The attitudes of Chiropractic students towards research at Durban University of Technology

A dissertation submitted in partial compliance with the requirements for a Masters Degree in Technology, in the Department of Chiropractic at the Durban University of Technology.

By

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I, Ryan Rieder, do declare that this dissertation is representative of my own work.

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DEDICATION

This Dissertation is dedicated to my family, Sean, Pearl and Dean Rieder, for their unwavering love and support.

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To my dad, thank you for always loving us with all your heart. The sacrifices you have made will never be forgotten and I will be forever grateful.

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ABSTRACT

Background: The aim of this study was to determine the attitudes of Chiropractic students towards research at Durban University of Technology (DUT). The Chiropractic profession has made significant progress with regard to the production of high quality and clinically relevant research (Newell and Cunliffe, 2003; Hawk *et al*, 2008) and the continuation of this research effort will be the responsibility of the graduates that constitute the future profession (Newell and Cunliffe, 2003). Furthermore Cull, Yudkowsky, Schonfeld, Berkowitz and Pan (2003) state that the greatest predictor of this is a positive attitude, therefore it is essential to establish the present attitudes amongst the students.

Method: The study was a quantitative questionnaire based, self administered, attitudinal survey. The sample group included all the Chiropractic students registered at DUT (n=185).

Results: There was a response rate of 74,59%. The results indicated that on average students thought that the research subjects and courses taught at DUT were not interesting and that they did not adequately prepare them to perform research. The majority of the students felt that the research process was completely vague to them and that they felt insecure about their knowledge of research methodology. It was evident that students thought that DUT staff members placed a great emphasis on research and that they were easy to approach with regards to research. The area of greatest concern was that although students thought that the student researcher relationship was of great importance, they indicated that it was difficult to find a supervisor and they also indicated that inadequate supervision had delayed their research progression. For the most part students thought that research was important and they enjoyed listening to and reading research. However, only slightly positive scores were recorded when students were asked if they wanted to do research in the future, as they felt it was difficult and time consuming.

Conclusion: Many factors were significantly associated with positive attitudes towards research at DUT and the strongest correlation between scales was between the importance of research and positive feelings towards research (r=0.713). Most students felt research was important and that it made them more knowledgeable however, if given the choice they would study at an institute where research was not mandatory.

Key Words: Chiropractic student, research, attitude

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DEFINITIONS

Allopathic

The treatment of disease by conventional means, i.e. with drugs having effects opposite to the symptoms/ symptom reducing effects (South African Concise Oxford Dictionary, 2007).

Attitude

Regularities of an individual's feelings, thoughts, and the predisposition to act toward some aspect of his or her environment (Milton, 1981).

Bottom-Up process

Bottom-Up processes of perception and attitude formation are driven by external environmental input from available stimuli (Hayes, 1994).

Chiropractic

A health care profession concerned with the diagnosis, treatment and prevention of disorders of the neuro-musculo skeletal system and the effects of these disorders on general health (Chapman-Smith, 2000; CASA, 2009).

Chiropractic student

Chiropractic students are defined as all students that were registered for the Chiropractic programme at DUT at the time of the study.

Complementary and alternative medicine (CAM)

Refers to a broad set of health care practices that are not part of a countries own tradition, or not integrated into its dominant health care system (World Health Organisation, 2005).

Content Validity

A questionnaire has content validity when the content of the questionnaire is considered effective, and well rounded enough to be able to assess a particular concept (Mouton, 1996). This was achieved by having the individuals in the focus group representative of the specific areas of expertise related to the research to be conducted as well as respondent representation (Dyer, 1997).

Evidence Based Medicine

Is defined as the conscientious, explicit and judicious use of current and best external scientific evidence in making decisions about the care of patients (Sackett, 1996).

Face Validity

Face validity is the simplest type of validity, which is determined by agreement between researchers and those with a vested interest in the questionnaire (i.e. interpreted in this study as those participants of the focus group), that 'on the face of it' the tool seems valid, unambiguous and easily interpreted by a lay person (Mouton, 1996).

Masters post fifth year examinations

In this study students that have completed the course work component of the masters programme, have been referred to as Masters students, post fifth year examinations.

Matriculant

A matriculant or Grade 12 learner is a school learner who is at their final year of study in their academic career at school (Crowther, 1997).

Perception

Refers to the way in which things are seen, understood to be like, and interpreted as (Oxford English Dictionary, 2002).

Perceptual set

Expectations or preconceived ideas, attitudes and behaviour an observer will bring into a situation where a perception may be formed (Coren and Ward, 1989).

Scale

A series of units, degrees or qualities for measuring something (Oxford English Dictionary, 2002). For the purpose of this research, scales are the six different sections which have been identified as factors that influence attitudes toward research (viz. negative feelings towards research, positive feeling towards research, training for research, department involvement, confidence to do research and importance of research).

Top-Down process

Considers prior knowledge and experience to be crucially important in the formations of perceptions and attitudes (Hayes, 1994).

Chapter One: Introduction

1.1. Background to the study:

Attitudes are formed by the interaction of people, events and objects within a particular context. As such, each of the three parts brings with it a unique aspect to the formation of a person's attitude. As a result of this, it should be considered that a person's background, social context/upbringing and learned experience play an important role in perception formation. This influences the individual's attitude and resultant behaviour towards the person, event or object with which that individual is interacting (Milton, 1981; Hayes, 1994; Eysanck and Keanes, 1996; Robbins, 1996 and Bergh and Theron, 1999). This process is named in the literature as the "Top-Down" approach toward perception formation (Hayes, 1994).

In contrast to this, the environment is shown to play a significant role. In this context the environment may positively or negatively enable perception, attitude or behaviour development towards a particular person, event or object. This is referred to in the literature as the "Bottom-Up" approach toward perception formation (Hayes, 1994).

These two approaches therefore play a significant role in perceptual set formation which will affect expectations or preconceived ideas an observer will bring into a situation (Coren and Ward, 1989; Hayes, 1994). This perceptual set will then form part of the "Top-Down" process for that individual when they interact in a similar manner in the future. Additionally, the perceptual set forms the basis of an individual's future interactions.

It is therefore important to identify and understand the factors that influence perceptual sets and ultimately that of perception, attitude and behaviour development. This identification and understanding can be used to facilitate a positive perceptual set; thus enabling a more productive interaction between the individual and a person, event or object for the greater good of the individual or the profession to which the individual belongs (Waters, Martelli, Zakrajsek, Popovich, 1988; Zhang, 1996).

In the context of this research the external environmental factors (Bottom-Up) have been identified as:

1) The development of Evidence Based Medicine (EBM).
2) Its associated affects on Complimentary and Alternative Medicine (CAM).
3) Philosophy of the Chiropractic profession.
4) The affects of the Medical-Chiropractic conflict on research.
5) Current status quo of research in the Chiropractic profession.
6) Research training globally.
7) Research training in South Africa.

The internal factors specific to the individual (Top-Down) have been identified as:

1) Importance of Research to the student.
2) Students confidence to do research.
3) Personal factors related to the student.
4) Age.
5) Gender.
6) Race.
7) Other qualifications.
8) Marital status.
9) Subject failure.
10) Level of parent's education.
11) Socio economic factors.
12) Computer and internet access at home.
13) Previous research exposure.
14) Career decision.

Therefore this study aimed to better understand students' attitudes towards research as this may enable instructors to develop instructional techniques which may lead to more positive attitudes toward research and ultimately increased participation and support of research, which is necessary for the continued growth and success of the profession (Waters, Martelli, Zakrajsek, Popovich, 1988; Zhang, 1996).

1.2. Aims and Objectives:

The aim of this study was to investigate the attitudes of Chiropractic students towards research at Durban University of Technology (DUT).

- Objective one was to document the demographic data with respect to the students.
- Objective two was to analyse the scales which structure an attitude in terms of the questions that make up the scale.
- Objective three was to determine the associations between the scales which structure an attitude and the demographics.

1.3. Rationale:

1. The Chiropractic profession has made significant progress with regard the production of high quality and clinically relevant research (Newell and Cunliffe, 2003; Hawk *et al*, 2008). The continuation of which will be the responsibility of the graduates that constitute the future profession (Newell and Cunliffe, 2003). Furthermore, Cull, Yudkowsky, Schonfeld, Berkowitz and Pan (2003) state that the greatest predictor of this is a positive attitude, therefore it is essential to establish the present attitudes amongst the students.

2. Understanding students' attitudes towards research is essential to enable instructors to develop instructional techniques leading to more positive attitudes toward research (Waters *et al*., 1988).

3. The literature that is available on students' attitudes in other countries, has only investigated those Masters' students whose decision to take part in research was an optional component of their studies (Zhang, 1996, Newell and Cunliffe, 2003). This is in contrast to Durban University of Technology where research is mandatory according to the Allied Health Professions Council of South Africa, Act 63 of 1982 (as amended). This external influence (Bottom-Up) may affect the students' attitudes towards research.

1.4. Benefits:

The benefits of the study were to ascertain what the present attitudes are amongst DUT students towards research and to gain insight into the possible factors contributing to their attitudes. Based on the results it may be possible to guide instructors and therefore students in the right direction to enable positive attitudes towards training of research, department involvement, confidence to do research and importance of research. This may achieve the ultimate goal of increasing research uptake in the future.

1.5. Limitations:

- As the researcher is a current student at DUT, it must be considered that a degree of bias may unknowingly be portrayed in the dissertation.

- It is assumed that the students were open and honest in answering the questionnaire in order to achieve an accurate perspective of their views. However in reality students may have answered the questionnaire in an attempt to please the researcher which may have skewed the results (Dyer, 1997).

1.6. Outline of chapters:

Given the outline provided in Chapter One, Chapter Two is a review of available literature, followed by Chapter Three which discusses the research methodology. The results and interpretation of the results are discussed in Chapter Four and the conclusion and recommendations follow respectively in Chapter Five.

Chapter Two: Literature Review

2.1. Introduction

In everyday life people react to the world around them in ways that are determined by many factors, the greatest of which is their attitude towards people, events and objects which they perceive in the context of the environment within which they interact at a certain point (Milton, 1981; Hayes, 1994). To begin to understand this process it is necessary to first understand what an attitude is and how it forms part of the psychological process that influences an individual's behaviour (Milton, 1981).

2.1.1. Attitudes

Within the social sciences realm the term "attitude" has lay and specialist connotations, however there is little consensus as to what is understood by it (Fielding, 2001). Milton (1981) describes attitudes as a combination of an individual's feelings and thoughts that results in the predisposition to act toward some aspect of his or her environment in a particular way. This is similar to the definition given by Fishbein and Ajzen (1975) who defined an attitude as the general feeling or evaluation a person has towards self, other people, events or objects. Both these definitions are similar to the "Bottom-Up" process of forming a perceptual set as they both place a great emphasis on the effects that the external stimuli have on an individual (Hayes, 1994).

However Rokeach (1948) and Coon and Mitterer (2007), place more emphasis on the previous or learned experience that mould an attitude. Rokeach (1948) defined an attitude as a learned orientation or disposition which provides a tendency to respond favourably or unfavourably to an object or situation. Coon and Mitterer (2007) suggest that a formed attitude is a mixture of belief and emotion based on previous experiences that predisposes a person to respond to other people, objects, or institutions in a positive or negative way. These definitions are similar to the "Top-Down" process of forming a perceptual set as this process concentrates on the importance of prior knowledge and other cognitive factors which may form a person's perception (Hayes, 1994).

In reality, it seems that a combination of both the “Bottom-Up” process as well as the “Top-Down” process form an integral part in the development of a person’s perceptions and that neither holds dominance over the other. Once a person’s perceptions are formed this has a resultant effect on their attitudes and behaviour thereafter. Common to most definitions of an attitude is that it is a predisposition to behave in a particular way (Proctor, 2001), and attitudinal research assumes a strong relationship between attitudes and behaviour (Bennett and Murphy, 1997).

Therefore, it is impossible to understand the importance of an individual’s attitudes without examining how these attitudes form part of the psychological process that influences an individual’s behaviour (Milton, 1981).

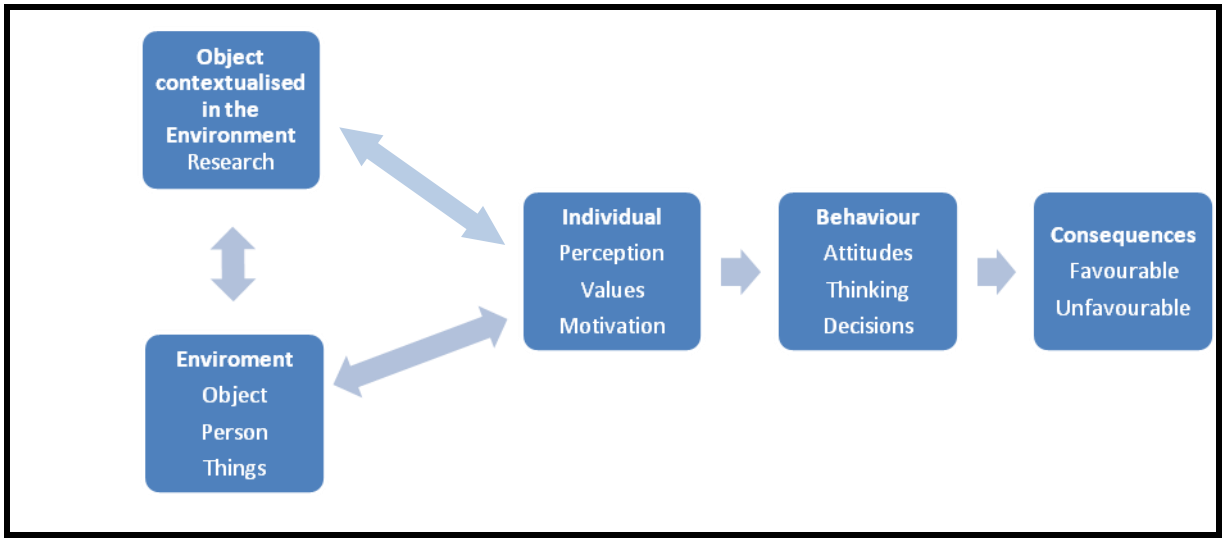

Figure 2.1 Psychological process affecting behaviour (Adapted from Maier (1965)).

As reflected in Figure 2.1 the environment consists of stimuli that surround an individual, which cannot be controlled by that individual. As such these environmental stimuli can affect a person’s perceptions, values, motivations and attitudes (defined in literature as the “Bottom-Up” formation of perceptions and values (Hayes, 1994)). However, an individual does not only respond passively to these stimuli, but rather their previous or prior learned experiences can affect the attitude with which they respond to the environmental factors (Milton, 1981; Hayes, 1994) (defined in literature as the “Top-Down” formation of perceptions and values (Hayes, 1994)). These factors, therefore, have an effect on the formation of an individual’s attitude and their consequent behaviour in a particular context which may

either be favourable or unfavourable (Milton, 1981; Hayes, 1994). Studying this outcome of favourability is important as behaviour that has a favourable consequence is likely to be repeated again and should therefore be enhanced (Milton, 1981).

Therefore, the next sections will deal with how the environmental factors influence the formation of positive or negative attitudes (the "Bottom-Up" formation of perceptions and values (Hayes, 1994)), followed by the effect of the person's characteristics (the "Top-Down" formation of perceptions and values (Hayes, 1994)) that they bring to the dynamic interaction process of attitude formation and their consequent behaviour. Lastly, the specific research process that a research student follows at DUT, will be outlined.

2.2. Factors affecting the "Bottom-Up" approach to attitude development

2.2.1. Environmental factors

The environmental factors that may be associated with the development of attitudes towards research include:

1) The development of Evidence Based Medicine (EBM).
2) EBM's associated affects on Complimentary and Alternative Medicine (CAM).
3) Philosophy of the Chiropractic profession.
4) The affects of the Medical-Chiropractic conflict on research.
5) Current status quo of research in the Chiropractic profession.
6) Research training globally.
7) Research training in South Africa.

These factors are individually assessed and thereafter the cumulative effect of the interaction of these factors will be assessed in terms of their likely effects on the student.

2.2.1.1. The Development of Evidence Based Medicine within a medical context

Before the major movement of Evidence-Based Medicine (EBM) all health care was an art or craft rather than an organised body of knowledge with little use of science in education and treatment methods (von Staden, 1996; Chapman-Smith, 2000; Goodman, 2003).

Thus, the intellectual birth of EBM may be traced back to Thomas Beddoes (1760-1808) who argued that medicine in the eighteenth century had become stagnant and secretive (Porter, 1992; Beck, 2004) and that the medical science of his day was harming patients (Goodman, 2003; Beck, 2004). As a result Beddoes proposed two solutions (Goodman, 2003):

1) The systemic collection of medical facts and
2) The collection and publishing of medical data.

Consequently the term EBM originated in the 1980's when Sackett sought to further improve the medical curriculum and training of future physicians (Cohen, 1996). Since then EBM has grown beyond academia into a common practice and is a standard utilized by the majority of medical practitioners today (Villanueva-Russell, 2005). In this context EBM has evolved to contain four major areas of study (Woolf, 2001):

1) Critical evaluation of individual research studies;
2) Meta-analysis or systemic reviews of studies in a particular area or practice;
3) Evidence-based practice guidelines outlining standards for professions and
4) Evidence-based systems of care focused on the implementation of health care protocols.

EBM does not mean that individual clinical experience is of no value but rather that experience combined with the best available scientific research will maximise clinical expertise of the practitioner leading to better patient outcomes (Nelson, Lawrence, Triano, Bronfort, Perle, Metz, Hegetschweiler and LaBrot, 2005). The ultimate

rationale behind EBM is to replace common sense, opinion and judgement with empirical, objective and scientific standards to evaluate and validate procedures and processes in clinical practice (Evidence-Based Medicine Working Group, 1992). To this end, the trend towards EBM has accelerated the need for research in recent times, as research is increasingly being accepted as the strongest justification of any health care modality (Sackett, 1997). Based on this, it is important to understand what impact the EBM movement within the allopathic health care arena has had on CAM (and subsequently Chiropractic).

2.2.1.2. The effects of EBM on CAM

Before the era of EBM the acceptance of the Chiropractic profession was determined by legislative rights alone, which afforded the profession a measure of isolation, but allowed for growth of the profession outside of medical scrutiny. It became evident that current medical practices were not optimizing patient outcomes and that a superior form of evaluation and judgment was needed (Haynes, 1999). By the 1990's EBM had become entrenched within academia and allopathic medicine, which was not the case within the CAM professions (e.g. Chiropractic) (Villanueva-Russell, 2005). EBM formed the solution that settled the discomfort felt by physicians and third party payers as it became the main means by which the cost effectiveness of healthcare would be achieved by creating a strict system to restrict insurance reimbursements (Villanueva-Russell, 2005). Therefore, following the EBM movement the criteria for acceptance of the Chiropractic profession came, not only from allopathic medicine, but also from third party payers in the form of Health Management Organisations (HMO's) (Villanueva-Russell, 2005; Haldeman, 2005). This resulted in the development of the profession being reliant not only on legislative developments but also on a need to produce research to validate its claims, as pressure mounted from within allopathic medicine disciplines for critical and empirical evaluation of CAM professions (Haynes, 1999).

These developments also coincided with the marked interest by the public in CAM (Eisenberg, Kessler, Foster, Norlock, Calkins and Delbanco, 1993; Eisenberg, Davis, Ellner, Apel, Wilkey, Rompey and Kessler, 1998), whose demands for access to information made it even more critical for CAM professions to consider research as a

vehicle for producing and disseminating evidence to support claims made by the profession.

For the most part, advocates of EBM (Association of Chiropractic Colleges, 2009) within CAM also saw this as an opportunity to bridge the gap between allopathic and CAM professions (Wilson and Mills, 2002); which led to the authorities in the Chiropractic profession suggesting that CAM professions should incorporate EBM into their teaching institutions (World Health Organisation, 2005) and focus on research agendas as this would allow for greater acceptance of CAM by allopathic medicine (Watkins, 1944). It was thought that this would not only help to validate current Chiropractic practice but also help integrate Chiropractic practice into mainstream medicine (Moley, 1991; Haldeman, 2005).

Some proponents within the Chiropractic profession, however, felt threatened by the need to develop a purely evidence based system, as the tenets of the profession had (until the advent of the EBM era) been accepted as “dogma” and there was little evidence to suggested that this theorised “dogma” was actually the closest approximation of the truth. This philosophical “dogma” was further enhanced by the perceived, “self evident” improvements in patients’ conditions, which was perceived not to require further investigation as the patients’ were in themselves evidence that the practice of Chiropractic did indeed achieve optimal outcomes (Haldeman, 2005; McCoy, 2008).

As a result, the Chiropractic profession could have been more affected by the philosophically driven majority of Chiropractors at the time, resulting in a late start in developing research and research infrastructure, which therefore led to the entrenched negative professional (historical) attitudes toward research which exist today (McCoy, 2008). Re-inforcing the need to overcome this obstacle, Meeker and Haldeman (2002) stated that the future of the Chiropractic profession would be determined by its commitment to EBM and research and that the next decade would determine whether the Chiropractic profession remains a CAM profession or if it becomes fully integrated into all healthcare systems.

As a result one cannot fully understand how the recent trend for research and EBM has affected the Chiropractic profession without discussing the foundations and philosophy of the Chiropractic profession itself (Villanueva-Russell, 2005).

2.2.1.3. Philosophy surrounding the Chiropractic profession

Chiropractors believed that there was a spinal abnormality (subluxation) that was interfering with the nervous system and thereby obstructing the body's own natural or "innate" healing power and that an adjustment / manipulation of this spinal abnormality was critical to the healing act (Kaptchuk and Eisenberg, 1998; Chapman-Smith, 2000). This belief and outlook on patient care was further re-inforced by the need for Chiropractic to define itself as a healing profession, outside of the realms of medicine. Any affiliation with medicine during the formative years of the Chiropractic profession often led to incarceration of the Chiropractor for performing medicine without a licence (Keating, Coyle and Hansen, 1992; Chapman-Smith, 2000 and Haldeman, 2005). Based on this, Chiropractors claimed to have an alternative and superior approach to healthcare and charged the medical doctors with merely treating symptoms with the remedy of the day (Chapman-Smith, 2000; Haldeman, 2005).This resulted in Chiropractors defining their profession as a separate and distinct healing art as compared to its principal rival profession, medicine (Keating *et al*., 1992). With this in mind Chiropractors long believed that the "proof" that their professional practice worked was that patients were getting better. As a result they felt comfortable thinking that no further investigation was needed and as a result led to most of the evidence supporting Chiropractic being anecdotal testimonials and case studies (Villanueva-Russell, 2005).

This "natural history approach" to patient management (Warner, 1985; Villanueva-Russell, 2005) was not congruent with the EBM movement as the methodology to validate the techniques within the Chiropractic profession were not randomized controlled, double-blind experiments that academia and therefore allopathic medicine had set as a gold standard (Sackett, 1997). The development of this softer science was partly due to the fact that the Chiropractic profession considered themselves antipodal to all things medical (Keating *et al*., 1992; Chapman-Smith, 2000; Haldeman, 2005). Another factor was that up to as late as the 1950's

Chiropractic education was seen as immature compared to that of allopathic medicine, which improved after the 1920 Flexner report that condemned most medical education (Chapman-Smith, 2000; Villanueva-Russell, 2005). These two factors therefore did not allow the Chiropractic profession to absorb the EBM movement requirements as the profession in its development was too immature (Keating *et al*., 1992; Wardwell, 1992).

Within this setting and the fact that Chiropractic appeared to lie in direct opposition to allopathic medicine and seemed to be unable to absorb the EBM requirements together with fact that Chiropractors still made outrageous health care claims led to further internal resistance to embracing EBM. This led to the alienation of the profession from mainstream healthcare funding and governmental support for EBM development (Keating *et al*., 1992; Stranack, 1995). These factors all played a part in shaping the current attitudes of the Chiropractic profession towards research and the resultant effect on student attitudes towards research. Furthermore there were also implications in terms of the development of the profession with regards to EBM, which will be discussed in the next section.

2.2.1.4. The affect that the Medical-Chiropractic conflict had on research

In line with the development of EBM and between the periods of 1910 and 1950 United States (U.S.) medicine education standards and funding from government and private entities greatly improved (Chapman-Smith, 2000; Beck, 2004). However, Chiropractic education remained poorly developed with regards to program standards, quality and length and it remained a tuition driven private enterprise (Chapman-Smith, 2000). As a result it was suggested by Chapman-Smith (2000) that the criticism towards Chiropractic was not consistent throughout the history of its development but rather that in order for allopathic medicine to gain credibility, unity, economical and political control of health care, it required a group of health care professions that did not comply with the “norms” as a target (viz. CAM professions of which Chiropractic was one). However, the converse is also possible in that the Chiropractic profession through its inability to develop through normal social developmental ‘norms’, also provided itself as a target for allopathic medicine to

utilise and highlight the professions inadequacies and their achievements over time (Keating *et al*., 1992; Wardwell, 1992; Chapman-Smith, 2000; Haldeman, 2005).

Consequently, the Chiropractic profession was ostracised by the American Medical Association (AMA) who in 1957, explicitly forbade further consultations by any medical professional with Chiropractors (Kaptchuk and Eisenberg, 1998). In 1963 the AMA formed a committee to primarily contain and eliminate Chiropractic in which their goal was to illegally create a monopoly for the medical profession (Kaptchuk and Eisenberg, 1998; Chapman-Smith, 2000). In 1976, five Chiropractors took up a suit against the AMA and after a long and costly litigation the AMA were found guilty in 1987 of conspiracy against Chiropractors (Kaptchuk and Eisenberg, 1998). This gave any member of the AMA freedom to make a decision whether or not to be professionally associated with Chiropractors, Chiropractic students or Chiropractic institutions (Wilk, 1987). There was immediately a significant increase in cooperation in practice, education, and research (Chapman-Smith, 2000). Additionally, this reprieve from the hands of organised allopathic medicine highlighted the need for the Chiropractic profession to develop its own internal organisation, review its developmental trajectory and engage in EBM. As a result of this the Chiropractic profession developed the formalised structure of the World Federation of Chiropractic (WFC) in 1988 (Chapman-Smith 2000).

However, much damage had already been done, as the long standing self isolation and the ostracism by allopathic medicine had resulted in isolation from other health professionals, universities and resources that might otherwise have been available to aid the research effort (Keating *et al*., 1992). The cumulative effect contributed to the Chiropractic profession being late on starting with research, research infrastructure and EBM (Keating *et al*., 1992). This, therefore, conflicted with and compounded the effects of the consumers that required increased information (Eisenberg *et al.,* 1993; Eisenberg *et al*., 1998) as well as the defined requirements that the leaders of the profession had for the development of the profession (Meeker and Haldeman, 2002). However these developments did not play into the hands of those Chiropractors who did not perceive the need for the development of EBM or had a strong philosophical view of the profession.

This had therefore been a hindrance on the development of the research culture of the profession which had early affects on the attitudes of the profession towards research which furthermore has had an effect on the current research status of the profession.

2.2.1.5. Current Research status

Until the 1980's the Chiropractic profession failed to produce a reasonable quantity of research to support the need for EBM, even though the first Chiropractic research initiative was founded as early as 1944 (The Foundation for Chiropractic Education (FCER)) (Chapman-Smith, 2000). Only much later, in 1979, the Journal of Manipulative and Physiological Therapeutics was launched (Haldeman, 2005), followed 20 years later by the Journal of Neuromusculoskeletal Medicine and almost 30 years later by the Journal of Chiropractic Medicine, Journal of Chiropractic History and Journal of Chiropractic Education (Haldeman, 2005).

Notwithstanding this slow development and movement toward EBM, Meeker and Haldeman (2002) showed that there had been at least 73 randomised clinical trials on broadly defined manipulative procedures with most of the papers being published in general medical and orthopaedic journals and only nineteen being published in Chiropractic peer reviewed literature by 2002. Most first authors had medical degrees with only 23 papers being written by Chiropractors (Meeker and Haldeman, 2002). It can be seen that Chiropractors contributed little in comparison to the allopathic professions, who by now had developed a research system that enjoyed support from many quarters (legislative, Health Maintenance Organisations (HMO's), pharmaceutical houses and the public).

The above therefore highlights the limited Chiropractic research base and clear need for research to be done by Chiropractors, as the literature base and research that has to date been found has been vital in contributing to the continued growth and success of the profession (Haldeman, 2005). McCoy (2008) states that within health care, professionals are faced with the ever increasing demands of evidence based medicine as well as the demands for information from patients. According to Haldeman (2005), the survival of the profession will be determined by its

commitment towards evidence based medicine and research which currently governs the allopathic medicine disciplines.

Therefore, the importance of research and research training is evident to aid in the increased uptake of EBM within the Chiropractic profession. With such a great need for research it is important that we develop positive attitudes towards research as this is a strong predictor for future research activity (Cull *et al.,* 2003). McCoy (2008) furthermore suggests that the best place to create positive attitudes towards research is at tertiary Chiropractic institutes through research training.

2.2.1.6. Attitudes towards Research training internationally

As previously outlined by Haldeman (2005), the survival of the Chiropractic profession will be determined by its commitment to EBM and research. This is interesting in light of the fact that Zhang (1996) showed that research training amongst Chiropractic students was relatively low and that a lack of education in research training may be the reason students do not develop an interest in furthering their knowledge in research. This is, however, not only unique to the Chiropractic educational system, as allopathic medical students at a similar point in research development, identified poor research training within a 3rd world country, as the single most important reason for the current poor research activity (Aslam, Qayuum, Mahmud, Qasim and Haque, 2004). Therefore, it is evident that poor research training or lack of research training will negatively affect attitudes towards research and that globally research training amongst students seems to be poor (Zhang, 1996; Aslam *et al.,* 2004).

Conversely, research training has clearly been shown to influence attitudes toward research as implementation of courses in research methodology result in positive outcomes towards research attitudes and productivity (Harrison, Lowery and Bailey, 1991; Adamsen, Larsen, Bjerregaard and Madsen, 2003; Marusic and Marusic, 2003; Newell and Cunliffe, 2003; Hakansson, Beckman, Hansson, Merlo and Mansson, 2005). Research training is also thought to help improve students' academic writing skills which have been identified as an important factor contributing

towards research success which may lead to more positive attitudes towards research (Mouton, 2001).

The above has outlined the importance of research training and the research training status quo internationally. However, as international trends often differ from a socio economic and historical viewpoint to that of African trends, it is imperative to outline how the South African context may compare to the international trends.

2.2.1.7. Chiropractic research education in South Africa

In 1982 the Chiropractors, Homeopaths and Allied Health Services Professions Council was formed, a statutory body that wrote Chiropractic into law (CASA, 2009). Following this, a few South African Chiropractors were authorised by the South African Associated Health service professions board to visit colleges overseas in 1984. As a result of the reports submitted to the Department of Health, an opportunity to offer Chiropractic education in South Africa arose and a curriculum was drawn up based on the overseas visits (Till, 1997).

In a South African Context Chiropractors are governed by the Allied Health Professions Council of South Africa (AHPCSA). According to Act 63 of 1982 (as amended) all institutes offering Chiropractic training need to conform to the regulations defined by the AHPCSA. The 2001 regulations of Act 63 of 1982 (as amended) clearly state that the minimum qualification requirements are a Masters Degree in Chiropractic before qualifying and registering legally as a practitioner (Allied Health Professions Act 63 of 1982 (as amended)).

In South Africa the Chiropractic Masters qualification comprises of 4 and ½ years[1] of course work in addition to the completion of a Masters dissertation and clinical requirements (thus the programme is at minimum 5 years in duration) (DUT Chiropractic Handbook, 2008). However, the course structure at DUT is somewhat different to that of other Chiropractic colleges which have a four year undergraduate degree (National University of Health Sciences, 2009), after which a graduate can apply for registration as a practitioner. Thus the graduate may elect to complete a

[1] Note the 4 ½ years prior to the Masters includes, a National Diploma (3 year degree equivalent) and a B-Tech (Bachelors/Honours equivalent year).

Masters dissertation after starting practice however it is not a mandatory requirement.

The World Health Organisation set up guidelines for the minimum requirements for Chiropractic education in December 2004 (World Health Organisation, 2004). The guidelines recommended that an applied research and biometrics course be taught with the equivalent of at least 32 hours of teaching making up the course. The World Health Organisation also recommended that a research investigation project be completed in the student's final year of study in order to stimulate and support research productivity.

The DUT Chiropractic programme more than complies with the guideline set out by the WHO, with approximately 540 hours being allocated to research training and research activities over three years (Korporaal, 2009). Therefore, it is expected that students at DUT should be more positive towards research following their extensive research training.

2.2.1.8. Cumulative Effects of Environmental Factors on Attitudes

It would seem that from the developmental trajectory of the profession (Keating *et al*., 1992; Chapman-Smith, 2000; Haldeman, 2005) that there is still internal discord as to the need for research and its role in the development of the profession (McCoy, 2008). This is further illustrated as McCoy (2008) urges Chiropractic colleges to make it mandatory to complete a research dissertation, in order to allow research exposure to the developing profession. Although this approach may be pragmatic in terms of the profession achieving its goal, it may actually alienate students from research in that the negative attitudes and apathy towards research that already exists (as a result of the internal discord in terms of the need for research) within the profession (Zhang, 1996; McCoy, 2008) may further be increased. This becomes more significant when examining the strong associations between negative attitudes towards research and poor performances in research and research related courses (Elmore and Lewis, 1991; Woehlke, 1991; Zeidner, 1991).

To counteract this possible negative reaction to research, recent years have seen the development of methods to change these attitudes towards research and encourage Chiropractors to study for Master's and Doctoral degrees. Some of these methods included providing work-study positions or scholarships to Master's students and revising curricula in an effort to increase teaching of research (Zhang, 1996; McCoy, 2008). Additionally, research training has been shown to influence and change attitudes positively toward research as implementation of courses in research methodology result in more positive outcomes compared to that of students attitudes before a course (Harrison *et al*., 1991; Marusic and Marusic, 2003; Adamsen *et al.,* 2003; Newell and Cunliffe, 2003; Hakansson *et al*., 2005). Following this trend, Zhang (1996) showed a significant correlation between high levels of research training and positive attitudes towards research amongst Chiropractic students. Furthermore, and most importantly there were also associations between high levels of research training and long term affect on attitudes towards research (Zhang, 1996; Suter, Vanderheyden, Trojan, Verhoef and Armitage, 2007). This is echoed by studies that showed that high levels of research training and experience are strongly associated with future research involvement (Segal, Lloyd, Houts, Stillman and Jungas, 1990; Reinders, Kropmans and Cohen-Schotanus, 2005).

In contrast Suter *et al.,* (2007) showed that although most Chiropractors had positive attitudes towards research, only a quarter of them were involved in research or EBM in their private practices. This is, however, not only unique to the Chiropractic profession, as allopathic medical students at a similar point in research development, identified poor research training within a 3rd world country, as the single most important reason for the current poor research activity (Aslam *et al.,* 2004).

Zhang (1996), therefore, states that a dilemma exists between a clear need for research training, directed by the need for the professions development and the feeling that students do not want to do research training (possibly related to the fact that students are already caught up in the internal Chiropractic discord before they reach the research training within their courses). This is supported by the fact that in most jurisdictions internationally, the Chiropractic graduate only completes research as an elective after they have already qualified and are eligible for legal registration as a practitioner (Worldwide Chiropractic Missions, 2009). This is not an option for

Chiropractic graduates in South Africa, where students are required to complete research prior to entering the practice environment (legal registration) (Allied Health Professions Act 63 of 1982 (as amended)).

It is therefore necessary to further investigate how students have developed their present attitudes toward research in South Africa, so to apply appropriate training to promote attitudes towards research amongst DUT students. This is important as positive attitudes toward research were found to be a strong predictor in a decision to pursue further research in the future (Cull *et al.,* 2003). These findings support Meeker and Haldeman (2002), who stated that the future of the Chiropractic profession will be determined by its commitment to EBM and research.

As a starting point, it is then important to look at those factors that affect the students perception (either from the external environment (as discussed in section 2.2.1) or from within the individuals paradigm of reference such as demographic and socio economic factors) as this may form the basis for the development of their attitudes from the "Top- Down" process of forming a perceptual set.

2.3. Factors affecting the "Top Down" approach to attitude development

These factors, as they pertain to the students, are directly linked to their cultural, academic, social development and lifestyle. Therefore, they form the basis for their development of perceptions through the "Top-Down" approach to the perceptual set formation and furthermore the resultant effects on attitudes, which will determine an individual's resultant behaviour towards a particular person, event or object (Hayes, 1994).

2.3.1. Factors specific to the individual

2.3.1.1. Importance of Research to the student

Based on the needs of the profession in the future, it is critical that students understand the importance of research as this will influence their willingness to participate in research and ultimately affect their attitudes (Zhang, 1996).

In this respect, over 70% of Chiropractic students thought that research was important and furthermore 58% indicating that they would be interested in conducting Chiropractic research (Zhang, 1996). However, it is telling that only 19.4 % indicated that it should be mandatory to conduct a research project as part of their education and professional training (Zhang, 1996). This implies that although students acknowledged the importance of research to the profession, they did not want the responsibility of doing the research themselves or that they felt that the profession obtains results by the fact that patients get better without the need for research. Additionally, it is possible that students actually do not understand the impact of EBM and research on the longevity of the profession and the implications this holds for them as future professionals.

Interestingly, the same situation seems to be evident amongst medical students with the majority agreeing that reading current literature is very important (Aslam *et al*., 2004). However, once again very few indicated actually reading journals (Aslam *et al*., 2004). Thus, it would seem that even in a more research established allopathic profession; students do not fully comprehend the need for research within the context of their future professional careers. However, in terms of the percentage responses it would seem that the likelihood of not understanding this is increased within the Chiropractic student population (Zhang, 1996) and this may be a direct result of the fact that research is an accepted norm within the allopathic profession as compared to the Chiropractic profession. This is seen in that more allopathic medical students are likely to engage in research at a later stage (Peters, Clark-Chiarelli and Block, 1999).

2.3.1.2. Students Confidence to do research

Confidence to do research with regard to perceived knowledge of present research, research design, analysis of research data and ability to understand research terminology are low amongst most research students within many different professions (Zhang, 1996; Suter *et al.,* 2007; McColl, Smith, White and Field, 1998). Suter *et al.,* (2007) showed that only 21.7% of Chiropractors indicated having knowledge in research design while Chiropractic students in a study by Zhang

(1996) reported having very little knowledge in present or past research. This is of importance when noting that research students only seemed willing to participate in a research project once they are confident that they are capable to conduct one (Zhang, 1996). This suggests that students within the Chiropractic programmes had little or no exposure to research and seems to indicate that they will only with future training feel confident enough to complete / participate in future research (Connolly, Lupinnaci and Bush, 2001). This is in contrast to the recommendation by the WHO, who indicate that research training should form a part of the Chiropractic programme (World Health Organisation, 2004). This is critical as Connolly *et al*., (2001) showed a link between confidence to do research and the incorporation of results of research studies into clinical practice.

This highlights the importance of improving students' confidence to perform research as it is evident that those students who were not confident in their research abilities were less likely to conduct further research or use research results within their practice.

2.3.1.3. Personal factors related to the student

2.3.1.3.1 Age

Zhang (1996) showed that age played a role in determining a Chiropractic student's attitude towards research. Statistically significant results were recorded with regard to older students having more knowledge of research analysis (p=0.05). Questions regarding willingness to perform research (p=0.076) and acknowledging that there are many things that need to be researched in Chiropractic (p=0.070) were insignificant but had minor associations with older students. These correlations could be attributed to the longer exposure to Chiropractic by older students, increasing the likelihood of them questioning the basic tenets of the profession and making them more aware of the need for research; which combined with an increased willingness to participate in research (Zhang, 1996; Ditcher and Tetley, 1999) allowed them a more positive attitude to research. This is in contrast to the younger students, who do not have these advantages and may also not be at a stage where they have the confidence, knowledge, awareness or learned life experience to question these

issues as required by research (Martin, Maclachlan, Karmel, 2001). Conversely, however, older students may also have had more exposure to the Chiropractic philosophical "dogma" that is less likely to rely on research and have a greater likelihood accepting current practices without question ("as they work"), which in turn may negatively affect the older students attitudes towards research and increase their likelihood of terminating their studies (Roberts, Watkins, Oakey and Fox, 2003). Following this thought, younger students may have more positive attitudes towards research as it was found that they are more likely to complete their research dissertation than older students (Martin *et al.,* 2001). However, in this study it may be expected that older students at DUT will acknowledge the importance of research and show more knowledge in research related design and analysis and therefore be more confident to perform research which in turn will positively affect their attitudes towards research.

2.3.1.3.2 Gender

Martin *et al.,* (2001) and Bills (2003) reported that females participated in research education at rates equal to that of men, and furthermore, are completing at rates slightly higher than men, which may suggest that females have a more positive attitude towards research. This may be as a result of females having higher scores for conscientiousness which may have discouraged them from missing classes and encouraging them to work harder (Woodfield, Jessop and McMillan, 2006). In addition females may be more inclined to study Chiropractic compared to men, as females tend to be more in favour of CAM therapies and the patient centered care approach that is generally adopted within the Chiropractic profession (Krupat, Hiam, Flemming and Freeman, 1999; Haldeman, 2005; Tatalias, 2006; Brown, Cooper, Franton, Steeves-Wall, Gillis-Ring, Barter, McCabe and Fernandez, 2007).

However, Zhang (1996) reported that gender did not play a role in Chiropractic student's attitudes towards research. This is in contrast to Newell and Cunliffe's (2003) study which showed that females were less confident to do research, than males. This is because the results found that males were more likely to think that research may be part of their job in the future and therefore took a greater interest in research and applied themselves accordingly (Newell and Cunliffe, 2003). These

varied outcomes may be related to females tending to be less confident when using computers and the internet and therefore tend to use research internet related activities less, making the process more laborious (Meelissen and Drent, 2008), thus negatively affect females' attitudes towards research.

In addition to this Dinham and Scott (1999) and Fleming and Mckee (2005) showed that females were more likely to have parenting responsibilities which affected the time they were able to devote to their research commitments. This may be a reason, Wright and Cochrane (2000), reported that women were less likely than men to be satisfied with their research education experience and therefore, may have negative attitudes towards research.

However, due to the conflicting literature it is not known what effect gender may have in determining students attitudes towards research at DUT.

2.3.1.3.3. Ethnicity

Ellis (2001) showed that Black students were most dissatisfied with their Doctoral research studies and may therefore have more negative attitudes towards research. However, ethnicity has not been regarded as a factor affecting attitudes towards research in previous studies (Zhang, 1996; Newell and Cunliffe, 2003). But in a South African context it cannot be disregarded given the divided cultural and socio-economic nature of the South African society (Myburgh and Mouton, 2007).

In South Africa, ethnic grouping still largely parallels socio-economic status, where the Black population make up the majority of the population (Statistics South Africa, 2009). It has been suggested that previously disadvantaged individuals may not be fully exposed to the Chiropractic profession, which has affected their decision to study Chiropractic (Rattan, 2007). This is compounded by the fact that Black South Africans in certain areas may still not have the ability to enter higher education programmes and may have negative attitudes towards education in general (Grant, 2006). Conversely, Black South Africans may perceive research or the attainment of a higher degree as a means by which to uplift their lifestyle and improve their socio-economic status above that of their parents (Makuakane-Drechsel and Hagedorn,

2000). Based on this it is expected that Black (and indeed any) student(s) could have either a negative or a positive attitude towards research at DUT, depending on their socio-economic entry into the higher education system.

2.3.1.3.4. Other qualifications

Grant (2006) showed that 23.9% of Chiropractic students at DUT had another qualification and that there were a lower percentage of failure rates amongst them as opposed to those students without another qualification. This supports previous studies (Lazarus and Folkman, 1984) which suggested that individuals who had studied previously, irrespective of whether the qualification was complete or incomplete, had developed coping mechanisms and time management skills during their studies as well as the academic literacy skills to improve their future study endeavours (Lazarus and Folkman, 1984). This is significant in that Mouton (2001) states that literacy skills and time management may play an important part towards a student's research success.

Therefore, it is expected that students with additional qualifications would be better prepared to cope with the difficulties associated with the research process. This may, therefore, positively affect their attitudes towards research.

2.3.1.3.5. Marital status

Marital status was identified as one of the factors that may hinder a student's academic progression due to the increased family commitments (Rendón, Jalomo and Nora, 1999; Fleming and Mckee, 2005). However, Mouton (2001) and Wintre and Jaffe (2002) reported that family may play a role in the retention of students and researchers; as a marital partner could be seen as a source of support and encouragement which may be the reason that students whose research dissertations were highly rated were more likely to be married (Marquis and Brush, 1966).

Therefore, due to the support that a married student might receive it is expected that they may have more positive attitudes towards research than those students that are not married. However this is in contrast to the fact that most students who apply to

higher education institutes are not married (Lovik, 2004). Grant (2006) indicated that this was also the case amongst Chiropractic students at DUT.

2.3.1.3.6. Subject failure

Grant (2006) showed that 34% of Chiropractic students indicated that they had failed at least one subject before. In contrast Marquis and Brush *et al.*, (1966) showed that higher grades were related to an overall higher quality of research and that the same would apply to lower grades being associated with an overall lower quality of research. Lower grades also correlated with students taking longer to complete their post graduate research (Marquis and Brush *et al.*, 1966).

Therefore, it may be expected that subject failure at some point in a Chiropractic student's career may be associated with students taking longer to complete their research and therefore have a more negative attitude towards research. However, students at DUT who have failed a subject are often unable to progress into the next year before successfully completing that subject (DUT Chiropractic Handbook, 2008). This often means that their workload is dramatically lowered in the year that they are repeating the failed subject. It has become a trend that these students start their research dissertations because they have more time available (Korporaal, 2009). This may result in these students enjoying the research process more as they have less academic responsibilities to juggle while doing their research dissertation.

2.3.1.3.7. Level of parents education

HortaÇsu (1995) showed a positive relationship between parents' level of education and children's academic achievement and their attitudes towards academics and that the level of parent's education may play a role in their children's attitude towards research. This is most likely due to the academic experience and support that is offered to the student by the parents. Makuakane-Drechsel and Hagedorn (2000) have shown that the families of first generation higher education students are unable to support them academically which in turn may negatively affect the student's attitudes towards research. Therefore it is thought that those students at DUT whose parents had no tertiary education may be more negative towards research. Grant

(2006), showed that 29% of Chiropractic student's fathers and 24% of mothers had tertiary education respectively. This would seem to suggest that a negative perception of research is possible. However one needs to consider that students whose parents did not have a tertiary degree may be more motivated to overcome the obstacles that the lack of academic support had posed in their research experience in order to better academically support their children. They therefore may have more positive attitudes towards research (Makuakane-Drechsel and Hagedorn, 2000).

2.3.1.3.8. Socio economic factors

According to Spours (1997), finance is one of the major problems which needs to be addressed in higher education worldwide and it is the most articulated aspect in South Africa as a factor that makes it challenging for learners to complete their studies (Pretorious and Le Roux, 1998; De Beer, 2005). Students who come from a poor socio-economic environment are often forced to work part time to help support their families and themselves, in addition to attending classes (Olenchak and Hebert, 2002). They face financial struggles to pay for tuition, books, high internet and computer hardware costs and other expenses associated with education and particularly research related activities (Creighton, 2007; Mazloomdoost, Mehregan, Mahmoudi, Soltani and Embi, 2007). The extra time associated with part time jobs and possible limitations of internet and computers make it difficult to perform research to the best of their ability which may negatively affect their attitudes towards research. Thus access to financial assistance in the form of student loans is essential to the enrolment and retention of students from poor socio-economic backgrounds in higher education (Nora, 2001). Evidence has suggested that lack of financial aid does have an effect on student persistence, especially among the economically disadvantaged (Tinto, 1999). Furthermore, Mouton (2001) also lists financial difficulties as a factor associated with non completion of post graduate research. Additionally, Wright and Cochrane (2000) also found that access to funding to perform research is associated with higher completion rates.

Therefore, it is expected that students who do not have access to financial aid in the form of parent funding or student loans and are required to work part time will have less time for research activities and therefore may have negative attitudes towards research. However, these students may also be more motivated to empower themselves through education to overcome the financial difficulties they had faced. Motivation has been identified as a factor that can influence a student's attitudes towards research (Mouton, 2001) and therefore, this may in turn positively affect the student's attitudes toward research.

2.3.1.3.9. Computer and internet access at home.

Hommadai (1990) and Bills (2003) showed that inadequate computer and internet resources were a major factor contributing to the non-completion of higher degree research in third world countries. This is highlighted by the fact that medical students from Iran, reported costs associated with internet access and purchasing hardware as the biggest barriers to gathering research information, negatively affecting their attitude towards research (Mazloomdoost *et al,* 2007). McCaughan, Thompson, Cullum, Sheldon and Thompson (2001), have also shown that there was an association between lack of access to computers and lack of confidence in computer skills and research related activities. Studies have also shown that having access to computer and internet at home has been associated with higher literacy skills and is a strong predictor of academic success (Atwell, 2000; National Center for Educational Statistics, 2000). As insufficient computer and internet access at home have been previously identified as factors hampering research progress and confidence to perform research it is thought that these students without these resources at home may therefore have negative attitudes towards research due to the difficulties and lack of confidence associated with gathering research information (Hommadai, 1990; McCaughan *et al.*, 2001; Bills, 2003).

2.3.1.3.10. Previous research exposure

Zhang (1996) as well as Newell and Cunliffe (2003), stated that previous research exposure had a positive effect on attitudes towards research. It is not quite clear as to whether this previous research exposure referred to students participating as a subject in research or actually performing the research. In addition to this, it would depend whether the student had a favourable or unfavourable experience in their prior exposure to research.

2.3.1.3.11. Career decision

Whether or not a student thought that Chiropractic was the correct career decision may have implications on the student's level of motivation and contribute to poor academic progression (Ditcher and Tetley, 1999; LeJeune, 2000). Mouton (2001) highlighted that a student's motivation may play an important role towards positively or negatively contributing to their research progression. Therefore, it is thought that if a student was not happy with their career decision they would not be as motivated to perform research and this may negatively affect the student's attitudes towards research (Grant, 2006).

2.3.1.3.12. Cumulative Effects of Factors Specific to the Individual on Attitudes

Motivations amongst students may differ as Zhang (1996) showed that Chiropractic students did not want to take part in a research project and furthermore Bunge (2007), showed that Chiropractic students at the University of Johannesburg perceived research as a subject that prolongs qualification. This may indicate that although students thought that research was important (Zhang, 1996), they did not want to be responsible for doing the research themselves, as they did not feel confident about the research process and their priority was to qualify. This may have an effect on influencing a student's confidence to perform research, which may further be enhanced or detracted from when considered in the context of other influencers that represent the various demographic and socioeconomic factors of the student.

This highlights the conflicts that exist within the context of the student and research. One between wanting to use research and not having the skills and confidence to do so (which may have links to a lack of access to computers and computer skills) (McCaughan *et al*., 2001); and two being that of placing the importance of qualification (self) above the professions development. Each of these parameters can either enhance or detract from the research experience depending on the student's individual development within the context of their education and Chiropractic development.

Additionally the dynamics (demographic variables and past experience) that every individual will bring to the fore will differ dramatically amongst the Chiropractic students at DUT. Based on previous studies on Chiropractic students at DUT it could be stated that the majority of the students seem to be single, White and female, who are financed by their parents and have a part time job (Grant, 2006; Fyfe, 2006). Most of the parents in previous studies had completed school while the majority of the fathers had attained a tertiary education degree (Grant, 2006; Fyfe, 2006). Just over half of the students from previous studies had reported failing at least one subject in their Chiropractic career (Grant, 2006; Fyfe, 2006). Based on these demographic variables, it would seem that the outcomes of this research should show a positive attitude towards research, although the influence of these factors in a South African and DUT setting have yet to be validated.

2.4. Factors that may affect the attitudes towards research in context of the research process at DUT.

To fully understand how the attitudes towards research are formed amongst the Chiropractic students at DUT, it is necessary to describe the processes and procedures that need to take place in order for a Chiropractic student to perform research at DUT. Following this the importance of supervision will be highlighted and the affects that this together with resources that are available on campus will have on attitudes towards research.

2.4.1 The research process at DUT

Figure 2.2 (Wilson, 2009), outlines the required steps that need to be followed to pursue a Masters research dissertation at DUT. According to Mouton (2001) and Korporaal (2009) this process may take between one and three years.

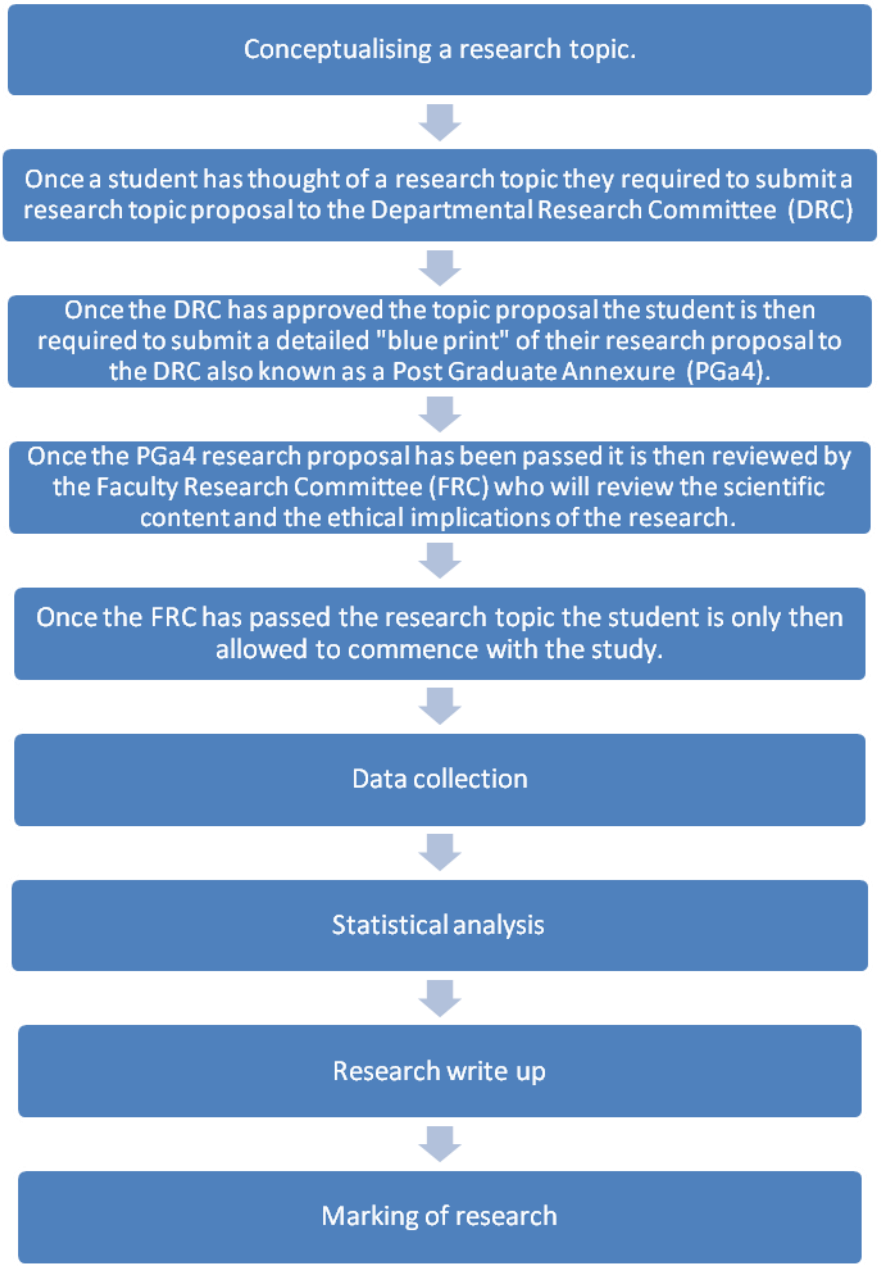

Figure 2.2. Research process

After outlining the research process above (Figure 2.2), it becomes more evident that the students need appropriate guidance from the Chiropractic staff/department members to help guide them through the process.

2.4.2. Staff Department involvement

Marchiori and Henkin (2003) state that the Chiropractic profession depends on department staff for continuous quality improvement in areas of curriculum. They also highlighted that integration of research into everyday teaching may be a way of creating a research culture as well as to help identify and clarify research ideas amongst students (McCoy, 2006; Hawk *et al.*, 2008). Hawk *et al.,* (2008) expressed the importance of experiential learning about research rather than only text book learning. However, undergraduate students felt that department staff, were lacking in their involvement in research and also in their use of it in teaching (Newell and Cunliffe, 2003). Similarly, research students within other professions also reported limited department staff involvement as they reported that very few placed a great deal of emphasis on research or discussed their own research interest in class (Tercanlioglu, 1999). Additionally, if a research supervisor or department staff are unfamiliar with research, are not engaged in research and have negative attitudes towards research, it is thought that this will negatively affect students' attitudes (McCoy, 2008). Hawk *et al.,* (2008) suggests that improving this area may get students excited about research and ultimately increase research support, attitudes and confidence to do research in the future.

Specifically in terms of research supervision, the relationship between the student and their supervisors is very important, as the supervisor is there to help guide the student through the research process (Wilson, 2009). Becher, Henkel and Kogan (1994) indicated that students who withdrew from Doctoral research commonly referred to overwhelming feelings of isolation and a lack of intellectual support from their departments and supervisors. In this context De Valero (2001) and McCoy (2006) found that if the quality of supervisor support within a department was high it correlated with better research completion. Nevertheless Holtman, Mukwada, Lesko and Mohammed (n.d) stated that there are concerns about the lack of knowledgeable supervisors, adequate access to regular supervision, lack of

interpersonal skills by supervisors and honest and timeous feedback from supervisors. Additionally, Holtman *et al.,* (n.d) suggested that supervisors should not be overburdened as this may compromise their capacity to supervise research. Within a DUT context it is noted that the ratio between supervision staff and students ranges from 1: 3.5 – 4 respectively (Korporaal, 2009), which could imply that there is limited interaction between students and supervisors as the students compete for the attention of their supervisors. The supervisor pool also includes novice researchers, which impacts on feedback, timing of the feedback and interaction between the students and the supervisor(s) (Korporaal, 2009). However, to compensate for this, DUT provides additional supporting material in the form of handbooks, resources and finances to support the research process and decrease the impact of the supervision process as the students are able to manage their processes to a greater extent (DUT Chiropractic Handbook, 2008; Korporaal, 2009).

2.4.3. Durban University of Technology Resources

Ditcher and Tetley (1999) identified inadequate resources as a factor contributing to academic failure. Mazloomdoost *et al.,* (2007) similarly showed difficulties in accessing computer and internet on campus due to high demands of these facilities in third world countries. This becomes more evident when comparing students self reported barriers for accessing information between first and third world countries. United Kingdom (first world) medical students reported lack of training as the biggest barrier while medical students in Iran (third world) reported lack of internet access, as the biggest barrier (Doney and Barlow, 2005; Mazloomdoost *et al*, 2007). McCaughan *et al*., (2001), also showed that there was an association between lack of access to computers and lack of confidence in computer skills and research related activities. In this context, DUT has provided a fully equipped library, computers and internet facilities, however, actually accessing these facilities is often very difficult due to the high demands (Naidoo, 2009). Therefore, students who thought that computer and internet access on campus were insufficient may have lacked the necessary research support may therefore have negative attitudes towards research.

2.4.4. Cumulative Effects of Factors associated with the research process on attitudes towards research.

Worldwide, the research process has been associated with negative attitudes because the average duration of writing a Master's research dissertation is two to three years (Mouton, 2001). This becomes more evident in the South African context as post graduate throughput in our country is amongst the lowest in the world (Mangaliso, 2007). In this respect campus resources (viz. computers, supervisors) have been identified as a factor contributing to enabling or detracting from the ability to develop confidence to perform research related tasks (Ditcher and Tetley, 1999; De Valero, 2001; McCaughan *et al*., 2001; Mouton, 2001; Doney and Barlow, 2005; McCoy, 2006; Mazloomdoost *et al.*, 2007; Hawk *et al.,* 2008). Based on the literature and in the DUT context, insufficient computer and internet access on campus, insufficient supervision or an inefficient research proposal process may be seen as detractors. Therefore, it is assumed that the overall attitude for DUT students will be negative as they have difficulties accessing computer and internet facilities and insufficient research supervision has been previously identified amongst South African research students (Holtman *et al.,* n.d).

2.5. Conclusion

Newell and Cunliffe (2003) state that a profession's attitudes are as much formed by influences during study as they are by professional experience gained thereafter. This, therefore, creates an ideal setting to create positive attitudes towards research. Research activity has increased in the production of high quality and relevant research which has been produced over the last 20 years (Newell and Cunliffe, 2003; Hawk *et al*., 2008). The continuation of this positive trend will be the responsibility of the students and graduates that constitute the future profession as today's students will be tomorrow's researchers (Zhang, 1996). It is thought that it is for this reason that McCoy (2008) urges Chiropractic institutes to make it mandatory to require their students to complete a research project prior to graduation.

However, although pragmatic in terms of the profession achieving its goal, this may actually alienate future professionals from research in that their negative attitudes may be further enhanced. Therefore, institutes that make research a mandatory requirement have a unique and difficult task of setting the platform for further research in the future as well as enabling positive attitudes at the same time.

Therefore this study aims to better understand students' attitudes towards research as this is essential to identify the enablers and detractors to the research process so as to enable instructors within these institutes to develop instructional techniques, supporting infrastructure, clear and transparent research processes which could lead to more positive attitudes toward research (Waters *et al*., 1988) and ultimately increased participation and support of research, which is necessary for the continued growth and success of the profession (Zhang., 1996).

Chapter Three: Methodology

3.1. Introduction

This chapter describes the research methodology, the development of the questionnaire as well as the collection and analysis of data.

3.2. Study Design

The study was an attitudinal survey, quantitative in nature, that was based on a self administered questionnaire (Salant and Dillman, 1994).

3.3. Advertising

No advertising was required as the sample group comprised only of Chiropractic students who were currently registered in the Chiropractic programme at DUT.

3.4. Sample

The sample group included all the Chiropractic students registered at DUT.

3.4.1. Sampling method

Once off, pre-selected participant sampling was applied.

3.4.2. Sampling size

It was intended to hand out the questionnaire to all Chiropractic students registered at the Durban University of Technology. The total population size was 193 students (Korporaal, 2009).

One student from each year (1st-4th), one 5th year masters student, two post 5th year masters students and the researcher were excluded from the sample as they had formed part of the focus group.

The final total sample was 185 students.

In order for these results to be statistically generaliseable in the context of the study and analysable, a minimum questionnaire return rate of 70% was required (Esterhuizen 2009). Returns exceeding the minimum required amounts were still included in the analysis.

3.4.3. Sample characteristics

Students registered for the Chiropractic programme at DUT formed the sample.

3.4.3.1. Inclusion criteria

The following students were included:

- All participants were eighteen years of age or older.
- All participants were registered Chiropractic student with the Durban University of Technology (DUT).

3.4.3.2. Exclusion criteria

The following students were excluded:

- Those students who participated in the research focus group were excluded as they took part in the development of the questionnaire. This is because these students had previous exposure and knowledge about this study and this would place them in a biased position, therefore compromising the results of the study (Mouton, 1996).

3.5. Research procedure

- The data collection of each class was done on the same day in order to eliminate inter-class discussions. This eliminated students being exposed to aspects of the questionnaire before they received it, which would place them in a biased position, therefore compromising the results of the study (Mouton, 1996).

- Each class was given the questionnaire and the same set of instructions, and if a student within the class had any questions or comments, the researcher was at hand to answer them in a group setting allowing consistency of response to respondents.

- The questionnaire (Appendix “H”), was accompanied by a Letter of Information (Appendix “G”) which explained the research topic.

- The questionnaires were given out to all Chiropractic students currently registered at DUT in a semi-supervised fashion towards the end of a lecture period. This included the researcher being present as well as an independent party to collect the questionnaire.

- The students were required to complete the questionnaire immediately and submit it to the independent party in the class using a ballot box system which would maintain anonymity and confidentiality.

- The independent party ticked the participant’s names off a class list as they handed the questionnaire back to determine the response rate.

- Once the minimum response rate of 70% was achieved, data analysis then took place (Esterhuizen, 2009).

3.6. Research tool

3.6.1. Questionnaire Development

The questionnaire was developed using the available literature (Waters *et al*., 1988; Zhang, 1996; Pretorious and le Roux, 1998; Cull *et al.,* 2003; Newell and Cunliffe, 2003; De Beer, 2005; Suter *et al.,* 2007 Hawk *et al*., 2008; McCoy, 2008). The literature identified various aspects and socio-economic factors which may affect a student's attitude toward research and the relevant questions which may elicit these attitudes towards these sections.

Six main factors affecting attitudes towards research were identified. Namely,

1. Negative feelings toward research.
2. Positive feelings toward research.
3. Training for research.
4. Staff/ department involvement.
5. Confidence to do research
6. Importance of research.

This questionnaire was subjected to a focus group for further refinement. Thereafter piloting of the questionnaire was used to further refine the post focus group questionnaire.

3.6.2. Focus group

The focus group in this study included ten people, namely:

- The researcher.
- A student from each of the relevant years (1^{st} -4^{th}).
- One 5^{th} year masters student.
- Two post 5^{th} year masters students.
- The research supervisor.
- The research co-supervisor.

Each member of the focus group received:

- Letter of information (Appendix A).
- Informed consent form (Appendix B).
- Confidentiality statement (Appendix C)
- Code of conduct (Appendix D).
- A copy of the questionnaire (Appendix E).

The group met to discuss the questionnaire and the issues that it covered. Thus ruling out any ambiguity and confusion and furthermore critically assessing the relevance of questions, therefore they added to, deleted or modified the questions presented (Salant and Dillman, 1994). Changes were only made to questions if there was a consensus amongst the focus group members. Focus groups also encourage the members other than those doing the research to support the research process by increasing research relevance as well as contextualize the questionnaire so to enhance the validity of the questionnaire (Salant and Dillman, 1994). This would include face validity and content validity (Mouton, 1996; Dyer, 1997; Bernard, 2000).

3.6.3. Recommended changes to questionnaire as per focus group

3.6.3.1. Demographics

3.6.3.1.1. Questions that were changed:

- **Question 4**, regarding year of study '**Masters student'** was changed to read '**Masters post 5th year examination'**.
- **Question 5**, was amended to add options '**Working on research topic**', '**In data collection phase**' and '**Waiting for dissertation to be marked**'. Furthermore, a question indicating '**How long you have been in this stage'** was added following this question.
- **Question 6** was changed to read '**Have you ever had previous post school education**' and a Table of options were added as follows, **Short course, Diploma, Honours, Bachelors, Masters and PhD.**

- **Question 9**, was changed to read '**Have you ever participated as a subject in any research at the DUT before'.**
- The options after **question 12**, were changed into a Table format referring to **Maternal** and **Paternal**. The options were changed to read, **No National Senior Certificate Obtained, Finished National Senior Certificate, Obtained a tertiary undergraduate qualification, Obtained a post graduate qualification.**

3.6.3.1.2. <u>Questions that were removed by the focus group:</u>

- **Question 7: Did you obtain qualification?**
- **Question 8: If yes, please state qualification?**
- **Question 10: Have you ever completed a research dissertation before?**
- **Question 11: Please indicate your socio-economic status:**
- **Question 13: Please indicate your matric aggregate:**

3.6.3.1.3. <u>Questions that were added by the focus group:</u>

- **Please indicate who supports you financially.**
- **Do you have any part time jobs?**
- **If yes, is it a financial necessity that you worked?**
- **Do you have a computer at home?**
- **Do you have internet access at home?**
- **Did you study Chiropractic straight after school?**
- **In your opinion is Chiropractic the correct career decision for you?**
- **Have you failed a subject before?**
- **Do you think that there are sufficient computer resources at the DUT?**
- **Do you think that there are sufficient internet resources at the DUT?**

- **Have you ever participated as a subject in any research outside of the DUT before?**

3.6.3.2. Changes to questions within the scales.

In the focus group the individual questions (sub-scales) were discussed within their relevant sections (scales) with the knowledge that the headings would be removed for the final questionnaire and that the questions would be randomly shuffled. These sections (scales) were those of:

1. Negative feelings toward research.
2. Positive feelings toward research.
3. Training for research.
4. Staff department involvement.
5. Confidence to do research.
6. Importance of research.

3.6.3.2.1. Changes to questions within the Negative Feelings Towards Research scale.

Grammatical changes were made to question 5.

Questions added to this section were:

- **Research is very time consuming.**
- **I don't like research.**
- **I have had a negative experience with regard to research.**
- **I don't want to do research.**

3.6.3.2.2. Changes to questions within the Positive Feelings Towards Research scale.

Grammatical changes were made to question 2.

Questions added to this section were:

- **I have had a positive experience with regard to research.**
- **Research has made me more knowledgeable within my field of research.**
- **The research process has increased my management skills.**

3.6.3.2.3. Changes to questions within the Training of Research scale.

Grammatical changes were made to questions 1, 2, 3 and 4.

Questions added to this section were:

- **The research component of Chiropractic Practice and Principles (CPP) in 3rd year and/or research methods and techniques taught in 4th year adequately teaches you what steps to follow in the research process.**
- **The research handbook is a useful tool in the research process.**
- **The required mock proposal in 4th year is of benefit in preparing me for the research proposal.**

3.6.3.2.4. Changes to questions within the Staff Department involvement scale.

Grammatical changes were made to questions 1, 2, 3, 4, 5 and 6.

Questions added to this section were:

- **These above interactions help to increase my interest in research.**

3.6.3.2.5. Changes to questions within the Confidence to do Research scale.

Grammatical changes were made to question 4.

Questions added to this section were:

- **Research training has improved my confidence to perform research.**

3.6.3.2.6. Changes to questions within the Importance of Research scale.

Grammatical changes were made to questions 1, 2, 5 and 6.
Questions added to this section were:

- **It is a necessity to conduct research to practice as a successful Chiropractor.**
- **It is important to have a Masters in Chiropractic.**

3.6.4. Pilot study

A pilot study was then conducted during the final proposal review. The purpose of this was to identify any problem areas in the questionnaire (Fink and Kosecoff, 1985).

3.6.4.1 Recommended changes to questionnaire as per piloting process

The headings that were used to identify the relevant sections (scales) for the focus group discussion of the questionnaire were removed and the questions were divided into five sections namely, Demographics followed by Sections A, B, C and D, which will be discussed later in this chapter.

3.6.4.1.1. Changes to Demographics (Section A)

Question 5- 'Have you ever received previous post school education' was broken down into three questions follows:

5.1) Have you ever had previous post school education.

5.2) If yes, please indicate the highest level of previous education.

5.3) If yes, did you finish the relevant course.

Question 21- 'Please indicate how long you have been in this stage of the research process'- was amended to read:

21) Relative to the above question please indicate how long you have been in this stage of the research process.

3.6.4.1.2. Changes to Section B:

Grammatical changes were made to questions 2, 6, 7, 14 and 23.

Questions added to this section were:

- **Q 26) It is important to have a Masters in Chiropractic.**
- **Q 27) If given the choice I would study Chiropractic at an institute were research was not mandatory.**

3.6.4.1.3. Changes to Section C:

Grammatical changes were made to questions 4, 7, 9, 14, 18, 19 and 20.

Questions added to this section were:

- **Q 22) The required mock proposal in 4th year is of benefit in preparing me for the research proposal.**

3.6.4.1.4. Changes to Section D:

This entire section was added which comprised of six questions:

- **Q 1) It is difficult to find a supervisor**
- **Q 2) The idea/topic proposal process is efficient.**
- **Q 3) The DUT 186/PG 4a proposal process is efficient.**
- **Q 4) Inadequate supervision from my supervisor has delayed my research progress.**
- **Q 5) It was easy to find a research idea/topic.**
- **Q 6)The researcher's relationship with his/her supervisor is of great importance.**

3.6.5. Final Questionnaire:

The final questionnaire was divided into five sections. The headings of the relevant scales were removed prior to handing it out as this decreased respondents' responses being biased by the inherent structure that headings provide (Dyer, 1997).

Section A was answered by all participants and was concerned with identification of current demographic, socio-economic and other personal data that may have had relevance to the current attitudes towards research at DUT. These variables were used as a measurement of association in analysis.

Section B was answered by all participants and it contained various questions that would elicit attitudes towards some of the identified sections which may play a part towards the current attitudes towards research at DUT. These were sections of **staff department involvement, importance of research, negative feelings toward research** and **positive feelings toward research.**

Section C was answered by all the students except those who had not started or completed the relevant research modules which are taught from

third year onwards. This section contained various questions that would elicit attitudes towards some of the identified sections which may play a part towards the current attitudes towards research at DUT. These were the sections of **training for research** and **confidence to do research.**

Section D was only answered by students who had had a research topic/idea passed. These questions were designed to shed more light on attitudes of Chiropractic students that have started the research proposal procedure.

3.6.6. Measurement Frequency:

Due to the nature of the study the measurement frequency was once off with regards to the completion of the questionnaire.

3.6.7. Statistical Methodology

SPSS version 15.0 (SPSS Inc., Chicago, Illinois, USA) was used to analyse the data. Descriptive statistics were used to present demographic data using mean and standard deviation for quantitative variables and frequency tables or bar graphs for categorical variables. Cronbach's alpha was used to assess internal consistency of scales after reversing the scoring in certain negatively phrased items. Scores for the items making up the scales were added together such that the higher the score the more positive the attitudes for that scale. The raw score was then divided by the maximum possible score for each scale and multiplied by 100 to express the score as a percentage out of the maximum score. Scale scores were only calculated for individuals with no missing values for any items in the scale. These scores were summarized using mean, standard deviation and range. Generalized linear models were constructed for each scale in order to asses which demographic and socio-economic factors were associated with each of the attitude scales (Esterhuizen, 2009).

Chapter Four: Results and Discussion

4.1. Introduction

This chapter is a representation of the statistical analysis of the results obtained from the respondents in this study as well as a discussion of these results. Although this is not the norm for standard dissertation presentation, it was decided to follow this format in order to enable a more concise approach to presenting the results and discussion, as in a perception / attitude study it can at times become complex when written as two separate chapters.

The data is discussed in the following order:

1. **Objective one:** To document the demographic data with respect to the students

2. **The scales that follow will be discussed according to objective two and objective three.**

- **Objective two** was to analyse the scales which structure an attitude in terms of the questions that make up the scales.
- **Objective three** was to determine the associations between the scales which structure an attitude and the demographics.

    - Scale One: Training of research.
    - Scale Two: Confidence to perform research.
    - Scale Three: Staff department involvement.
    - Scale Four: Importance of research.
    - Scale Five: Positive feelings towards research.
    - Scale Six: Negative feeling towards research.

3. **Inter-correlations between all attitude scales.**

4. **Summary and review of objectives.**

4.1.2. Primary Data

Primary data was obtained from respondents in this study answering the questionnaire (Appendix H).

4.1.3. Secondary Data

This particular data came from many different sources, which included: Textbooks, Journal articles, specialist internet search sites and personal communications.

4.1.4. Key Of Symbols

N	=	number.
n	=	refers to sample size
%	=	percentage.
<	=	refers to a figure “less than” the figure reported.
***p* value**	=	probability value.
Q	=	question.
SD	=	standard deviation.

4.1.5. Special statistics

Cronbach's alpha	=	Test for a survey's internal consistency (Cronbach, 1990)
a	=	Set to zero because this parameter is redundant.
b	=	Maximum likelihood estimate.

4.2. Response rates

At the date of proposal approval for this research there was a total of 193 registered Chiropractic students at Durban University of Technology (Korporaal, 2009). However one student from each year (1^{st}-4^{th}), a 5^{th} year Masters students, two post 5^{th} year Masters' students and the researcher were excluded from the sample as they had formed part of the focus group (Section 3.6.2). Therefore the final total sample was 185 students. In order for these results to be statistically generaliseable in the context of the study and analyzable, a minimum questionnaire return rate of 70% was required (Esterhuizen, 2009).

The data collection of each class was done on the same day in order to eliminate inter-class discussions. Attempts were made to reach all students but due to student absentees this was not possible. The questionnaire was distributed to all students present on the day of data collection (n=138).

As one hundred and thirty-eight students participated in the study there was a total sample size of 74.59 % which is in keeping with the required minimum (Esterhuizen 2009). According to Lindström (2007) a response rate in the range of 40-100% can be generaliseable to the entire population.

There were similar numbers of respondents from each year of study. Figure 4.1 shows the percentage of students from each year.

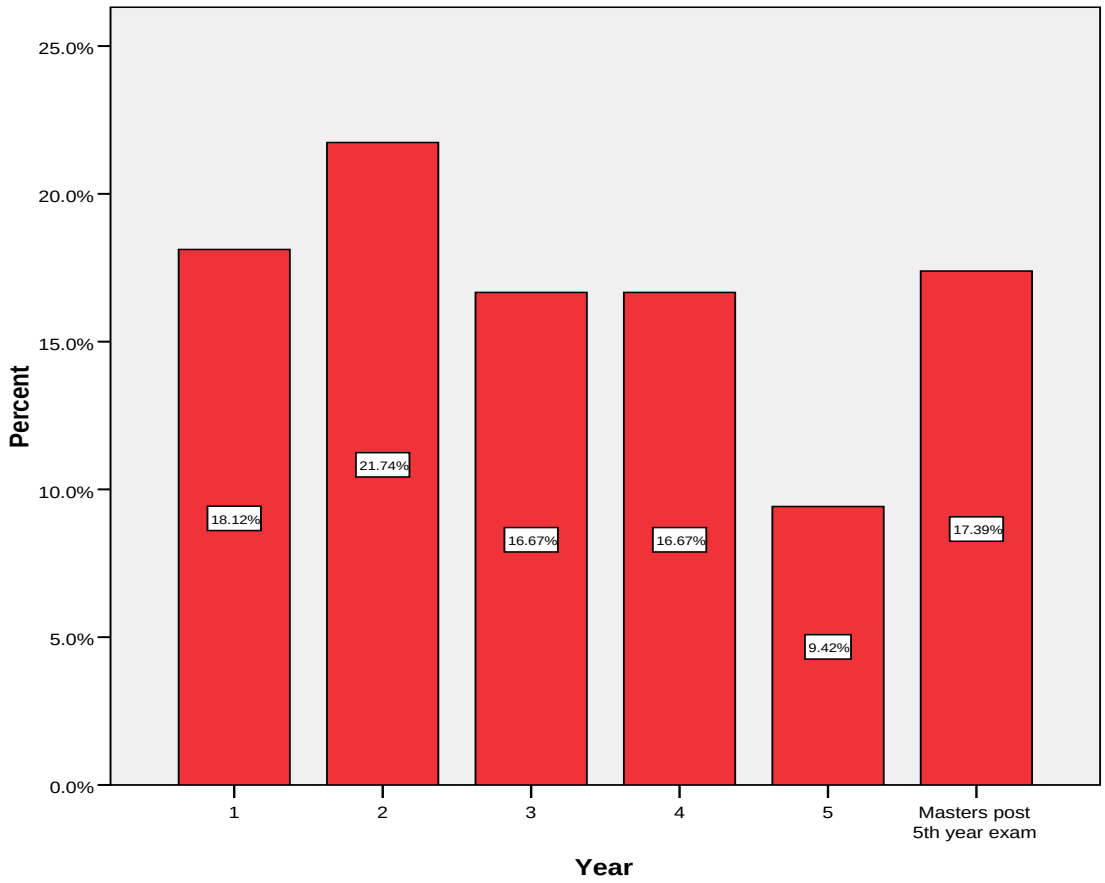

Figure 4.1: Study students by year of study

There were similar percentage response rates from each year of study, with the exception of the 5th year class were the response rate was slightly lower. This is thought to be as a result of the smaller class size affecting response rates to a greater extent.

4.3. Results

Objective one: To document the demographic data with respect to the students

4.3.1. Demographics

4.3.1.1. Age

Table 1.1: Summary statistics for age of students

N	Valid	138
	Missing	0
Mean		22.78
Std. Deviation		3.766
Minimum		18
Maximum		37

The mean age of students was 22.78 years (SD 3.8 years) with a range from 18 to 37 years (Table 1.1). This is almost an exact comparative mean age to a previous study done on Chiropractic students at DUT where the mean age was 22.7 years (Fyfe, 2006). The mean age of students in the Chiropractic course at DUT is relatively young compared to that of studies done at Chiropractic institutes abroad (National University of Health Sciences, 2009). Chiropractic students who study overseas are historically mature students as Zhang (1996) and Newell and Cunliffe (2003) both reported that the majority of students from their studies were over the age of 26. This comparative difference may be as a result of differences between the entry requirements for overseas colleges as compared to the South African higher education system (DUT Chiropractic Handbook, 2008; National University of Health Sciences, 2009)

In addition to the above, age groups in other Chiropractic institutes are far wider than that at DUT where the standard deviation is 3.766 years. Zhang (1996) showed that 27.14% of students were between 20-25 years of age, 35.7% were between 26-30 years of age, 10% were between 31-35 years of age, 17.14% were between 36-40 years of age and 10% were between 41-45 years of age.

Considering this context Zhang (1996) showed significant correlations between positive attitudes towards research and older students. These correlations could be attributed to a greater chance of lifelong exposure to Chiropractic by older students which would make them more aware of the need for research and willingness to participate in research. This contrasts with the younger Chiropractic students, who may not at that age have the exposure and then also the confidence, knowledge, awareness or learned life experience to question issues within the Chiropractic context. Conversely however, older students may also have had more exposure to the old school Chiropractic philosophical "dogma" that is less likely to rely on research and have a greater likelihood accepting current practices without question ("as they work"), which in turn may negatively affect the older students attitudes towards research and increase their likelihood of terminating their studies (Roberts *et al.*, 2003).

As Chiropractic students at DUT are far younger than other institutes, it is expected that this may have a negative effect on students' attitudes towards research. Additionally, as the age ranges at DUT are very narrow and the majority of Chiropractic students are not mature students, attitudes according to age may all be very similar. As a result and in this case it is expected that these younger students may have more negative attitudes towards research, and may be more apprehensive about the process when compared to the older students.

4.3.1.2. Gender

Table 1.2: Gender of students

		Frequency	Percent
Valid	Male	57	41.3
	Female	81	58.7
	Total	138	100.0

The majority of students were female (58.7%). This concurs with Fyfe (2006) who showed that this was also the case in a study done amongst Chiropractic students at DUT where 53.3% of the students were females. According to Tatalias (2006) and Brown *et al.*, (2007) females are more likely to be more in favour of CAM Therapies which may be the reason for the higher percentage of female Chiropractic students. Another reason may be that female medical students were more likely to display a more patient centered care approach than male medical students (Krupat *et al*., 1999), which is congruent with Chiropractic practice (Haldemann, 2005). This may have been the influencing factor responsible for attracting female students to the programme, resulting in the ratio of female to male applicants.

In addition to the above, it is reported by Martin *et al.,* (2001) and Bills (2003) that females are more likely to complete a research degree than men which may result in increased female applicants to the DUT Chiropractic programme. Furthermore, it suggests that females may in fact have a more positive attitude towards research (Martin *et al.,* 2001; Bills, 2003). This may be attributed to females being more academically conscientious which discourages them from missing classes and encouraging them to work harder which in turn could relate into positive attitudes towards research (Woodfield *et al*., 2006).

However and in contrast to the above, Dinham and Scott (1999) showed that females were more likely to have parenting responsibilities which affected the time they were able to devote to their research commitments. Thus, it would seem that females may not place as much emphasis on the time of completion of

a research dissertation as they are not the breadwinner and therefore may not be as pressured in completing their dissertation compared to males (Dinham and Scott, 1999). More recently Meelissen and Drent (2008), showed that females tended to be less confident when using computers and the internet in the research context, which may be an additional reason for their slow completion times. This would concur with the previous results of Wright and Cochrane (2000), who reported that females were less likely than males to be satisfied with their research education experience. The cumulative result would therefore indicate that females would most likely have a negative attitude towards research as compared to males, even though it is more likely for them to complete the research process when compared to males.

In the context of this research, it would seem that with the age group being younger and predominantly female that the attitudes of the group as a whole would be predominantly negative.

4.3.1.3. Ethnicity

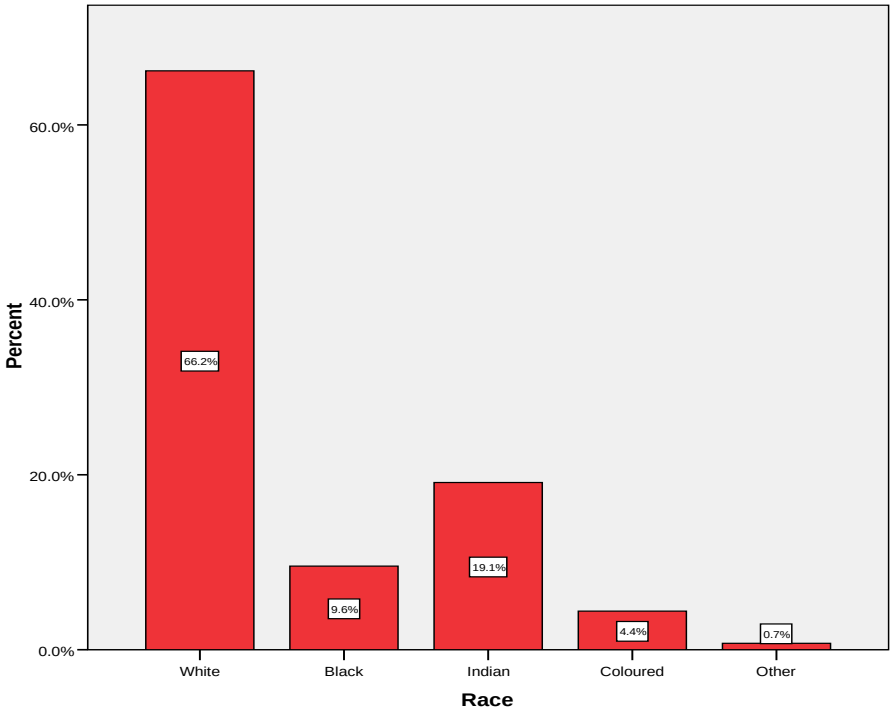

Figure 4.2: Ethnicity of participants

Figure 4.2 shows that the vast majority of students in this study were White (66.2%). Fyfe (2006) showed that Blacks made up 5% of the course, Coloureds 0.8%, Indians 26.9% and Whites 66.4%. It is interesting to note the increase in Black and Coloured students and the decrease in Indian students found in this study. This demographic profile is in contrast to the South African context where the Black ethnic group makes up the majority of the population (Rattan, 2007; Statistics South Africa, 2009).

A possible reason for this is that the Black population make up the majority of the previously disadvantaged population (Statistics South Africa, 2009), which had limited access to higher education through one or more of academic limitations, geographic limitations and / or financial limitations (Pretorious and Le Roux, 1998; De Beer, 2005). In addition to this, the Black population group by virtue of their traditions and cultures have limited access to or perceived need for manual therapy. This is reflected in the fact that traditional African cultures do not as a

norm include manual therapy in their frame of reference (Korporaal and Talmage, 2008).

However, as Black and Coloured entrants have increased over the past few years, it may suggest that these barriers may be eroding. In this context, Black students may perceive research or the attainment of a higher degree as a means by which to uplift their lifestyle and improve their socio-economic status (Makuakane-Drechsel and Hagedorn, 2000). Therefore it is expected that Black and Coloured students may be more motivated to study Chiropractic and therefore be more positive towards the required research dissertation and research in general, in contrast to the White and Indian students in this study.

Cumulatively the majority population in this study are White, female and an average of 22.78 years, indicating that their perception of research may tend towards a negative perception.

4.3.1.4. Marital status

Table 1.3: Marital status of students

		Frequency	Percent
Valid	Single	126	93.3
	Married	8	5.9
	Divorced/Separated	1	.7
	Total	135	100.0
	Missing	3	

The majority of students were single (93.3%). This is in keeping with the global perspective as most learners who apply to higher education institutes are single (Lovik, 2004).

With this in mind, Mouton (2001) and Wintre and Jaffe (2002) reported that family may play a role in the retention of students and researchers, as a marital partner may be seen as a source of support and encouragement. In the research context this would agree with the prior finding of Marquis and Brush (1966), who found

that students whose research dissertations were completed and highly rated were more likely to be married. This is, however, in stark contrast to the findings that married students were identified as one group that may hinder a learner's academic progression due to the increased family commitments (Rendón *et al*., 1999).

Therefore, due to the support that a married student might receive and the fact that students who are married seem to produce a higher standard of research it is expected that, in this study, married students may have more positive attitudes towards research than those students that are not married.

However with the majority of the students being single (93.3%), White (66.2%), females (58.7%) of approximately 22,78 years of age, the positive effect of the marriage on attitudes to research may be limited or even negated.

4.3.1.5. Previous post school education

Table 1.4: Previous post school education of students

		Frequency	Percent
Valid	Yes	39	28.3
	No	99	71.7
	Total	138	100.0

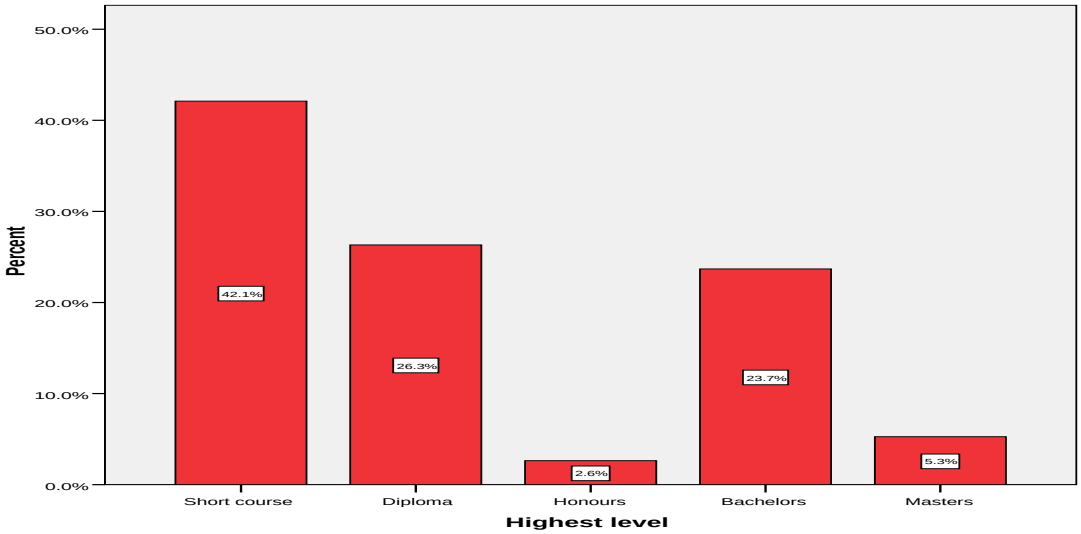

Figure 4.3: Highest post school education of students (n=38)[1]

A total of 39 students (28.3%) had previous post school education. However, of these only 48.7% completed the course. Grant (2006) showed that 23.9% of Chiropractic students in 2006 had finished an additional qualification. Both these results are relatively low considering that Zhang (1996) reported that in his study 77% of the Chiropractic students had previous higher education qualifications. This may be due to the fact that many of the Chiropractic colleges abroad require that applicants must have obtained a previous tertiary degree prior to them applying for the course (National University of Health Sciences, 2009). This relative lack of students with prior degrees may be a negative factor in influencing attitudes towards research as it is thought that individuals who have

[1] It is noted that although 39 students reported post school education and training, one student omitted to indicate what this post school education and training was.

studied previously have developed coping mechanisms and time management skills as well as the academic literacy skills to improve their future study / research endeavors (Lazarus and Folkman, 1984).

Therefore, it is thought that the students that had prior higher education exposure would have a more positive attitude toward research. However, it needs to be considered that they are in the minority and therefore are unlikely to affect the overall outcomes of this study.

4.3.1.6. Education level of parents

Table 1.5: Highest level of education of students parents

		Mother		Father	
		Frequency	Valid Percent	Frequency	Valid Percent
Valid	No matric	12	8.8	11	8.4
	Matric	63	46.0	43	32.8
	Bachelors or Honours	54	39.4	62	47.3
	Masters or PhD	8	5.8	15	11.5
	Total	137	100.0	131	100.0
Missing	System	1		7	
Total		138		138	

More participants' mothers had obtained their matric (46%) as their highest qualification, while fathers tended to have a degree (47.3%). In this context HortaÇsu (1995) showed that there is a relationship between parents' level of education and children's beliefs and academic achievement. This was based on the premise that beliefs form a major component of attitudes and based on this it is expected that the level of a student's parent's education may play a role in their attitude development toward academia and research (HortaÇsu, 1995). This is most likely due to the academic experience and support that is offered to the student by the parent (Makuakane-Drechsel and Hagedorn, 2000). Therefore it is expected that if a parent does not have a tertiary education they may not be as well equipped to academically support their children which may negatively affect their child's attitude towards education and research.

In the context of this research then, 58.8 % of fathers and 45.2% of mothers have the proposed ability to assist their children. This indicates that at least half of the student population surveyed in this study should have a positive attitude towards research based solely on the support that parents have the skills to give.

4.3.1.7. Financial support

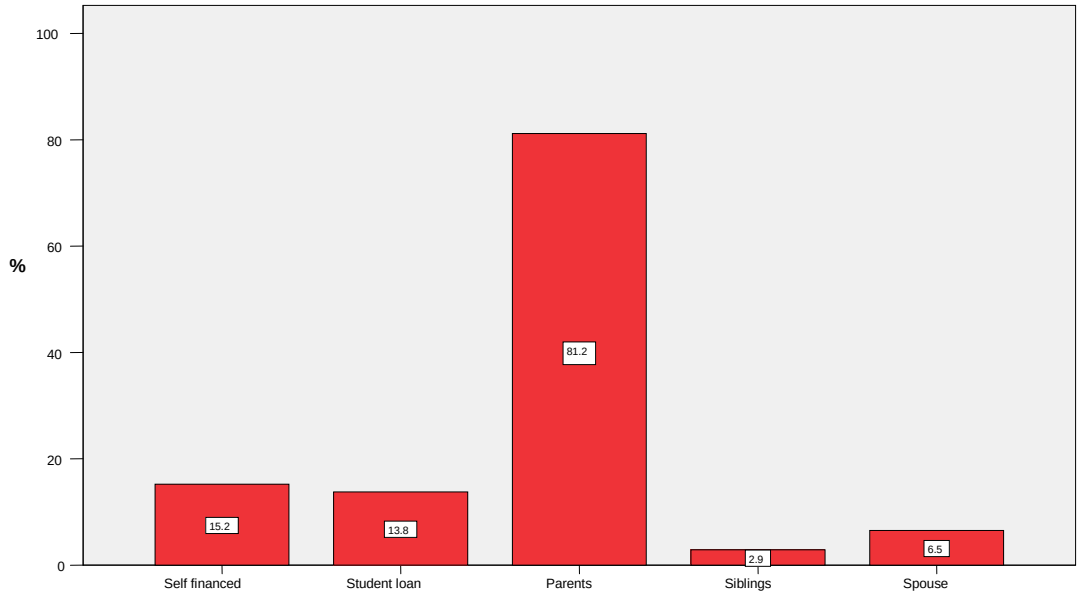

Figure 4.4: Financial support source of students

Figure 4.4 shows that the vast majority of students were funded by their parents. According to the literature, students in South Africa identify financial difficulties as a major factor contributing to making it challenging for learners to complete their studies (De Beer, 2005; Pretorious and Le Roux, 1998).

Wright and Cochrane (2000) and Mouton (2001) have shown that access to funding to perform research is associated with higher completion rates. This concurs with the previous findings of Tinto (1999), who indicated that a lack of financial aid does have an effect on student persistence, especially among the economically disadvantaged. It has more recently been suggested that this may be as a result of these students being forced to work part time to help support themselves / their families in addition to attending classes (Olenchak and Hebert, 2002).

Therefore, it is expected that students who do not have access to financial aid in any form may have to supplement their income by working part time jobs and may therefore have less time to allocate to research. This in turn may negatively affect their attitudes towards research. However, since this is reflected by the minority in this study, it is not expected that this would be a principle cause of a negative attitude formed by the students.

4.3.1.8. Part time job

Table 1.6: Part time job

		Frequency	Percent
Valid	Yes	90	65.2
	No	48	34.8
	Total	138	100.0

Ninety students had a part time job (65.2%). As mentioned previously (Section 2.3.1.3.8) the extra time associated with part time jobs may negatively affect students' attitudes towards research.

Table 1.7: Perceived financial necessity

		Frequency	Percent
Valid	Yes	50	55.6
	No	40	44.4
	Total	90	100.0

Over half of the students that worked part time did so because it was a perceived financial necessity (55.6%). In the context of this study, the perceived need to work would be congruent with Figure 4.4, where 38.4% of students indicated that they had financial support outside of their parents.

In terms of the literature, students who come from a poor socio-economic environment are often forced to work part time to help support themselves and or their families in addition to attending classes (Olenchak and Hebert, 2002). In this context they face financial struggles to pay expenses associated with education

and research related activities (Creighton, 2007; Mazloomdoost *et al,* 2007). The extra time associated with part time jobs on top of a heavy work load associated with research may negatively affect students' attitudes towards research.

It is therefore anticipated that the perceived necessity as indicated in the response to this question, may actually counter the positive effect that parental financial support gives in terms of the attitude that students have towards research.

4.3.1.9. Computer and internet access at home

Table 1.8: Computer access at home

		Frequency	Percent
Valid	Yes	126	91.3
	No	12	8.7
	Total	138	100.0

As many as 91.3% of students had a computer at home. Bills (2003) showed that equipment and software failure and availability was a common reason for slow progress in research. This may therefore negatively affect the perception of and attitude towards research. Based on this, it is expected that the students in this research may have a more positive attitude towards research as computer access forms an integral part of research activities.

Table 1.9: Internet access at home

		Frequency	Percent
Valid	Yes	101	73.2
	No	37	26.8
	Total	138	100.0

From the results of this research, it was found that the majority of students had internet access at home (73.2%), indicating that this should be a positive enabler of attitudes amongst these students. Although only 26.8% of students reported not having access to internet at home, it is quite high in comparison to internet

access in first word countries as Doney and Barlow (2005) showed that only 13% of UK General Practitioners reported not having access to internet.

This is supported by Hommadai (1990) who showed that inadequate computer and internet resources were major factors contributing to the non-completion of higher degree research and therefore also negative attitudes towards research in third world countries.

4.3.1.10. Did students study Chiropractic straight after school ?

Table 1.10: Studied Chiropractic straight after school

		Frequency	Percent
Valid	Yes	82	59.4
	No	56	40.6
	Total	138	100.0

The majority of the students reported studying Chiropractic straight after school (59.4%). As indicated in the literature, students who do not study straight after school may have an advantage over those who do, as they adapt more rapidly to study environment as well as the pressure of challenging academic workloads (Ditcher and Tetley, 1999). They therefore, may have more positive attitudes towards research as compared to the younger student who entered their Chiropractic studies straight after school.

4.3.1.11. Did students think that Chiropractic is the correct career decision

Table 1.11: Correct career decision

		Frequency	Percent
Valid	Yes	120	87.0
	No	17	12.3
	Total	137	99.3
Missing	System	1	0.7
Total		138	100.0

Most students stated that they had made the correct career decision (87%).

It is thought that students' motivation may be lower if they thought they had not made the correct career decision, with the low motivation contributing to poor academic progression (Ditcher and Tetley, 1999; LeJeune, 2000). Therefore, it has been suggested that a students' motivation may play an important role towards positively or negatively contributing to his / her progression through research (Ditcher and Tetley, 1999; LeJeune, 2000; Mouton, 2001).

In this study it is expected that students who thought that they had not made the correct career decision may therefore be less motivated which may in turn negatively affect their attitudes towards research. However with this only being representative of the minority of the respondents, it is unlikely to affect the overall outcome.

4.3.1.12. Previous subject failure

Table 1.12: Have previously failed a subject

		Frequency	Percent
Valid	Yes	56	40.6
	No	82	59.4
	Total	138	100.0

Students that had failed a subject before were as high as 40.6%. This is higher than self reported subject failure amongst students in 2006 (34%) (Grant, 2006).

According to the literature lower grades / failures are associated with an overall lower quality of research and students taking longer to complete their post graduate research (Marquis and Brush, 1966). It is thought because research takes longer for these students they may therefore be more negative towards research (Mouton, 1996). Therefore it may be expected that students that have failed a subject before may have negative attitudes towards research. In contrast however, those students that have previously failed may have a greater chance at developing life skills normally associated with older / mature age students, therefore the expected negative attitude may actually not be as great as anticipated from the literature (Lazarus and Folkman, 1984).

4.3.1.13. DUT computer and internet resources

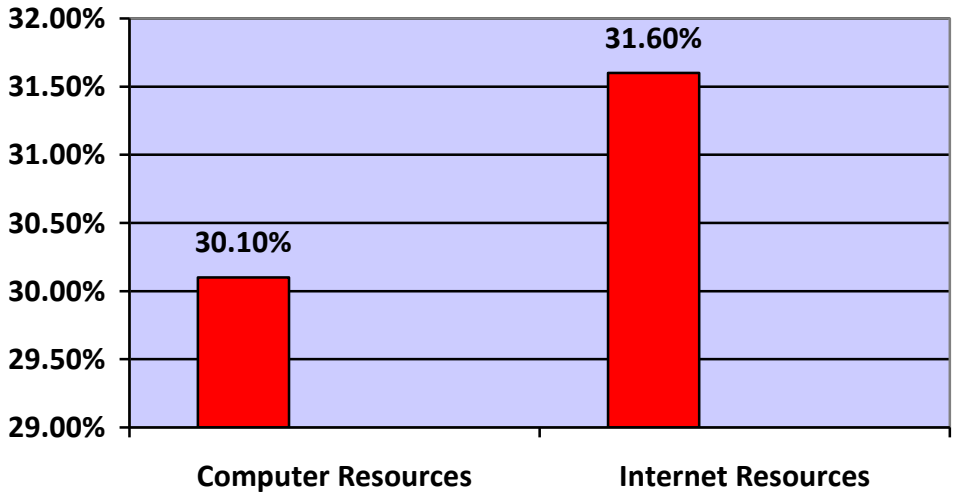

Figure 4.5: DUT computer and internet resources

Only 30.1% of students thought that the computer resources at DUT were sufficient while only 31.6% of students thought that the DUT internet resources were satisfactory.

These access points for information are important in allowing for the facilitation of academic success (Doney and Barlow, 2005; Mazloomdoost *et al*, 2007). According to Ditcher and Tetley (1999), inadequate resources are an identified factor contributing to academic failure. Furthermore, the literature shows that there is an association between lack of access to computers and lack of confidence in computer skills and research related activities (McCaughan *et al.*, 2001).

Therefore, the perceived lack of computer and internet resources on campus may make it difficult to access research information which may in turn have an effect on confidence to perform research and therefore may have a negative effect on students' attitudes towards research. However, the effects of this, in this study, may be countered by the fact that the majority of students actually have computers at home and internet access at home (Section 4.3.1.9).

4.3.1.14. Previous participation as a research subject

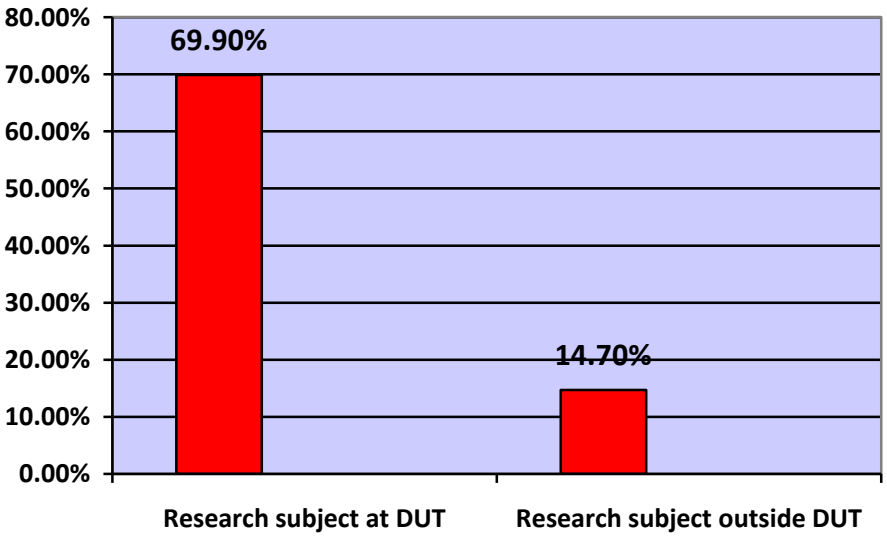

Figure 4.6: Research subject at DUT or outside DUT

Of the student respondents in this study, a high number of students had been a research participant at DUT (69.9%) while only 14.7% of students had been a research participant outside of DUT. Zhang (1996) stated that previous research exposure had a significant positive effect on attitudes towards research. However, it is required that the exposure be contextualized in the interaction with the research as this may have been positive or negative. In the context of this study, it is expected that majority of students would have had a positive experience with the research process, as it forms part of the process of the qualification completion and many of the students participate in multiple studies in their time on campus (Korporaal, 2009).

4.3.1.15. Stage in the research process

Table 1.13: Stage in the research process

		Frequency	Percent
Valid	Haven't started	54	39.1
	Working on research topic	44	31.9
	Topic proposal passed	21	15.2
	DUT 186 passed by Department	2	1.4
	DUT 186 passed by Ethics	3	2.2
	Data collection phase	6	4.3
	Dissertation write up	6	4.3
	Waiting for dissertation to be marked	2	1.4
	Total	138	100.0

Table 1.13 shows the number of students who were at each stage in the research process at the DUT. The majority (39.1%) had not started working on their research topic proposal yet, which is consistent with the larger proportion of respondents being in the 1st – 2nd years of study. From those in the research process, the majority (31.9%) indicated that they had only just started working on their topic proposal, which concurs with the number of respondents in the 3rd-4th year of study, which is the time period in which they are expected to work on their research topics and proposals. This leaves about a third of the remaining students (commensurate with the 5th and post 5th year master students) in the process of working through the remaining stages of their research process.

Based on the literature it was thought that a higher level of research exposure of a student would correlate with positive attitudes towards research (Newell and Cunliffe, 2003; Zhang, 1996). It is therefore expected that the students in this study involved in the research process at DUT would have a more positive attitudes towards research, since their exposure to research starts in the 3rd year and spans to the completion of their Masters research dissertation.

Table 1.14: Length of time in above stage in the research process

		Frequency	Valid Percent
Valid	6 weeks	27	33.3
	6 months	25	30.9
	9 months	15	18.5
	1 year and longer	14	17.3
	Total	81	100.0
	Missing	3	

The majority of the students were in the relevant stage of the research process for approximately 6 weeks to 6 months. There were no significant correlations between the length of time and a specific stage in the research process.

4.3.1.16. Summary of demographics

One hundred and thirty eight students participated in this study, which formed 74% of the total sample size (185 students). The majority of the students were not married (93.3%) and most were females (58.7%), and the mean age of the students was 22.78 years. The majority of the sample was White (66.2%) with 19.1% of the students being Indian and 9.6% being Black. A total of 39 students (28.3%) had previous post school education, however only 48.7% of these students had completed their course. With regards to parents level of education most students' mothers had obtained their matric (46%) while most of the fathers had an undergraduate degree (47.3%).

Financial support for the majority of the students came from their parents (81.2%) with 65.2% of the students indicating that they had a part time job and of those, 55.6% indicated that they worked out of a financial necessity. Computer access at home was high with 91.3% of the students indicating that they had a computer at home. However, slightly fewer students had access to internet at home (73.2%). With regards to computer and internet access on campus only 30.1% of students thought that computer resources at DUT were sufficient while 31.6% of the students thought that internet resources on campus were sufficient.

The majority of the students studied Chiropractic straight after school (59.4%) and 87% of the students thought that Chiropractic was the correct career decision for them. Students indicated that 40.6% of them had failed a subject. A high number of students had participated as a research subject at DUT (69.9%) while only 14.7% had participated as a research subject outside of DUT. In addition the majority of students had not started with their research (39.1%) while 31.9% had started working on a research topic. Only 15.2 % of the students had had a research topic passed, 1.4% were passed by the Department Research Committee, 2.2% were passed by the Faculty Research Committee, 4.3% were in the data collection phase, 4.3% were busy with their write up and only 1.4 % were waiting for their research dissertation to be marked.

Based on the outcomes of this summary it is expected that the majority outcomes, in terms of the students' attitude towards research, will be either slightly positive or indifferent (neither positive nor negative).

4.3.2. The scales that follow will be discussed according to objective two and objective three.

- **Objective two** is to analyse the scales which structure an attitude in terms of the questions that make up the scales.
- **Objective three** is to determine the associations between the scales which structure an attitude and the demographics.

4.3.2.1. Scale One: Training of research

4.3.2.1.1. Mean response to each item from Training of research

Table 2.1: Positively phrased questions

For positively phrased questions, a mean score closer to one represented a more negative attitude while scores closer to six represented a more positive attitude.

Section and Number	Question	Mean	Standard Deviation	Minimum	Maximum
C1	The research component of Chiropractic Principles and Practice (CPP) in 3rd year and/or research methods and techniques taught in 4th year at DUT are very interesting.	2.5	1.1	1.0	6.0
C5	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT adequately prepare you to do research.	2.4	1.3	1.0	6.0
C9	Research training should be a mandatory part of any Chiropractic course?	3.7	1.6	1.0	6.0
C13	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year adequately teaches you what steps to follow in the research process.	2.9	1.4	1.0	6.0
C15	The research handbook is a useful tool in the research process.	3.7	1.5	1.0	6.0
C22	The required mock proposal in 4th year is of benefit in preparing me for the research proposal.	4.2	1.6	1.0	6.0

Low mean responses were found in questions C1, C5, C13. All these questions were related to some aspect of the research courses / subjects taught in the Chiropractic course at DUT. Therefore, students had relatively negative attitudes

about the course being interesting, adequately preparing them to perform research and adequately showing what steps to follow in the research process. These results are in keeping with the literature, which indicates that medical students from another 3rd world country reported poor research training as the most important reason for poor attitudes towards research and subsequent research activity (Aslam *et al.,* 2004).

Higher mean responses were found in questions C9, C15, C22. Students were more positive about questions with regards to research being a mandatory part of the Chiropractic course. In addition, they felt that the research handbook and the mock research proposal which students are required to complete in their 4th year were of benefit to them in the research process.

It would seem that the responses to the these six questions are inherently contradictory in that the students attitudes were positive to the research being a mandatory part of the programme, but their attitudes to the support training seemed to be more negative with the exception of the research handbook and the mock research proposal. This may be because some of the respondents had not yet completed the research training and therefore could not comment on it directly (other than perhaps hearsay from peers), whereas the research handbook and mock research proposal would make sense within the system without the students having had to complete these processes to identify their benefit.

Table 2.2: Negatively phrased questions

For negatively phrased questions a mean score closer to one represented a more positive attitude while scores closer to six represented a more negative attitude.

Section and Number	Question	Mean	Standard Deviation	Minimum	Maximum
C3	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT are very complicated.	3.4	1.3	1.0	6.0
C7	I don't want to do training in research methodology.	4.1	1.4	1.0	6.0
C14	Research training in the Chiropractic course is not necessary.	4.4	1.5	1.0	6.0

An average mean response was recorded for question C3 while high mean responses were found in Questions C7 and C14. With regards Question C3, students thought that the research courses / subjects taught at DUT were complicated. High mean responses were found in questions C7 and C14 which indicated relatively negative attitudes about wanting to do research training and that students thought that research training is not necessary in the Chiropractic course. This was expected as literature stated similar results amongst Chiropractic students abroad (Zhang, 1996). However, it is contradictory to the responses in Section 4.3.2.1.1, where students indicated that the Chiropractic programme should contain a mandatory research component. Additionally, it would seem that although students wanted to complete a research dissertation (mandatory), they did not feel that they needed training in order to complete the endeavour. This is contrary to the literature that indicates that research training leads to an improved ability to deal with and complete a research dissertation and facilitates increased completion rates (Harrison, Lowery and Bailey, 1991; Adamsen *et al.,* 2003; Newell and Cunliffe, 2003; Marusic and Marusic, 2003; Hakansson *et al.*, 2005). This is particularly true in a younger population, who have not yet developed the life skill sets in order to be able to deal with the research process on their own (Martin *et al.*, 2001) unless they plan to rely on their parents to assist them through the process (Section 4.3.1.6).

4.3.2.1.2. Factors associated with "Training of Research" attitude scale

Table 2.3: Generalized linear model of demographic and socio-economic factors versus Training of Research scale (n=65)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	p value
(Intercept)	2.179	26.4205	-49.604	53.963	0.007	1	0.934
Age	-0.119	0.6342	-1.362	1.124	0.035	1	0.851
Female	8.013	3.1561	1.827	14.199	6.446	1	0.011
Male	0(a)						
Coloured	8.046	8.9152	-9.428	25.519	0.814	1	0.367
Indian	7.028	4.1018	-1.012	15.067	2.936	1	0.087
Black	20.030	6.5028	7.285	32.775	9.488	1	0.002
White	0(a)						
Divorced/separated	-16.293	11.5093	-38.851	6.264	2.004	1	0.157
Married	-9.620	8.7242	-26.719	7.479	1.216	1	0.270
Single	0(a)						
No post school education	12.540	5.2826	2.186	22.894	5.635	1	0.018
Post school education	0(a)						
Mother has post grad qualification	16.725	7.8035	1.431	32.020	4.594	1	0.032
Mother has tertiary undergrad qualification	-2.410	6.1051	-14.375	9.556	0.156	1	0.693
Mother has senior certificate	2.316	4.3614	-6.232	10.864	0.282	1	0.595
Mother has no senior certificate	0(a)						
Father has post grad qualification	3.082	5.4702	-7.640	13.803	0.317	1	0.573
Father has tertiary undergrad qualification	-3.261	4.3905	-11.866	5.344	0.552	1	0.458
Father has senior certificate	3.566	5.8946	-7.987	15.120	0.366	1	0.545
Father has no senior certificate	0(a)						
Not self financed	21.757	6.0613	9.877	33.637	12.885	1	0.000
Self financed	0(a)						
No student loan	-10.743	3.8175	-18.226	-3.261	7.920	1	0.005
Student loan	0(a)						
No parent funding	13.062	6.1487	1.011	25.113	4.513	1	0.034
Parent funding	0(a)						
No sibling funding	35.823	12.6013	11.125	60.521	8.082	1	0.004
Sibling funding	0(a)						
No spouse funding	23.358	13.2411	-2.594	49.310	3.112	1	0.078
Spouse funding	0(a)						
No part-time job	-0.120	3.4268	-6.837	6.596	0.001	1	0.972
Part-time job	0(a)						

Table 2.3: Generalized linear model of demographic and socio-economic factors versus training of Research scale (n=65) continued

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	p value
No computer at home	10.465	6.4935	-2.262	23.192	2.597	1	0.107
Computer at home	0(a)						
No internet access at home	3.797	3.3494	-2.767	10.362	1.285	1	0.257
Internet access at home	0(a)						
Did not study Chiropractic straight after school	15.850	5.8260	4.431	27.269	7.401	1	0.007
Studied Chiropractic straight after school	0(a)						
Chiropractic not correct career choice	-7.043	4.4220	-15.710	1.624	2.537	1	0.111
Chiropractic correct career choice	0(a)						
Year =6 (Masters post 5th year exams)	5.603	8.9537	-11.946	23.152	0.392	1	0.531
Year =5	0.154	6.3753	-12.341	12.649	0.001	1	0.981
Year =4	-1.766	5.1421	-11.845	8.312	0.118	1	0.731
Year =3	0(a)						
Insufficient internet resources at DUT	-13.843	5.3457	-24.321	-3.366	6.706	1	0.010
Sufficient internet resources at DUT	0(a)						
Never participated as a research subject at DUT	-12.727	4.8489	-22.231	-3.223	6.889	1	0.009
Participated as a research subject at DUT	0(a)						
Never participated as a research subject outside DUT	4.749	5.4735	-5.979	15.477	0.753	1	0.386
Participated as a research subject outside DUT	0(a)						
Waiting for dissertation to be marked	-66.059	27.9500	-120.840	-11.278	5.586	1	0.018
Dissertation write up	-40.565	26.1647	-91.847	10.717	2.404	1	0.121
In data collection phase	-45.773	22.5643	-89.998	-1.548	4.115	1	0.043
DUT 186 passed by Ethics	-51.265	24.1295	-98.558	-3.972	4.514	1	0.034
DUT 186 passed by Department	-67.444	22.7712	-112.075	-22.813	8.772	1	0.003
Topic proposal passed	-37.079	20.2353	-76.740	2.581	3.358	1	0.067
Working on research topic	-30.213	19.7580	-68.938	8.512	2.338	1	0.126
Haven't started the research process	0(a)						
1 year and longer	6.824	4.3330	-1.669	15.316	2.480	1	0.115
9 months	-2.704	3.6253	-9.809	4.402	0.556	1	0.456
6 months	.455	3.7488	-6.892	7.803	0.015	1	0.903
6 weeks	0(a)						
(Scale)	44.009(b)	7.7198	31.206	62.066			

Dependent Variable: Training of Research

Model: (Intercept), A1, A2, A3, A4, A5.1, A6.1, A6.2, A7.1, A7.2, A7.3, A7.4, A7.5, A8, A10, A11, A12, A13, A15, A14, A16, A17, A18, A19, A20, A21

a Set to zero because this parameter is redundant.

b Maximum likelihood estimate.

Table 2.3 shows that there were several factors significantly associated with this training of research scale (this analysis was only performed on those who were in year 3 or higher). The interpretation of the generalized linear model, using the example of gender in Table 2.3 is thus: males were used as the reference (baseline) group. After adjustment for confounders, females scored on average 8.013% higher for the training of research scale than males and this difference was statistically significant (p=0.011).

On average, higher attitude scores for this scale were found in:

- Females recorded higher attitude scores than Males (*p*=0.011). This is consistent with the research findings that females tend to prefer research training in order to support them through their research process (Woodfield *et al.*, 2006). This is, however, in contrast to the general results within the scale where the students generally indicated that they did not positively perceive the training (Table 2.1). This discordance might be accounted for by the fact that there are more female students in the 3rd through final year students, than there are in the 1st and 2nd year student populations (Korporaal, 2009). This may therefore result in an increased tendency to positive attitude differences between males and females in this group. This indicates that the males in particular, have a very strong negative attitude as they are in the minority and yet have influenced the general responses in such a manner so as to make the general assessment of training different to the 3rd – final year student assessment.

- Blacks recorded higher attitude scores than Whites (*p*=0.002). This does not concur with the literature (Ellis, 2001), as it would have been expected that the White population group have a greater tendency towards a positive attitude to research and research training, based on the parental support (education) (Section 2.3.1.3.7), financial support (Section 2.3.1.3.8) and increased likelihood for technical and computer support (Section 2.3.1.3.9) (Hommadai, 1990; Tinto, 1999; Pretorious and Le

Roux, 1998; Makuakane-Drechsel and Hagedorn, 2000; Bills, 2003; De Beer, 2005). Conversely and in agreement with this result, the Black and other minority groups have little support and would benefit more from the research and research training. This is because they do not have parental support to the same extent and therefore would be more inclined to utilise the training provided so to facilitate their progress through the research process (Makuakane-Drechsel and Hagedorn, 2000).

- Those whose mothers had post graduate education recorded higher attitude scores than those whose mothers had no matric (p=0.032). This would support the suggestion made under the previous bullet point, where parental support seems to be a critical factor in the student identifying research training with a significantly positive attitude. This also concurs with what was found in the literature (HortaÇsu, 1995 and Makuakane-Drechsel and Hagedorn, 2000).

- Those who were not self financed recorded higher attitude scores than those who were self financed ($p<0.001$). This would support the suggestion made under the ethnicity bullet point, where financial support seems to be a critical factor in the student identifying research training as a significantly positive attitude. This is in keeping with the literature which places great emphasis on financial shortcomings having an effect on students completing their studies (Spours, 1997; De Beer, 2005; Pretorious and Le Roux, 1998). In addition, it is thought that students who are not self financed do not have to work part time out of necessity and therefore do not have the added time constraints associated with work which may negatively affect their attitudes towards research.

- Those who had no parent funding recorded higher attitude scores than those with parent funding (p=0.034).
- Those with no sibling funding recorded higher attitude scores than those with sibling funding (p=0.004).

- Those with student loans recorded higher attitude scores than those with no student loans (p=0.005).

  The above three bullet points support the assertions made under the previous ethnic, maternal qualification and self financed bullet points above, where financial support seems to be a critical factor in the student identifying research training by a significantly positive attitude. Additionally, Nora (2001) showed that access to financial assistance in the form of student loans is essential to the enrolment and retention of students. Furthermore, Tinto (1999) suggested that lack of financial aid has an effect on student persistence, especially among the economically disadvantaged. Therefore, those students that did not have access to a student loan may have to work to subsidize their finances and may associate their financial difficulties at present with academics in general and may therefore tend to have more negative attitudes towards research.

- Those with no post school education recorded higher attitude scores than those with post school education (p=0.018). It would seem that this result indicates that those who are pursuing a degree for the first time have a more positive attitude towards research than those that already have a previous qualification. There are a number of possible factors that could influence this, including but not limited to :

  - A student with no post school education may realize that the lack of a tertiary degree may hinder their progress in the working world. Therefore, they are more likely to think of the tertiary process that they are currently pursuing, more positively as compared to those that have a previous qualification (who would be able to return to their previous employment based on their previous qualification if the research process became to extended or provided more hassles than opportunities).

- Those that have previous post school education may be older, and may by virtue of this also have extra family and other responsibilities, especially if they are married and / or have children for which they are responsible (Roberts *et al.*, 2003).

- Lastly, those students that have received previous post school education have had the opportunity to develop coping mechanisms and time management skills during their studies as well as the academic literacy skills to improve their future study endeavours and may therefore be more positive towards research (Lazarus and Folkman, 1984). However, students who have not studied before may acknowledge that they are lacking in these skills may because of this place more emphasis on research training. This may mean that because these students realize that research training is important for their successful research progress they may therefore be more positive towards research training.

- Those who did not study Chiropractic straight after school recorded higher attitude scores than those who studied Chiropractic straight after school (p=0.007). As noted in the literature, students who do not study straight after school may have an advantage over those who do, as they adapt more rapidly to a study environment as well as the pressure of challenging academic workloads (Ditcher and Tetley, 1999). Therefore, these students may cope better with the academic challenges associated with research and the complex nature of research related topics which would be dealt with in the research training and therefore they may have more positive attitudes towards research training.

- Those who thought that the internet resources at DUT were sufficient recorded higher attitude scores than those who thought that the internet resources at DUT were insufficient (p=0.010). The literature indicates that a perceived lack or insufficient internet access was one of the most

reported barriers for accessing information in third world countries (Doney and Barlow, 2005; Mazloomdoost *et al*, 2007). It is thought that if students had limited access to internet they would become completely dependent on research subjects and courses taught at DUT to gain research related knowledge. However if students were not satisfied with the current research training and were not able to substitute their learning via internet based education, students may be more likely to have negative attitudes towards research training.

- Those who had participated as a research subject in DUT research (p=0.009) recorded higher attitude scores than those who had never participated as a research subject in DUT research. This stands to reason as those that have previously participated in a research process are more likely to understand at least some of the dynamics of the organization and logistics required for the dissertation process and therefore be less likely to see research as a mammoth task that needs to be overcome. This concurs with the literature which shows that previous exposure to research has been associated with more positive attitudes towards research (Newell and Cunliffe, 2003; Zhang, 1996). It is based on this premise that it is thought that those students who had not been exposed to research, in this case as a subject, may have had a more negative attitude towards research.

- Those who had not started the research process yet, recorded higher attitude scores than those who had their DUT 186 passed by the Department (p=0.003).
- Those who had not started the research process yet, recorded higher attitude scores than those who had their DUT 186 passed by Ethics (p=0.034).
- Those who had not started the research process yet, recorded higher attitude scores than those in the data collection phase (p=0.043).

- Those who had not started the research process yet recorded higher attitude scores than those who were waiting for their dissertation to be marked (p=0.018).

  Those students who were not in the research process, and therefore had not yet been exposed to the research difficulties and management skills that are associated with research, are more likely to be positive towards research training. This indicates that those without research experience were more likely to think that research is easy, whereas those in the process are detracted from this thought / attitude, as they focus on the problems that they have whilst they are trying to manage their research process (Hawk *et al.,* 2008). This change in attitude may be related to them being overwhelmed by the process, having had bad experiences in the process or having found that their expectations of the process are not congruent with the outcomes that the programme sets for them.

4.3.2.1.3. Cronbach's alpha for "Training of research" scale

Table 2.4: Cronbach's alpha for "Training of research" scale

Positively phrased questions

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C1	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT are very interesting.	28.8533	37.721	0.425	0.630
C5	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT adequately prepare you to do research.	28.8533	34.559	0.593	0.593
C9	Research training should be a mandatory part of any Chiropractic course?	27.6133	38.727	0.196	0.678
C13	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year adequately teaches you what steps to follow in the research process.	28.4800	32.821	0.660	0.573
C15	The research handbook is a useful tool in the research process.	27.5333	40.225	0.145	0.686
C22	The required mock proposal in 4th year is of benefit in preparing me for the research proposal.	27.1867	35.965	0.352	0.642

Table 2.5: Cronbach's alpha for "Training of research" scale

Negatively phrased questions

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C3	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT are very complicated.	28.0267	40.297	0.169	0.678
C7	I don't want to do training in research methodology.	27.2400	39.266	0.221	0.669
C14	Research training in the Chiropractic course is not necessary.	26.8800	34.296	0.457	0.616

There were 9 items making up this scale, which were only answered by those students in 3rd year or higher (n=80). As a result of missing data, only 75 students were evaluated as they had no missing values for any of the items in this scale. The Cronbach's alpha for this scale was 0.670 overall, indicating moderate internal consistency. The item – total correlation is shown in Table 2.4 and Table 2.5, as well as the Cronbach's alpha if the items were deleted. It can be seen that no individual item is influencing the overall Cronbach's alpha.

4.3.2.1.4. Discussion for the 'training of research' section

Research training has clearly been shown to influence attitudes toward research as implementation of courses in research methodology result in positive outcomes towards research attitudes and productivity (Adamsen *et al.,* 2003; Harrison *et al.*, 1991; Newell and Cunliffe, 2003; Hakansson *et al.*, 2005; Marusic and Marusic, 2003). Therefore, it is imperative that research training form part of the curriculum within Chiropractic institutions, in order to cultivate a research culture for the profession. This is supported by Zhang (1996), who showed a significant correlation between positive attitudes towards research and high levels of research training amongst Chiropractic students.

According to Table 2.1, the majority of the Chiropractic students agreed that research training should be a mandatory part of the Chiropractic course. However when asked negatively phrased question as follows "I don't want to do training in research methodology" and "Research training in the Chiropractic course is not necessary" once again high mean responses were found. This finding could illustrate the affects of negatively phrased questions. However, it could also be suggested that although students acknowledged the importance of research training and that research should be a mandatory part of a Chiropractic course, they still had strong negative feelings about actually doing research training.

As mentioned in the literature the World Health Organization set up guidelines for the minimum requirements for Chiropractic education in December 2004 (WHO, 2004). In these guidelines they recommended that a research course be taught which comprised of at least 32 hours of teaching. It is interesting to note that the amount of hours allocated for research training and research activities are significantly higher at DUT than those recommended by the WHO (Korporaal, 2009).

However, according to Table 2.1, it is evident that on average students thought that the research subjects and courses taught at DUT were not interesting and that they did not adequately prepare student to perform research or properly educate them as to what steps to follow in the research process. This is a significant finding as there were significantly more negative attitudes found in students that had started the research process as opposed to those had not started the research process. This may suggest that they did not feel adequately prepared. It is of interest to note that student's had higher mean response with regards to the research handbook being of benefit and that the mock research proposal that students are required to perform in 4th year was of benefit in preparing them for the research proposal. Both these factors help guide and prepare students through the research proposal process as well as what steps to follow. Therefore it is suggested that students favoured a more interactive learning (Hawk *et al.,* 2008) that guided them through the research process and that possibly this is lacking in the current research curriculum at DUT.

4.3.2.2. Scale Two: Department involvement

4.3.2.2.1. Mean response to each item from department involvement

Table 2.6: Positively phrased questions "Years 1 and 2"

For positively phrased questions a mean score closer to one represented a more negative attitude while scores closer to six represented a more positive attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
B2	The Majority of the DUT staff members and part time lecturers/clinicians place great emphasis on research.	4.1	1.2	1.0	6.0
B6	The Majority of the DUT staff members and part time lecturers/clinicians discuss their own research interests in class.	3.0	1.3	1.0	6.0
B7	The above class interactions help to increase my interest in research.	3.3	1.4	1.0	6.0
B14	The Majority of the DUT staff members and part time lecturers/clinicians use research findings as part of their teaching material.	3.4	1.5	1.0	6.0

Table 2.7: Positively phrased questions "Years 3 and above"

For positively phrased questions a mean score closer to one represented a more negative attitude while scores closer to six represented a more positive attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
B2	The Majority of the DUT staff members and part time lecturers/clinicians place great emphasis on research.	4.1	1.2	1.0	6.0
B6	The Majority of the DUT staff members and part time lecturers/clinicians discuss their own research interests in class.	3.0	1.3	1.0	6.0
B7	The above class interactions help to increase my interest in research.	3.3	1.4	1.0	6.0
B14	The Majority of the DUT staff members and part time lecturers/clinicians use research findings as part of their teaching material.	3.4	1.5	1.0	6.0
B18	The Majority of the DUT staff members and part time lecturers/clinicians are easy to approach with regards to research.	3.9	1.3	1.0	6.0
C19	The Majority of the DUT staff members and part time lecturers/clinicians are knowledgeable with regards to the research process.	4.0	1.3	1.0	6.0
C20	The Majority of the DUT staff members and part time lecturers/clinicians are up to date with the latest Chiropractic research within their areas of interest.	3.9	1.3	1.0	6.0
D6	The researcher's relationship with his/her supervisor is of great importance.	5.3	1.3	1.0	6.0

Table 2.8: Negatively phrased questions "Years 3 and above"

For negatively phrased questions a mean score closer to one represented a more positive attitude while scores closer to six represented a more negative attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
D1	It is difficult to find a supervisor.	4.0	1.6	1.0	6.0
D4	Inadequate supervision from my supervisor has delayed my research progress	4.3	1.6	1.0	6.0

Middle to slightly positive mean scores were found regarding questions B6, B7 and B14. Questions B6 (3.0) and B7 (3.3) found that students were only slightly positive about DUT staff members discussing their own research interests in class whether these class interactions increase the students interest in research. Question B14 (3.4) found that students were only slightly positive about whether they used their own research findings as part of their teaching material in class. It seems evident from these findings that integration of research interest and findings in class could be improved especially since Hawk *et al.,* (2008) expressed the importance of experiential learning about research rather than text book learning only.

Higher mean responses were found to questions B2 (4.1), B18 (3.9), C19 (4.0), C20 (3.9). Questions B2 and B18 were with regards to whether DUT staff members place great emphasis on research and are easy to approach with regards to research. Questions C19 and C20 were whether students thought that DUT staff members were knowledgeable with regards to the research process and up to date with the latest Chiropractic research within their areas of interest.

The highest mean responses in this section were found in questions D1 (4.0), D4 (4.3), D6 (5.3). These questions dealt with aspects of the supervisor student relationship. Question D6 recorded the single highest mean score in the entire questionnaire indicating that students thought that the student supervisor relationship was of great importance. However, students indicted that it was hard to find a supervisor and that inadequate supervision had delayed their research progress. This seems to be in keeping with the South Africa research perspective about supervision in as Holtman *et al.,* (n.d) highlighted concerns about the lack of knowledgeable supervisors, adequate access to regular supervision, lack of interpersonal skills by supervisors and honest and timeous feedback from supervisors.

4.3.2.2.2. Factors associated with "Department involvement" attitude scale

Since this scale was composed of different items for the group of students who were in year 1 and 2, compared to those who were higher than year 2, the year of study was used as a controlling independent variable in this analysis. Table 2.9 shows that there were several factors significantly associated with this scale.

Table 2.9: Generalized linear model of demographic and socio-economic factors versus Department Involvement scale (n=83)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	133.807	33.0102	69.108	198.505	16.431	1	0.000
Age	-1.126	1.0255	-3.136	.884	1.206	1	0.272
Female	8.214	3.7129	0.937	15.491	4.894	1	0.027
Male	0(a)						
Other race	-19.905	13.5769	-46.515	6.706	2.149	1	0.143
Coloured	10.060	11.4240	-12.331	32.450	0.775	1	0.379
Indian	4.067	4.6322	-5.011	13.146	0.771	1	0.380
Black	6.652	9.6623	-12.285	25.590	0.474	1	0.491
White	0(a)						
Divorced/separated	-21.067	15.7964	-52.028	9.893	1.779	1	0.182
Married	-4.783	12.3449	-28.978	19.413	0.150	1	0.698
Single	0(a)						
No post school education	-5.499	6.4343	-18.110	7.112	0.730	1	0.393
Post school education	0(a)						
Mother has post grad qualification	-9.997	9.5107	-28.637	8.644	1.105	1	0.293
Mother has tertiary undergrad qualification	-12.752	7.6285	-27.704	2.200	2.794	1	0.095
Mother has senior certificate	-4.248	7.6611	-19.263	10.768	0.307	1	0.579
Mother has no senior certificate	0(a)						
Father has post grad qualification	3.273	9.9371	-16.204	22.749	0.108	1	0.742
Father has tertiary undergrad qualification	-3.690	8.5136	-20.376	12.996	0.188	1	0.665
Father has senior certificate	-3.402	8.7397	-20.532	13.727	0.152	1	0.697
Father has no senior certificate	0(a)						
Not self financed	-8.551	8.1319	-24.489	7.387	1.106	1	0.293
Self financed	0(a)						
No student loan	-9.021	5.4593	-19.721	1.679	2.730	1	0.098
Student loan	0(a)						
No parent funding	-18.598	8.0545	-34.384	-2.811	5.331	1	0.021
Parent funding	0(a)						
No sibling funding	4.018	10.8714	-17.290	25.326	0.137	1	0.712
Sibling funding	0(a)						
No spouse funding	-28.941	9.7965	-48.141	-9.740	8.727	1	0.003
Spouse funding	0(a)						

Table 2.9: Generalized linear model of demographic and socio-economic factors versus Department Involvement scale (n=83) continued

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
No part-time job	-0.784	4.3729	-9.355	7.787	0.032	1	0.858
Part-time job	0(a)						
No computer at home	-3.600	7.2475	-17.805	10.605	0.247	1	0.619
Computer at home	0(a)						
No internet access at home	0.228	5.4507	-10.455	10.912	0.002	1	0.967
Internet access at home	0(a)						
Did not study Chiropractic straight after school	-4.830	5.7072	-16.016	6.356	0.716	1	0.397
Studied Chiropractic straight after school	0(a)						
Chiropractic not correct career choice	-6.786	5.1265	-16.833	3.262	1.752	1	0.186
Chiropractic correct career choice	0(a)						
Never failed a subject	-13.153	4.5173	-22.007	-4.299	8.478	1	0.004
Failed a subject	0(a)						
Year =6 (Masters post 5th year exams)	1.273	12.8090	-23.832	26.379	0.010	1	0.921
Year =5	-7.926	11.0816	-29.646	13.793	0.512	1	0.474
Year =4	-5.886	10.8219	-27.096	15.325	0.296	1	0.587
Year =3	-20.858	17.9786	-56.095	14.380	1.346	1	0.246
Year =2	-3.359	5.0394	-13.236	6.518	0.444	1	0.505
Year =1	0(a)						
Insufficient computer resources at DUT	0.046	6.9576	-13.591	13.682	0.000	1	0.995
Sufficient computer resources at DUT	0(a)						
Insufficient internet resources at DUT	1.399	6.3201	-10.988	13.786	0.049	1	0.825
Sufficient internet resources at DUT	0(a)						
Never participated as a research subject at DUT	1.371	4.5125	-7.474	10.215	0.092	1	0.761
Participated as a research subject at DUT	0(a)						
Never participated as a research subject outside DUT	12.439	5.0589	2.524	22.354	6.046	1	0.014
Participated as a research subject outside DUT	0(a)						
Waiting for dissertation to be marked	-18.456	16.0385	-49.891	12.979	1.324	1	0.250
Dissertation write up	10.221	13.8781	-16.980	37.421	0.542	1	0.461
In data collection phase	3.331	13.0230	-22.194	28.855	0.065	1	0.798
DUT 186 passed by Ethics	6.161	15.3714	-23.966	36.289	0.161	1	0.689
DUT 186 passed by Department	10.469	19.1510	-27.067	48.004	0.299	1	0.585
Topic proposal passed	15.791	9.4461	-2.723	34.306	2.795	1	0.095
Working on research topic	4.604	6.5474	-8.229	17.437	0.494	1	0.482
Haven't started the research process	0(a)						
(Scale)	130.355(b)	20.2350	96.160	176.709			

Dependent Variable: Department Involvement

Model: (Intercept), A1, A2, A3, A4, A5.1, A6.1, A6.2, A7.1, A7.2, A7.3, A7.4, A7.5, A8, A10, A11, A12, A13, A15, A14, A16, A17, A18, A19, A20

a Set to zero because this parameter is redundant.

b Maximum likelihood estimate.

On average, higher attitude scores for this scale were found in:

- Females recorded higher attitude scores than Males (p=0.027).

This was in keeping with what was found in the previous section (Section 4.3.2.1.2) and was discussed accordingly, with there being no further literature evidence to suggest that the previous discussion requires further elaboration.

- Higher attitude scores were found in those with parent funding (p=0.021) and spouse funding (p=0.003) compared to those without. These two findings are in keeping with the literature that states that financial difficulties are a major factor contributing to low student persistence and non completion and therefore may be the reason for negative attitudes towards research (De Beer, 2005; Pretorious and Le Roux, 1998; Wright and Cochrane, 2000; Tinto, 1999; Mouton, 2001).

- Those who had never participated as a research subject outside of DUT were more positive about research than those who had participated as a research subject outside DUT (p=0.014). This is in contrast to the literature (Newell and Cunliffe, 2003; Zhang, 1996) which suggests that previous research exposure may be associated with more positive attitudes towards research. In this case, the finding may be attributed to the fact that students who had not participated as a research subject outside of DUT had not been exposed to research in a negative environment. Those who had participated in research outside of DUT are possibly less positive because of this reason.

- Those who had failed a subject before had more positive attitudes towards research than those who had never failed a subject (p=0.004). This is in contrast to the literature that showed that students with lower grades and who had failed a subject take longer to complete research and have a lower quality of research and therefore may have negative attitudes towards research (Marquis and Brush, 1966). However, as discussed in

the literature, if a student failed a subject it often means that their workload is dramatically lowered in the year that they are repeating the failed subject. It has become a trend that these students start their research dissertations because they have more time available. This may result in these students enjoying the research process more as they have less academic responsibilities to juggle while doing their research dissertation. Another factor to consider may be that these students who had previously failed a subject may be more motivated to correct their error and therefore may not be as negative towards research and staff department involvement as those students who had never failed a subject.

4.3.2.2.3. Cronbach's alpha for "Department Involvement" scale

Table 2.10: Cronbach's alpha for "Department Involvement" scale in the year 1 and 2 group

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B2	The Majority of the DUT staff members and part time lecturers/clinicians place great emphasis on research.	10.31	12.460	0.640	0.843
B6	The Majority of the DUT staff members and part time lecturers/clinicians discuss their own research interests in class.	11.22	11.413	0.753	0.797
B7	The above class interactions help to increase my interest in research.	10.71	10.812	0.773	0.787
B14	The Majority of the DUT staff members and part time lecturers/clinicians use research findings as part of their teaching material.	11.00	12.000	0.644	0.842

There were 4 items making up this scale in the year 1 and 2 group. There were 51 students with non missing responses on these items. The overall Cronbach's alpha was 0.857 indicating good consistency. No individual item was problematic as shown in Table 2.10.

Table 2.11: Cronbach's alpha for "Department Involvement" scale in the year 3 and above group "Positively phrased questions"

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B2	The Majority of the DUT staff members and part time lecturers/clinicians place great emphasis on research.	33.6364	46.609	0.539	0.732
B6	The Majority of the DUT staff members and part time lecturers/clinicians discuss their own research interests in class.	34.7955	48.306	0.425	0.746
B7	The above class interactions help to increase my interest in research.	34.7955	51.934	0.211	0.773
B14	The Majority of the DUT staff members and part time lecturers/clinicians use research findings as part of their teaching material.	34.5455	46.486	0.490	0.737
B18	The Majority of the DUT staff members and part time lecturers/clinicians are easy to approach with regards to research.	33.9091	45.759	0.523	0.732
C19	The Majority of the DUT staff members and part time lecturers/clinicians are knowledgeable with regards to the research process.	33.8864	43.638	0.726	0.706
C20	The Majority of the DUT staff members and part time lecturers/clinicians are up to date with the latest Chiropractic research within their areas of interest.	33.8182	46.199	0.614	0.724
D6	The researcher's relationship with his/her supervisor is of great importance.	32.2045	54.073	0.122	0.780

Table 2.12: Cronbach's alpha for "Department Involvement" scale in the year 3 and above group "Negatively phrased questions"

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
D1	It is difficult to find a supervisor.	33.6136	45.498	0.425	0.748
D4	Inadequate supervision from my supervisor has delayed my research progress	33.3182	48.222	0.298	0.768

There were 10 items making up this scale in the year 3 and above group. There were 44 students with no missing responses on these items. The overall Cronbach's alpha was 0.765 indicating moderate consistency. No individual item was problematic as shown in Table 2.11 and Table 2.12.

4.3.2.2.3. Discussion for Department involvement

Hawk *et al.,* (2008) expressed the importance of experiential learning for research rather than text book learning. McCoy (2006) suggested that integration of research into everyday teaching by the staff department may be a way to help identify and clarify research ideas amongst Chiropractic students.

However, as shown in Table 2.7, mean scores regarding whether students thought that DUT staff department members discussed their own research interests in class or whether DUT staff department members used their own research findings as part of their teaching material in class were only 3.0 and 3.4 respectively. Although these mean responses are slightly above three and indicate slightly positive feelings about these issues, it is felt that there is room for improvement with these issues.

The role of the supervisor cannot be overemphasized and it is not surprising that it has been consistently mentioned as a major factor that affected the success or failure associated with post graduate research completion (Mouton, 2001). This sentiment seems to be shared by the Chiropractic students at DUT as the mean response to question D6 (The researcher's relationship with his/her supervisor is of great importance) had the highest mean score (5.3) in the entire questionnaire.

With this in mind it is worrying that students indicated that it was difficult to find a supervisor (mean response 4.0) and that inadequate supervision had delayed their research progress (mean response 4.3). De Valero (2001) found that if the quality of supervisor support within a department was high it correlated with better research completion. It is suggested that staff that are actively supervising Masters students do not generate their own peer-reviewed publications and therefore lack the necessary post Masters experience (McCoy, 2006). Issues surrounding the reasons why students thought research supervision had delayed their progression may need to be examined in future studies.

4.3.2.3. Scale Three: Confidence to do research

4.3.2.3.1. Mean response to each item from confidence to do research

Table 2.13: Positively phrased questions

For positively phrased questions a mean score closer to one represented a more negative attitude while scores closer to six represented a more positive attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
C2	I am confident in my ability to understand research terminology.	3.0	1.2	1.0	6.0
C4	I am confident in my ability to design a research proposal	3.0	1.3	1.0	6.0
C6	I am confident in my ability to evaluate research findings in terms of their application to Chiropractic practice.	3.3	1.2	1.0	6.0
C11	Research training has improved my confidence to perform research.	3.4	1.2	1.0	6.0
D5	It was easy to find a research idea/topic	2.2	1.4	1.0	6.0

Questions C6 and C11 are the only questions in this section that indicated positive attitudes towards confidence to perform research. A mean response of 3.3 indicated that students felt slightly confident in their ability to evaluate research findings in terms of their application to Chiropractic practice. Similarly, a mean response of 3.4 indicated research training had marginally improved students' confidence to perform research. A mean response of 3 was recorded when asked if students felt confident in their ability to understand research terminology and design a research proposal. The lowest mean response in this section was recorded when students were asked if it was easy to find a research idea/topic.

Table 2.14: Negatively phrased questions

For negatively phrased questions a mean score closer to one represented a more positive attitude while scores closer to six represented a more negative attitude.

Section and Number	Question	Mean	Standard Deviation	Minimum	Maximum
C10	The research process is completely vague to me.	3.7	1.6	1.0	6.0
C12	I feel insecure about my knowledge of research methodology.	3.5	1.3	1.0	6.0
C8	I am not confident in my ability to review literature.	3.7	1.3	1.0	6.0

Above average responses were found to all negatively phrased questions (C10, C12, C8) indicating that just over half the students felt that the research process was completely vague to them and that they felt insecure about their knowledge of research methodology and that they were not confident in their ability to review literature. These findings seem to be fairly congruent with what was found in the literature indicating that confidence to do research is relatively low amongst most research students within many different professions (Zhang, 1996; Suter *et al.,* 2007; McColl *et al.,* 1998).

4.3.2.3.2. Factors associated with "Confidence to do Research" attitude scale

Table 2.15 shows that there were several factors significantly associated with this scale. This analysis was only performed on those who were in year 3 or higher.

Table 2.15: Generalized linear model of demographic and socio-economic factors versus Confidence to do Research scale (n=40)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	p value
(Intercept)	29.495	100.3680	-167.222	226.213	0.086	1	0.769
Age	-0.428	3.8108	-7.897	7.041	0.013	1	0.911
Female	13.761	5.1542	3.658	23.863	7.128	1	0.008
Male	0(a)						
Indian	21.389	9.2182	3.321	39.456	5.384	1	0.020
Black	20.555	10.1194	0.721	40.389	4.126	1	0.042
White	0(a)						
Divorced/separated	4.099	17.9240	-31.031	39.229	0.052	1	0.819
Married	-41.775	50.9546	-141.644	58.094	0.672	1	0.412
Single	0(a)						
No post school education	39.038	23.0103	-6.062	84.137	2.878	1	0.090
Post school education	0(a)						
Mother has post grad qualification	-25.433	18.6188	-61.925	11.059	1.866	1	0.172
Mother has tertiary undergrad qualification	-18.982	15.3182	-49.005	11.041	1.536	1	0.215
Mother has senior certificate	2.009	9.2438	-16.109	20.126	0.047	1	0.828
Mother has no senior certificate	0(a)						
Father has post grad qualification	29.985	29.4845	-27.803	87.774	1.034	1	0.309
Father has tertiary undergrad qualification	6.831	16.3041	-25.125	38.786	0.176	1	0.675
Father has senior certificate	-7.409	11.6191	-30.182	15.364	0.407	1	0.524
Father has no senior certificate	0(a)						
Not self financed	33.719	14.7195	4.869	62.568	5.248	1	0.022
Self financed	0(a)						
No student loan	-29.043	13.8736	-56.235	-1.852	4.382	1	0.036
Student loan	0(a)						
No parent funding	4.212	20.3790	-35.730	44.154	0.043	1	0.836
Parent funding	0(a)						
No sibling funding	13.950	20.9694	-27.149	55.050	0.443	1	0.506
Sibling funding	0(a)						
No spouse funding	26.635	43.7849	-59.182	112.451	0.370	1	0.543
Spouse funding	0(a)						
No part-time job	-3.340	5.3989	-13.922	7.241	0.383	1	0.536
Part-time job	0(a)						

Table 2.15: Generalized linear model of demographic and socio-economic factors versus Confidence to do Research scale (n=40) continued

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	p value
No computer at home	5.422	14.3707	-22.744	33.588	0.142	1	0.706
Computer at home	0(a)						
No internet access at home	1.514	4.6033	-7.508	10.536	0.108	1	0.742
Internet access at home	0(a)						
Did not study Chiropractic straight after school	54.739	13.3334	28.606	80.872	16.854	1	0.000
Studied Chiropractic straight after school	0(a)						
Chiropractic not correct career choice	-3.388	7.1178	-17.339	10.563	0.227	1	0.634
Chiropractic correct career choice	0(a)						
Never failed a subject	-2.310	4.4936	-11.118	6.497	0.264	1	0.607
Failed a subject	0(a)						
Year =6 (Masters post 5th year exams)	-49.837	24.9383	-98.716	-.959	3.994	1	0.046
Year =5	-23.376	16.1303	-54.991	8.239	2.100	1	0.147
Year =4	-46.788	19.2829	-84.582	-8.994	5.887	1	0.015
Year =3	0(a)						
Insufficient computer resources at DUT	-3.424	9.2260	-21.506	14.659	0.138	1	0.711
Sufficient computer resources at DUT	0(a)						
Insufficient internet resources at DUT	-1.968	11.7890	-25.074	21.138	0.028	1	0.867
Sufficient internet resources at DUT	0(a)						
Never participated as a research subject at DUT	28.098	11.4625	5.632	50.564	6.009	1	0.014
Participated as a research subject at DUT	0(a)						
Never participated as a research subject outside DUT	-23.479	16.8965	-56.595	9.638	1.931	1	0.165
Participated as a research subject outside DUT	0(a)						
Waiting for dissertation to be marked	-2.776	15.6019	-33.355	27.803	0.032	1	0.859
Dissertation write up	13.332	21.4371	-28.684	55.348	0.387	1	0.534
In data collection phase	9.076	7.1528	-4.943	23.095	1.610	1	0.204
DUT 186 passed by Ethics	3.700	22.8429	-41.072	48.471	0.026	1	0.871
DUT 186 passed by Department	36.749	12.8036	11.655	61.844	8.238	1	0.004
Topic proposal passed	4.763	5.7780	-6.561	16.088	0.680	1	0.410
Working on research topic	0(a)						
(Scale)	17.007(b)	3.8029	10.972	26.361			

Dependent Variable: Confidence to do research

Model: (Intercept), A1, A2, A3, A4, A5.1, A6.1, A6.2, A7.1, A7.2, A7.3, A7.4, A7.5, A8, A10, A11, A12, A13, A15, A14, A16, A17, A18, A19, A20

a Set to zero because this parameter is redundant.

b Maximum likelihood estimate.

On average, higher attitude scores for this scale were found in:

- Females recorded higher attitude scores than Males (p=0.008).
- Blacks (p=0.042) and Indians (p=0.020) recorded higher attitude scores than Whites.
- Those who were not self financed recorded higher attitude scores than those who were self financed (p=0.022).
- Those who did not study Chiropractic straight after school recorded higher attitude scores than those who studied Chiropractic straight after school (p<0.001).
- Those with student loans recorded higher attitude scores than those with no student loans (p=0.036).

The above are in keeping with what was found in the previous sections (Section 4.3.2.1.2 and Section 4.3.2.2.2) and was discussed accordingly, with there being no further literature evidence to suggest that the previous discussion requires further elaboration.

- Positive attitudes towards confidence to perform research were found in those who had never participated as a research subject in DUT research versus those who had participated as a research subject in DUT research (p=0.014). This is in contrast to the literature that suggests that students may be more positive towards research after a certain amount of exposure to research (Zhang, 1996; Newell and Cunliffe, 2003). Possible reasoning for this may be that students only realized the magnitude of a research dissertation at DUT once they had been exposed to it as a research subject. This could be compounded by the fact that it was found in the previous section (Training of research: Section 4.3.2.1.2) that students who had begun the research process were more negative about research. Therefore these students may have portrayed research in a negative light to their fellow student research subjects.

- Positive attitudes towards confidence to perform research were found in those who had their DUT 186 passed by Ethics compared to those who were still working on their research topic (p=0.004). This is to be expected as this process is the final step in the proposal process and by this stage students would have gained more confidence and insight into performing research. Additionally, the students are then also more in control of the development of the research process from this point and only require the approval or intervention of the supervisor for them to progress. However if a student is still within the research approvals process, they are more regulated and require input from many more stakeholders to progress past this point (Wilson, 2009).

- Third year students had more positive attitudes towards confidence to perform research than those students in fourth year (p=0.015) and those students in sixth year (p=0.046). Zhang (1996) also found similar results amongst Chiropractic students' confidence to perform research. Zhang (1996) attributed the perceived drop in the confidence of later year students to the increased workloads associated with those years. However, in this case it is suggested that it may be through pure ignorance that third year students thought that they were more confident to perform research than fourth and sixth year students. The majority of third year students would not have started the research process and therefore would not actually know if they were confident to perform research. Confidence levels seem to decrease amongst the fourth year students as the challenging prospects of finding a research topic and beginning the research process become more imminent. Additionally, it needs to be considered that the ages of the Chiropractic students in the DUT context are a lot lower than in comparative literature (Zhang, 1996), which may precipitate the students being less able to deal with issues surrounding critical evaluation of their own work by themselves as well as through input from the supervisor(s). This process may, if the student is

not mature enough to deal with the process of critical reflection, lead to the reduced confidence of the student.

4.3.2.3.3. Cronbach's alpha for "Confidence to do research" scale

Table 2.16: Cronbach's alpha for "Confidence to do research" scale Positively phrased questions

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C2	I am confident in my ability to understand research terminology.	23.0000	37.190	0.426	0.736
C4	I am confident in my ability to design a research proposal.	22.7209	31.730	0.688	0.683
C6	I am confident in my ability to evaluate research findings in terms of their application to Chiropractic practice.	22.3721	36.382	0.474	0.728
C11	Research training has improved my confidence to perform research.	22.3721	39.953	0.200	0.772
D5	It was easy to find a research idea/topic	23.5814	36.440	0.394	0.741

Table 2.17: Cronbach's alpha for "Confidence to do research" scale Negatively phrased questions

Section and Number	Question	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C10	The research process is completely vague to me.	22.2326	31.278	0.566	0.707
C12	I feel insecure about my knowledge of research methodology.	22.3721	36.906	0.391	0.741
C8	I am not confident in my ability to review literature.	22.0465	35.426	0.497	0.723

There were 8 items making up this scale, which was only answered by those students in 3rd year or higher (n=80). With there being 37 incomplete data sets, only 43 students were evaluated as they had no missing values for any of the items in this scale. The Cronbach's alpha for this scale was 0.756 overall, indicating moderate internal consistency. The item – total correlation is shown in Table 2.16 and Table 2.17, as well as the Cronbach's alpha if the item were

deleted. It can be seen that no individual item is influencing the overall Cronbach's alpha.

4.3.2.3.4. Discussion for confidence to perform research

Confidence to do research with regard to perceived knowledge of current research, research design, analysis of research data and ability to understand research terminology are low amongst most research students within many different professions (Zhang, 1996; Suter *et al.,* 2007; McColl, 1998). Suter *et al.,* (2007) showed that only 21.7% of Chiropractors indicated having knowledge in research design while the majority of Chiropractic students in a study by Zhang (1996) reported having very little knowledge in present or past Chiropractic research.

Table 2.13, shows that mean responses were middle to slightly positive with regards to confidence in understanding research terminology, designing a research proposal and ability to evaluate research findings in terms of the application to the Chiropractic profession. However, when asked negatively phrased questions, high mean responses were recorded when asked if "I felt insecure about my knowledge of research methodology" and "I am not confident in my ability to review literature" indicating negative attitudes about these issues (Table 2.14).

A high mean score was recorded to question C10 which indicated that the research process was completely vague to the students. As discussed in the previous section (Training of research: Section 4.3.2.1.2) it seems that once again there were negative attitude scores recorded with regards to the research process. Be this as it may it was found that those students who had their DUT 186 passed by Ethics (completed a literature review) were more positive about their confidence to perform research than those students who were still working on their research topic (still to complete literature review) (p=0.004). This is to be expected as this process is the final step in the proposal process and by this

stage students would have gained more confidence and insight into performing research.

The fact that fourth and sixth year students at DUT perceived that they were less confident to perform research than third year students, is similar to what Zhang (1996) found amongst Chiropractic students confidence to perform research. He attributed the perceived drop in the confidence of later year students to increased workloads. However, in this case it is suggested that it was through pure ignorance that third year students thought that they were more confident to perform research than fourth and sixth year students as the majority of third year students would not have started the research process and therefore would not actually know if they were confident to perform research. Confidence levels seem to decrease amongst the later year students as the challenging prospects of finding a research topic and beginning the research process became more imminent. Additionally, it needs to be considered that the ages of the Chiropractic student in the DUT context is a lot lower than in comparative literature (Zhang, 1996), which may precipitate the students being less able to deal with issues surrounding critical evaluation of their own work by themselves as well as through input from the supervisor(s). This process may, if the student is not mature enough to deal with the process of critical reflection, lead to reduced confidence of the student.

The lowest mean score recorded in this section was to question D5 indicating that students thought it was not easy to find a research topic. Hawk *et al*., (2008) and McCoy (2006) both suggested that integration of research into everyday teaching by the staff department may be a way to help identify and clarify research ideas amongst Chiropractic students.

4.3.2.4. Scale Four: Importance of research

4.3.2.4.1. Mean response to each items from importance of research

Table 2.18: Positively phrased questions

For positively phrased questions a mean score closer to one represented a more negative attitude while scores closer to six represented a more positive attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
B5	Research should be in the Chiropractic course.	3.8	1.6	1.0	6.0
B10	Research is important for identifying and investigating problems in the Chiropractic profession.	4.6	1.3	1.0	6.0
B13	Research is important in improving Chiropractic clinical practice.	4.4	1.4	1.0	6.0
B1	Research at DUT is important in the recognition and development of the Chiropractic profession.	4.4	1.5	1.0	6.0
B19	I am interested in doing Chiropractic research once I qualify.	3.1	1.7	1.0	6.0
B23	It is a necessity to conduct research to practice as a successful Chiropractor.	3.1	1.6	1.0	6.0
B26	It is important to have a Masters in Chiropractic.	5.1	1.4	1.0	6.0

Table 2.19: Negatively phrased questions

For negatively phrased questions a mean score closer to one represented a more positive attitude while scores closer to six represented a more negative attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
B24	Conducting research is not an important part of a Chiropractic course.	3.8	1.5	1.0	6.0

It is evident that Chiropractic students at DUT thought that research is important with high mean responses to questions B1 (Research at DUT is important in the recognition and development of the Chiropractic profession), B10 (Research is important for identifying and investigating problems in the Chiropractic profession) and B13 (Research is important in improving Chiropractic clinical practice). An even higher mean response was recorded when students were asked if it was important to have a Chiropractic Masters degree. These results are comparative to other studies assessing students attitudes towards the importance of research where 70% indicated that research is important (Zhang, 1996).

However, slightly lower mean responses were recorded to questions B19 (I am interested in doing Chiropractic research once I qualify) and question B23 (It is a necessity to conduct research to practice as a successful Chiropractor). When asked a negatively phrased question (B24) (Conducting research is not an important part of a Chiropractic course) high mean responses were recorded. Once again, 19.4% of students in other studies indicated that it should be mandatory to conduct a research project as part of their education and professional training and furthermore only 58% indicating that they would be interested in conducting Chiropractic research (Zhang, 1996).

4.3.2.4.2. Factors associated with "Importance of Research" attitude scale

Table 2.20, shows that there were several factors significantly associated with this scale.

Table 2.20: Generalized linear model of demographic and socio-economic factors versus Importance of Research scale (n=120)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	p value
(Intercept)	102.634	20.7412	61.982	143.286	24.486	1	0.000
Age	-0.233	0.6126	-1.433	0.968	0.144	1	0.704
Female	5.478	2.5568	0.467	10.489	4.591	1	0.032
Male	0(a)						
Other race	21.673	12.1015	-2.046	45.391	3.207	1	0.073
Coloured	-2.964	5.4135	-13.574	7.646	0.300	1	0.584
Indian	-4.095	3.3180	-10.598	2.408	1.523	1	0.217
Black	-5.937	5.5750	-16.864	4.990	1.134	1	0.287
White	0(a)						
Divorced/separated	-22.500	13.9002	-49.743	4.744	2.620	1	0.106
Married	-13.458	7.9264	-28.993	2.078	2.883	1	0.090
Single	0(a)						
No post school education	9.097	4.4476	0.379	17.814	4.183	1	0.041
Post school education	0(a)						
Mother has post grad qualification	-9.182	6.7503	-22.413	4.048	1.850	1	0.174
Mother has tertiary undergrad qualification	-2.261	4.7591	-11.589	7.066	0.226	1	0.635
Mother has senior certificate	0.794	4.6729	-8.365	9.953	0.029	1	0.865
Mother has no senior certificate	0(a)						
Father has post grad qualification	-10.250	5.7788	-21.576	1.076	3.146	1	0.076
Father has tertiary undergrad qualification	-9.715	4.7693	-19.063	-0.368	4.150	1	0.042
Father has senior certificate	-4.912	5.0402	-14.791	4.966	0.950	1	0.330
Father has no senior certificate	0(a)						
Not self financed	6.019	4.6201	-3.036	15.075	1.697	1	0.193
Self financed	0(a)						
No student loan	-8.629	3.5828	-15.651	-1.607	5.801	1	0.016
Student loan	0(a)						0
No parent funding	-5.251	4.8462	-14.750	4.247	1.174	1	0.279
Parent funding	0(a)						
No sibling funding	-7.087	7.2571	-21.310	7.137	0.954	1	0.329
Sibling funding	0(a)						
No spouse funding	-20.079	7.3637	-34.511	-5.646	7.435	1	0.006
Spouse funding	0(a)						

Table 2.20: Generalized linear model of demographic and socio-economic factors versus Importance of Research scale (n=120)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	p value
No part-time job	3.371	2.8660	-2.246	8.988	1.383	1	0.240
Part-time job	0(a)						
No computer at home	-0.760	4.7423	-10.055	8.535	0.026	1	0.873
Computer at home	0(a)						
No internet access at home	-0.217	3.2045	-6.497	6.064	0.005	1	0.946
Internet access at home	0(a)						
Did not study Chiropractic straight after school	10.739	3.6356	3.614	17.865	8.726	1	0.003
Studied Chiropractic straight after school	0(a)						
Chiropractic not correct career choice	-19.632	3.8042	-27.088	-12.176	26.632	1	0.000
Chiropractic correct career choice	0(a)						
Never failed a subject	-3.412	2.7044	-8.712	1.889	1.592	1	0.207
Failed a subject	0(a)						
Year =6 (Masters post 5th year exams)	-10.128	7.6222	-25.067	4.811	1.766	1	0.184
Year =5	-11.163	5.9995	-22.922	.596	3.462	1	0.063
Year =4	-13.595	5.8485	-25.058	-2.133	5.404	1	0.020
Year =3	-3.009	5.2461	-13.291	7.273	0.329	1	0.566
Year =2	-4.739	4.1567	-12.886	3.408	1.300	1	0.254
Year =1	0(a)						
Insufficient computer resources at DUT	-4.600	4.8428	-14.091	4.892	0.902	1	0.342
Sufficient computer resources at DUT	0(a)						
Insufficient internet resources at DUT	3.373	4.6669	-5.774	12.520	0.522	1	0.470
Sufficient internet resources at DUT	0(a)						
Never participated as a research subject at DUT	1.402	3.1672	-4.805	7.610	0.196	1	0.658
Participated as a research subject at DUT	0(a)						
Never participated as a research subject outside DUT	3.361	3.4013	-3.305	10.027	0.976	1	0.323
Participated as a research subject outside DUT	0(a)						
Waiting for dissertation to be marked	-15.503	11.5559	-38.152	7.146	1.800	1	0.180
Dissertation write up	23.521	9.1010	5.684	41.359	6.680	1	0.010
In data collection phase	-1.416	7.9880	-17.073	14.240	0.031	1	0.859
DUT 186 passed by Ethics	1.184	10.8600	-20.101	22.469	0.012	1	0.913
DUT 186 passed by Department	-13.958	14.2963	-41.978	14.062	0.953	1	0.329
Topic proposal passed	-0.196	4.7691	-9.543	9.152	0.002	1	0.967
Working on research topic	8.345	3.7694	0.957	15.732	4.901	1	0.027
Haven't started the research process	0(a)						
(Scale)	115.42(b)	14.9017	89.624	148.662			

Dependent Variable: Importance of research

Model: (Intercept), A1, A2, A3, A4, A5.1, A6.1, A6.2, A7.1, A7.2, A7.3, A7.4, A7.5, A8, A10, A11, A12, A13, A15, A14, A16, A17, A18, A19, A20

a Set to zero because this parameter is redundant.

b Maximum likelihood estimate.

On average, higher attitude scores for this scale were found in:

- Females recorded higher attitude scores than Males (p=0.032).
- Those with no post school education recorded higher attitude scores than those with post school education (p=0.041).
- Those who did not study Chiropractic straight after school recorded higher attitude scores than those who studied Chiropractic straight after school (p=0.003).
- Those with a student loan recorded higher attitude scores than those with no student loan (p= 0.016).
- Those with spouse funding recorded higher attitude scores than those with no spouse funding (p=0.006).

This was in keeping with what was found in the previous sections (Section 4.3.2.1.2; Section 4.3.2.2.2 and Section 4.3.2.3.2) and was discussed accordingly. No further literature indicates that the presented reasons for this outcome should be any different to the previous discussions.

- Those who were working on their research topic (p=0.027) and those who were writing up their dissertation (p=0.010) recorded more positive scores towards importance of research than those who had not started the research process. It is thought that students who have started working on their research topic or while working on their dissertation write up are more actively engaged in reviewing the available literature, and may therefore be more able to contextualize the benefits and importance of doing research compared to those who have not started the research process.

- Those whose fathers had no matric recorded higher attitude scores towards importance of research than those whose fathers had a tertiary undergraduate qualification (p= 0.042). This is in contrast to what was expected from the literature (Makuakane-Drechsel and Hagedorn, 2000;

HortaÇsu, 1995). However, one needs to consider that students whose parents did not have a tertiary degree may be more motivated to overcome the obstacles that the lack of academic support had posed in their research experience in order to better academically support their children. Additionally, those students who's parents had not completed matric were more likely to have formed part of a previously disadvantaged minority group (i.e. Black students). This is significant as it was shown that Black students had more positive attitudes towards training of research (Section: 4.3.2.1.2). Therefore, this may have had an impact on the resultant confidence of these students to perform research.

- Higher attitude scores towards importance of research were found in first year students compared to fourth year students (p=0.020). Similar results were found in the confidence to perform research section with fourth and sixth year students perceiving that they were less confident do perform research. Zhang (1996) attributed the perceived drop in the confidence of latter year students to the increased workloads associated with those years. Based on this it may also be true that students in fourth year are more focused on completing the heavy course workloads at that stage, and not their research. Another reason for the perceived drop in importance may be because as the prospect of performing research becomes more imminent the student's negative attitudes become more enhanced.

- Those who thought that Chiropractic was the correct career choice for them had higher positive attitude scores towards importance of research than those who thought that Chiropractic was not their correct career choice (p<0.001). It is thought that these students may have higher levels of motivation. This is significant as a student's level of motivation contributes to their academic and research progression (Ditcher and Tetley, 1999; LeJeune, 2000; Mouton, 2001). Therefore, it is thought that if a Chiropractic student was not happy with his career decision they would

not be as motivated to perform research and this may affect the students attitudes towards research negatively (Grant, 2006).

4.3.2.4.3. Cronbach's alpha for "Importance of research" scale

Table 2.21: Cronbach's alpha for "Importance of research" scale "Positively phrased questions"

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B5	Research should be in the Chiropractic course.	28.7652	45.647	0.621	0.772
B10	Research is important for identifying and investigating problems in the Chiropractic profession.	27.9167	48.245	0.615	0.776
B13	Research is important in improving Chiropractic clinical practice.	28.1061	47.195	0.643	0.772
B1	Research at DUT is important in the recognition and development of the Chiropractic profession.	28.0833	46.749	0.629	0.772
B19	I am interested in doing Chiropractic research once I qualify.	29.4848	50.633	0.313	0.822
B23	It is a necessity to conduct research to practice as a successful Chiropractor.	29.4167	45.146	0.618	0.773
B26	It is important to have a Masters in Chiropractic.	27.4167	50.214	0.460	0.796

Table 2.22: Cronbach's alpha for "Importance of research" scale "Negatively phrased questions"

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B24	Conducting research is not an important part of a Chiropractic course.	28.7348	50.822	0.361	0.811

There were 8 items making up this scale, which was answered by all participants. All 132 students were evaluated as they had no missing values for any of the items in this scale. The Cronbach's alpha for this scale was 0.809 overall, indicating good internal consistency. The item –total correlation is shown in Table 21 and Table 22, as well as the Cronbach's alpha if the item were deleted. It can be seen that no individual item is influencing the overall Cronbach's alpha.

4.3.2.4.3. Discussion

Zhang (1996) states that if students understand the importance of research it may influence their willingness to participate in research and ultimately affect their attitudes. It seems evident from the results that students at DUT thought that research is important for identifying and investigating problems in the Chiropractic profession (B10) and improving Chiropractic clinical practice (B13). They also thought that research at DUT is important in the recognition and development of the Chiropractic profession (B1).

When students were asked if research should be part of the Chiropractic course (B5), a high mean score of 3.8 was recorded indicating that they were in favour of research being part of the course. However, when a similar question (B24) was negatively phrased, again high mean scores were recorded (3.8), indicating that students thought conducting research is not an important part of a Chiropractic course. From the conflicting results it may be evident that students

have mixed ideas as to whether research should be part of the Chiropractic course. Chiropractic students abroad seemed to be more certain about their feelings towards being required to do a research project as only 19.4% agreed that it should be a requirement (Zhang, 1996).

Students were slightly less positive when asked if they were interested in doing Chiropractic research once they qualified (mean score 3.1). This result is similar to what Zhang (1996) highlighted where 58% of participants indicated that they would be interested in conducting Chiropractic research.

Low attitude scores towards the importance of research were found in fourth year students, which seemed to highlight the possibility that as students came closer to performing research they became more anxious about it. However, it is interesting to note that students' scores towards importance of research became higher when they were interactively involved with their supervisor and literature reviewing during the topic proposal stage as well as the write up stage. A possible reason for this may be that students attitudes may be negatively affected by the level of isolation experienced (Mouton, 2001) while students are in the data collection phase, as they are at that stage not actively interacting with their supervisor on a regular basis. Therefore, the evidence suggests that a possible way to sensitize students about the importance of research would be to actively engage them in some type of literature reviewing at an earlier stage in their Chiropractic studies as well as encourage students to consistently meet with their supervisors throughout the research dissertation stages.

4.3.2.5. Scale Five: Positive feelings towards research

4.3.2.5.1. Mean responses to each items form positive feelings towards research

Table 2.23: Positively phrased questions "Years 1 and 2"

For positively phrased questions a mean score closer to one represented a more negative attitude while scores closer to six represented a more positive attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
B3	I enjoy discussing or listening to discussions about Chiropractic research.	3.7	1.3	1.0	6.0
B8	I enjoy reading research papers from the Chiropractic literature.	3.3	1.4	1.0	6.0
B11	I find people who do research very interesting to listen to.	3.8	1.4	1.0	6.0
B15	I like research.	2.8	1.5	1.0	6.0
B17	I have had a positive experience with regard to research.	3.0	1.3	1.0	6.0
B18	Research is easy.	2.1	1.3	1.0	6.0
B21	I am interested in research.	3.5	1.4	1.0	6.0

Table 2.24: Positively phrased questions "Years 3 and above"

For positively phrased questions a mean score closer to one represented a more negative attitude while scores closer to six represented a more positive attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
B3	I enjoy discussing or listening to discussions about Chiropractic research.	3.7	1.3	1.0	6.0
B8	I enjoy reading research papers from the Chiropractic literature.	3.3	1.4	1.0	6.0
B11	I find people who do research very interesting to listen to.	3.8	1.4	1.0	6.0
B15	I like research.	2.8	1.5	1.0	6.0
B17	I have had a positive experience with regard to research.	3.0	1.3	1.0	6.0
B18	Research is easy.	2.1	1.3	1.0	6.0
B21	I am interested in research.	3.5	1.4	1.0	6.0
C17	Research has made me more knowledgeable within my field of research.	4.2	1.3	1.0	6.0
C16	The research process has increased my management skills.	3.2	1.3	1.0	6.0
D2	The idea/topic proposal process is efficient.	3.4	1.5	1.0	6.0
D3	The DUT 186 proposal process is efficient.	3.0	1.3	1.0	6.0

According to the mean scores it is evident the majority of the students agreed that they enjoyed discussing or listening to discussions about research (B3), enjoyed reading research papers from the Chiropractic literature (B8) and that they found people who do research very interesting to listen to (B11). These results would support the findings in the previous section (Section 4.3.2.4.3) which showed that students were more positive towards research while they were either actively engaged in reviewing the available literature or were actively interacting and discussing their research with their research supervisors.

Most of them also indicated that they were interested in research (B21), research had made them more knowledgeable (C17) and improved their management skills (C16) and that the topic proposal process was efficient (D2).

The lower mean responses were recorded to questions, I like research (B15), research is easy (B18), the DUT 186 proposal process is efficient (D3) and I have had a positive experience with regard to research (B17).

4.3.2.5.2. Factors associated with "Positive feelings towards research" attitude scale

Since this scale was composed of different items for the group of students who were in year 1 and 2, compared to those who were higher than year 2, the year of study was used as a controlling independent variable in this analysis. Table 2.25 shows that there were several factors significantly associated with this scale.

Table 2.25: Generalized linear model of demographic and socio-economic factors versus Positive feeling towards research scale (n=84)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	99.004	30.7119	38.810	159.198	10.392	1	0.001
Age	-0.291	0.9571	-2.167	1.585	0.092	1	0.761
Female	6.223	3.5196	-0.676	13.121	3.126	1	0.077
Male	0(a)						
Other race	-1.841	12.7001	-26.733	23.051	0.021	1	0.885
Coloured	4.200	7.2386	-9.987	18.387	0.337	1	0.562
Indian	-1.759	4.2615	-10.111	6.594	0.170	1	0.680
Black	-6.322	9.0638	-24.087	11.443	0.486	1	0.485
White	0(a)						
Divorced/separated	3.464	14.4888	-24.934	31.861	0.057	1	0.811
Married	-3.312	11.4325	-25.719	19.096	0.084	1	0.772
Single	0(a)						
No post school education	4.646	6.0203	-7.153	16.446	0.596	1	0.440
Post school education	0(a)						
Mother has post grad qualification	-16.186	8.6877	-33.214	0.841	3.471	1	0.062
Mother has tertiary undergrad qualification	-5.038	7.1447	-19.041	8.966	0.497	1	0.481
Mother has senior certificate	-6.349	7.0600	-20.186	7.488	0.809	1	0.369
Mother has no senior certificate	0(a)						
Father has post grad qualification	-20.939	9.0946	-38.764	-3.114	5.301	1	0.021
Father has tertiary undergrad qualification	-17.250	7.9632	-32.857	-1.642	4.692	1	0.030
Father has senior certificate	-11.581	8.3681	-27.982	4.820	1.915	1	0.166
Father has no senior certificate	0(a)						
Not self financed	4.772	7.7668	-10.450	19.995	0.378	1	0.539
Self financed	0(a)						
No student loan	-9.428	5.2362	-19.691	.834	3.242	1	0.072

Table 2.25: Generalized linear model of demographic and socio-economic factors versus Positive feeling towards research scale (n=84)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
Student loan	0(a)						
No parent funding	-4.797	7.4044	-19.309	9.715	0.420	1	0.517
No sibling funding	-4.149	8.4249	-20.661	12.364	0.242	1	0.622
Sibling funding	0(a)						
No spouse funding	-14.747	8.6309	-31.663	2.169	2.919	1	0.088
Spouse funding	0(a)						
No part-time job	-0.804	3.9118	-8.471	6.863	0.042	1	0.837
Part-time job	0(a)						
No computer at home	-3.395	6.6125	-16.355	9.565	0.264	1	0.608
Computer at home	0(a)						
No internet access at home	0.190	5.1544	-9.912	10.293	0.001	1	0.971
Internet access at home	0(a)						
Did not study Chiropractic straight after school	4.221	5.1937	-5.958	14.401	0.661	1	0.416
Studied Chiropractic straight after school	0(a)						
Chiropractic not correct career choice	-10.415	4.9499	-20.116	-.713	4.427	1	0.035
Chiropractic correct career choice	0(a)						
Never failed a subject	-10.447	4.1697	-18.619	-2.274	6.277	1	0.012
Failed a subject	0(a)						
Year =6 (Masters post 5th year exams)	-29.172	11.5776	-51.864	-6.481	6.349	1	0.012
Year =5	-27.292	9.8918	-46.680	-7.904	7.612	1	0.006
Year =4	-22.603	9.7067	-41.628	-3.578	5.422	1	0.020
Year =3	-30.918	16.4613	-63.182	1.346	3.528	1	0.060
Year =2	-4.931	4.7671	-14.274	4.413	1.070	1	0.301
Year =1	0(a)						
Insufficient computer resources at DUT	-0.639	6.3844	-13.153	11.874	0.010	1	0.920
Sufficient computer resources at DUT	0(a)						
Insufficient internet resources at DUT	-0.615	5.7898	-11.963	10.732	0.011	1	0.915
Sufficient internet resources at DUT	0(a)						
Never participated as a research subject at DUT	-0.565	4.2634	-8.921	7.791	0.018	1	0.895
Participated as a research subject at DUT	0(a)						
Never participated as a research subject outside DUT	11.151	4.8763	1.593	20.708	5.229	1	0.022
Participated as a research subject outside DUT	0(a)						
Waiting for dissertation to be marked	5.682	15.2512	-24.209	35.574	0.139	1	0.709
Dissertation write up	32.109	13.1457	6.344	57.875	5.966	1	0.015
In data collection phase	20.078	12.3840	-4.194	44.350	2.629	1	0.105
DUT 186 passed by Ethics	37.245	14.4332	8.957	65.534	6.659	1	0.010
DUT 186 passed by Department	25.141	18.3764	-10.876	61.158	1.872	1	0.171
Topic proposal passed	24.945	8.9814	7.342	42.548	7.714	1	0.005
Working on research topic	8.016	5.9983	-3.740	19.773	1.786	1	0.181
Haven't started the research process	0(a)						
(Scale)	114.99(b)	17.7441	84.984	155.604			

Dependent Variable: Positive feelings

Model: (Intercept), A1, A2, A3, A4, A5.1, A6.1, A6.2, A7.1, A7.2, A7.3, A7.4, A7.5, A8, A10, A11, A12, A13, A15, A14, A16, A17, A18, A19, A20

a Set to zero because this parameter is redundant.. b Maximum likelihood estimate.

On average, significantly higher positive attitude scores were found in:

- Those who had never participated as a research subject outside of DUT versus those who had participated as a research subject outside of DUT (p=0.022).
- Those whose fathers have no matric versus those whose fathers had a post graduate qualification (p=0.021).
- Those whose fathers have no matric versus those whose fathers had a tertiary undergraduate qualification (p=0.030).
- Those who thought that Chiropractic was the correct career choice versus those who thought that Chiropractic was not their correct career choice (p=0.035).
- First year students had higher attitude scores compared to all years but they were significantly higher than students in 6th (p=0.012), 5th (p= 0.006) and 4th year (p=0.020).
- Those who had failed versus those who had never failed a subject (p=0.012).

This was in keeping with what was found in the previous sections (Section 4.3.2.1.2; Section 4.3.2.2.2; Section 4.3.2.3.2 and Section 4.3.2.4.2) and was discussed accordingly. No further literature indicates that the presented reasons for this outcome should be any different to the previous discussions.

- Those who had their topic proposal passed (p=0.005) or their DUT 186 passed by Ethics (p=0.010) or were in the dissertation write up stage (p=0.015), versus those who had not started research yet. It seems that students generally feel more positive towards research as they progress through the relevant stages of the research proposal process (except for their feelings about research training- Section: 4.3.2.1.2). This could be because at these stages the students are actively engaged with their research supervisors which help eliminate the feeling of isolation that many research students report (Becher *et al.,* 1994; Mouton, 2001).

However those students who had had their research passed by the Department Research Committee did not share the same positive attitude as those in all the other stages of the research processes. This correlates with the fact that students indicated that the research proposal process was more efficient than the DUT proposal process (Table 2.24).

4.3.2.5.1. Cronbach's alpha for "positive feelings towards research" scale Years 1 and 2

Table 2.26: Cronbach's alpha for "Positive feelings towards research" scale in the year 1 and 2 group

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B3	I enjoy discussing or listening to discussions about Chiropractic research.	19.92	34.754	0.769	0.845
B8	I enjoy reading research papers from the Chiropractic literature.	20.57	36.930	0.594	0.868
B11	I find people who do research very interesting to listen to.	19.88	34.346	0.746	0.847
B15	I like research.	20.82	34.428	0.750	0.847
B17	I have had a positive experience with regard to research.	20.63	37.838	0.591	0.868
B18	Research is easy.	21.82	40.588	0.421	0.886
B21	I am interested in research.	20.35	33.873	0.738	0.848

There were 7 items making up this scale in the year 1 and 2 group. There were 51 students with no missing responses on these items. The overall Cronbach's alpha was 0.877 indicating good consistency. No individual item was problematic as shown in Table 2.26.

Table 2.27: Cronbach's alpha for "Positive feelings towards research" scale in the year 3 and above group

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B3	I enjoy discussing or listening to discussions about Chiropractic research.	30.88	57.962	0.446	0.761
B8	I enjoy reading research papers from the Chiropractic literature.	31.19	55.488	0.534	0.751
B11	I find people who do research very interesting to listen to.	30.81	56.774	0.424	0.763
B15	I like research.	32.21	53.455	0.581	0.744
B17	I have had a positive experience with regard to research.	31.84	55.854	0.472	0.757
B18	Research is easy.	32.21	58.265	0.301	0.779
B21	I am interested in research.	31.16	50.140	0.826	0.715
C17	Research has made me more knowledgeable within my field of research.	31.16	59.568	0.306	0.776
C16	The research process has increased my management skills.	30.14	58.075	0.348	0.772
D2	The idea/topic proposal process is efficient.	31.12	59.200	0.257	0.784
D3	The DUT 186 proposal process is efficient.	31.47	59.636	0.317	0.774

There were 11 items making up this scale in the year 3 and above group. There were 43 students with non missing responses on these items. The overall Cronbach's alpha was 0.779 indicating moderate consistency. No individual item was problematic as shown in Table 2.27.

4.3.2.5.3. Discussion

The majority of the students had recorded positive scores towards positive feelings about research. However, the two lowest scores recorded in this section were “I like research” and “Research is easy”.

Lower scores were recorded towards ‘positive feelings towards research in fourth, fifth and sixth year students compared to first year students. This may indicate that as the students progressed through the relevant years they became progressively more negative towards research. However, in contrast, students attitudes towards research were higher in those that had their topic proposal passed, their DUT 186 passed by Ethics and those that were in the dissertation write up stage. Therefore students seemed to be more positive towards research as they progressed through the relevant stages of the research proposal process. This seems to point out that as students came closer to having to perform research they became more negative towards research, but as they gained more insight and knowledge into research while they progressed through the relevant research proposal stages they became more positive towards research. Yet, students who had had their research passed by the DRC did not share the same positive attitudes as those in all the other stages of the research process. This correlates with the fact that students indicated that the research proposal process was more efficient than the DUT proposal process (Table 2.24).

Possible reasoning for this drop in attitude may be attributed to logistical issues surrounding the process or the fact that relatively high mean responses were recorded to question C10 (mean score 3.7) indicating that students thought that the research process was completely vague to them (Table 2.4). Additionally, the mean score recorded to question C13 was only 2.9, which indicated slightly negative feelings about whether the current research training at DUT adequately teaches what steps to follow in the research process. The issues surrounding this finding may need to be further investigated in future studies.

4.3.2.6. Scale Six: Negative feelings towards research

4.3.2.6.1. Mean responses to each items for negative feelings towards research

Table 2.28: Negatively phrased questions "Years 1 and 2"

For negatively phrased questions a mean score closer to one represented a more positive attitude while scores closer to six represented a more negative attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
B4	Research is difficult.	4.8	1.4	1.0	6.0
B9	Research is stressful.	5.0	1.3	1.0	6.0
B12	Research makes me anxious.	4.7	1.4	1.0	6.0
B16	I don't want to do research.	3.7	1.9	1.0	6.0
B20	I don't like research.	3.8	1.8	1.0	6.0
B22	I have had a negative experience with regard to research.	3.3	1.6	1.0	6.0
B25	Research is very time consuming.	5.2	1.2	1.0	6.0
B27	If given the choice I would study Chiropractic at an institute were research was not mandatory.	3.8	1.8	1.0	6.0

Table 2.29: Negatively phrased questions "Years 3 and above"

For negatively phrased questions a mean score closer to one represented a more positive attitude while scores closer to six represented a more negative attitude.

Section and Number	Questions	Mean	Standard Deviation	Minimum	Maximum
B4	Research is difficult.	4.8	1.4	1.0	6.0
B9	Research is stressful.	5.0	1.3	1.0	6.0
B12	Research makes me anxious.	4.7	1.4	1.0	6.0
B16	I don't want to do research.	3.7	1.9	1.0	6.0
B20	I don't like research.	3.8	1.8	1.0	6.0
B22	I have had a negative experience with regard to research.	3.3	1.6	1.0	6.0
B25	Research is very time consuming.	5.2	1.2	1.0	6.0
B27	If given the choice I would study Chiropractic at an institute were research was not mandatory.	3.8	1.8	1.0	6.0
C21	Research is delaying me from qualifying.	4.5	1.7	1.0	6.0

Above average mean responses were recorded to all the questions in this section with no question recording a mean score of 3 or below. Questions that recorded a relatively high score of between 3 and 4 were questions, I don't want to do research (B16), I don't like research (B20), I have had a negative experience with regard to research (B22) and if given the choice I would study Chiropractic at an institute were research was not mandatory (B27). Very high mean response were recorded to the questions, research is difficult (B4), research is stressful (B9), research makes me anxious (B12), research is very time consuming (B25) and research is delaying me from qualifying (C21).

4.3.2.6.2. Factors associated with "Negative feelings towards research" attitude scale

Table 2.30: Generalized linear model of demographic and socio-economic factors versus Negative feeling towards research scale (n=120)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	25.985	22.6195	-18.348	70.318	1.320	1	0.251
Age	1.081	.6773	-0.246	2.409	2.549	1	0.110
Female	-0.811	2.7376	-6.176	4.555	0.088	1	0.767
Male	0(a)						
Other race	4.976	13.1069	-20.713	30.665	0.144	1	0.704
Coloured	-7.097	5.9137	-18.688	4.493	1.440	1	0.230
Indian	-2.645	3.6937	-9.884	4.595	0.513	1	0.474
Black	1.298	5.7942	-10.059	12.654	0.050	1	0.823
White	0(a)						
Divorced/separated	-37.405	15.0792	-66.959	-7.850	6.153	1	0.013
Married	-5.138	8.4782	-21.755	11.479	0.367	1	0.544
Single	0(a)	.	.	.	.	.	0.
No post school education	-8.758	4.8407	-18.246	.729	3.274	1	0.070
Post school education	0(a)						
Mother has post grad qualification	20.581	7.3766	6.123	35.039	7.784	1	0.005
Mother has tertiary undergrad qualification	4.849	5.2008	-5.344	15.043	0.869	1	0.351
Mother has senior certificate	1.083	5.2226	-9.153	11.319	0.043	1	0.836
Mother has no senior certificate	0(a)						
Father has post grad qualification	5.981	6.1382	-6.050	18.012	0.949	1	0.330
Father has tertiary undergrad qualification	3.894	5.3006	-6.495	14.283	0.540	1	0.463
Father has senior certificate	2.583	5.7087	-8.606	13.772	0.205	1	0.651
Father has no senior certificate	0(a)						
Not self financed	2.529	5.0377	-7.345	12.402	0.252	1	0.616
Self financed	0(a)						
No student loan	14.032	3.9992	6.194	21.870	12.311	1	0.000
Student loan	0(a)						
No parent funding	7.755	5.5228	-3.069	18.580	1.972	1	0.160
Parent funding	0(a)						
No sibling funding	-6.150	7.9416	-21.715	9.415	0.600	1	0.439
Sibling funding	0(a)						
No spouse funding	4.342	7.9691	-11.277	19.961	0.297	1	0.586
Spouse funding	0(a)						
No part-time job	7.428	3.1415	1.271	13.585	5.591	1	0.018
Part-time job	0(a)						
No computer at home	3.334	5.1739	-6.806	13.475	0.415	1	0.519

Table 2.30: Generalized linear model of demographic and socio-economic factors versus Negative feeling towards research scale (n=120)

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
Computer at home	0(a)						
No internet access at home	-3.231	3.6870	-10.458	3.995	0.768	1	0.381
Internet access at home	0(a)						
Did not study Chiropractic straight after school	-6.839	3.9275	-14.536	.859	3.032	1	0.082
Studied Chiropractic straight after school	0(a)						
Chiropractic not correct career choice	9.607	4.1910	1.393	17.821	5.255	1	0.022
Chiropractic correct career choice	0(a)						
Never failed a subject	0.775	3.0517	-5.207	6.756	0.064	1	0.800
Failed a subject	0(a)						
Year =6 (Masters post 5th year exams)	19.238	9.3557	0.902	37.575	4.229	1	0.040
Year =5	6.678	6.8648	-6.777	20.132	0.946	1	0.331
Year =4	6.361	6.7395	-6.849	19.570	0.891	1	0.345
Year =3	3.318	5.7982	-8.047	14.682	0.327	1	0.567
Year =2	3.646	4.4609	-5.097	12.389	0.668	1	0.414
Year =1	0(a)						
Insufficient computer resources at DUT	14.322	5.2381	4.056	24.588	7.476	1	0.006
Sufficient computer resources at DUT	0(a)						
Insufficient internet resources at DUT	-6.253	5.0570	-16.164	3.659	1.529	1	0.216
Sufficient internet resources at DUT	0(a)						
Never participated as a research subject at DUT	-0.610	3.3226	-7.122	5.902	0.034	1	0.854
Participated as a research subject at DUT	0(a)						
Never participated as a research subject outside DUT	-5.100	3.7121	-12.376	2.175	1.888	1	0.169
Participated as a research subject outside DUT	0(a)						
Waiting for dissertation to be marked	15.040	13.1238	-10.682	40.762	1.313	1	0.252
Dissertation write up	-8.635	10.3011	-28.825	11.554	0.703	1	0.402
In data collection phase	-4.156	9.2142	-22.215	13.904	0.203	1	0.652
DUT 186 passed by Ethics	-20.675	12.4548	-45.086	3.736	2.756	1	0.097
DUT 186 passed by Department	-8.267	15.9072	-39.444	22.911	.270	1	0.603
Topic proposal passed	-0.770	5.4693	-11.490	9.950	0.020	1	0.888
Working on research topic	3.520	4.3806	-5.066	12.106	0.646	1	0.422
Haven't started the research process	0(a)						
(Scale)	135.867(b)	17.5404	105.493	174.987			

Dependent Variable: Negative feelings

Model: (Intercept), A1, A2, A3, A4, A5.1, A6.1, A6.2, A7.1, A7.2, A7.3, A7.4, A7.5, A8, A10, A11, A12, A13, A15, A14, A16, A17, A18, A19, A20

a Set to zero because this parameter is redundant.

b Maximum likelihood estimate.

Negative attitudes were significantly higher in the following:

- Those whose mothers had a postgraduate qualification versus those whose mothers had no matric (p=0.005).
- Those who said Chiropractic was not their correct career choice versus those who thought that Chiropractic was their correct rarer choice (p=0.022).
- 6th year students versus 1st year students (p= 0.040).
- Those who felt there were insufficient computer resources at DUT versus those who thought that there was sufficient computer resources at DUT (p=0.006).
- Those with no student loan versus those with a student loan (p<0.001).

This was in keeping with what was found in the previous sections (Section 4.3.2.1.2; Section 4.3.2.2.2; Section 4.3.2.3.2; Section 4.3.2.4.2 and Section 4.3.2.5.2) and was discussed accordingly. No further literature indicates that the presented reasons for this outcome should be any different to the previous discussions.

Those with no part time job (p=0.018) recorded higher mean scores towards negative feelings about research than those with a part time job. This was in contrast to the literature that suggested that if a student had a part time job they may be more negative towards research as they had less time to dedicate to it (Olenchak and Hebert, 2002). In this case it must be noted that students with no student loan also recorded higher mean scores towards negative feelings about research. This is in keeping with what was found in the literature that shows that access to financial assistance is essential to the enrolment and retention of students (Nora, 2001). It is suggested that if students doing research did not have access to financial assistance in the form of a student loan and furthermore were not able to substitute their finances by working a part time job, it may significantly affect their research progression and experience. Therefore as a result of this these students may have more negative attitudes towards research.

4.3.2.6.1. Cronbach's alpha for "negative feelings towards research" scale Years 1 and 2

Table 2.31: Cronbach's alpha for "Negative feelings towards research" scale in the year 1 and 2 group

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B4	Research is difficult.	26.15	60.592	0.314	0.820
B9	Research is stressful.	26.23	56.025	0.504	0.797
B12	Research makes me anxious.	26.47	54.216	0.572	0.788
B16	I don't want to do research.	27.38	46.432	0.725	0.761
B20	I don't like research.	27.21	48.668	0.734	0.761
B22	I have had a negative experience with regard to research.	27.83	58.644	0.344	0.819
B25	Research is very time consuming.	25.96	57.575	0.498	0.799
B27	If given the choice I would study Chiropractic at an institute were research was not mandatory.	27.40	51.898	0.556	0.790

There were 8 items making up this scale in the year 1 and 2 group. There were 53 students with non missing responses on these items. The overall Cronbach's alpha was 0.815 indicating good consistency. No individual item was problematic as shown in Table 2.31.

Table 2.32: Cronbach's alpha for "Negative feelings towards research" scale in the year 3 and above group

Section and Number	Questions	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
B4	Research is difficult.	36.06	59.097	0.477	0.795
B9	Research is stressful.	35.78	61.696	0.458	0.799
B12	Research makes me anxious.	36.15	56.458	0.605	0.781
B16	I don't want to do research.	37.20	50.846	0.601	0.779
B20	I don't like research.	37.03	51.037	0.648	0.771
B22	I have had a negative experience with regard to research.	37.51	57.797	0.436	0.800
B25	Research is very time consuming.	35.58	65.083	0.287	0.813
B27	If given the choice I would study Chiropractic at an institute were research was not mandatory.	36.94	53.021	0.580	0.782
C21	Research is delaying me from qualifying.	36.66	54.910	0.481	0.796

There were 9 items making up this scale in the year 3 and above group. There were 80 students with non missing responses on these items. The overall Cronbach's alpha was 0.810 indicating good consistency. No individual item was problematic as shown in Table 2.32

4.3.2.6.3. Discussion

High mean scores were recorded to all questions in this section indicating negative attitudes towards research. More specifically students thought that research is very time consuming (B25), research is stressful (B9), research is difficult (B4), research makes them anxious (B12) and research is delaying them from qualifying (C21).

Students thought that research was delaying them from qualifying (C21) and if given the choice they would study Chiropractic at an institute were research was not mandatory (B27). As previously discussed, the inclusion of research as a mandatory part of a Chiropractic degree, although pragmatic in terms of the profession achieving its goal of enhancing the current research status, may actually alienate students from further research in that the negative attitudes and apathy towards research that already exists within the profession (McCoy, 2008; Zhang, 1996) may be further enhanced. This may result in them not wanting to perform research in the future even though they acknowledged the importance (Section 4.3.2.4.3).

4.3.3. Inter-correlations between all attitude scales

Table 2.33, shows that there were many correlations between attitude scales, but most were weak to moderate correlation coefficients although statistically significant with the exception of **importance of research** and **positive feelings about research.**

Table 2.33: Pearson's correlation between all scales

		Training of Research	Confidence to do research	Importance of research	Department Involvement	Positive feelings	Negative feelings
Training of Research	Pearson Correlation	1	0.400(**)	0.447(**)	0.453(**)	0.231	-0.286(*)
	Sig. (2-tailed)		0.010	0.000	0.003	0.146	0.013
	N	75	41	73	42	41	75
Confidence to do research	Pearson Correlation	0.400(**)	1	0.469(**)	0.263	0.472(**)	-0.559(**)
	Sig. (2-tailed)	00.010		0.002	0.093	0.002	0.000
	N	41	43	42	42	41	43
Importance of research	Pearson Correlation	0.447(**)	0.469(**)	1	0.402(**)	0.713(**)	-0.481(**)
	Sig. (2-tailed)	0.000	0.002		0.000	0.000	0.000
	N	73	42	132	91	90	128
Department Involvement	Pearson Correlation	0.453(**)	0.263	0.402(**)	1	0.504(**)	-0.061
	Sig. (2-tailed)	0.003	0.093	0.000		0.000	0.563
	N	42	42	91	95	91	93
Positive feelings	Pearson Correlation	0.231	0.472(**)	0.713(**)	0.504(**)	1	-0.597(**)
	Sig. (2-tailed)	0.146	0.002	0.000	0.000		0.000
	N	41	41	90	91	94	93
Negative feelings	Pearson Correlation	-0.286(*)	-0.559(**)	-0.481(**)	-0.061	-0.597(**)	1
	Sig. (2-tailed)	0.013	0.000	0.000	0.563	0.000	
	N	75	43	128	93	93	133

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

- The strongest correlation was between the importance of research scale and positive feelings (*r*=0.713). It is critical that students understand the importance of research as this will ultimately influence their attitudes and their willingness to participate in research (Zhang, 1996). Furthermore it is important to create these positive attitudes toward research as they were found to be a strong predictor in a decision to pursue further research in the future (Cull *et al.,* 2003).

- Negative correlations were found between some of the scales and negative feelings. Therefore, the stronger a student's negative feelings towards research, the more likely they were to have negative feelings about training of research, confidence to do research, perceived lack of importance of research and lack of positive feelings about research.

4.3.4. Summary and review of Objectives

Objective One: To document the demographic data with respect to the students.

One hundred and thirty eight students participated in this study, which formed 74.59 % of the total sample size (185 students). The majority of the students were not married (93.3%) and most were females (58.7%), and the mean age of the students was 22.78 years. The majority of the sample were White (66.2%) with 19.1% of the students being Indian and 9.6% of the students being Black.

A total of 39 students (28.3%) had previous post school education, however only 48.7% of these students had completed their course. With regards to parents level of education 46% of students' mothers had obtained their matric, while 47.3% of the fathers had an undergraduate degree.

Financial support for the majority of the students came from their parents (81.2%) with 65.2% of the students indicating that they worked a part time job and of those that worked a part time job, 55.6% indicated that they worked a part time job out of a financial necessity.

Computer access at home was high with 91.3% of the students indicating that they had a computer at home, however, slightly less students had access to internet at home (73.2%). With regards to computer and internet access on campus only 30.1% of students thought that computer resources at DUT were sufficient while 31.6% of the students thought that internet resources on campus were sufficient.

The majority of the students studied Chiropractic straight after school (59.4%) and 87% of the students thought that Chiropractic was the correct career decision for them. Students indicated that 40.6% of them had failed a subject. A high number of students had participated as a research subject at DUT (69.9%) while only 14.7% had participated as a research subject outside of DUT. Majority

of the students hadn't started with their research (39.1%) while 31.9% had started working on a research topic. Only 15.2 % of the students had had a research topic passed, 1.4% were passed by the DRC, 2.2% were passed by the FRC, 4.3% were in the data collection phase, 4.3% were busy with their write up and only 1.4 % were waiting for their research dissertation to be marked.

Therefore based on this summary it was expected that the majority outcomes, in terms of the students' attitude towards research, would be either slightly positive or indifferent (neither positive nor negative).

Objective Two: To analyse the scales which structure an attitude in terms of their subscales.

Scale One: Training of research (Section: 4.3.2.1)

Students had relatively negative attitudes about the research courses being interesting (mean score 2.5), adequately preparing them to perform research (mean score 2.4) and adequately showing what steps to follow in the research process (mean score 2.9).

Students were more positive about questions with regards to research being a mandatory part of the Chiropractic course (mean score 3.7) and that the research handbook was a useful tool in the research process (mean score 3.7) and that the mock research proposal students are required to perform is of benefit in preparing them for the research proposal (mean score 4.2).

Scale Two: Confidence to do research (Section: 4.3.2.2)

Positive attitude scores were recorded to questions "I am confident in my ability to evaluate research findings in terms of their application to Chiropractic practice" (mean score 3.3); "Research training has improved my confidence to perform research" (mean score 3.4), "I am confident in my ability to evaluate research

findings in terms of their application to Chiropractic practice" (mean score 3.3) and "Research training has improved my confidence to perform research" (mean score 3.4). A mean response of 3 was recorded when asked if students felt confident in their ability to understand research terminology and if they felt confident in their ability to design a research proposal. The lowest mean response in this section was recorded when students were asked if it was easy to find a research idea/topic (mean score 2.2).

High mean responses were found to all negatively phrased questions. "The research process is completely vague to me" (mean score 3.7) "I feel insecure about my knowledge of research methodology" (mean score 3.5) and "I am not confident in my ability to review literature" (mean score 3.7).

Scale Three: Department involvement (Section: 4.3.2.3)

Slightly positive scores were recorded to questions "The Majority of the DUT staff members and part time lecturers/clinicians discuss their own research interests in class" (mean score 3.0) and "The above class interactions help to increase my interest in research" (mean score 3.3), "The Majority of the DUT staff members and part time lecturers/clinicians use research findings as part of their teaching material" (mean score 3.4).

Higher mean scores were recorded to questions "The Majority of the DUT staff members and part time lecturers/clinicians place great emphasis on research" (mean score 4.1), "The Majority of the DUT staff members and part time lecturers/clinicians are easy to approach with regards to research" (mean score 3.9), "The Majority of the DUT staff members and part time lecturers/clinicians are knowledgeable with regards to the research process" (mean score 4.0), "The Majority of the DUT staff members and part time lecturers/clinicians are up to date with the latest Chiropractic research within their areas of interest" (mean score 3.9).

The highest mean responses in this section were found in questions “The researcher’s relationship with his/her supervisor is of great importance” (mean score 5.3), “It is difficult to find a supervisor” (mean score 4.0) and “Inadequate supervision from my supervisor has delayed my research progress” (mean score 4.3).

Scale Four: Importance of research (Section: 4.3.2.4)

It is evident that Chiropractic students at DUT thought that research is important with high mean responses to questions “Research at DUT is important in the recognition and development of the Chiropractic profession” (mean score 4.1), “Research is important for identifying and investigating problems in the Chiropractic profession” (mean score 4.6) and “Research is important in improving Chiropractic clinical practice” (mean score 4.4). An even higher mean response was recorded when students were asked if it was important to have a Chiropractic Masters degree (mean score 5.1).

However, slightly lower mean responses were recorded to questions B19 (I am interested in doing Chiropractic research once I qualify) (mean score 3.1) and question B23 (It is a necessity to conduct research to practice as a successful Chiropractor) (mean score 3.1).

When asked a negatively phrased question (B24) (Conducting research is not an important part of a Chiropractic course) (mean score 3.8) high mean responses were recorded.

Scale Five: Positive feelings towards research (Section: 4.3.2.5)

High mean responses were recorded to questions “I enjoy discussing or listening to discussions about Chiropractic research” (mean score 3.7), “I enjoy reading research papers from the Chiropractic literature” (mean score 3.3), “I find people who do research very interesting to listen to” (mean score 3.8), “I am interested

in research" (mean score 3.5), "The research process has increased my management skills" (mean score 3.2), "The idea/topic proposal process is efficient" (mean score 3.4), "Research has made me more knowledgeable within my field of research" (mean score 4.2).

The lower mean responses were recorded to questions "I like research" (mean score 2.8); "research is easy" (mean score 2.1); "The DUT 186 proposal process is efficient" (mean score 3.0) and "I have had a positive experience with regard to research" (mean score 3.0).

Scale Six: Negative feelings towards research (Section: 4.3.2.6)

Relatively high mean responses were recorded to all the questions in this section with no question recording a mean score of 3 or below. Questions that recorded a relatively high score were questions, "I don't want to do research" (mean score 3.7); "I don't like research" (mean score 3.8); "I have had a negative experience with regard to research" (mean score 3.3); "If given the choice I would study Chiropractic at an institute were research was not mandatory" (mean score 3.8)

Very high mean response were recorded to questions, "research is difficult" (mean score 4.8); "research is stressful" (mean score 5.0); "research makes me anxious" (mean score 4.7); "Research is very time consuming" (mean score 5.2); and "research is delaying me from qualifying" (mean score 4.5).

Objective Three: To determine the associations between the scales which structure an attitude and the demographics.

Factors that were significantly associated with positive attitudes were:
(Only those factors that appeared more than once are mentioned)

- Females.
- Black students.
- Those who did not study Chiropractic straight after school.
- Those with no post school education.
- Those who had failed a subject.
- Those who were not self financed.
- Those with a student loan.
- Those whose DUT 186 was passed by ethics.
- Those who were writing up their dissertation.
- Those students in first year.
- Those who had never participated as a research subject outside of DUT.
- Those who thought that Chiropractic was the correct career decision.

Chapter Five: Conclusions and Recommendations

5.1. Introduction

The following chapter serves to conclude the study that determined the attitudes of Chiropractic students towards research at Durban University of Technology. Conclusions are drawn from the results and the discussion of those results from Chapter Four. Recommendations will be made regarding both possible methodological changes and for the profession of Chiropractic based on the outcomes of the study.

5.2. Conclusions

1. On average students thought that the research subjects and courses taught at DUT were not interesting and that they did not adequately prepare them to perform research or properly educate them as to what steps to follow in the research process. It is evident that students regarded the research handbook and the mock research proposal that students are required to perform in 4th year to be of greatest benefit in preparing them for the research proposal process.

2. Students were only slightly confident in their ability to evaluate research findings, understand research terminology and design a research proposal. Majority of the students felt that the research process was completely vague to them and that they felt insecure about their knowledge of research methodology and that they were not confident in their ability to review literature. The strongest attitude score recorded in this section indicated that students thought that it was difficult to find a research topic.

3. It is evident that students thought that DUT staff members placed a great emphasis on research and that they were easy to approach with regards

to research. However, only slightly positive attitudes were recorded about the DUT staff members discussing their own research interests in class and whether they used their own research findings as part of their teaching material in class. Students also thought that DUT staff members were knowledgeable with regards to the research process and up to date with the latest Chiropractic research within their areas of interest. The area of greatest concern was that although students thought that the student supervisor relationship was of great importance, they indicated that it was difficult to find a supervisor and they also indicated that inadequate supervision had delayed their research progression.

4. For the most part students thought that research was important. However, only slightly positive scores were recorded when students were asked if they wanted to do research in the future.

5. Students indicated that they enjoyed listening to and reading research and that they felt it had made them more knowledgeable. However, they indicated that they did not like research and that research was not easy. With regards to the research process students indicated that the topic proposal process was more efficient than the DUT 186 proposal process.

6. Students indicated the research was difficult, stressful, time consuming and that it made them anxious. They also indicated that they did not like research and that they did not want to do research and furthermore, if they were given the choice they would study at an institute where research was not mandatory.

7. Factors that were significantly associated with positive attitudes were:
(Only those factors that appeared more than once are mentioned)

- Females.
- Black students.
- Those who did not study Chiropractic straight after school.
- Those with no post school education.
- Those who had failed a subject.
- Those who were not self financed.
- Those with a student loan.
- Those whose DUT 186 was passed by ethics.
- Those who were writing up their dissertation.
- Those students in first year.
- Those who had never participated as a research subject outside of DUT.
- Those who thought that Chiropractic was the correct career decision.

8. The strongest correlation between scales was between the importance of research and positive feelings towards research (r=0.713).

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5.3. Recommendations

5.3.1. Methodological recommendations

- The questionnaire was of medium length in order to obtain greater insight. However, a slightly shorter questionnaire might have yielded a better response.

- A qualitative study may be recommended in the future to better ascertain the reasons behind some of the results. These may be issues surrounding what students thought were lacking in the training of research and what aspects of research supervision resulted in delaying their research progression.

- Even though 85% of medical students cited using electronic resources as their primary reference for accessing information (Mazloomdoost *et al*, 2007) it is recommended that in future studies, library use and accessibility be researched as it may play a role in determining a student's attitudes towards research.

- The results of this study illustrate that there is more than one research question surrounding this topic which could be broken down into individual issues in further research.

5.3.2. Recommendations for the Chiropractic Department based on the outcomes of the study

- The current research training curriculum could be amended to help eliminate the anxiety surrounding what steps to follow in the research process and students research methodology knowledge. This may be achieved by incorporating more interactive study methods, as it was evident from this study that students indicated that they were most

helped in their research preparation (mock research proposals and research handbooks).

- Department staff should attempt to guide students with regards to possible research topic ideas as students indicated it was not easy to find a topic. Hawk *et al*., (2008) and McCoy (2006) both suggested that integration of research into everyday teaching by the staff department may be a way to help identify and clarify research ideas.

- Research supervisors need to be aware that students have indicated that poor research supervision had delayed their research progression in order for them to possibly improve upon their current research supervision techniques. The Chiropractic department may also want to initiate research supervisor workshops to improve current research supervision.

- From the results of the study it would seem evident that if students acknowledged the importance of research they were more likely to have positive attitudes towards research. Therefore it should be made a priority within the Chiropractic Department that students become aware of the Chiropractic professions sparse research history and the resultant importance of creating a research culture and urgent need for further research to be conducted. It is hoped that this will create positive attitudes about research which will ultimately result in further research being conducted in the future (Cull *et al.,* 2003).

- Finally, the results of this study need to be assessed and similar research needs to be conducted in the future to ascertain the outcome and whether any implemented strategies based on this research have borne any dividends to the student's attitude and progression through the research process.

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“Appendix A”

LETTER OF INFORMATION- FOCUS GROUP

Dear participant,

I would like to thank you and welcome you into participating in the focus group of my study.

Title:

An investigation into the research attitudes amongst Chiropractic students at Durban University of Technology.

Introduction:

Within health care we are faced with the ever increasing demands for evidence based medicine as it has increasingly been accepted as the strongest justification of any healthcare modality.

Chiropractic research activity has increased with regard to production of relevant and quality research over the last 20 years and the continuation of this positive trend will be the responsibility of the students and graduates that will make up the future profession as today’s students will be tomorrow’s researchers.

Identification of whether negative or positive attitudes toward research exist at DUT is important as negative attitudes have been found to serve as obstacles to learning and furthermore are associated with poor performances in such courses. A favourable attitude toward research on the other hand has been found to be the strongest predictor in a student’s decision to pursue further research.

Therefore assessing and understanding students’ attitudes towards research is essential to enable instructors to develop instructional techniques leading to more positive attitudes toward research, as their attitudes toward research will affect their decision to participate in and support research in the future, which is necessary for the continued growth and success of the profession.

Focus group:

The reason for holding a focus group is to stimulate individuals thinking about the research topic and to encourage them to develop ideas about it (Salant and Dillman, 1994). Focus groups also encourage individuals other than those participating in the research process to support the research by increasing the relevance of the research (Salant and Dillman,1994).

In order to understand the outcomes required for the focus group it is important to understand the objectives set out for this study:

1. To determine the demographics of the respondents.
2. To investigate the factors that structure attitude.
3. To assess the association between the factors that structure an attitude and the demographic data.

Therefore the research would require you as members of the focus group to assist and identify as many pertinent factors as possible related to the present attitudes towards research at DUT.

Your participation in this study is much appreciated and you are assured that your comments and contributions will be kept confidential.

If you have any further questions please feel free to contact me.

Ryan Rieder (0828338195)

Supervisor:
Dr. G. Talmage
M. Tech: Chiropractic

"Appendix B"

INFORMED CONSENT FORM

(TO BE COMPLETED BY THE PARTICIPANTS OF THE FOCUS GROUP))

DATE:

TITLE OF RESEARCH PROJECT:

An Investigation into the research attitudes amongst Chiropractic students at Durban University of Technology.

NAME OF SUPERVISOR

Dr G. Talmage (031-3732102)

NAME OF RESEARCH STUDENT:

Ryan Rieder (082 8338195)

Please circle the appropriate answer

	YES/NO	
1. Have you read the research information sheet?	Yes	No
2. Have you had an opportunity to ask questions regarding this study?	Yes	No
3. Have you received satisfactory answers to your questions?	Yes	No
4. Have you had an opportunity to discuss this study?	Yes	No
5. Have you received enough information about this study?	Yes	No
6. Do you understand the implications of your involvement in this study?	Yes	No
7. Do you understand that you are free to		
a) withdraw from this study at any time ?	Yes	No
b) withdraw from the study at any time, without reasons given	Yes	No
c) withdraw from the study at any time without affecting your future health care or relationship with the Chiropractic day clinic at the Durban University of Technology.	Yes	No
8. Do you agree to voluntarily participate in this study	Yes	No
9. Who have you spoken to regarding this study?		

If you have answered NO to any of the above, please obtain the necessary information from the researcher and / or supervisor before signing. Thank You.

Please Print in block letters:

Participant name: _____ Signature: _____

Witness Name: _____ Signature:_____

Researcher's Name: _____ Signature:_____

Supervisor's Name: _____ Signature:_____

“Appendix C”

CONFIDENTIALITY STATEMENT – FOCUS GROUP DECLARATION

IMPORTANT NOTICE:

THIS FORM IS TO BE READ AND FILLED IN BY EVERY MEMBER PARTICIPATING IN THE FOCUS GROUP, BEFORE THE FOCUS GROUP MEETING CONVENES.

1. All information contained in the research documents and any information discussed during the focus group meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.
2. The returned questionnaires will be coded and kept anonymous in the research process.
3. None of the information shall be communicated to any other individual or organisation outside of this specific focus group as to the decisions of this focus group.
4. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

   Once this form has been read and agreed to, please fill in the appropriate information below and sign to acknowledge agreement.

Member represents	Member’s Name	Signature	Contact Details

"Appendix D"
CODE OF CONDUCT

This form needs to be completed by every member of the Focus Group prior to the commencement of the focus group meeting.

As a member of this committee I agree to abide by the following conditions:

1. All information contained in the research documents and any information discussed during the focus group meeting will be kept private and confidential. This is especially binding to any information that may identify any of the participants in the research process.

2. None of the information shall be communicated to any other individual or organisation outside of this specific focus group as to the decisions of this focus group.

3. Due respect should be given to every suggestion and comment by any member of the focus group and be debated with reference to the outcomes of the research.

4. The information from this focus group will be made public in terms of a journal publication, which will in no way identify any participants of this research.

Member represents	**Member's Name**	**Signature**	**Contact Details**

"Appendix E"

Demographics

Q1) Gender: Male ☐ Female ☐

Q2) Age: _____**yrs**.

Q3) Ethnic group? (statistical purposes only)

Caucasian ☐ African ☐ Asian ☐ Coloured ☐

Q4) Year of study:

1ST	2ND	3RD	4TH	5TH	Masters Student (excluding 5th year students)

Q5) Where are you in the research process?

Topic Proposal Passed	D186 Passed by Department	D186 Passed by Ethics Committee	Dissertation write up	N/A Haven't started research process

Q6) Have you had previous tertiary education?

YES ☐ **NO** ☐

Q7) If yes, did you obtain a Qualification?

YES ☐ **NO** ☐

Q8) If yes, please state Qualification? _____

Q9) Have you ever participated as a subject in any research before?

YES ☐ **NO** ☐

Q10) Have you ever completed a research dissertation before? (Masters or Honours)

YES ☐ **NO** ☐

Q11) Please indicate your socioeconomic status:

LOW	AVERAGE	HIGH	VERY HIGH

Q12) Please indicate your parent's level of education:

LOW (No matric)	AVERAGE (Finished Matric)	HIGH (Obtained a undergraduate qualification)	VERY HIGH (Obtained a Masters or PHD)

Q13) Please indicate your matric aggregate:

A	B	C	D	E

TRAINING OF RESEARCH

QUESTION 1
The research subjects taught at DUT are very interesting.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2
The research subjects taught at DUT are very complicated.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3
The research subjects adequately prepare you to do research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4
Further training in research methodology is necessary.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5
Research training should be a mandatory part of the Chiropractic course.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6
Research training in the Chiropractic course is NOT necessary.

Strongly disagree	1	2	3	4	5	6	Strongly agree

CONFIDENCE TO DO RESEARCH

QUESTION 1
I am confident in my ability to understand research terminology.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2
I am confident in my ability to design a research dissertation.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3
I am confident in my ability to evaluate research findings in terms of their application to Chiropractic practice.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4
I feel insecure about my knowledge of research design.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5
The research process is completely vague to me.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6
I am not confident in my ability to review literature.

Strongly disagree	1	2	3	4	5	6	Strongly agree

IMPORTANCE OF RESEARCH

QUESTION 1
Performing research is NOT an important part of a Chiropractic course.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2
Research should be compulsory in the Chiropractic course.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3
Research is important for identifying and investigating problems in Chiropractic.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4
Research is important in improving Chiropractic clinical practice.

Strongly	1	2	3	4	5	6	Strongly

disagree							agree

QUESTION 5
Research is important in the recognition and development of the Chiropractic profession.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6
I am interested in doing further Chiropractic research once I qualify.

Strongly disagree	1	2	3	4	5	6	Strongly agree

FACULTY INVOLVEMENT

QUESTION 1
Chiropractic department members and part time lecturers/clinicians place great emphasis on research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2
Chiropractic department members and part time lecturers/clinicians discuss their own research interests in class.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3
Chiropractic department members and part time lecturers/clinicians use research findings as part of their teaching material.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4
Chiropractic department members and part time lecturers/clinicians are easy to approach with regards to research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5
Chiropractic department members and part time lecturers/clinicians are knowledgeable with regards to the research process.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6
Chiropractic department members and part time lecturers/clinicians are not up to date with the latest Chiropractic research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

<u>POSITIVE FEELINGS TOWARD RESEARCH</u>

QUESTION 1
I enjoy discussing or listening to discussions about Chiropractic research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2
I enjoy reading research papers in the Chiropractic literature.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3
I find people who do research very interesting to listen to.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4
I like research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5
Research is easy.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6
I am interested in research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

NEGATIVE FEELINGS TOWARD RESEARCH

QUESTION 1
I do not or would NOT enjoy working on a research dissertation.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2
Research is difficult.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3
Research is stressful.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4
Research makes me anxious.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5
Research is preventing me from qualifying.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6
Research is difficult.

Strongly disagree	1	2	3	4	5	6	Strongly agree

"Appendix F"

Questionnaire

Please note: This questionnaire is anonymous, please do not write your name or make any other markings that may identify you.

Please complete the questionnaire by marking the appropriate block.

Section A

(To be answered by all students)

Demographic and socio-economic data

1. **Gender:** Male ☐ Female ☐

2. **Age:** _____**yrs**.

3. **Did you study Chiropractic straight after school?**

   YES ☐ **NO** ☐

4. **Ethnic group? (Statistical purposes only)**

Caucasian ☐ African ☐ Asian ☐ Coloured ☐ Indian ☐

Other _____

5. **Please indicate what year subjects you are registered for:**
(You may indicate more than one year if applicable)

1ST	**2ND**	**3RD**	**4TH**	**5TH**	**Masters Student post 5th year examinations**

6. **Have you failed a subject before?**

YES ☐ **NO** ☐

7. **In your opinion is Chiropractic the correct career decision for you?**

YES ☐ **NO** ☐

8.1) Where are you in the research process?

1) Haven't started research process.	
2) Working on research topic.	
3) Topic proposal passed.	
4) DUT 186 passed by department.	
5) DUT 186 passed by ethics committee	
6) In data collection phase.	
7) Busy with dissertation write up	
8) Waiting for dissertation to be marked.	

8.2) Please indicate how long you have been at this stage of the research process.

6 weeks	**6 months**	**9 months**	**1 year or longer**

9.1) Have you had previous post school education?

YES ☐ **NO** ☐

9.2) If yes, please indicate type of course.

Short course	
Diploma	
Undergraduate degree	
Honours degree	
Masters degree	
PhD	

10. Have you ever participated as a subject in any research at DUT before?

YES ☐ **NO** ☐

11. Have you ever participated as a subject in any research outside of DUT before?

YES ☐ **NO** ☐

12. Please indicate your parent's level of education:

12.1) Maternal:

No National Senior Certificate Obtained. (i.e. No Matric or Grade 12)	
Finished National Senior Certificate. (i.e. Finished Matric or Grade 12)	
Obtained a tertiary undergraduate	

qualification.	
Obtained a post graduate qualification (i.e. Honours , Masters or PhD)	

12.2) Paternal:

No national senior certificate obtained (i.e. No Matric or Grade 12)	
Finished national senior certificate (i.e. Finished Matric or Grade 12)	
Obtained a tertiary undergraduate qualification	
Obtained a post graduate qualification (i.e. Honours , Masters or PhD)	

13. Do you have a computer at home?

YES ☐ **NO** ☐

14. Do you have internet access at home?

YES ☐ **NO** ☐

15. Do you think that there are sufficient computer and internet resources at DUT?

YES ☐ **NO** ☐

16. Please indicate who supports you financially.
(You may indicate one or more of the following)

Self	
Student loan	
Parents/guardian	
Spouse or partner	

17.1) Do you have any part time jobs?

YES ☐ **NO** ☐

17.2) If yes , was it a financial necessity that you worked?

YES ☐ **NO** ☐

TRAINING OF RESEARCH

QUESTION 1
The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT are very interesting.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2
The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT are very complicated.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3
The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT adequately prepare you to do research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4
More training in research methodology is necessary at DUT.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5

Do you think that research training should be a mandatory part of the Chiropractic course?

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6

Research training in the Chiropractic course is NOT necessary.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 7
The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year adequately teaches you what steps to follow in the research process.

Strongly disagree	1	2	3	4	5	6	Strongly agree

CONFIDENCE TO DO RESEARCH

QUESTION 1

I am confident in my ability to understand research terminology.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2

I am confident in my ability to design a research dissertation.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3

I am confident in my ability to evaluate research findings in terms of their application to Chiropractic practice.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4
I feel insecure about my knowledge of research methodology.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5
The research process is completely vague to me.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6

I am not confident in my ability to review literature.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 7
Research training has improved my confidence to perform research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 8
Research training has improved my confidence to perform research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

IMPORTANCE OF RESEARCH

QUESTION 1

Conducting research is NOT an important part of a Chiropractic course.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2
Research should be in the Chiropractic course.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3

Research is important for identifying and investigating problems in the Chiropractic profession.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4

Research is important in improving Chiropractic clinical practice.

Strongly	1	2	3	4	5	6	Strongly

disagree							agree

QUESTION 5

Research at DUT is important in the recognition and development of the Chiropractic profession.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6

I am interested in doing further Chiropractic research once I qualify.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 7

It is a necessity to conduct research to be a successful Chiropractor.

Strongly disagree	1	2	3	4	5	6	Strongly agree

DEPARTMENT INVOLVEMENT

QUESTION 1

Majority of the Chiropractic department members and part time lecturers/clinicians place great emphasis on research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2

Majority of the Chiropractic department members and part time lecturers/clinicians discuss their own research interests in class.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3
These class interactions help to increase my interest in research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4

Majority of the Chiropractic department members and part time lecturers/clinicians use research findings as part of their teaching material.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5
Majority of the Chiropractic department members and part time lecturers/clinicians are easy to approach with regards to research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6
Majority of the Chiropractic department members and part time lecturers/clinicians are knowledgeable with regards to the research process.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 7
Majority of the Chiropractic department members and part time lecturers/clinicians are up to date with the latest Chiropractic research within there areas of interest.

Strongly disagree	1	2	3	4	5	6	Strongly agree

POSITIVE FEELINGS TOWARD RESEARCH

QUESTION 1

I enjoy discussing or listening to discussions about Chiropractic research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 2

I enjoy reading research papers in the Chiropractic literature.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3

I find people who do research very interesting to listen to.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4

I like research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5

Research is easy.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6

I am interested in research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 7

I have had a positive experience with regard to research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 8

Research has made me more knowledgeable within my field of research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 9

The research process has increased my management skills.

Strongly disagree	1	2	3	4	5	6	Strongly agree

NEGATIVE FEELINGS TOWARD RESEARCH

QUESTION 2

Research is difficult.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 3

Research is stressful.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 4

Research makes me anxious.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 5

Research is delaying me from qualifying.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 6

I don’t want to do research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 7

I don’t like research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 8

I have had a negative experience with regard to research.

Strongly disagree	1	2	3	4	5	6	Strongly agree

QUESTION 9

Research is very time consuming.

Strongly disagree	1	2	3	4	5	6	Strongly agree

"Appendix G"

Dear Student
Welcome to my research study. Thank you for your interest.

Study Title

The attitudes of Chiropractic students towards research at Durban University of Technology

Introduction:

Within health care we are faced with ever increasing demands of evidence based medicine and the Chiropractic profession will be more affected given the late start on a research infrastructure and the entrenched negative professional attitudes toward research.

The Chiropractic profession has made significant progress with regard to the production of high quality and relevant research. The continuation of this research effort will be the responsibility of the graduates that make up the future profession.

Negative attitudes have been found to serve as obstacles to learning and furthermore are associated with poor performances in such courses. However a positive attitude toward research is a strong predictor in a decision to pursue further research.

The objective of this research is to determine and analyse the underlying factors which may contribute to the present attitudes towards research amongst Chiropractic students at the Durban University of Technology (DUT).

Confidentiality

Please be assured that your personal details as well as the information, which you furnish, will be treated with the utmost confidentially. Please do not place any personal details on the questionnaire that may identify you in any way. This will ensure complete anonymity.
With the exception of your age, all the questions can be answered by marking the appropriate box or boxes with a cross.

Once completed, please place the Questionnaire into the box provided

Thank you for participating in this survey.
Your time and assistance are greatly appreciated.

Ryan Rieder

Supervisor:
Dr. G. Talmage
M. Tech: Chiropractic

"Appendix H"

Questionnaire

Please note: This questionnaire is anonymous, please do not write your name or make any other markings that may identify you.

Please complete the questionnaire by marking and "X" in the appropriate block.

Section A

(To be answered by all students)

SECTION A: Demographic and socio-economic data													
Demographics:													
1	Age:											years old	
2	Gender:			Male						Female			
3	Race:	White		Black		Indian			Coloured		Other		
4	Marital Status:	Single		Married		Divorced/ Separated					Other		
5.1	Have you ever had previous post school education?			Yes						No			
5.2	If yes, please indicate the highest level of previous education.			1	Short course								
				2	Diploma								
				3	Honours								
				4	Bachelors								
				5	Masters								
				6	PhD								
5.3	If yes, did you finish the relevant course			Yes						No			
6) Please indicate parents highest level of education.				Maternal						Paternal			
	No National Senior Certificate Obtained (i.e. No Matric or Grade 12)			Yes		No				Yes		No	
	Finished National Senior Certificate (i.e. Finished Matric or Grade 12)			Yes		No				Yes		No	
	Obtained a tertiary undergraduate qualification (i.e. Bachelors and Honours)			Yes		No				Yes		No	
	Obtained a post graduate qualification (i.e. Masters or PhD)			Yes		No				Yes		No	
7) Please indicate who supports you financially.													
	1	Self financed		Yes						No			
	2	Student loan		Yes						No			
	3	Parents/guardian		Yes						No			
	4	Sibling		Yes						No			
	5	Spouse or partner		Yes						No			
8	Do you have any part time jobs?			Yes						No			
9	If yes, is it a financial necessity that you worked?			Yes						No			
10	Do you have a computer at home?			Yes						No			
11	Do you have internet access at home?			Yes						No			

Studies									
12	Did you study Chiropractic straight after school?	Yes					No		
13	In your opinion is Chiropractic the correct career decision for you?	Yes					No		
14	Please indicate what year subjects you are registered for (You may indicate more than one year if applicable)	1	2	3	4	5	Masters post 5th year examinations		
15	Have you failed a subject before?	Yes					No		
16	Do you think that there are sufficient computer resources at the DUT?	Yes					No		
17	Do you think that there are sufficient internet resources at the DUT?	Yes					No		
18	Have you ever participated as a subject in any research at the DUT before?	Yes					No		
19	Have you ever participated as a subject in any research outside of DUT before?	Yes					No		
20	Where are you in the research process?	1	Haven't started the research process.				Yes		No
		2	Working on research topic.				Yes		No
		3	Topic proposal passed.				Yes		No
		4	DUT 186 passed by Department.				Yes		No
		5	DUT 186 passed by Ethics Committee.				Yes		No
		6	In data collection phase.				Yes		No
		7	Dissertation write up.				Yes		No
		8	Waiting for dissertation to be marked.				Yes		No
21	Relative to the above question please indicate how long you have been in this stage of the research process.	1	6 weeks				Yes		No
		2	6 months				Yes		No
		3	9 months				Yes		No
		4	1 year and longer				Yes		No

Section B: Attitude questions								
TO BE ANSWERED BY ALL STUDENTS		Strongly disagree					Strongly agree	
1	Research at DUT is important in the recognition and development of the Chiropractic profession.	1	2	3	4	5	6
2	The majority of the DUT staff members and part time lecturers/clinicians place great emphasis on research.	1	2	3	4	5	6
3	I enjoy discussing or listening to discussions about Chiropractic research.	1	2	3	4	5	6
4	Research is difficult.	1	2	3	4	5	6
5	Research should be in the Chiropractic course.	1	2	3	4	5	6
6	The majority of the DUT staff members and part time lecturers/clinicians discuss their own research interests in class.	1	2	3	4	5	6
7	The above class interactions help to increase my interest in research.	1	2	3	4	5	6
8	I enjoy reading research papers from the Chiropractic literature.	1	2	3	4	5	6
9	Research is stressful.	1	2	3	4	5	6
10	Research is important for identifying and investigating problems in the Chiropractic profession.	1	2	3	4	5	6
11	I find people who do research very interesting to listen to.	1	2	3	4	5	6
12	Research makes me anxious.	1	2	3	4	5	6
13	Research is important in improving Chiropractic clinical practice.	1	2	3	4	5	6
14	The majority of the DUT staff members and part time lecturers/clinicians use research findings as part of their teaching material.	1	2	3	4	5	6
15	I like research.	1	2	3	4	5	6
16	I don't want to do research.	1	2	3	4	5	6
17	I have had a positive experience with regard to research in general.	1	2	3	4	5	6
18	Research is easy.	1	2	3	4	5	6
19	I am interested in doing Chiropractic research once I qualify.	1	2	3	4	5	6
20	I don't like research.	1	2	3	4	5	6
21	I am interested in research.	1	2	3	4	5	6
22	I have had a negative experience with regard to research in general.	1	2	3	4	5	6
23	It is a necessity to conduct research to practice as a successful Chiropractor.	1	2	3	4	5	6
24	Conducting research is not an important part of a Chiropractic course.	1	2	3	4	5	6
25	Research is very time consuming.	1	2	3	4	5	6
26	It is important to have a Masters in Chiropractic.	1	2	3	4	5	6
27	If given the choice I would study Chiropractic at an institute were research was not mandatory.	1	2	3	4	5	6

Section C: Attitude questions							
ONLY TO BE ANSWERED BY STUDENTS WHO ARE IN 3RD, 4TH, 5TH AND MASTERS YEARS		Strongly disagree					Strongly agree
1	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT are very interesting.	1	2	3	4	5	6
2	I am confident in my ability to understand research terminology.	1	2	3	4	5	6
3	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at the DUT are very complicated.	1	2	3	4	5	6
4	I am confident in my ability to design a research proposal.	1	2	3	4	5	6
5	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year at DUT adequately prepare you to do research.	1	2	3	4	5	6
6	I am confident in my ability to evaluate research findings in terms of their application to Chiropractic practice.	1	2	3	4	5	6
7	I don't want to do training in research methodology.	1	2	3	4	5	6
8	I am not confident in my ability to review literature.	1	2	3	4	5	6
9	Research training should be a mandatory part of any Chiropractic course.	1	2	3	4	5	6
10	The research process is completely vague to me.	1	2	3	4	5	6
11	Research training has improved my confidence to perform research.	1	2	3	4	5	6
12	I feel insecure about my knowledge of research methodology.	1	2	3	4	5	6
13	The research component of CPP in 3rd year and/or research methods and techniques taught in 4th year adequately teaches you what steps to follow in the research process.	1	2	3	4	5	6
14	The research training component in the Chiropractic course is not necessary.	1	2	3	4	5	6
15	The research handbook is a useful tool in the research process.	1	2	3	4	5	6
16	The research process has increased my management skills.	1	2	3	4	5	6
17	Research has made me more knowledgeable within my field of research.	1	2	3	4	5	6
18	The majority of the Chiropractic department members and part time lecturers/clinicians are easy to approach with regards to research.	1	2	3	4	5	6
19	The majority of the DUT staff members and part time lecturers/clinicians are knowledgeable with regards to the research process.	1	2	3	4	5	6
20	The majority of the DUT staff members and part time lecturers/clinicians are up to date with the latest Chiropractic research within their areas of interest.	1	2	3	4	5	6
21	Research is delaying me from qualifying.	1	2	3	4	5	6
22	The required mock proposal in 4th year is of benefit in preparing me for the research proposal.	1	2	3	4	5	6

Section D: Attitude questions							
ONLY TO BE ANSWERED BY STUDENTS WHO HAVE HAD A RESEARCH TOPIC PASSED		Strongly disagree					Strongly agree
1	It is difficult to find a supervisor.	1	2	3	4	5	6
2	The idea/topic proposal process is efficient.	1	2	3	4	5	6
3	The DUT 186/PG 4a proposal process is efficient.	1	2	3	4	5	6
4	Inadequate supervision from my supervisor has delayed my research progress.	1	2	3	4	5	6
5	It was easy to find a research idea/topic.	1	2	3	4	5	6
6	The researcher's relationship with his/her supervisor is of great importance.	1	2	3	4	5	6

"Appendix I"

DURBAN UNIVERSITY of TECHNOLOGY

Faculty of Health Sciences

ETHICS CLEARANCE CERTIFICATE

Student Name	Ryan Rieder	**Student No**	20300559
Ethics Reference Number	FHSEC 038/09	**Date of FRC Approval**	24 Aug 2009
Qualification	M.Tech: Chiropractic		
Research Title:	The attitudes of chiropractic students towards research at Durban University of Technology		

In terms of the ethical considerations for the conduct of research in the Faculty of Health Sciences, Durban University of Technology, this proposal meets with Institutional requirements and confirms the following ethical obligations:

1. The researcher has read and understood the research ethics policy and procedures as endorsed by the Durban University of Technology, has sufficiently answered all questions pertaining to ethics in the DUT 186 and agrees to comply with them.
2. The researcher will report any serious adverse events pertaining to the research to the Faculty of Health Sciences Research Ethics Committee.
3. The researcher will submit any major additions or changes to the research proposal after approval has been granted to the Faculty of Health Sciences Research Committee for consideration.
4. The researcher, with the supervisor and co-researchers will take full responsibility in ensuring that the protocol is adhered to.
5. ***The following section must be completed if the research involves human participants:***

	YES	NO	N/A
❖ Provision has been made to obtain informed consent of the participants	✓		
❖ Potential psychological and physical risks have been considered and minimised	✓		
❖ Provision has been made to avoid undue intrusion with regard to participants and community	✓		
❖ Rights of participants will be safe-guarded in relation to:			
- Measures for the protection of anonymity and the maintenance of Confidentiality.	✓		
- Access to research information and findings.	✓		
- Termination of involvement without compromise	✓		
- Misleading promises regarding benefits of the research	✓		

SIGNATURE OF STUDENT/RESEARCHER — DATE: 25/08/09

SIGNATURE OF SUPERVISOR/S — DATE: 25-08-09

SIGNATURE OF HEAD OF DEPARTMENT — DATE: 25/8/09

SIGNATURE: CHAIRPERSON OF RESEARCH ETHICS COMMITTEE — DATE: 25/8/09

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