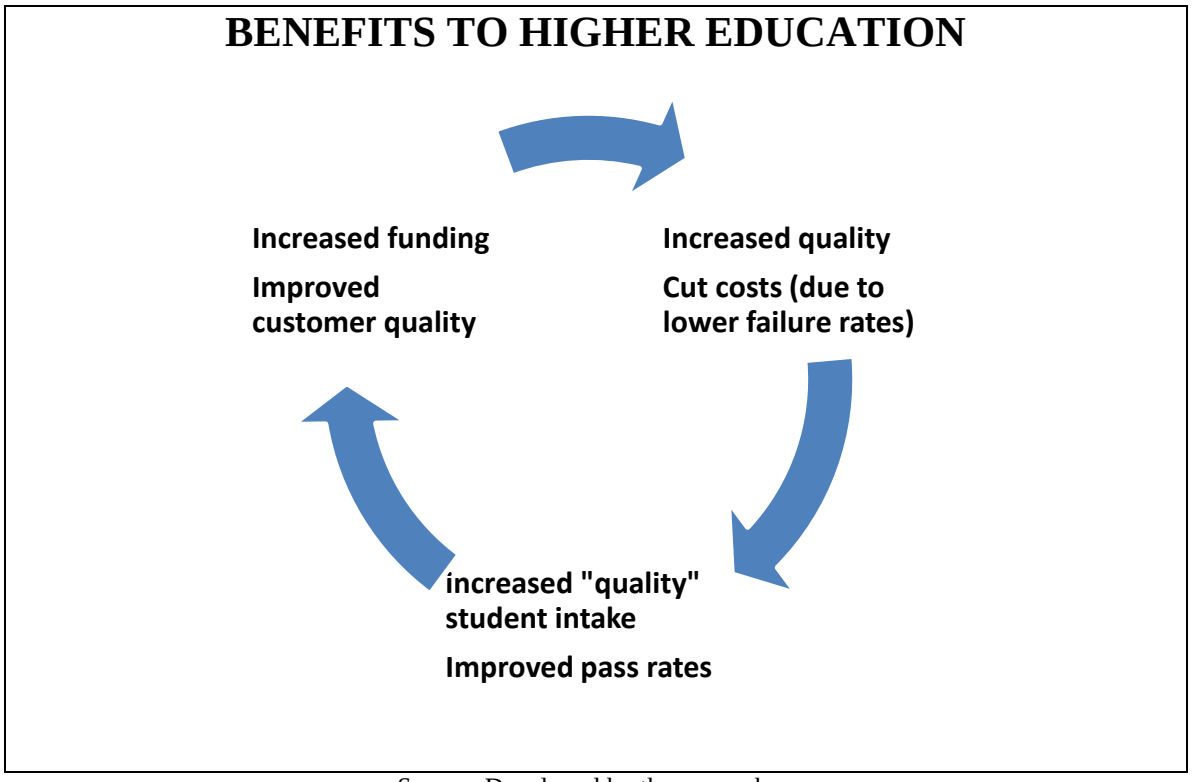
Spanbauer (1995:526) mentions that in order to monitor quality in a higher education institution, the use of meaningful, appropriate and correct data is essential for subsequent decision-making. He states that the data collected needs to determine and document customer's needs and expectations as to what a quality HEI is. Hence, the DAHE-QMF is

based on the understanding that planning is fundamental to organising and prioritising any action aimed towards quality improvement, and that planning should act as a guide to data-centric decision-making. The DAHE-QMF does, however, take cognizance that there are variations in understanding and in the capabilities of people, and that the decisions which are guided by facts should take into account these variations, so that ultimately all employees can work together to bring about incremental or continuous quality improvement.

4.3.8 Quality chain reaction

This section discusses the role of, and advantages of, the quality chain in quality improvement. Deming (1986) explained a quality chain reaction in a business enterprise as being when a focus is placed on quality and quality then improves, and customer satisfaction improves. This increased customer satisfaction results in better market share and organisations can lower prices. Deming states that this is external to the organisation and is what is viewed by the world. Furthermore, if quality improves internally then productivity increases because of fewer defects, and as productivity increases the costs goes down. This leads to reduced costs and reduced prices – the net effect being increased profits. The cause-and-effect relationship of improved quality can be transferred to higher education, wherein, as Johnson (1993:12) postulates, any improvement in quality has great ramifications for the higher education institution, as poor quality could have various direct and indirect costs. Direct costs include, amongst others, ineffective teaching, wasted effort on projects that are not completed, wrong decisions made and irate customers. In this study it is perceived that improved quality will see a reduction, or elimination of these direct and indirect costs, with the resultant effect of satisfied customers and less defects (such as failures amongst students). This will lead to improved funding (due to the subsidies earned for students who pass within the minimum throughput time), thus leading to more funds being made available for improved resource allocation. Some of the benefits of improved quality (quality chain) are illustrated in Figure 12:

Figure 4.3: Quality Chain Reaction



Source: Developed by the researcher.

Kleijnan et al. (2011:142-144) concur that an increase in the level of quality of an education programme could lead to an improvement in the number of students passing in the minimum required time (throughput). The researcher suggests that this will lead to a reduction in financial cost to the institution, as they would receive more income in the form of state subsidies. Institution costs would be reduced as they would have smaller numbers of failed students who do not attract a subsidy or only pay a portion of the fee for the academic year. By having fewer repeat students in the class, the institution can enrol more first entry students, and they may be able to attract and select students with higher marks as students would want to study at an institution that is perceived as offering a quality education.

Kleijnan et al. (2011:142-144) reports that these students are likely to be high-performers and the pass rates are likely to further improve, leading to increased state funding, which could be used to further improve the quality of education and of customer quality service delivery.

4.4 Components of the DAHE-QMF

This section outlines the components of the DAHE-QMF, and provides a discussion of each component. This discussion is supported by the use of literature, and seeks to illustrate the co-relationship between the individual components of the DAHE-QMF and the quality management of South African dental assisting education.

A review of the literature reveals that there are various internal and external influences on quality in higher education in South Africa. This study aimed at contextualising these influences by thematically grouping them into various components, then reviewing each component to identify quality improvements responding to the deficiencies identified in both the pilot and preliminary questionnaires (see appendix 8, page 147). Additionally, these thematic areas will be influenced by the eight fundamental principles that were discussed earlier in this chapter, as well as having been influenced overall by Deming's cycle. Individual component measures instituted to improve quality using these components will be described. Macy et al. (1998:33) proposes three broad thematic areas which, if subjected to quality improvement measures, will result in improved quality in higher education institutions. These three thematic areas are: human resources, administration and management, and infrastructure and curriculum. This study adopted and altered these components, and added a fourth component. Thus, the four components that make up the DAHE-QMF are: stakeholders, information management, infrastructure and didactics. These four components were also selected as they were found to be similar to those found in the EduQUAL quality improvement measurement tool, which is a tool that was developed by Mahapatra and Khan (2007). The EduQUAL tool is a composite tool made up of an amalgamation of the various quality measurement tools that were designed by various authors such as Aspinwall (1998), Owlia and Aspinwall (1998), Scheerens and Baker (1997), Redfern (1980), Horne and Pierce (1996), Harvey and Knight (1996) and Trethowan (1987). These studies incorporated these four areas in the development of the DAHE-QMF as the major quality improvement components and are described in the following sections.

4.4.1 Stakeholders

Customer focus, leadership and teamwork make up the three sub-components of the category stakeholders. These sub-components were selected due to the key role that they play in the

routine operations of an institution and were informed by Mahapatra and Khan, (2007: 3); Srikanthan and Dalrymple, (2005:77-80) and Macy et al., (1998:33) and are discussed below.

4.4.1.1 Customer focus

Srikanthan and Dalrymple (2005:77-79) argue that appropriate student-centred methods should be employed to encourage active student participation. All customers (stakeholders), both internal and external, should be briefed on the characteristics and methods of the QMF, and their active participation and buy-in sought. The use of students in quality circles, which was noted as being minimal in the South African dental assisting education provider institutions surveyed in the preliminary study, is also to be encouraged in the DAHE-QMF.

People are the foundation of any higher education institution, be they employees, students, visitors or even society in general (Scott and Palmer, 2007:34). Pfeffer (1998) and Collins and Smith (2006) have consistently demonstrated the link between organisational success and human resources. Johnson (1993: 7) mentions that the ability of any organisation to achieve higher levels of quality depends on the willingness of employees to perform at a high-level. The link between people (human resources) and the quality management of dental education in South Africa, as proposed by Nair (2010:144-146) is one that has been identified by the researcher as being of importance to the DAHE-QMF. The DAHE-QMF recognises that South Africa has unique population composition, and calls for this diversity to be taken into account to ensure that the multi-cultural mix is considered in the recruitment of both employees and students.

Students entering into the dental assisting programme should be healthy, in order to be able to comply with the physical demands of the profession. It should be noted that disabled students should not be unfairly discriminated against – provided that the nature of their disability allows them to successfully undertake their assigned tasks, and should be given the means to remain healthy. This can be done through the provision of a comprehensive medical and psychological counselling service for students. Dental assisting employees, be they in an academic or support employees role should be provided with all the necessary psycho-socio support that they may require in order to function efficiently and effectively, and to be always geared to improving quality.

4.4.1.2 Leadership

Stensaasen (1993:588-590) mentions that leadership is about leading people, and that a leader's main role is to "help people do a job better". He states that the educator should consider his/her task as being those of a leader, rather than an instructor, and that everyone has the innate quality of being a leader. The DAHE-QMF notes that leadership is fundamental and essential to the design and implementation of any successful QMF implementation. Therefore, the framework calls for top-level management, middle and lower managerial levels to actively spearhead and participate in the implementation of the DAHE-QMF. An analysis of the data obtained from the preliminary study indicated that there was minimal to no participation by dental assisting programme employees in school, faculty and university (senate) management and decision-making processes. The DAHE-QMF seeks to ensure that, in dental assisting education, this leadership should include participation in decision-making at Faculty, Head of School and programme leader management level, so as to ensure that the model is fully supported, and its viability and success is ensured.

4.4.1.3 Teamwork

Stensaasen (1995:587) mentions that ways to foster cooperation between departments should be found, and that departments should work as teams with each other, and cooperate to solve problems. The DAHE-QMF takes cognisance of the importance of teamwork as one of the foundations of QM, and calls for the relevant role-players within the dental assisting education fraternity to participate actively, and as a team, so that the quality of dental assisting education could improve continuously and incrementally, in keeping with the kaizen approach.

4.4.2 Information management

The EduQUAL quality measurement tool lists a number of components that are related to higher education institutions; administration, management and the use of statistics and data as being essential to improving quality in education. The DAHE-QMF grouped the various administration and data collection and analysis activities in the major thematic group of 'information management'. The three sub-components of information management are administration, statistics and data management, and are discussed in the sections that follow.

4.4.2.1 Administration

The UNICEF Report (2000:13) reports that high quality administrative support and leadership is essential in any higher education institution's processes for both internal customers (students and lecturers), as well as external customers (employers and the State). Organisational support by administration employees is often an important factor to the success or failure of any QMF, as very often the first line of resistance may come from the support sector, which may see itself as being side-lined or ignored by management. These administrative support employees may feel that they are being burdened with more documentation and bureaucratic paperwork. This lack of support for the framework may prove to be an obstacle to the implementation of the DAHE-QMF, or to the successful implementation of any quality initiatives. The DAHE-QMF therefore calls for all administrative support employees, and especially the leadership of such employees, to receive training in the implementation of the QMF, as well as to receive continuous professional development and training so that they too, could become active participants in the quality improvement processes of the higher education institution. The support employees should also receive training so that they become familiar with pedagogical principles, and therefore would be placed in the position to enhance the outputs.

Stensaasen (1995:589) emphasises that regular, frequent training and retraining of employees is essential in today's rapidly changing world, and employees should be exposed to continuous training so that they can become multi-skilled. The DAHE-QMF therefore calls for administration support employees to become multi-skilled so that they could undertake various administrative support roles, to direct their activities in a manner that would lead to greater improvement in quality rather than causing conflict between the different divisions of higher education institution administration.

4.4.2.2 Institutional data management

Johnson (1993: 9) postulates that evaluation through the use of statistical tools underlies almost every decision-making and problem-solving initiative that may be undertaken to improve quality. The DAHE-QMF relies heavily on the participation of every member of the higher institution community, including both internal and external customers, to participate in any decision-making processes. These decisions, be they on a strategic scale or driven at a particular service point, must be data driven. Thus, the data that is made available to the

university community by stakeholders needs to be current, reliable and relevant. The DAHE-QMF requires that an institutional data management unit be created to ensure the efficient and effective collection, management and interpretation of meaningful data (statistics) as a quality improvement management tool. This data must be made available in an appropriate and suitable manner to all the necessary stakeholders so that they can make data-centric informed decisions.

4.4.2.3 Statistics

In order to provide reliable data the proposed data management unit needs to have an array of suitable primary data sources. Dolmans et al. (2003:211) argue that to ensure quality improvement the data collected must be systematic, structured and come from an array of sources (internal and external customers). Such sources could include the student admission department (for numbers of applicants, suitability of these applicants), and the student records department (number of students per course, their religion or gender). The student management system (SMS), the system used by higher education institutions to manage student registration, information and assessment results, is a valuable source of statistical information for an array of data such as pass/fail trends analysis. The Finance Departments in the institutions could provide valuable financial statistics that would guide management in its facilities and human resource allocation budget decisions. The DAHE-QMF recommends the appointment of a statistician to advise the institution on the quality and type of statistical data that would be required to make meaningful quality improvement decisions. Additionally the statistician could set up the necessary data-capturing processes and systems.

4.4.3 Infrastructure

The EduQUAL quality measurement tool lists a number of components that are related to higher education institutions infrastructure, such as furniture and equipment, buildings, teaching equipment and transport facilities as being essential to improving quality in education. In the DAHE-QMF the various infrastructural components are grouped in the major thematic group ‘infrastructure’. The three sub-components of infrastructure are tools, equipment and facilities, and are discussed in the sections that follow. The following sections expand on the various infrastructural requirements for ensuring that a dental assisting programme be managed effectively.

4.4.3.1 Tools

In order to improve quality, students and employees should be provided with the necessary tools for teaching and learning, such as computers, textbooks, audio-visual and multimedia equipment and resources, practical laboratories and dental equipment, so that they can engage in appropriate, effective and efficient learning. The DAHE-QMF requires that a review of these tools occurs periodically and that new tools be purchased as and when the need arises.

4.4.3.2 Equipment

Dentistry is a dynamic field, and dental surgery equipment that is aligned to current technology, albeit expensive, should be constantly procured to ensure that teaching and learning is current and relevant. Additionally, sufficient quantities of safe and appropriate dental materials and equipment such as Personal Protective Equipment (PPE) should be available to ensure that the health and safety of students is maintained. This will include items such as safety goggles and latex gloves. The DAHE-QMF requires that appropriate equipment be made available to ensure that quality teaching and learning can occur.

4.4.3.3 Facilities

The UNICEF Report (2000: 7) shows that positive learning outcomes occur in quality learning environments. These environments are physical and psychosocial. Physical environments such as buildings, infrastructure, furniture, equipment, water and sanitation, class size, lecturer-student ratios, availability of computer laboratories should be of the highest standard possible. Senior management should allocate the necessary resources to allow for the procurement of such resources. Psychosocial elements such as a safe environment that is conducive to learning, and the availability of career guidance and social-welfare services should also be made available so as to promote improved quality in the teaching and learning.

A third area that the DAHE-QMF requires pertains to the facilities of service delivery and the provision of health and wellness services to students. The following services should be made available to students:-

- Chaplaincy and pastoral services - the needs of the diverse South African student population must be taken into account in providing these services
- Student counselling services - personal, academic and careers counselling

- Disability services for disabled and differentially-abled/challenged employees and students
- Health and wellness services, and vaccination clinics - especially for health profession students
- Mentorship and peer-support programmes
- Financial support (National Student Financial Aid Support – NSFAS; institutional bursaries and academic achievement awards, food security programmes which is especially crucial in South Africa where some students go hungry, welfare support and student loans
- Transition support programmes that assist students in the transition from high school to tertiary education
- Orientation and social inclusion programmes, especially for, but not limited to, first year students
- Library and information technology services and the provision of adequate internet-enabled computer labs, media technology services such as wireless internet access on the campus, adequate reasonably-priced photocopying and printing services
- Accommodation and inter-campus travel services
- Administrative services that are easily accessible such as academic records and student management systems, student cards, curriculum advice
- Academic and study services such as learning skills, presentation skills, research methodology workshops, the provision of Academic Development Officers
- Student-sensitive legal and disciplinary services via the Proctor/Registrar and Faculty/School, for example appeals against academic/disciplinary exclusions, and legal advice relating to transgressions of the institutions rules and regulations

4.4.4 Didactics

Didactics refers to all activities pertaining to the provision of education. These include matters relating to curriculum development and reform, teaching and learning and the development of pedagogical methodologies (Uljens, 1997:24). In the EduQUAL quality measurement tool a large number of questions pertain to didactics, and these questions reflect important quality improvement areas that can occur in higher education. The DAHE-QMF

takes cognisance of these focal areas (for example: curriculum, teaching and learning and professional development), and a discussion of these three components follows.

4.4.4.1 Curriculum

The UNICEF Report (2000:10) states that the curriculum should be based on defined outcomes, be non-discriminatory, be student-centric and include local and national content. The curriculum should be compliant with the requirements of critical cross-field outcomes (CCFOs), and demonstrate established standards and targets for student learning. The preliminary study of the current research indicated minimal use of external examiners and moderators being involved in quality visits (see appendix 8), and the DAHE-QMF calls for increased utilisation of these resources in order to improve curriculum quality. An evaluation of the curriculum should be undertaken regularly and the necessary changes made, in keeping with the principles of Deming's PDCA cycle.

4.4.4.2 Teaching and learning

Scott and Palmer (1994:141) espouse that current assessment methods must be evaluated and alternate assessment methods developed that could, over time, lead to quality improvement. The UNICEF Report (2000:16) mentions that feedback mechanisms should be put in place to ensure that effective and efficient learning occurs. The report also states that frequent monitoring and assessment by lecturers should be undertaken to ensure that further learning occurs. The results of the preliminary study revealed that the three participating local universities of technology did not have an institution-wide employees' further education and learning enablement policy for both academic and support (administrative, technical and other non-academic) employees. Such a policy could lead to quality improvements. This identified deficiency is thus addressed in the developed framework by ensuring that such a policy is developed. Learning and teaching should also include non-dental assisting related learning that would serve to ensure that the future dental assistants are not only competent professionals but contribute to the citizenry of South Africa, with the ability to be 'educated' persons. This 'education' is defined in this study, in alignment with the writing of Dolmans et al. (2003:214-217), as people becoming critical thinkers with high levels of literacy, numeracy and a broad range of life skills, such as communication, conflict resolution, self-awareness, empathy, and humanity.

Scott and Palmer (1994:139) state that, for education to be recognised as being of the best possible quality, it must be research led, although still subject to further quality improvements. Hence, the framework stresses that lecturers should appreciate and value the need for research, and to participate in these activities. It is acknowledged that part-time lecturers do not always benefit the student as they are unable to give of their entire energy and concentration to education, although the framework does recognise that these part-time lecturers bring in a different insight and industry-based perspective to the dental assisting programme. The framework suggests a mix of more than one permanent lecturer, and for the appointment of a number of part-time subject specialist lecturers, who will add value to the theoretical and practical components of the dental assisting course. Additionally teaching material should be comprehensible, relevant, and easily obtainable and be race and gender sensitive (Pounder,
2007:178).

4.4.4.3 Professional development

Students and lecturers should be provided with on-going professional development opportunities, and there should be emphasis on positive and gender sensitive students/lecturer relationships. Scott and Palmer (1994:40) suggest that heads of academic institutions be instructional leaders, and support and encourage employees to improve themselves. The DAHE-QMF proposes that management of higher education institutions ensure that adequate funding is available to finance training courses, and to provide replacements for employees attending training courses. A key feature of this model is that the framework advises employees to be constantly and continuously exposed to the latest technological, pedagogical and methodological advances in both the fields of dentistry and educational pedagogy.

Scott and Palmer (1994:139) state that educators should be constantly determining the effectiveness of their teaching methods, and should be continuously up-skilling themselves. This is to ensure that education of the highest quality possible is provided to future dental assistants, with the understanding that there is still further room for improvement and that lifelong learning must occur. Scott and Palmer (1994:140) also cite Becher (1984) who believes that educators who become more skilful in their professional activities are able to devote more time to teaching, and produce better students. The DAHE-QMF recognises that

highly-educated employees make good teachers, researchers, administrators and academics and in turn should have the ability to impart these skills to the students.

4.5 Quality management framework review

This section discusses the need for a review of the developed QMF in order to identify the deficiencies that may occur in its implementation. This is to ensure that continuous quality improvements can occur.

Spanbauer (1995:525) states that a system of on-going assessment of the QMF is required. The QMF should be reviewed at regular planned intervals, so that any required changes can be made timeously. Dolmans et al. (2003:211-216) writes that all quality improvement activities should be structural, and implies that reviews of quality management frameworks be carried out at regular intervals, in a structured manner, and at regular and frequent intervals and not on an *ad hoc* basis. Dolmans et al. further writes that it is difficult to define the frequency at which quality evaluations should occur. However, they argue that, because evaluations may take weeks to months to conduct and analyse, an evaluation should be undertaken either once a year or every two years. Based on this literature the suggested review period for the DAHE-QMF should be undertaken at least annually. This is to ensure that the system is successfully implemented and maintained, and to identify any shortcomings that may have occurred during this implementation process.

This review will also ensure that the DAHE-QMF is being implemented correctly as per the agreed benchmarks, and that any shortcomings are identified early and quickly corrected, so that the system can produce optimal and continuous quality improvements. These shortcomings could be identified through the use of internal and external customer satisfaction survey; management reports; strengths, weaknesses, opportunities and threats (SWOT) analysis; and from internal and external examiner and moderator reports. The review will also seek to ensure that all role-players, within the individual processes and systems, contribute to the greater good of the quality component of the higher education institution, and are not working against the framework to the detriment of higher education students education. The purpose of this QMF review is to:-

- review the on-going suitability and effectiveness of the QMF in order to identify SWOT that could affect the QMF
- review the quality policy and measure the desired objectives against the actual outcomes
- review the adequacy of resources provided to support the QMF
- provide a forum for the discussion of identified issues affecting the quality of practices and a repository where the results of review can be discussed and actions agreed on and carried out

Key areas which could be assessed by the use of satisfaction surveys, and quality management experts, include the following questions (adapted from Spanbauer, 1995:522-536):-

- Has learning improved?
- Has teaching improved?
- Has the number of graduates who gained employment increased?
- Has the institution become more efficient?
- Are students and other customers happier with the higher education institution than in the past?
- Has there been a change in primary focus?
- Has communications within the institution improved?
- Is there more group participation, teambuilding and group integration?
- Is there more concern for people, the student and the institution?
- Has the support sector (administration employees) improved in the outlook and willingness to improve quality?

4.5.1 Performance indicators

This section outlines the need for the use of performance indicators, and discusses how these indicators could be used to enhance quality within the dental assisting programme.

Spanbauer (1995:526) states that a system of agreed indicators is essential, and that these indicators should be dynamic in keeping with the changing environment of HEI's in order to meet with and exceed expectations. Deming (1986) asserts that quality cannot be improved unless it can be measured, and this theoretical view supports the use of performance

indicators which have become standard components of the language of educational quality (Law, 2010:68). Fitz-Gibbon (1996: 5) is cited by Law (2010:68-69) as defining a performance indicator as being "an item of information collected at regular intervals" to track the performance of a system.

The use of performance measurement indicators is a tangible and quantifiable indication of benefits that the DAHE-QMF van have to the customers of higher education. Law (2010:68) is of the view that performance indicators can be used to assess student performance, for example pass rates and student retention rates. The students will have a clear driving force as the academic and support employees will be motivated to meet the requirements of their performance management agreement and thus students will give of their best performance. In so doing students would be motivated to perform well academically, as this improved academic performance may be one of the Key Performance Areas (KPA's) in the lecturer's performance management agreement, together with the results of student satisfaction surveys, and course evaluations (Pounder, 2007:178).

Scrabec (2000:298-299) writes that these are measures that allow for easy measurement, monitoring and evaluation of the success or failure of the QMF Jie et al. (2009:5) theorise that students' evaluations in QM are very important, and should be carried out throughout the academic year. This will allow for defects, abnormalities, commitments and criticisms to be timeously brought to the fore, and the necessary remedial action be put into place to ensure continuous quality improvement. This is in keeping with the principles of TQM and its philosophy of continuous, incremental and gradual improvement.

Scrabec also found that, in order to operationalize the proposed model, a set of measurable terms be established. He suggests that the measures contained in Table 4 (below) be used. This study incorporated the adapted measures as they were suitable to the needs of the developed DAHE-QMF, and that could lead to its successful implementation.

Table 4.1: Performance Measures for DAHE-QMF

Standardised national tests and examinations.
Accreditation of higher education institutions by regulatory bodies (in this case the Health Professions Council of South Africa (HPCSA)).
Internal and external audits.
Student satisfaction surveys.
Student course and subject evaluations.
Industry feedback.
Curriculum benchmarking – nationally and internationally.

Source: Adapted from Scrabec (2000:200).

4.5.2 Performance management

This section discusses how the various customers (internal and external) will be encouraged to participate in, and contribute to, quality improvement by managing their individual and/or collective performances. An outline of the suggested performance measures is also provided.

In order to encourage and motivate individuals to make lasting changes in their behaviour and performance, a performance management system (PMS) should be put into place. Extrinsic motivation can be imposed through the use of suitable rewards and disincentives (Johnson, 1993:7). This PMS will help define outstanding performances and set goals for improvement (Wruck and Jensen, 1994:31). These authors also believe that QM performance measures differ from traditional performance measures in a number of ways. The first difference is that productivity and quality are now measured from a customer-focused viewpoint. The second difference is that they measure and seek to monitor day-to-day progress. The third difference is that they operations-oriented and measured by different qualitative values, rather than being measured in terms of currency (rands and cents, in the South African context). It is essential to reward good performance and penalise poor performance, and this framework suggests that good performance be rewarded with both monetary and non-monetary rewards such as public recognition, salary increases, promotions, being sent to national and international conferences and other rewards.

Penalties could include the non-award of salary increases and promotions, as well as being sent on training courses that could lead to a change in mind-set and/or the individual becoming more conscious of his/her role as a quality improvement agent within the higher education institution.

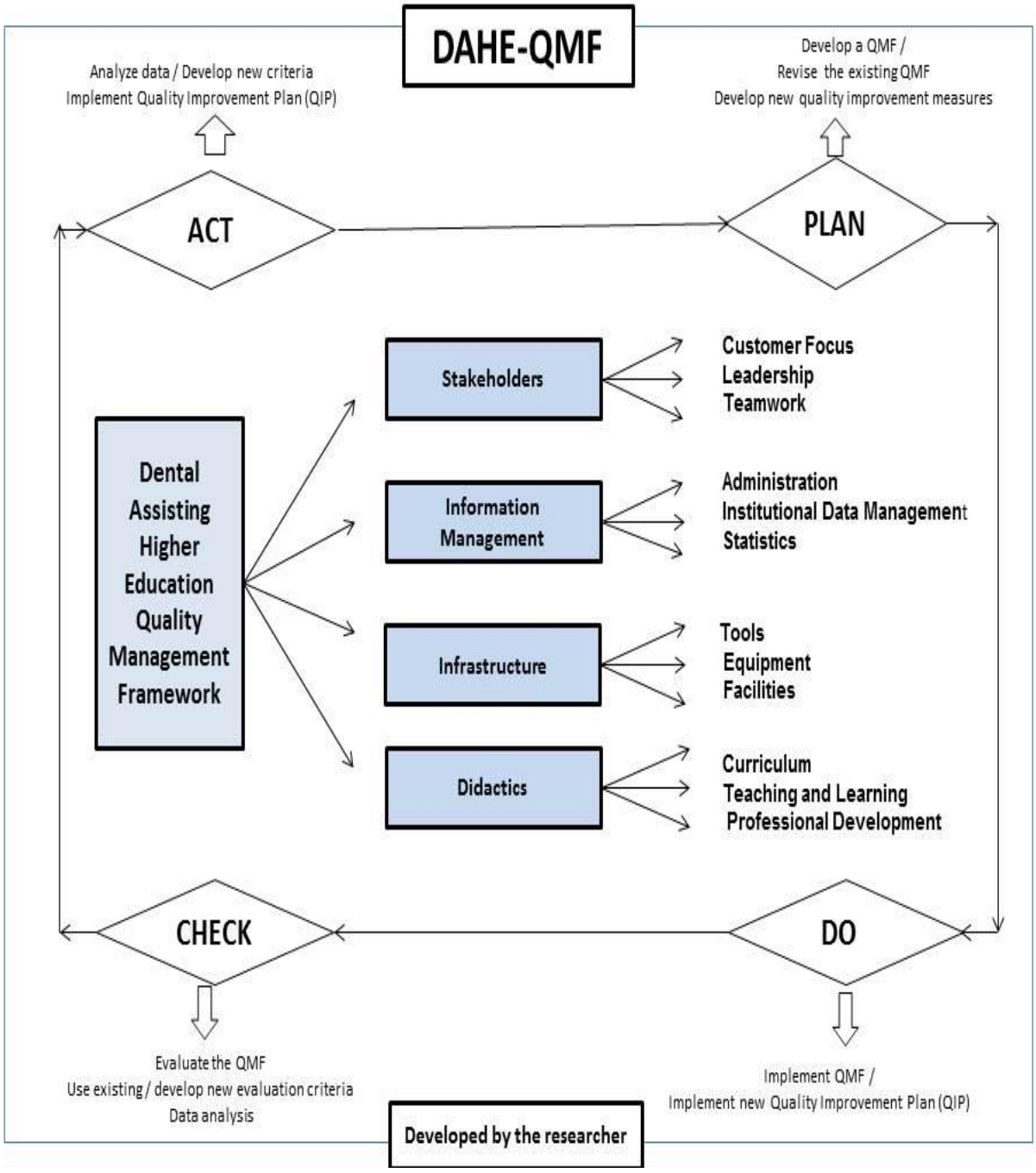
4.5.3 Plan, Do, Check, Act cycle

The overarching principle of Deming's PDCA cycle applies to the DAHE-QMF. The elements of the PDCA cycle have been described in earlier sections of this chapter. Whilst continuous incremental changes are being made in the four identified thematic areas namely: stakeholders, information management, infrastructure and didactics, there is a cyclic review, re-evaluation, redesign and readjustment of the factors involved in the quality management of dental assisting higher education. The PDCA cycle consists of four stages (plan, check, do, act), and each of the four components of the DAHE-QMF identified above will be evaluated using this cycle. In this manner any potential failures in quality improvement of these components can be identified and reconfigured to ensure that quality improvement occurs.

4.6 Presentation of the DAHE-QMF

The quality management framework that emerged through this study is labelled the Dental Assisting Health Education Quality Management Framework (DAHE-QMF). This framework is diagrammatically presented below.

Figure 4.4: The Dental Assisting Health Education - Quality Management Framework



4.7 Proposed implementation process of DAHE-QMF in higher education

This section discusses the proposed implementation process. A detailed discussion of the individual components then follows.

Rampa (2005:92) cquotes authors such as Steyn (1999) and Motwani and Kumar (1997) who suggest that the implementation process of quality could occur through the adoption of a FIVE-PHASE APPROACH. This five-phase approach has been adapted by the researcher for this study. The adapted strategy encompasses five distinct phases which are outlined below:-

4.7.1 Phase One - management commitment

Law (2010:68-69) states that each employee has the responsibility to follow the QM policies, and procedures of the QMF, and is responsible for quality improvement and the QMF implementation. Managerial support is required at this phase. Management commitment must be evident through the resources it allocates to the implementation and maintenance of the QMF. The QMF must have a dedicated team to manage and administer it in order to ensure its success. Additionally, senior management must participate in the management review process of the quality management system.

This phase consists of three sections: induction and training; application of the QMF; and commitment of the role-players.

4.7.2 Phase Two - preparation for implementation

Needs assessment to identify strengths, weaknesses, opportunities, and threats should to be conducted at this stage. This phase includes the provision of support to personnel; employee needs assessment; quality certification; benchmarking; strategic planning and the formulation of visions and goals.

4.7.3 Phase Three – launching the process

The QMF is implemented at this stage. The different processes are implemented, on-going training is provided, customer-surveys are conducted, and measures and quality indicators are established.

4.7.4 Phase Four – integrating the process

The framework is integrated and then expanded as necessary. On-going training and education is provided, skills are developed, teams and committees formed, rewards and awards are presented, and role-players are given the necessary recognition for their quality improvement efforts.

4.7.5 Phase Five - evaluation

The implemented framework is evaluated, appraised, adjusted and redesigned, as and if necessary, to fit the ever-changing quality requirements of the institution. The success or failure of the QMF is evaluated through self-appraisal, evaluations and through the use of specialist consultants. The QMF is then redesigned or adjusted in order to ensure that continuous quality improvement occurs.

4.8 Conclusion

The final part of this chapter proposes that the four UoTs that offer dental assisting education in South Africa consider the implementation of the DAHE-QMF. It is envisaged that once the developed quality management framework is presented to the dental assisting programme leaders they will seek to implement part, or all, of the framework in an attempt to enhance the quality of South African dental assisting education.

CHAPTER 5

Conclusions and Recommendations

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5.1 Introduction

This chapter will provide concluding remarks of observations made in the study, as well as of the developed QMF. It will conclude by providing some recommendations that could lead to future research in the area of quality management in higher education.

5.2 Achievement of research hypothesis, aims and objectives

The aim of this study was to develop a specific quality management framework, designed for dental assisting education in South Africa. Based on the results, the hypothesis of the study, which stated that dental assisting education in South Africa will improve if a QMF is developed and adopted for the dental assisting higher education, was accepted. The objectives of the study were to determine existing deficiencies in quality management; ascertain the current quality management principles pertaining to dental assisting education in South Africa; and determine the knowledge, attitudes, and perceptions of dental assisting academic employees towards the implementation of a quality management system framework for dental assisting education in South Africa that could lead to continuous improvements in the quality of South African dental assisting education. The researcher developed a DAHE-QMF.

5.3 Restrictions and limitations

The limitations of the study in terms of study population size present opportunities for future research, in that this research could be extended to health education in general. Whilst the findings are related to dental assisting education at the four South African UoT's that offer dental assisting education, they could be adapted, with suitable modifications, to all the various higher education programmes and institutions in South Africa.

5.4 Recommendations

The QMF could be applied to dental assisting education in South Africa in order to facilitate the continuous, incremental improvement of the quality of dental assisting higher education. The starting point for the implementation of the QMF would be ensuring buy-in from management, and all the relevant role-players. Top management should therefore begin the process of implementing the framework by instituting workshops to outline and explain the QMF implementation process to employees, and should lead by example, by being active in the adoption and implementation of the QMF. All role-players should be encouraged to adopt a customer focus, and make decisions based on facts. Some factors to consider are:-

- Benchmarking – prior to, during and after implementation of the QMF, benchmarking should be undertaken. By undertaking benchmarking in an attempt to ensure an organised and mutual comparison of the practices and performances of the higher education institutions, the need for quality improvement is continuously highlighted.
- Data collection – systems and structures should be established to ensure efficient and effective data collection, analysis and reporting for data-based decisions making.
- Goals and vision – the goals and vision should be defined and should be based on the **SMART** principle, which is **S**pecific, **M**easurable, **A**ccepted, **R**easonable, and **T**ime set (Najafabadi, 2008:89).

5.5 Way forward

This small-scale research involved a very small number of South African (n_1=4) and international (n_5=20) institutions. Whilst a greater number of participants would have elicited a greater range of views, the very nature of dental assisting education delivery in South Africa and internationally does not allow for this. However, this research may be seen as being illuminative and as highlighting some of the key quality related challenges that face dental assisting education within the ambit of higher education providers in South Africa. Therefore, some of the key issues and complexities highlighted in this research deserve further exploration and study in future work.

5.6 Concluding remarks

Appropriate quality management provides a continuous and infinite improvement in the quality of the product or service delivered. The review of the current status of quality management in South African dental assisting education, and the comparative analysis of the quality management systems of dental assisting in twenty countries highlighted certain deficiencies in practice. These deficiencies were then reviewed, and a quality management framework developed. By utilising the principles of quality management the researcher suggested that dental assisting education in South Africa can be improved. The use of quality management systems have already proved to be effective in improving quality in industry and higher education, as evidenced in the literature review.

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APPENDICES

Appendix One

Garvin's Eight Dimensions of Quality

Dimension	Definition
Reliability	The products' probability of failure-free performance over a specified period of time.
Performance	The primary operating characteristics of a product.
Features	The secondary characteristics of a product that supplement its basic functioning.
Conformance	The degree to which a products' physical and performance characteristics meet design specification.
Durability	A measure of useful product life.
Serviceability	The ease, speed, courtesy, and competence of repair
Aesthetics	How the product looks, feels, sounds, tastes or smells, a matter of personal preference.
Perceived	Quality-based on image, brand name or advertising rather than product attributes and is subjectively assessed.

Source: Sebastian and Tamini (2002:445).

Appendix Two

Fundamental guiding principles

The following eight principles serve as the pillars to a customer-focused management system.

1. PROCESS MANAGEMENT
Activities are managed as processes that add value to customers.
A structure must be in place to support the flows.

2. CUSTOMER FOCUS
The purpose of what we do is to add value to customers.

3. CONTINUOUS IMPROVEMENT
We continually improve what we do to increase value to customers.
There is no such thing as optimal; it can be improved infinitely.
If everything can be improved, the key is **prioritization**.
Types of improvement
Stability (eliminate defects)
Incremental (evolution)
Breakthrough (jump start)

4. TOTAL EMPLOYEE INVOLVEMENT AND EMPOWERMENT (THE INCLUSIVE PRINCIPLE)
All people are involved in improvement; all areas of performance are included.
Everyone pays attention to how we can add value to others (customers).

5. COOPERATION, TEAMWORK, AND A SYSTEMS APPROACH
Cooperate and align to create synergy. No group or person can operate effectively as an island.
Diversity is a key component to enhancing individual and group learning, thereby, improving organisation capacity.
Systems Approach: The whole cannot be optimized by optimizing the parts. Interactions are key.

6. DATA-BASED DECISION MAKING
Decisions are guided by facts and data not gut feelings.
Planning is fundamental to organizing and prioritizing efforts as well as a guide to proper decision-making.
Understanding variation
Understanding own capability (what can we do) and stability (how stable are we).

7. SCIENTIFIC METHOD / PDCA LEARNING CYCLE
Use of the scientific method involves learning from what we do.
Feedback loops are key to continuous improvement.

8. QUALITY CHAIN REACTION
Concentrate on Quality because:
Increase quality - Cut costs - Increase productivity -Lower prices - Increase market share - Benefit the organisation
Plan, Do

Source: Deming, W. E. (1986). Out of crises. Cambridge. Massachusetts

Appendix Three

Deming's 14-Principles of TQM

1. Create consistency of purpose for improving the product and service, with the aim of becoming competitive and staying in business, and providing jobs.
2. Adopt a new philosophy.
3. Create dependence on mass inspection to achieve quality.
4. Terminate the awarding of business on the basis of price.
5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus to decrease cost.
6. Institute training on the job.
7. Institute leadership.
8. Drive out fear so that every worker may work effectively.
9. Break down the barriers between departments.
10. Eliminate slogans, expectations and targets asking for new levels of productivity without providing the workforce with the methods to do the job better.
11. Eliminate work standards that prescribe numerical quotas.
12. Remove barriers that rob people of their rights to pride of workmanship.
13. Institute a vigorous programme of education and self-improvement.
14. Put everyone in the company to work to accomplish the transformation.

Source: Mukhopadhyay, 2005:34.

Juran's 10-steps for TQM

1. Create awareness for the need and opportunity for improvement.
2. Set explicit goals for improvement.
3. Create an organisational structure to drive the improvement process.
4. Provide appropriate training.
5. Adopt a project approach to problem solving.
6. Identify and report progress.
7. Recognize and reinforce success.
8. Communicate results.
9. Keep records of change.
10. Build an annual improvement cycle into all processes of the company.

Source: Mukhopadhyay, 2005:34.

Crosby's 14-steps towards TQM

1. Establish full management commitment to the quality programme.
2. Set up a quality team to drive the programme.
3. Introduce quality management procedures.
4. Define and apply the principle of the cost of quality.
5. Institute a quality assurance programme.
6. Introduce corrective action procedures.
7. Plan for the implementation of a zero-defect system.
8. Implement supervisor training.
9. Announce a zero-defects day to launch the process.
10. Set goals to bring about action.
11. Set up an employee-management communication system.
12. Recognize those who have actively participated.
13. Set up quality councils to sustain the process.
14. Do it all over again.

Source: Mukhopadhyay, 2005:35.

Appendix Four

10-Step Benchmarking process

PHASE	STEPS
PHASE 1 Planning what to benchmark	**1. Identify the problem.** Decide what has to be benchmarked. Identify processes that could be improved. 2. **Identified benchmark partners**. This is critical to effective benchmarking. A successful approach would include internal, competitive and functional benchmarking. Internal benchmarking looks at similar practices within the institution. Competitive benchmarking looks at competitors and what the best direct competitors are doing. Functional benchmarking is a comparison of functional activities of similar organisations that have the best potential for describing and stimulating innovative practices. **3. Determine the measurement method**. Plan, determine data collection methods and conduct an investigation. Collect data. Various sources such as internal electronic searches, observation of best practices and conducting site visits maybe useful and productive in the benchmarking process.
PHASE 2 Analysis of the performance gaps	**4. Pre-measure own performance**. This is done by comparing own performance of internal and external institutions by examining the best practices of other institutions and measuring the performance gaps. Such deficiencies may include a lack of customer surveys for the assessment practices etc. The analysis should include which inputs, outputs, processes or steps in the process are superior and, to what extent are each of these components superior. Once the cause of the gaps or deficiency is determined through conducting a problem analysis, an alternative course of action to close the gaps or remedy the deficiency is sought and implemented. **5. (a). Future performance levels are determined**. Performance levels are objectively compared in order to determine how to achieve a competitive performance edge over competitors, or to at least be on par with competitors.
PHASE 3 Integration of functional goals	**5. (b). Goals are predefined and incorporated into the planning processes.** **6. Benchmark findings are committed to management and approval sought**. Management would include academic programme leaders, Heads of Departments, Deans, faculty managers, finance managers, student admissions office managers, student housing managers, etc. **7. After management approval of the recommendations made performance goals are revised**. **8. Integration of targets and strategies into action plans and operational reviews are implemented, and updated as and when necessary.**
PHASE 4 Develop action plan	**9. Best practices are implemented and monitored and monitoring of the process is undertaken. These best practices are periodically readjusted as and when needed.** **10. Benchmarks are recalibrated, re-evaluated and updated to ensure that they are based on current performance data.**

Source: Steyn, (2000:16-17).

Appendix Five

Characteristics of a quality education institution

- Teaching methodologies are designed to encourage independent thinking;
- Capable, motivated, well-trained lecturers;
- Appropriate, well-designed curriculum;
- Effective learning materials, not limited to text-books;
- A safe, well-maintained learning environment;
- A valid, reliable examination and learning system;
- Ample direct instructional time;
- Adequate financing; and
- Effective organisational structure and support.

Source: Chapman and Adams (2002:16).

Appendix Six

01 August 2011

Dear Colleague

Research Questionnaire

I am presently studying towards a Master's degree in Quality Management. The topic of my study is "Development of a Quality Management Model for Dental Assisting Education in South Africa. " I intend to carry out research at the four Universities of Technology in South Africa that offer Dental Assisting education. The investigation does require the completion of a questionnaire by the programme leaders at the various Universities of Technology. Kindly note that by completing you will be making a valuable contribution to this research, and also provide the foundation for the development of a quality management system that is specific to Dental Assisting. The possible implementation of the developed quality management model could lead to improvements in the quality of Dental Assisting education for all its customers (student, the dental profession, as well as the academic and administrative staff).

The answering of the questionnaire should not take more than 20 minutes.

You are assured on the confidentiality of your responses, and your name is not required on the questionnaire. Your participation is voluntary and you may withdraw at any time without giving any reasons. However, bearing in mind that there are only four (4) Dental Assisting programmes, your participation would be greatly appreciated, as it could be highly instrumental in taking account your unique needs, in the development of the quality management model for Dental Assisting in South Africa.

Kindly complete the questionnaire and consent forms and return these separately in the envelopes provided.

Thank you for your co-operation and the time that you have set aside for this research.

Yours sincerely

[redacted]

Ahmed Muslim (Ph 031 – 260 755) muslimt@ukzn. ac.za

Research Supervisor: Dr Shalini Singh, Senior Lecturer: Department of Quality Management

Faculty of Management Sciences: Durban University of Technology

031 – 373 5337 (T)

CONSENT

I consent to participate in this study.

_____

Signature of participant

_____

Date

Appendix Seven

QUESTIONNAIRE

In answering these questions you will assist the researcher to identify a management strategy that would lead to the development of a TQM quality model for possible implementation into the Dental Assisting Educational Programme at the four accredited Universities of Technology in South Africa.

Programme Management and Operation

No.	Question	Yes, all programmes	Yes, some programmes	No	Uncertain
1.	Does your institution have a Quality Management System in place for the Academic component of educational programmes				
2.	Does your institution have a Quality Management System in place specifically for the Academic component of the Dental Assisting programme				
3.	Does your institution have a Quality Management System in place for the Administrative component of educational programmes.				
4.	Does your institution have a Quality Management System in place specifically for the Administrative component of the Dental Assisting programme.				

No	Question	Yes	No	Uncertain
5.	Has the Dental Assisting programme benchmarked itself against other UoT's in South Africa?			
6.	Has the Dental Assisting programme benchmarked itself against other Dental Assisting programmes internationally?			
7.	Do you have a programme quality assurance circle within Dental Assisting?			
8	Are students included in the quality assurance circle?			
9.	Is your institution located in an ideal location? (proximity to transport, safety etc.)			

No	Question			Yes	No	Uncertain
10.	Are the Dental Assisting programme facilities (buildings) of an acceptable and suitable standard?					
11.	Are the Dental Assisting programme facilities (equipment) of an acceptable and suitable standard?					
12.	Is the Dental Assisting programme involved in Faculty/Departmental planning sessions?					
13.	Is the Dental Assisting programme involved in Faculty/Departmental team-building sessions?					
14	Are any Dental Assisting academic staff member(s) of senate/EXCO?					
15.	Is there an institution wide staff (academic and support) enablement and empowerment policy in place at your institution?					
16.	Are Dental Assisting academic and administrative staffs easily able to access funds to attend staff enablement and empowerment courses, workshops etc.?					
17.	Is there an Institutional quality assurance system policy in place?					
18.	Do you apply an institution wide quality assurance policy in your programme?					
19.	Do you think that there is a need for a TQM model to be developed in Dental Assisting education?					
20.	Is there a Faculty -based/Faculty-dedicated quality assurance officer in your institution?					
No	**Question**	**A great deal of interaction**	**Some interaction**	**Minimal interaction**	**No interaction**	**Uncertain**
21.	What is the level of interaction that Dental Assisting has with the Faculty-based / dedicated quality assurance officer?					

No	Question	A great deal of input.	Some input.	Minimal input.	No input at all.	Uncertain
22.	Do you have a role to play in the programme management (student numbers, resource allocation etc.) at a faculty level?					
23.	Are Dental Assisting staff members involved in the review of the Quality Assurance policy?					

Curriculum Design, Content and Organisation

No.	Question	Yes	No	Uncertain
24.	Would your programme be willing to adapt a national curriculum, testing and grading system?			
25.	Is the curriculum designed appropriately?			

No	Question	Yes, to a large extent	Yes, to a minimal extent	No, not at all	Uncertain
26.	Is the content relevant, sufficient, current and valid?				
27.	Is the curriculum planned in an appropriate way and are the pre-requisites considered?				

Teaching, Learning and Assessment

No.	Question	Yes	No	Uncertain
28.	Does your institution have a quality control policy for service/experiential learning?			

No.	Question	Yes, to a large extent	Yes, to a minimal extent	No, not at all	Uncertain
29.	Have staff development needs been identified and addressed?				
30.	Is there a teaching and assessment plan within the dental assisting programme?				

No.	Question	Yes, to a large extent	Yes, to a minimal extent	No, not at all	Uncertain
31.	Are students aware of on what, how and when they will be assessed?				

No.	Question	Based on pass/failure rates	Based on the number of distinctions and marks in the higher percentage brackets	Based on student/peer Lecturer Evaluations	Uncertain
32.	How is the effectiveness of teaching, learning and assessment monitored?				

Student Support and Guidance

No.	Question	Yes, to a large extent	Yes, to a minimal extent	No, not at all	Uncertain
33.	Are students views taken into account by the institutions management?				
34.	Are staff views taken into account by the institutions management?				
35.	Is there sufficient Academic administration support at a programme level?				
36.	Are different kinds of support and guidance are available to students and are students aware of these?				

Learning Resources

No.	Question	Yes, to a large extent	Yes, to a minimal extent	No, not at all	Uncertain
37.	Is there a handbook for the programme and are there course descriptions informing them of the regulations and requirements?				
38.	Have the quality, quantity and range of resources been developed with specific reference to Dental Assisting?				

Quality Assurance and Enhancement

39. Will you implement a Quality Management System if one is developed especially for dental assisting?

Yes, to a large extent		No, not at all		Yes, to a minimal extent		Uncertain	

40, Which obstacles do you foresee in the implementation of a Quality Management System at a programme level?

Management resistance		Programme staff resistance		Student resistance	

41. Which obstacles do you foresee in the implementation of a Quality Management System on a personal level?

Workload		Time		student numbers	
staff numbers		don't know		personal capacity to implement quality management system	

External Evaluation

42. Does your programme make use of external examiners?

Yes, to a large extent		Yes, to a minimal extent		No, not at all		Uncertain	

43. How are the external examiners appointed?

By headhunting		Through advertising		Another method		Uncertain	

44. Does your programme make use of external moderators?

Yes, to a large extent		Yes, to a minimal extent		No, not at all		Uncertain	

45. How are the external examiners appointed?

By headhunting		Through advertising		Another method		Uncertain	

46. Do the external examiners conduct quality inspection visits?

Yes, to a large extent		Yes, to a minimal extent		No, not at all		Uncertain	

47. How often do the external examiners conduct quality inspection visits?

Less than once a year		Between 2-5 times a year		More than 5 times a year		never	

48. Do the external moderators conduct quality inspection visits?

Yes, to a large extent		Yes, to a minimal extent		No, not at all		Uncertain	

49. How often do the external moderators conduct quality inspection visits?

Less than once a year		Between 2-5 times a year		More than 5 times a year		never	

50. Are Dental Assisting alumni utilised to provide quality assurance feedback?

Yes, often		Yes, rarely		Never	

51. Do you have any suggestions, comments etc. that could be of assistance in the development of a Quality Management Model for Dental Assisting Education in South Africa?

_____

_____

_____

Thank you for your assistance, it is much appreciated.

Appendix eight

RESULTS OF PRELIMINARY WORK

PHASE ONE

AND

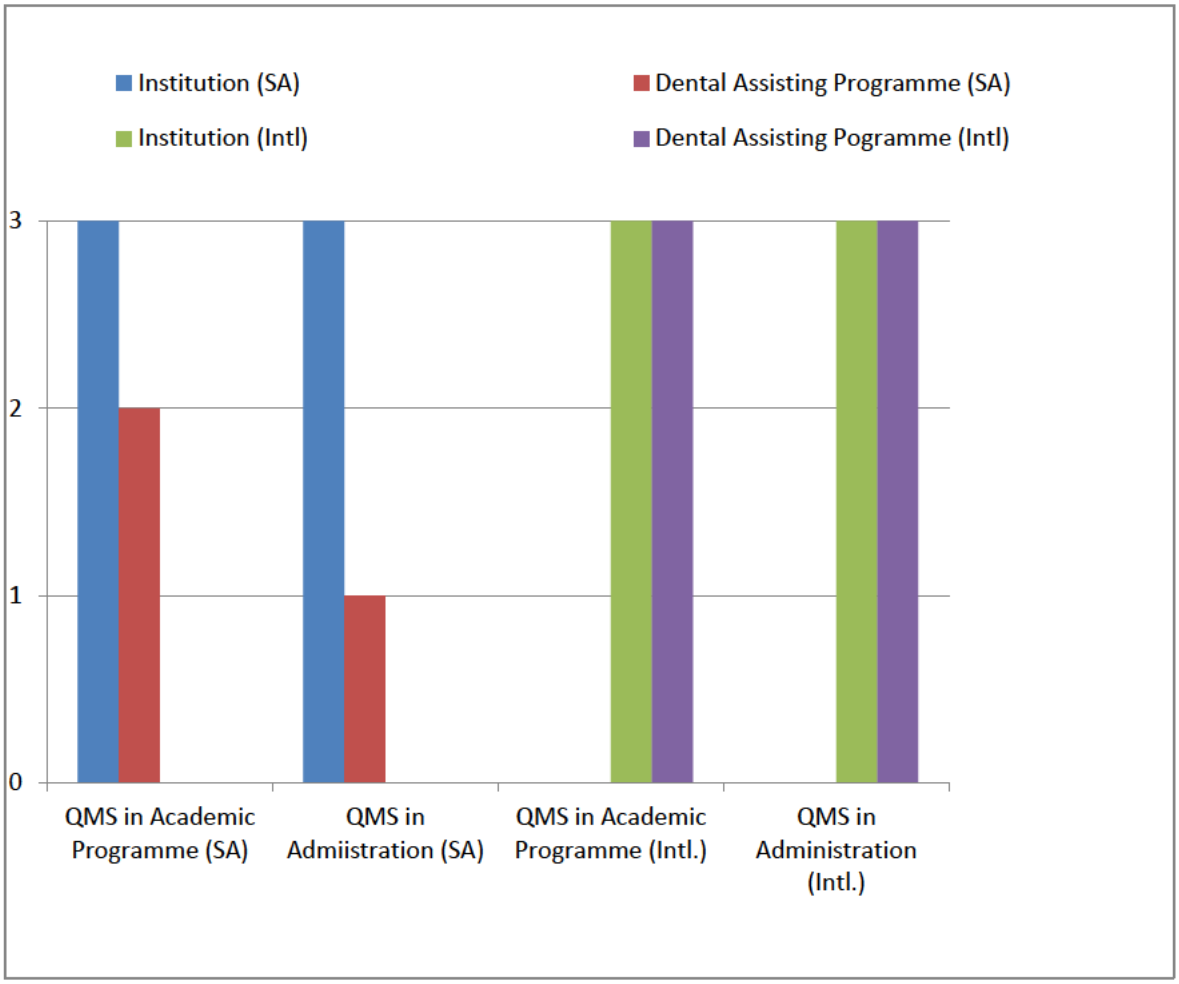
PHASE TWO

8.1 Research findings

An analysis and evaluation of the responses received from the participants, via the questionnaire, was done and will be reflected and discussed in the following sections.

8.1 Programme management and operations

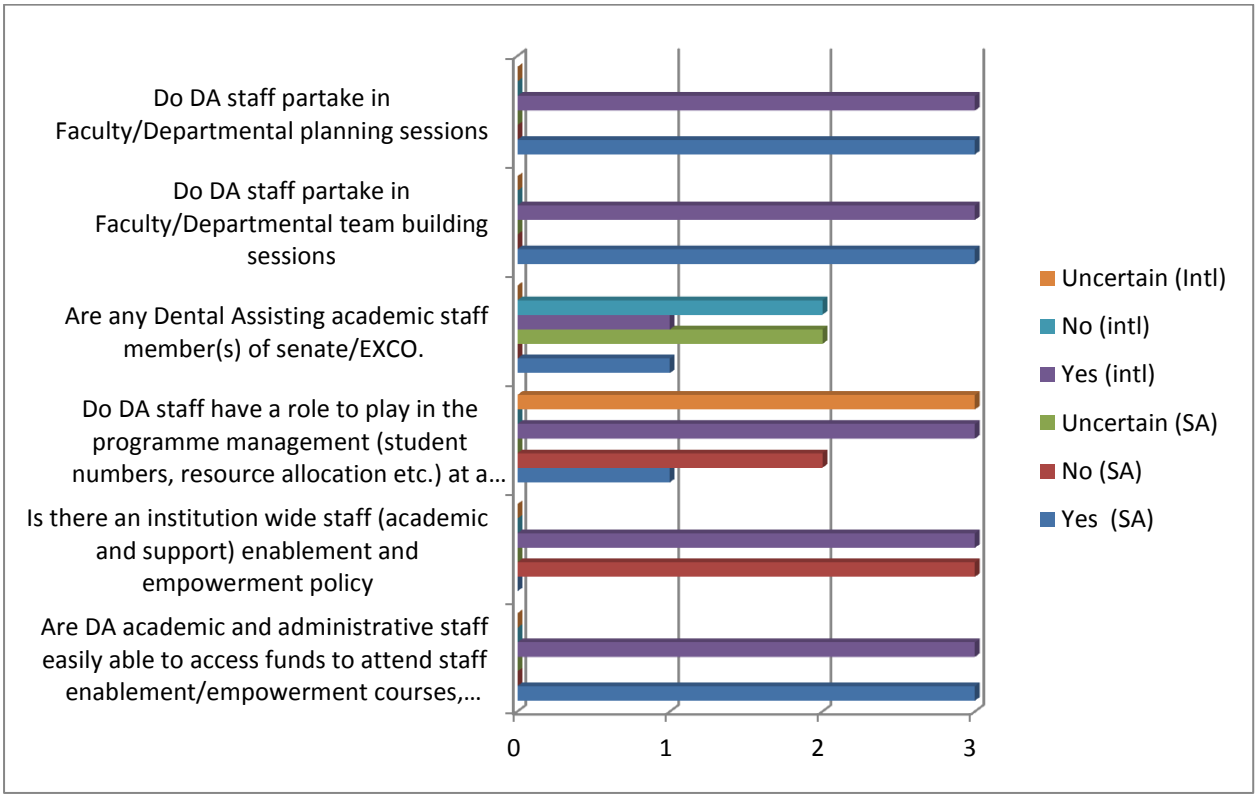
Figure 1: QMF in the academic and administration components of participating institutions and individual programmes.



8. 2. Dental assisting staff management, consultation and participation in decision-making.

The participants were asked these questions in order to ascertain their level of involvement at junior and senior management level. Questions 12-16 in Appendix 7 were consolidated as one theme under the heading dental assisting staff management, consultation and participation in decision-making.

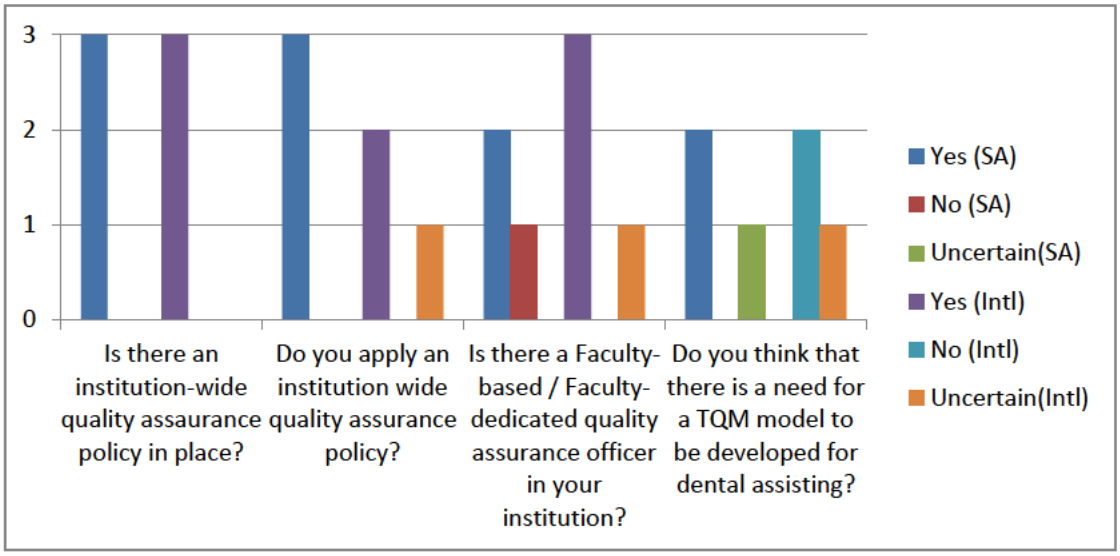
Figure 2: The different participant responses to questions pertaining to academic and administration staff participation in the management and empowerment of higher education institutions.



8.3 Quality assurance at institutional level

In order to ascertain the availability and application of quality assurance policies the participants were asked questions 17-20. These questions were consolidated under the heading quality assurance at institutional level and are available in Appendix 7.

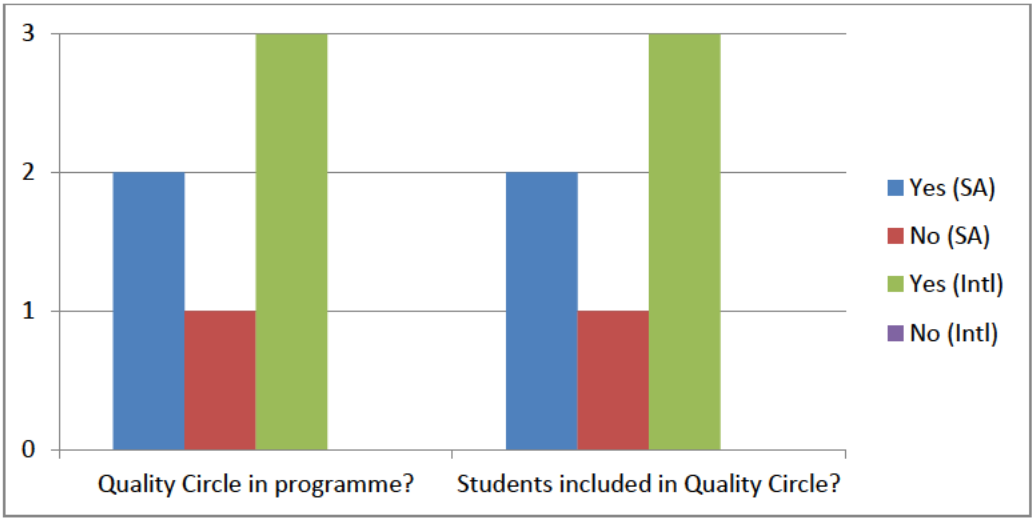
Figure 3: Responses to questions regarding QA and the need for TQM in Dental Assisting.



8.4 Quality assurance circle

In order to determine the quality circle practices of dental assisting education providers the questions asked were questions 7 and 8 in Appendix 7, which were consolidated under the heading quality assurance circles:

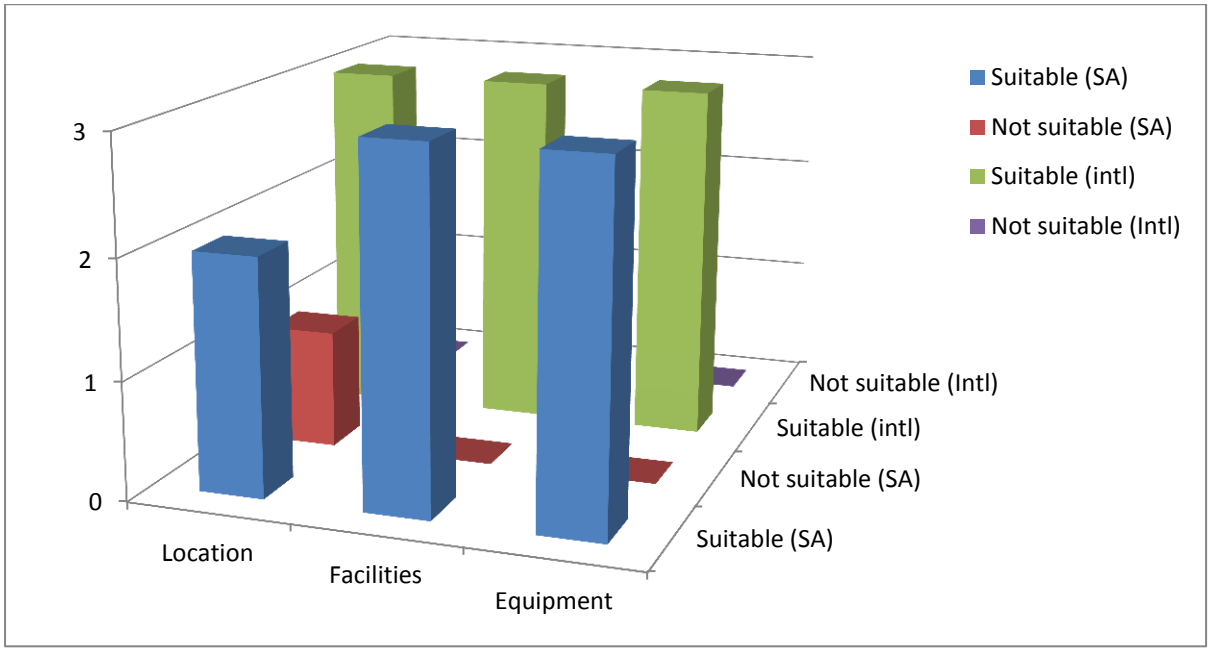
Figure 4: Presence of quality circles and the inclusion of students therein.



8. 5 Facilities, location and equipment

Participants were asked questions relating to their institutions' location and facilities and equipment. These questions were asked in order to ascertain if the environment (geographic, spatial and physical) was conducive to excellence and quality in teaching and learning. The questions asked were question numbers 9-11 in Appendix 7, and were consolidated under the heading facilities, location and equipment.

Figure 5: Responses to questions posed about if the environment (geographic, spatial and physical) was conducive to excellence and quality in teaching and learning.

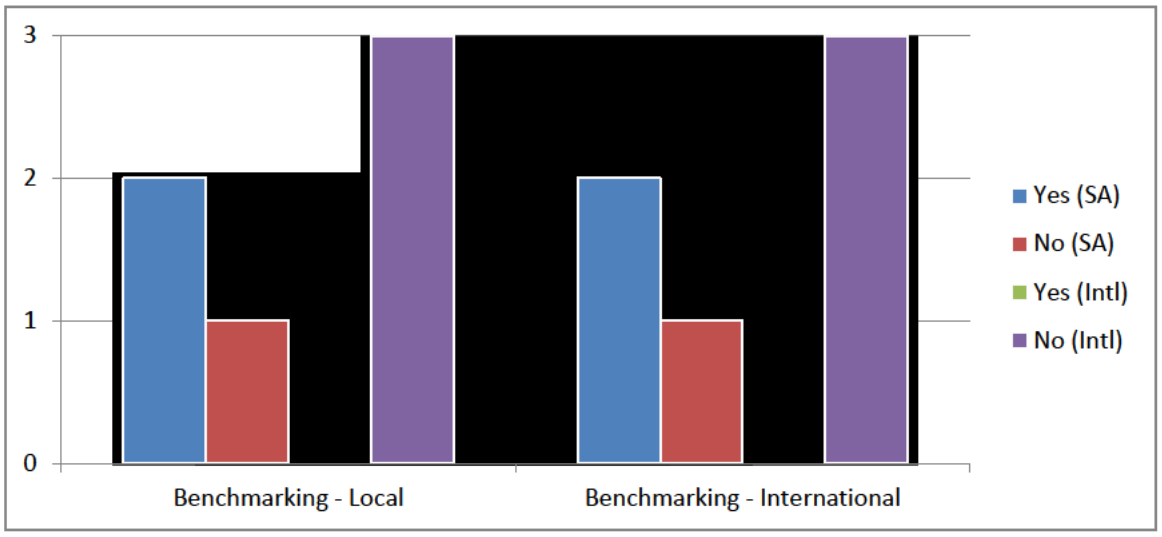


8.6 Benchmarking

The UoT's were asked if they had benchmarked themselves against other UoT's locally and internationally, in keeping with the principles of quality assurance and quality promotion.

The detailed questions from the questionnaire (Appendix 7, numbers 5 and 6) were consolidated under the heading benchmarking.

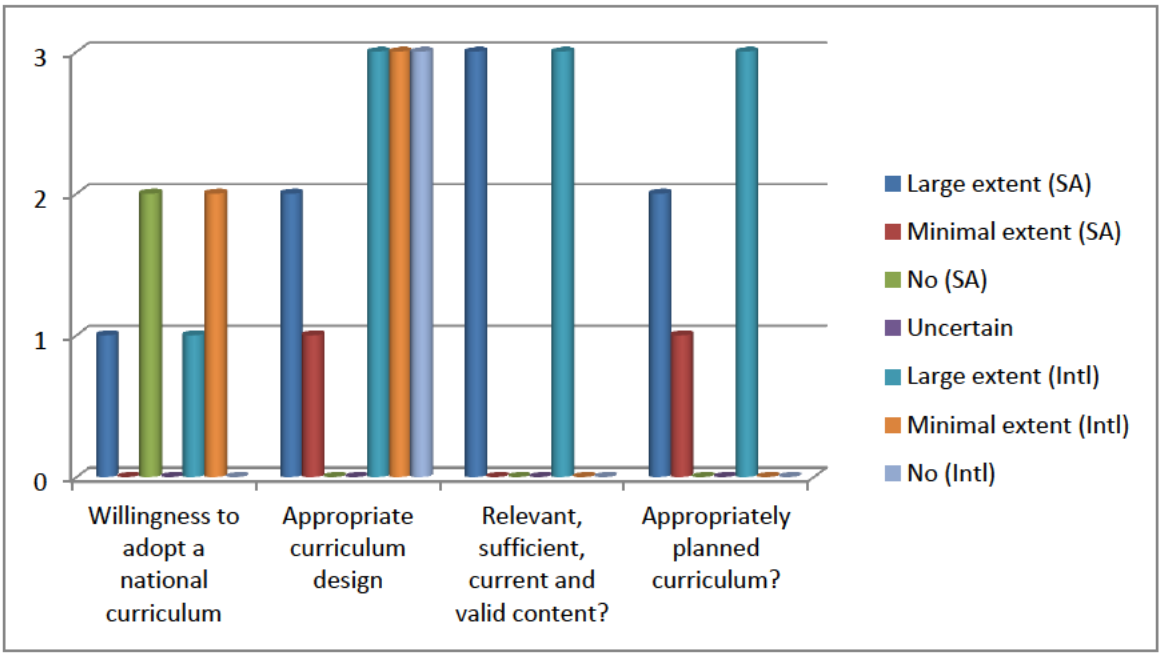
Figure 6: Participants' responses to questions relating to benchmarking.



8.7 Curriculum design, content and organisation

The detailed questions are available as questions 24-27 in the questionnaire (Appendix 7) and were grouped under the heading curriculum design, content and organisation.

Figure 7: Participants' responses to questions on curriculum design, content and organisation.



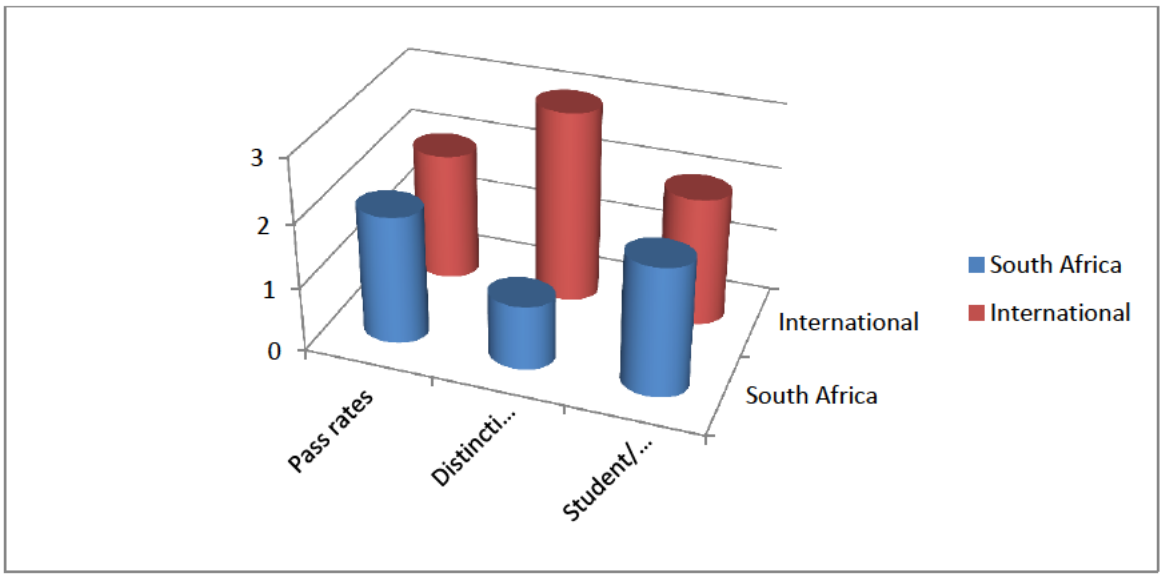
8.8 Teaching, learning and assessment

The following questions were consolidated under the heading teaching, learning and assessment and were asked in an attempt to determine current quality practices related to teaching, learning and assessment, and the participants' responses are indicated below.

Figure 8: Participants, responses to questions pertaining to teaching, learning and assessment.

	South Africa				*International*			
Criteria	**Large**	**Minimal**	**No**	**Don't know**	**Large**	**Minimal**	**Don't know**	**No**
Does your institution have a quality control policy for service/experiential learning?	2	0	0	1	2	0	1	0
Have staff development needs been identified and addressed?	0	2	0	1	2	1	0	0
Is there a teaching and assessment plan within the dental assisting programme?	1	2	0	0	3	0	0	0
Are students aware of on what, how and when they will be assessed?	3	0	0	0	3	0	0	0
Does your institution have a quality control policy for service/experiential learning?	0	0	2	1	2	2	0	1

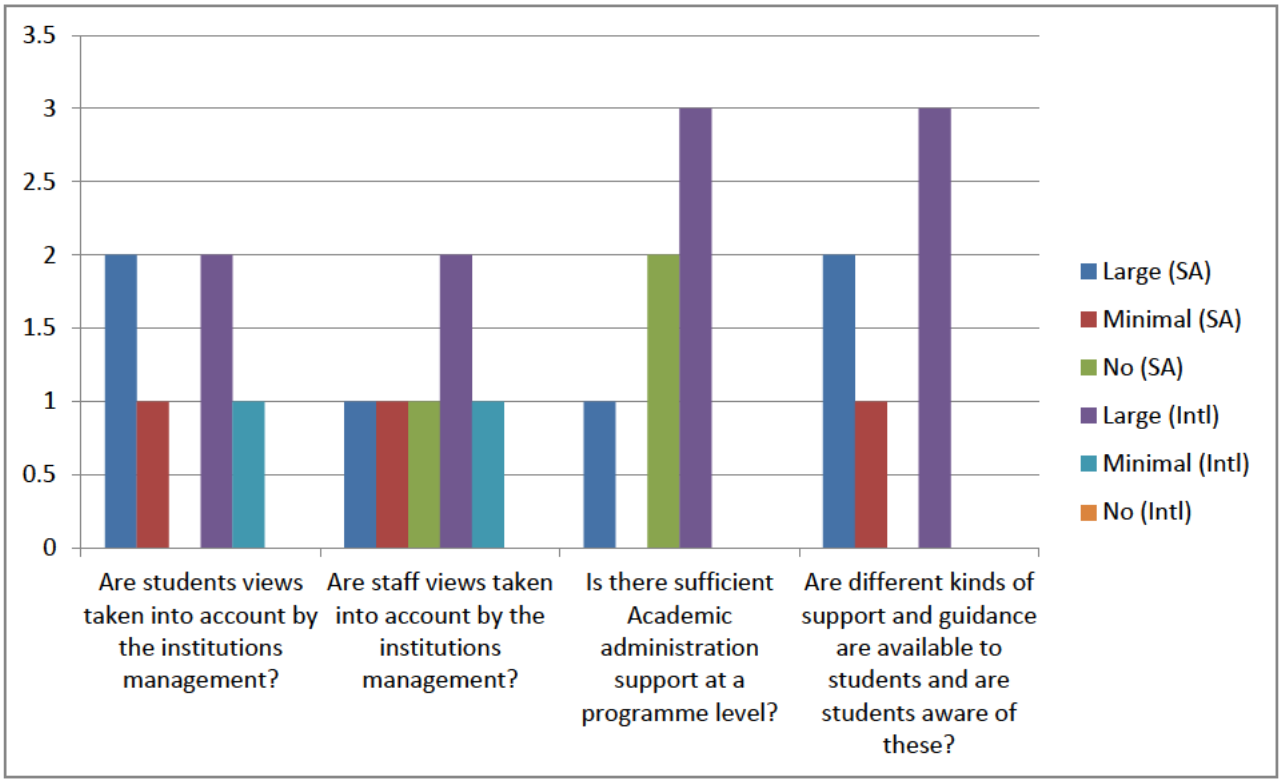
Figure 9: How the effectiveness of teaching, learning and assessment is monitored.



8.9 Student support and guidance

Participants were asked questions pertaining to whether staff and students view are taken into account by management. Questions 33-36 in Appendix 7 were consolidated under the heading student support and guidance and were queried. The responses are indicated in the chart below.

Figure 10: Responses to questions pertaining to student support and guidance.



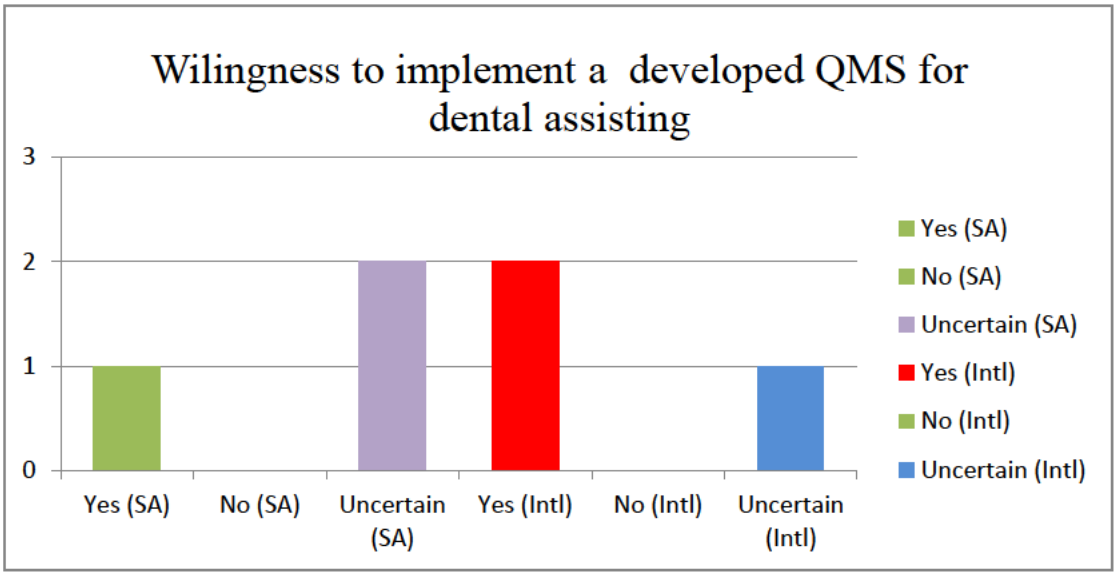
8.10 Learning resources

Questions 37 and 38 in Appendix 7 were asked. The participants' responses are noted below. All three South African and all three international participants responded that there a handbook for the programme and that are there course descriptions informing students of the regulations and requirements. Two South African and all three international institutions have developed a Dental Assisting-specific range of quality teaching and learning resources.

8.11 Quality assurance and enhancement

Participants were asked question numbers 39, 40 and 41, from Appendix 7, which were consolidated under the heading quality assurance and enhancement.

Figure 11: Participants' willingness to implement a developed QMF for their programmes.



Participants were asked to outline what they saw as possible obstacles to QMF implementation at programme level. The results are reflected below:

Figure 12: Responses to the question regarding possible TQM implementation problems.

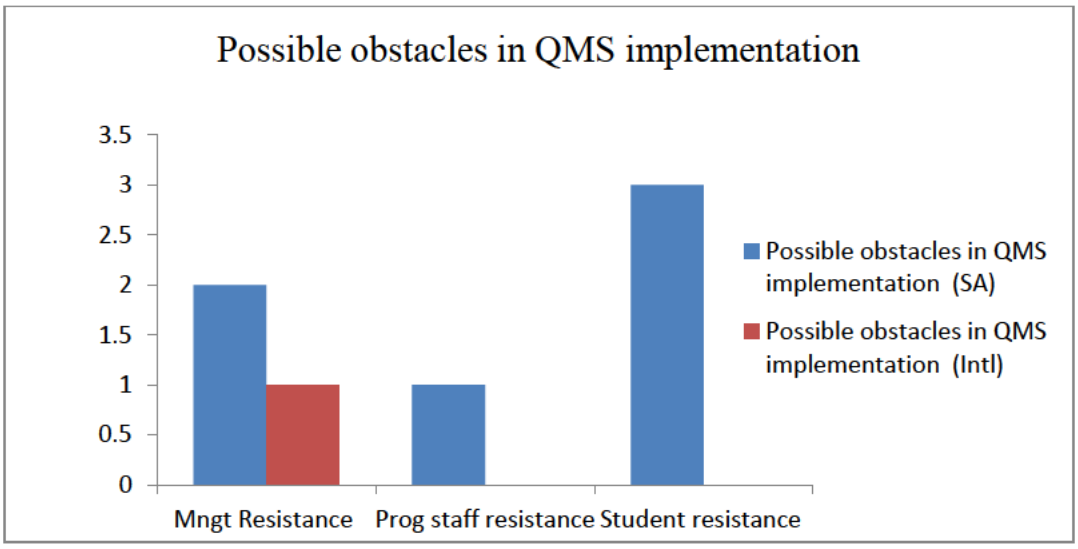
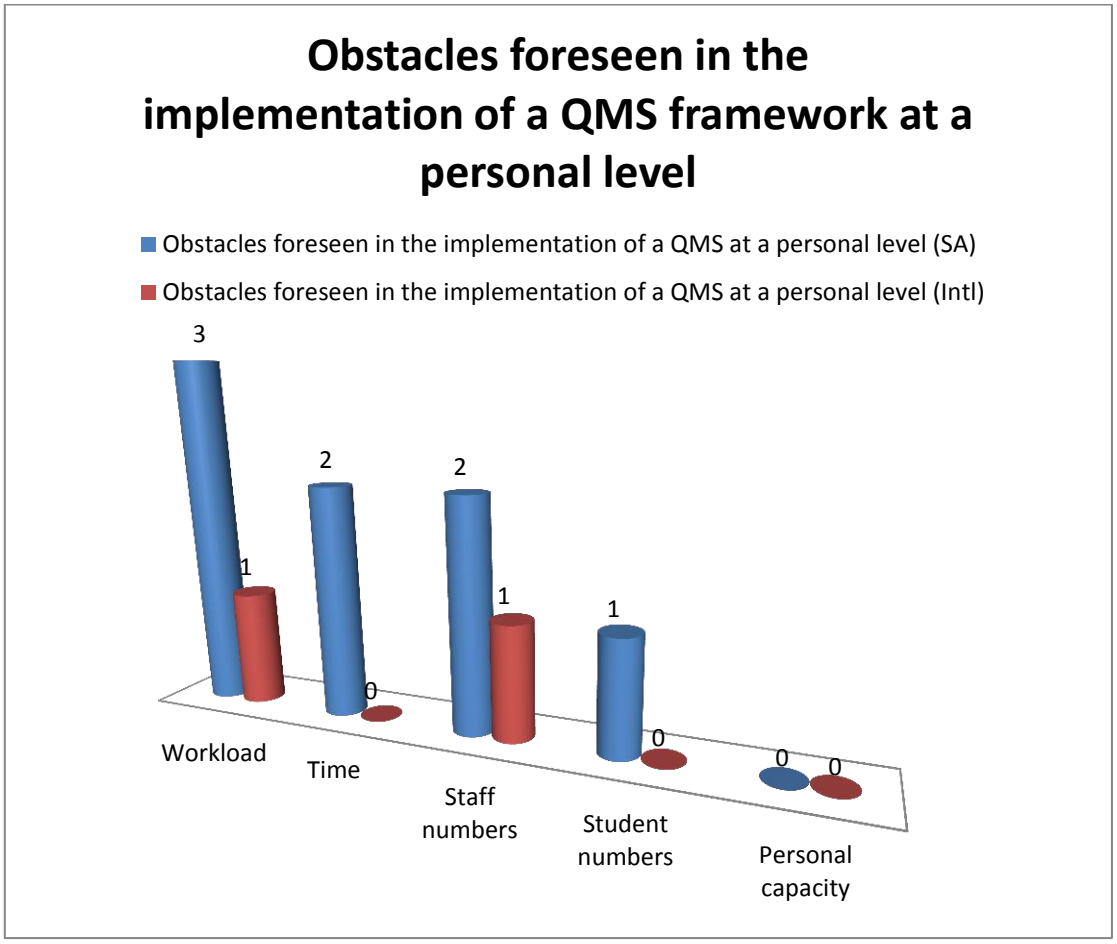


Figure 13: Possible obstacles to QMF implementation.



8.12 External evaluation

The detailed questions (Nos. 42-50) are contained in Appendix 7, and were posed in an attempt to determine current external evaluation practices, and were consolidated under the heading external evaluation.

Figure 14: Responses to questions relating to external evaluation.

			International	
Criteria	**Yes**	**No**	**Yes**	**No**
Does your programme make use of external examiners?	33,3%	66,66%	33,3%	66,66%
Does your programme make use of external moderators?	33,3%	66,66%	33,3%	66,66%
Do the external examiners conduct quality inspection visits?	33,3%	66,66%	33,3%	66,66%
Do the external moderators conduct quality inspection visits?	33,3%	66,66%	33,33%	66,66%
Are dental assisting alumni utilised to provide quality assurance feedback?	100%	0%	66,66%	33,33%

Both the single local and single international institutions that reported using external examiners and moderators indicated that these examiners and moderators only conducted quality inspection visits during internal review processes, which was one every three years.

Appendix nine

COMPARATIVE ANALYSIS OF THE QMF USED IN DENTAL ASSISTING EDUCATION IN TWENTY COUNTRIES

9.1 CONTINENT: AFRICA

COUNTRY	FORMAL QUALIFICATION	PROFESSIONAL REGISTRATION	QUALITY MANAGEMENT SYSTEM	SOURCE OF INFORMATION
Egypt	Egyptian dental assistants receive on-the-job training and there is no formal qualification process.	The Egyptian Dental Association (EDA) and the Egyptian Dental Syndicate (EDS) are responsible for registering dental personnel in Egypt.	All dental training is quality assured by the National Accreditation and Quality Assurance Agency of Egypt (NAQAAE). A review of the EDA website reveals the absence of a QMF (www. eda - egypt. org). Two e-mails to the EDA requesting further information were not responded to.	Egyptian Dental Association (EDA) (www. eda - egypt. org).
Sudan	Dental assistants can either receive on-the-job training or complete a two-year Diploma in Dental Medical Assistant at the Kassala Training Centre for Allied Professionals.		No information on the quality management system used by the Kassala Training Centre for Allied Professionals could be located, despite a thorough internet search. An e-mail sent to the university requesting further information was not responded to.	(Bushara and Badr, 2005:6).
Tanzania	Tanzanian dental assistants are trained at the dental training school, College of Health and Allied Sciences, Muhimbili University College.	Dental assistants must register with the Tanzanian Dental Association and the Tanzanian Medical and Dental Council (www. tdadent. or. tz/index. php).	No information could be found on the quality assurance and management of this training institution, and two e-mails to the Tanzanian Dental Association requesting further information were not answered.	Tanzanian Dental Association and the Tanzanian Medical and Dental Council (www. tdadent. or. tz/index. php).
Libya	The Libya Dental Association accredits training provided by the University Dental Colleges at Bangaze and Ellfatah. Dental assistants are not formally trained.	Dental Assistants do not have to undergo any registration process.	No information could be found on the quality assurance and management of this training institution.	Libya Dental Association website. No contact details were and further information could not be sourced.
Nigeria	Dental assistants in Nigeria receive on-the-job training from their employers (dentists and therapists).	The Medical and Dental Council of Nigeria is the responsible registration body for the dental profession in Nigeria. There is no provision for their professional registration of dental assistants.	There is no quality management system for DA training in Nigeria	The Medical and Dental Council of Nigeria(www. mdcnigeria. org).

9.2 CONTINENT: THE AMERICAS

COUNTRY	FORMAL QUALIFICATION	PROFESSIONAL REGISTRATION	QUALITY MANAGEMENT SYSTEM	SOURCE OF INFORMATION
United States of America (USA)	Dental assistants require to be certified in order to gain registration in the individual states and territories. Dental assistants presenting for this examination can receive on-the-job training or attend either a technical high school or a community college.	The Dental Assisting National Board (DANB) offers the Certified Dental Assistants Examination on behalf of the American Dental Association (ADA).	DANB utilizes the Total Quality Management system of quality management.	ADA website (www. ada. org).
Canada	In Canada it is compulsory for dental assistants to hold a level 2 National Dental Assistants Examination Board (NDAEB) certificate, in order to practice legally. .	The dental profession is regulated by the different provincial regulatory bodies. Dental education in Canada is regulated by the Commission on Dental Accreditation of Canada	The dental assisting profession in Canada uses the ISO 9002 Quality Management System, which it adopted in 1997 (Kenny et al. ,, 1999:106). Dental practices that subscribe to this QMF are used to train dental assistants. There was no evidence of the NDAEB having a quality management system.	(www. ndaeb. ca).
Cuba	Cuban dental assistants are known as Dental Aides. Mid-level workers (the equivalent of the South African Dental Therapist) are known as Dental Assistants in Cuba. Cuban dental assistants only receive on-the-job training.	The Sociedad Cubana de Estomatologia (Cuban Dental Association) is an association of dental practitioners in Cuba, but does not regulate training nor is it involved in professional registration.	There is no QMF for such training (www. mndental. org).	The Sociedad Cubana de Estomatologia (www. mndental. org).
Brazil		A review of the Brazilian Dental Council reveals that there is no formal registration or training of dental assistants in Brazil.	A review of the course outline, the Dental Assistant Specialist (code 98150) which is available and which is used to train army dental assistants is the only that provides a curriculum, and does not reveal any quality management systems in use.	Brazilian Dental Council (www. abo. org. br)

9. 3 CONTINENT: ASIA

COUNTRY	FORMAL QUALIFICATION	PROFESSIONAL REGISTRATION	QUALITY MANAGEMENT SYSTEM	SOURCE OF INFORMATION
Hong Kong	The Faculty of Dentistry offers the one-year Diploma in Dental Surgery Assisting with formal training at the Prince Phillip Dental Hospital, under the control of the University of Hong Kong (HKU) (Crosswaite, 2007:65).	Dental Surgery Assistants (DSAs) are the Hong Kong equivalent of dental assistants. They belong to the Hong Kong Association of Dental Surgery Assistants (HKADSA). These dental surgery assistants are not required to register with any professional body, nor does such a body exist.	The Hong Kong University has a comprehensive QA system in place for all academic programmes, which was developed in-house to suit the institution (QA in HKU, 2010:9) (www. hku. hk).	QA in HKU, 2010:9) (www. hku. hk). (Crosswaite, 2007:65).
Singapore	Dental assisting education is provided by a single institution, the National Institute of Technical Education Centre (NITEC). The NITEC is accredited by the National Dental Centre of Singapore (NDC). The course is the one-year full-time NITEC Certificate in Dental Assisting.	Dental assistants in Singapore are not compelled to register with the regulatory body, the Singapore Dental Council. Nor do they have to register with the Singapore Dental Association or the Singapore Ministry of Health.	Correspondence from the NITEC reveals that the NITEC uses the Singapore Quality Award (SQA) Business Excellence Framework (ISO 9001:2008) quality management system. According to its website this QMF was adopted in 2002 (www. ite. edu. sg). No further information could be gained from an internet search, and two e-mail requests for further information went answered.	a
Thailand	The Certificate in Dental Assisting is only offered by Mahidol University Dental Education Centre, Bangkok. Dental assistants can also receive on-the-job training, and do not require a formal qualification in order to practice in Thailand.	Dental assistants do not require a formal qualification or registration in order to practice in Thailand.	The year-long certificate course is quality assured by the Academic Promotion and Development Unit of the Mahidol University Dental Education Centre, Bangkok.	Mahidol University Dental Education Centre, Bangkok. (www. dt. mahidol. ac. th).
India	Indian dental assistants receive on-the-job training or can attend one of 24 private or government dental training colleges. These colleges are recognised by the Dental Council of India.	Dental assistants do not have to be registered in India.	The dental assisting course is quality assured by the Ministry of Health and Family Welfare. The Ministry ensures that these 24 dental colleges comply with the standards as laid down for the Dental Operating Room Assistant Course (Regulation 2007).	Dental Council of India (www. dciindia. org).

9. 4. CONTINENT: EUROPE

COUNTRY	FORMAL QUALIFICATION	PROFESSIONAL REGISTRATION	QUALITY MANAGEMENT SYSTEM	SOURCE OF INFORMATION
United Kingdom (UK)	Dental assisting training is regulated by the Qualification and Curriculum Authority (QCA) and is based on occupational standards. The British Dental Association (BDA) conducts the assessments for dental assistants by assessing the "Record of Experience" before awarding the National Certificate in Dental Assisting (NVQ Level 3).	Dental assistants are legally compelled to register with the General Dental Council (GDC). The GDC undertakes a quality assurance review of curriculum documents submitted by course providers and awarding bodies (Lester, 2001: 576).	The British Dental Association (BDA) conducts the assessments for dental assistants by assessing the "Record of Experience" before awarding the National Certificate in Dental Assisting (NVQ Level 3). In 1995 the BDA adopted the ISO 9002 quality management tool. However this system is used for the organisation in general, and not specifically for the training or examination of dental assistants (Lester, 2001: 582).	General Dental Council (GDC) (Lester, 2001: 582).
France	French dental assistants (Assistante dentaire) are trained for 18 months and graduate with a Certificate in Dental Assisting Level IV. Training takes place at accredited training centres. The accreditation body is the SPES (Society for the Promotion of higher vocational training).	There is no evidence of professional registration for dental assistants.	There is no prescribed QMF for these training centres.	(www. assistantsinfrance. com).
Germany	German dental assistants receive three years of on-the-job training and then undertake the Dental Associations final examination.	There is no mechanism for registration with the German Dental Association (Arbeitsgemainschaft der Deutschen Zahnarztekammern).	Their training is not regulated or quality assured by the German Dental Association (Arbeitsgemainschaft der deutschen Zahnarztekammern). This training occurs in terms of the Dental Practice Act (www. bzaek. de/english. html).	German Dental Association (Arbeitsgemainscha ft der Deutschen Zahnarztekammern) (www. bzaek. de).

9.5. CONTINENT: MIDDLE EAST

COUNTRY	FORMAL QUALIFICATION	PROFESSIONAL REGISTRATION	QUALITY MANAGEMENT SYSTEM	SOURCE OF INFORMATION
Kingdom of Saudi Arabia (KSA)	The Saudi Dental Association does not register or accredit dental assisting courses. However the Certificate in Dental Assisting II (ARAMCO) is offered by the Saeed R al-Zahrani Corporation, for employees of the ARAMCO hospital group.	Dental assistants are not registered.	The King Saud University (KSU) - College of Dentistry offers the two-year Dental Assisting Diploma Programme (DADP) to females only, and utilises the ISO9001-2008 QMF.	The KSU website provides comprehensive details of this QMF (www ksu.edu.sa).
United Arab Emirates (UAE)	Do not require any formal training. Dental assistants can undertake a Diploma in Dental Assisting at the University of Sharjah, Dubai. This training is not essential, as dental assistants can receive on-the-job training.	Dental assistants are not registered.	A search of the University of Sharjah's website does not reveal if any quality management tool is in use, and an e-mail request for further information went answered (www. sharjah. ac. ae).	

9. 6 CONTINENT: OCEANIA

COUNTRY	FORMAL QUALIFICATION	PROFESSIONAL REGISTRATION	QUALITY MANAGEMENT SYSTEM	SOURCE OF INFORMATION
Australia	Training for dental nurses is provided by universities, Technical and Further Education institutions (TAFE) or private dental nurse schools.	Dental assistants do not have to register with the Australian Health Practitioner Regulatory Authority (AHPRA) which is the regulatory body for the dental profession in terms of the Health Practitioner Regulation National Law Act (2009).	Quality assurance of dental assistant training is maintained by the Dental Assisting Education Council of Australia (DAECA). This board ensures that the Certificate III in Dental Assisting course is offered according to the standards laid out in the National Training Package (HLT07) – National Dental Standards package. The private dental nurse training schools do not have to subscribe to any quality management system and need only be registered with the Australian Qualifications Training Framework (AQTF) council as Registered Training Organisations (RTO's). The TAFE maintain their own QMF and utilise the AS/NZS ISO 9001:2008 quality management system. This QMF is an integrated set of policies, procedures, guidelines, manuals and forms that guide and prescribe protocols to students and staff. All aspects of the TAFE operations are covered (administration, teaching and learning, management) (www. edu. com. au).	Australian Health Practitioner Regulatory Authority (AHPRA) and (www. edu. com. au).
New Zealand	The New Zealand Dental Association is a registered private training establishment with the New Zealand Qualifications Authority (NZQA) and offers the Certificate of Dental Assisting (level 3, which is recognised by NZQA. Students undertaking the course work for a dentist or dental specialist for a minimum of 20 hours per week, and in this manner receive on-the-job training.	Formal professional registration for dental assistants does not exist in New Zealand.	The New Zealand Dental Association Certificate of Dental Assisting (level 3) is recognized by NZQA but no evidence of a QMF could be found.	The New Zealand Dental Association (NZDA) website.