Practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa

BELINDA SCROOBY

12335746

Submitted in fulfilment of the requirements for the degree

Philosophiae Doctor

in the

School of Nursing Science of

North-West University (Potchefstroom Campus)

Promoter: **Prof H.C. Klopper**

April 2012

Potchefstroom

DECLARATION

I hereby solemnly declare that this thesis, entitled *Practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa,* presents the work carried out by myself and to the best of my knowledge does not contain any material written by another person except where due reference is made. I declare that all the sources used or quoted in this study are acknowledged in the bibliography; that the study has been approved by the Ethics Committee of North-West University; and that I have complied with the ethical standards set by the institution.

Belinda Scrooby

April 2012

ACKNOWLEDGEMENTS

"I can do all things through Christ who strengthens me."

Philippians 4:13

I am overwhelmed with emotion when I reflect on my doctoral study, as this is a journey that no person can undertake on their own. To allow me to undertake this academic task, I was able to surround myself with a wonderful support system comprising many people. Each of them played an integral part in this work.

My sincere thanks and gratitude to:

- My family and friends for all their prayers, support, unconditional love and patience I receive each day from you.
- Prof Hester Klopper, my promoter, for your visionary leadership. Your vision and scholarly role is truly a remarkable model. I honour you for your wisdom and constant inspiration.
- To Dr Emmerentia du Plessis, a real expert in her field, for the co-coding of the qualitative data.
- Dr Suria Ellis, Head of the Statistical Consultation Service, North-West University, Potchefstroom Campus, for all the friendly consultations and patient explanations of the quantitative data analysis, and Dr Gerhard Koekemoer for helping me with all the graphics for Chapter 3.
- Prof Casper Lessing for checking the bibliographical references.
- Doepie de Jongh for the technical editing of my thesis.
- Santie Pieterse for the visualisation of the conceptual framework and model.
- Charl Schutte for the language editing of my thesis. Thank you for the excellent quality and prompt delivery of the product.

- My colleagues at the School of Nursing Science for their support and daily encouragement, and Ingrid van der Walt for presenting my classes throughout the second semester.
- The North-West University Institutional Research Office for the financial assistance for completing this thesis.
- All the students that were prepared to take time out of your busy schedules to answer a few questions that help guide the practice model.

ABSTRACT

The teaching-learning of basic medical sciences generally, and anatomy particularly, have been “diluted” in the health science curricula globally during the past two to three decades. This reduction in anatomy teaching-learning has started showing the consequences in clinical practice, patient care, and health science education (Memon, 2009:125). Turney (2007:104) supports this, saying that between 1995 and 2000, there was a seven-fold increase in claims associated with anatomical errors. This results in public and media pressure for doctors and other health care practitioners to have a sound knowledge of anatomy.

The main aim of this research was to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning. The research design utilised a theory-generative, quantitative and qualitative design (Brink, 2006:10-11; Mouton & Marais, 1996:159) to explore (Mouton & Marais, 1996:45) and describe (Mouton & Marais, 1996:46) teaching-learning of anatomy in a specific context (Klopper, 2008:68).

The study was conducted in two phases with two steps under each phase, including three objectives. Phase one consisted of the identification of concepts, description and definition of the three objectives. Step 1 under phase one consisted of identifying main and related concepts and this process was completed for objectives one and two, namely to assess interprofessional students’ (IPS) and peer group’s (PG) opinions on the teaching-learning approach to anatomy; and to explore interprofessionals’ perceptions of the importance of anatomy in clinical practice. All data gathered, synthesized and concepts identified from objectives one and two lead to step 2 of phase one, that is to say concept descriptions and definitions that were completed through objective three, which was to describe a conceptual framework for interprofessional teaching-learning of anatomy.

Phase two (model construction), step 1 (to construct relational meaning of main and related concepts) and step 2 (model construction through theory

synthesis) was completed from the concept descriptions and definitions identified in phase one. This practice model will be implemented in the health sciences faculty of the higher education institution where the researcher is working.

[**Keywords:** practice model, interprofessional teaching-learning, anatomy, higher education institution]

OPSOMMING

Die onderrig-leer van basiese mediese wetenskappe in die algemeen, en in die besonder anatomie, is oor die afgelope twee of drie dekades globaal in gesondheidswetenskappe-kurrikulums “verwater”. Hierdie verswakking in anatomie-onderrig het in die onderrig van kliniese praktyk, pasiëntsorg, en gesondheidswetenskappe gevolge begin toon (Memon, 2009:125). Turney (2007:104) ondersteun hierdie standpunt en noem dat tussen 1995 tot 2000, daar ’n sewevoudige toename was in eise wat geassosieer kon word met anatomiese foute. Dit het gelei tot openbare en media-druk op dokters en ander gesondheidsorg-praktisyns om ’n gegronde kennis van anatomie te moet bekom.

Die hoofdoel van hierdie navorsingstudie was om ’n praktyk-model te ontwikkel vir die interprofessionele onderrig-leer van anatomie by ’n hoër onderrig- instansie in Suid-Afrika ten einde diep-holistiese lewenslange leer te bevorder. Die navorsingsontwerp van die studie het ’n teorie-ontwikkelende, kwantitatiewe en kwalitatiewe ontwerp gebruik (Brink, 2006:10-11; Mouton & Marais, 1996:159) om die onderrig-leer van anatomie in ’n spesifieke konteks (Klopper, 2008:68) te ontdek (Mouton & Marais, 1996:45) en te beskryf (Mouton & Marais, 1996:46).

Die navorsingstudie is in twee fases uitgevoer met twee stappe onder elke fase, insluitende drie doelwitte. Fase een het bestaan uit die identifikasie van konsepte, beskrywing en definisie van die drie doelwitte. Stap 1 onder fase een het bestaan uit die identifisering van hoof- en verwante konsepte en hierdie proses is afgehandel vir doelwitte een en twee, naamlik om die opinies te verkry van interprofessionele studente (IPS) en portuur groep (PG) oor die onderrig-leer benadering tot anatomie; en om die interprofessionele persepsies oor die belangrikheid van anatomie in die kliniese praktyk te ondersoek en te beskryf. Al die data verkry en gesintetiseer, en konsepte van doelwitte een en twee wat geïdentifiseer is, het gelei tot stap 2 van fase een, naamlik: konsep-beskrywings en definisies wat afgehandel is deur doelwit

drie, naamlik: om ’n konseptuele raamwerk vir interprofessionele onderrig-leer in anatomie te beskryf.

Fase twee (modelkonstruksie), stap 1 (om verwantskapsbetekenisse van hoof- en verwante konsepte te skep) en stap 2 (modelkonstruksie deur sintese van teorie) is afgehandel deur die konsep-beskrywings en definisies geïdentifiseer in fase een. Hierdie praktyk-model sal geïmplementeer word in die gesondheidswetenskappe-fakulteit van die hoër onderwys-instansie waar die navorser werksaam is.

[**Sleutelwoorde:** praktyk-model, interprofessionele onderrig-leer, anatomie, hoër onderwys-instelling]

ACRONYMS

ANAB	Movement anatomy
ANAM	Introductory anatomy
ANAS	Systematic anatomy
ANOVA	Analysis of Variance
BA	Baccalaureus Artium
BCur	Baccalaureus Curationis
BSc	Baccalaureus Scientiae
CL	Cooperative learning
DENOSA	Democratic Nursing Organisation of South Africa
DOH	Department of Health
EL	Experiental learning
HEI	Higher Education Institution
IPE	Interprofessional education
IPS	Interprofessional student
ITEA	Institutional Teaching Excellence Award
NWU	North-West University
PBL	Problem-based learning
PG	Peer group
PIPE	Promoting interprofessional education
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization

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CHAPTER 1

OVERVIEW OF THE RESEARCH STUDY

1.1 INTRODUCTION

The aim of this research study was to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning. Chapter One provides an overview of the research study. This chapter starts with the background to and rationale for the research study, followed by the statement of the problem and research questions, research aim and objectives, then the researcher's meta-theoretical, theoretical and methodological assumptions. The rest of the chapter includes the discussion of the research design, rigour and ethical considerations of this research study.

1.2 BACKGROUND AND RATIONALE FOR THE STUDY

Historically, higher education institutions have evolved from institutions that primarily provided education (during the Middle Ages) to institutions that conduct research (post-Humboldt). Presently, higher education institutions are learning institutions that focus on both education and research (Council on Higher Education, 2004:11). In South Africa today, higher education is characterised by constant demands. Such demands require educators to supervise more research students, motivate students to ensure an effective throughput, conduct more research, publish research articles, acquire increased external funding and manage larger student groups in classes. These demands increase stress as academic staff are constantly expected to carry high workloads with less time in which to complete these tasks. As a direct result of this, the educator can no longer assume sole responsibility for preparing the student for the demands that he/she faces. It is therefore vital that students systematically develop their own abilities towards life-long-learning and acquiring a creative approach to scientific knowledge. A shift in focus from providing education to managing learning is required (Le Grange *et al.*, 2006:72; Lategan, 2005:182; Liebenberg & Barnes, 2004:7; Klopper,

2000:2-3). The different concepts will now be discussed that plays an important role in higher education.

1.2.1 Teaching-Learning

It is important to establish the difference between teaching and learning. Teaching means helping/assisting/supporting a student to learn. An educator can “tell” students about a certain subject, can help students practise a skill (such as giving an injection), or assist students in discovering knowledge for themselves (for example, by talking to a person who has recovered from malaria). However, the educator can only support students and find ways to make it easier for them to learn. The educator can never learn for the students. Each student must master the knowledge, skills and competencies by him- or herself (Ehlers, 2002:3-4). This learning is a dynamic, active and cumulative process of knowledge construction that takes place through understanding and interpretation (Klopper, 2000:9). To achieve learning, skill and effort are needed and educators should not expect students to achieve this without guidance and assistance (Killen, 2007:5). Students need to assimilate large quantities of information, yet the way in which students consume, organise and logically link information to other data differs (All *et al.*, 2003:311). Klopper (2000:3) also notes that learning should be the students’ way of understanding or experiencing the world around them. Their world includes the concepts and methods characteristic of the discipline/ profession for which they are studying.

Thus, the above explanation indicates that the function of teaching is to enable students to learn. This entails constant exchanges between the activities of learning and teaching. Teaching-learning takes place by means of classroom communication during which the educator communicates messages (e.g. content/principles) to the student. The student receives these messages through his/her senses and assigns meaning through learning (thought) processes. Therefore, the educator employs a certain manner of communicating the learning content to the student. This could take the form of the spoken word, the written word or even modern technology such as computers (Vreken, 1997:1-2). In anatomy the substantial advantages of web-

based tutorial systems are an intensive use of the feedback possibilities, the opportunity for continuous updating of the contents, and the favourable distribution and faster utilization of improved techniques (Filler *et al.,* 1999:499).

1.2.2 Use of multimedia

In the past, teaching was mostly achieved by direct communication between the student and educator, inclusive of discussion and lectures. As time progressed, teaching incorporated additional media to support the spoken word. Comenius (1592-1670) (as quoted by Vreken, 1997:1-2) noted the importance of illustrating the learning content and used textbooks with drawings. Pestalozzi (1756-1827) (as quoted by Vreken, 1997:1-2) felt that students should learn through personal experience but when this was not possible recommended that visual aids be used to support the contents. Traditionally, educators mostly used the spoken word and applied other media such as books, pictures and blackboard, as supporting teaching aids. Presently, the spoken word has lost its position as the primary teaching medium and has made way for a multimedia approach. Such an approach could include audio cassettes, study guides and more advanced media such as computers, television and the internet (Huang, 2005:223-233). Eftekhar *et al.* (2005:15) support the author above and state that three-dimensional models made from materials such as wax, bronze and ivory have been used in the teaching of medical sciences for many centuries, but more recently technology, with the development of high quality visual and often interactive three-dimensional (3D) computer-generated images, has started to displace this traditional way of teaching. Educators' primary concern was "what and how much" students learned and comprehensive assessment-methods were developed to measure this. However, in the last quarter of the twentieth century, accumulated evidence suggests that educators should focus more on "how" students learn and the contextual environment shaped by their learning (Cannon & Newble, 2002:1). Teaching methods should therefore shift in focus to "how to teach/learn" rather than "what to teach/learn" (Shatzer, 1998:38).

1.2.3 Development of critical thinking skills

In nursing education, where the researcher plays a pivotal role, it has been noted during the past decade that educators experience frustration with attempts to enhance the thinking skills and critical thinking of nursing science students. In the past, nursing science educators viewed their task as transferring content and believed it was possible. As a result the nursing science educator's achievement was measured according to the students' academic results. The quality of teaching was thus measured according to the quantity of facts that were transferred. A knowledge explosion occurred over the past decade that implies that nursing science educators can no longer simply cover the content of a subject/discipline (Klopper, 2000:3 and 19-20). Slabbert and Gouws (2006:152) support the above and state that courses do not adequately prepare the student for the professional demands that they face after completing their studies.

Anatomy is one of the core subjects underpinning medicine and health-related sciences. It describes the normal structure of the human body and forms a springboard for the later study of abnormality. In currently crowded health sciences curricula (and with the increasing development of new subjects and integrated systems/problem-based curricula) there is less time to make sense of anatomical knowledge or (more importantly) integrate such knowledge in a clinical context (Briggs *et al.*, 2001:9). Older (2004:87) supports the above authors and states that there is a trend in anatomy teaching to include more integrated problem-based learning (PBL) and computer-assisted teaching, while reducing overall content, didactic lectures and mechanical rote memorisation. Problem-based learning is supported to enhance the integration of students' knowledge and it should prepare students better for actual clinical practice. Older (2004:89) also states that anatomy is a living subject, not a collection of facts learnt early and then forgotten. Retaining anatomical details requires constant practical application and to be taught by scientists and clinicians with a clinical perspective.

1.2.4 Assessment

Where there is teaching-learning, there must be a fair way of assessing the type and amount of learning that has occurred. Measuring the extent of students' learning and evaluating the merits of it are two of the more important and difficult aspects of being an educator (Hamachek, 1995:374). According to the South African Department of Education (2002:18) assessment should also help students to make judgments about their own performance, set goals for progress and provoke further learning.

Cannon and Newble (2002:165) explain that active involvement in the assessment of students is one of the educator's most critical tasks. Assessment is more than a selection of techniques; it is a systematic process and a critical education component. Firstly, it is important to understand what the concept assessment entails. Assessment, according to the Council on Higher Education (2004:121), Ehlers (2002:134) and Klopper (2000:117) is a method used to measure something, to add value to it or to test it. Therefore, assessment could be defined as assessment based on values, norms and criteria. Assessment is usually based on abilities (knowledge, skills, competencies and values) and attitudes according to a prescribed level. The assessment process should be dynamic, continuous and open-ended. An education and/or learning programme is only complete when one establishes the extent of the learning that occurred. The assessment results could also guide decisions regarding future teaching. Ehlers (2002:135) describes assessment as a process that is caring and subjective where the educator aims to diagnose and facilitate (assist) the student's achievements and attempts to acquire specific learning outcomes, knowledge, skills and competencies. Therefore, the objective of assessment is to determine the student's education needs.

Educators usually take assessment seriously. However, there are gaps in the quality of assessment procedures. In order to improve assessments educators should be clear about the objectives of assessments. Various objectives for assessments were evaluated, including measuring essential skills, knowledge and competencies, measuring improvement over time,

diagnosing the students' problems, providing the students with feedback, evaluating the course's effectiveness and motivating the students to study. Although an assessment method could achieve more than one of the stated intentions, assessments are too often used to achieve unsuitable objectives and do not successfully provide valid and reliable data. One should also not forget the assessment's potentially powerful impact on the student, especially if their future relies on the assessment. It could have a positive, negative or even damaging effect on the student (Cannon & Newble, 2002:165-166).

Different assessment processes exist and could be formative (continuous) or summative (final). Formative assessment provides students with feedback on their progress and the outcomes achieved. Summative assessment is conducted at the end of a semester or year to assign a percentage to the student's abilities (Ehlers, 2002:134-135; Cannon & Newble, 2002:167; Friedrich-Nel *et al.*, 2005:880).

1.2.5 Importance of anatomy for clinical practice

Since the researcher is involved with the teaching-learning of anatomy for undergraduate students at a higher education institution, it is important to examine the importance of anatomy in undergraduate medical-related fields. Manninen (1999:83-84) and Mitchell *et al.* (2004:738) explain that familiarity with the biological sciences is important for nurses' basic medical knowledge, for example understanding of pathophysiological implications. Additionally, the students cite basic medical knowledge as the most important knowledge form in each phase of their training and indicate anatomy to be the most important science, as it prepares them for later work. This is supported by Nayak *et al.* (2006:2) who states that anatomy and physiology are the foundation sciences for the medical curriculum. Understanding anatomy and physiology is essential to understand other subjects in the medical curriculum.

Dall'Alba (2004:679-680) explains that traditionally, professional skill has been investigated in terms of attributes, such as knowledge, skills and competencies that professionals possess and apply in practice. These attributes are typically identified and described in a manner that is

decontextualised from the practice to which they refer. Similarly, when developing professional skill in formal education and in workplaces, the point of departure is usually a formalised body of knowledge, skills and competencies, often described in textbooks. For example, in formal professional education, the curriculum design typically assumes progressive accumulation of a body of knowledge, skills and competencies. Aspiring professionals are initially expected to acquire basic knowledge, skills and competencies relevant to the profession and then obtain more advanced knowledge, skills and competencies later (Bridges, 2006:375).

The particular knowledge, skills and competencies that we develop and utilise in professional practice depend on how we understand that practice. In other words, the way in which we understand professional practice is fundamental to how we both perform and develop that practice (Dall'Alba, 2004:680; Bridges, 2006:375).

Dall'Alba (2004:681), as supported by Bridges (2006:375), explains that in stating the programme's aims, several areas of biomedical knowledge are identified that relate to diagnosing and treating sicknesses and symptoms, as well as knowledge about how to develop a productive doctor-patient relationship. Conventional modules that emphasise the acquisition of (biomedical) knowledge, skills and competencies through lectures, laboratory work, practical skills classes, clinical seminars, observations of clinical practice, and progressive involvement in clinical practice, were common in the programme, particularly towards the end. It is, therefore necessary that a curriculum design should be used in which pre-clinical studies (e.g. cell biology, anatomy, and physiology) precede clinical courses (such as geriatrics, psychiatry, paediatrics, and gynaecology and obstetrics).

Anatomical knowledge supports examination of a patient, the formation of a diagnosis and communication of these findings to the patient and other medical staff professionals. Anatomy provides a platform of knowledge suitable to all medical careers (Turney, 2007:104).

1.2.6 Anatomy at Higher Education Institutions (HEI)

South Africa has 21 higher education institutions of which six higher education institutions contain a medical school/faculty. The remaining 15 higher education institutions are responsible to teach anatomy within non-medical schools/faculties. The context of this research is the North-West University (Potchefstroom Campus) (referred to as NWU) where anatomy teaching is the responsibility of the School of Nursing Science in the Faculty of Health Sciences. Anatomy is taught to students registered for various bachelor's degrees and entails different subject orientations. The anatomy curriculum presented by the NWU includes three different courses as summarised in Table 1.1.

Table 1.1: Summary of the anatomy modules in the Faculty of Health Sciences of the North-West University (Potchefstroom Campus)

Course code	Module content	Semester	Target degree	Students in the target degree	Number of students per class	Years presented
ANAM111	Introductory anatomy: bones, muscles, joints, blood, nerves	First: February-June	BA BSc	Biokinetics, psychology, Dietetics, general BSc-students	250-270	2003-2008
ANAB111	Movement anatomy of thorax, abdomen, pelvis, back, upper and lower extremities, head and neck	First: February-June	BCur	Part of the nursing science curriculum	50	2001-present
ANAS121	Systematic anatomy: cardio-pulmonary, -digestive, -genitourinal, nervous system	Second: July-November	BA BCur BSc	Part of the nursing science and dietetics students' curriculums	90	2001-present

1.2.7 Interprofessional education

As stated in Table 1.1 it can be seen that anatomy is presented to different health science professions. Interprofessional education (IPE) describes learning activities involving at least two professional groups (Parsell & Bligh, 1998:89). The common theme of shared learning appears to be a consensual agreement that each represents a generic term for learning activities in which students from different spheres of health and social care coalesce within a framework of common learning aims and objectives (Carlisle *et al.*, 2005:4).

Although IPE is not a "new" educational concept, the current drive to develop multiprofessional approaches to care gained momentum in view of recent scandals in health and social care settings in which health professionals failed to communicate adequately or were unaware of each other's activities and roles (Great Britain's Department of Health (DOH), 1999, 2003). A growing body of opinion appears to suggest that IPE may offer a solution to these issues through a potential – by shared learning activity – to improve professional relationships and ultimately enhance clinical care (Barrington *et al.,* 1998:530; Carpenter, 1995:265; World Health Organization (WHO), 2010:13). The wider benefits of IPE also appear to influence and improve professional confidence, reflective practice, mutual professional respect and shared knowledge, skills and competencies (Munro *et al.,* 2002:799).

1.3 STATEMENT OF PROBLEM AND RESEARCH QUESTIONS

Mehmet and Berrak (2005:590) indicate that despite the fact that educators have long been criticised for their use of methods that promote passiveness, these methods are still the most widely used and accepted in teaching. Educators are used to conveying information to large audiences with little risk for the students and allowing the educator to have maximum control over the learning experience. Yet, it fails to provide the educator with feedback about the extent of the students' learning. Since learning is a dynamic process, students who are actively involved in the learning activity will learn more than students who are passive recipients of information. A well-organised lecture can provoke thought and enhance clinical thinking if it is aimed at arousing

students' curiosity, motivating them to learn, and guiding them towards creative thinking (Brown & Manogue, 2001). Thus, in contrast to passive listening, interactive teaching-learning establishes two-way interaction between the educator and the students. This is said to increase the effectiveness of delivering a mass of information (Steinert & Snell, 1999:37; Stunkel, 1999:424).

Additionally, interactive techniques allow educators to receive feedback regarding students' needs, how they assimilate information and guidance regarding future learning directions. Interactive techniques also provide students with feedback on their knowledge and performance. In other words, interactive lecturing could supply the benefits of small group learning to large group formats (Steinert & Snell, 1999:38; Kumar, 2003:20).

The teaching-learning of basic medical sciences generally, and anatomy in particular, has been "diluted" in the health science curricula globally during the past two to three decades. This reduction in anatomy teaching-learning has started showing the consequences in clinical practice, patient care, and health science education (Memon, 2009:125). Turney (2007:104) supports this, and saying that between 1995 and 2000, there was a seven-fold increase in claims associated with anatomical errors. This results in public and media pressure for doctors and other health care professionals to have a sound knowledge of anatomy.

According to the literature above and the researcher's personal experience, while interacting with students during the teaching-learning of anatomy, students of different anatomy modules display different learning needs. Additionally, the application of multimedia differs due to diverse student numbers in the different modules (50 students in small groups and 250-270 in large groups). Assessment methods also differ since appropriate assessment tools are used to promote time-effective marking of tests and examinations.

Ehlers (2002:138) and Smuts (2005:943) state that although the assessment process marks the end of the learning process on a specific theme, it should also be viewed as the initiation point for the next theme or session. It is

subsequently important that the educator is aware of how students assess his/her teaching. This information should then be used to enhance future teaching-learning. The students' assessment of educators in the different anatomy modules should therefore also be investigated to determine what and why differences exist and to determine the efficiency of educator assessments. The core question to be asked is:

- How can interprofessional teaching-learning of anatomy at a higher education institution in South Africa facilitate deep-holistic lifelong learning?

The researcher formulated the following questions, based on the statement of the problem and literature mentioned above:

1. What are interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy?

2. What are interprofessionals' perceptions on the importance of anatomy for clinical practice?

3. What does the literature say about interprofessional teaching-learning of anatomy?

1.4 RESEARCH AIM AND OBJECTIVES

Considering the statement of the problem above and the questions that it poses, the main aim of this research is:

- To develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning.

The main aim will be obtained upon achieving the following objectives:

- To assess interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy;

- To explore interprofessionals' perceptions on the importance of anatomy in clinical practice; and

- To describe a conceptual framework for interprofessional teaching-learning of anatomy.

1.5 RESEARCHER'S ASSUMPTIONS

De Vos *et al.* (2002:43-44) state that all scientific research is conducted within a specific paradigm, or way of viewing one's research material. The meta-theoretical, theoretical and methodological assumptions of the research study are stated.

1.5.1 Meta-theoretical assumptions

According to Mouton and Marais (1996:192) meta-theoretical assumptions are non-epistemic statements that are not intended to be tested. The argumentative nature of scientific communication demands that these assumptions are stated explicitly.

1.5.1.1 Personal teaching-learning view

The researcher uses a Christian worldview as departure point as she believes God created all people and while Jesus Christ was on earth He taught the people about His Father and the Holy Ghost. He also sends His disciples to go out and teach people. We can see that teaching and learning since the Biblical times was important (Bible, 1988).

1.5.1.2 View of man

The researcher sees a person (in this research study the student and educator) as a holistic being created by God to interact with his/her environment and with other people.

In this research study the person with a need to obtain knowledge, skills and competencies (student), takes responsibility for his/her own learning, and will be accompanied by a more knowledgeable, skilled and competent person (educator) in a style that is characterised by specific techniques, methods and

skills to help the student to achieve specific outcomes to prepare him/her for a specific profession.

1.5.1.3 View of society

The researcher views the society that the student and educator come from as the environment inclusive of culture and educational background. They come together in a shared environment/society where they teach and learn from each other by interaction and discourse.

In this research study the environment is the higher education institution in South Africa. The student and educator come together in a context where theory and practical information is shared and knowledge co-constructed between them. The student and educator already have an educational background (the student has at least a grade twelve certificate and the educator has a basic professional degree at a higher education institution) and comes from different cultures to an environment where they have to work together to reach common goals/outcomes.

1.5.1.4 View of education

The researcher views education as an interactive process that takes place between the student and the educator as well as between the students themselves. Education consists of teaching-learning, but also assessment of outcomes reached during the teaching-learning process.

In this research study the teaching-learning process uses interaction between the student, the educator and the study material (study guide, textbooks and teaching aids). The accumulation of data (active participation by use of individual preparedness and reflection) consists of personal knowledge, understanding and insight that are shared during contact sessions with other students and the educator with the goal to reach the study outcomes.

For teaching-learning to occur, assessment plays an important role and the student and educator uses reflection (to think about previous experience and knowledge to understand the current situation) on a regular basis. The

student is measured internally (self-assessment) and also against the study outcomes to see if he/she has reached the outcomes.

For the teaching-learning process above to be achieved, facilitation which is characterised by mutual respect and accepting of individualism of each person involved in this process is necessary. The purpose of the teaching-learning process is to support active participation in own learning to reach a deep-holistic lifelong learning experience. The researcher's role as educator is to build a bridge between the knowledge (concepts) of anatomy and the practice (skills, knowledge and competencies used in nursing or other professions).

1.5.1.5 View of health

The researcher views health as a state of complete physical, mental and social well-being. Health also encompasses a person's social and psychological resources as well as their physical capacities.

In this study, the health of the educator and student are important as the educator has to take into consideration the special learning needs and the use of various teaching skills. The educator and student are also coming together from different social, psychological and physical settings and backgrounds, but they have to work together to reach common goals/outcomes.

1.5.2 Theoretical assumptions

The theoretical assumptions include models and theories used in the research and definitions of the concepts that are central to this research's field of study.

1.5.2.1 Models and theories

In this research study the following models and theories will be used:

- **Klopper's model for contructivist learning in nursing science**

The researcher used teaching-learning from a constructivist framework and used the model for constructivist learning in nursing science by Klopper (2009).

The aim of teaching is to facilitate student learning. Teaching-learning involves constantly interchanging activities and one learns by teaching. Teaching is a craft that demands creativity. The teaching role of the educator is to create a context conductive to learning.

The student and educator enter the teaching-learning situation with the same aim, and that is striving towards deep-holistic lifelong learning. The educator's approach toward teaching is student centred, and the context conducive to learning is created to facilitate deep-holistic lifelong learning. To create this context, the educator always refers to the student's existing cognitive framework to find a starting point and to begin the relationship on equal level.

The creation of context further takes place through an interactive approach maintained by the educator. The interaction between the educator and student is based on reflection and this requires dialogue, discourse and narrative. Motivation is a prerequisite for the achievement of the aim of interaction. The educator should be motivated to create a context conducive to learning, and the student should be motivated to become a lifelong learner through constructivist learning. Klopper's model for constructivist learning is outlined in Figure 1.1.

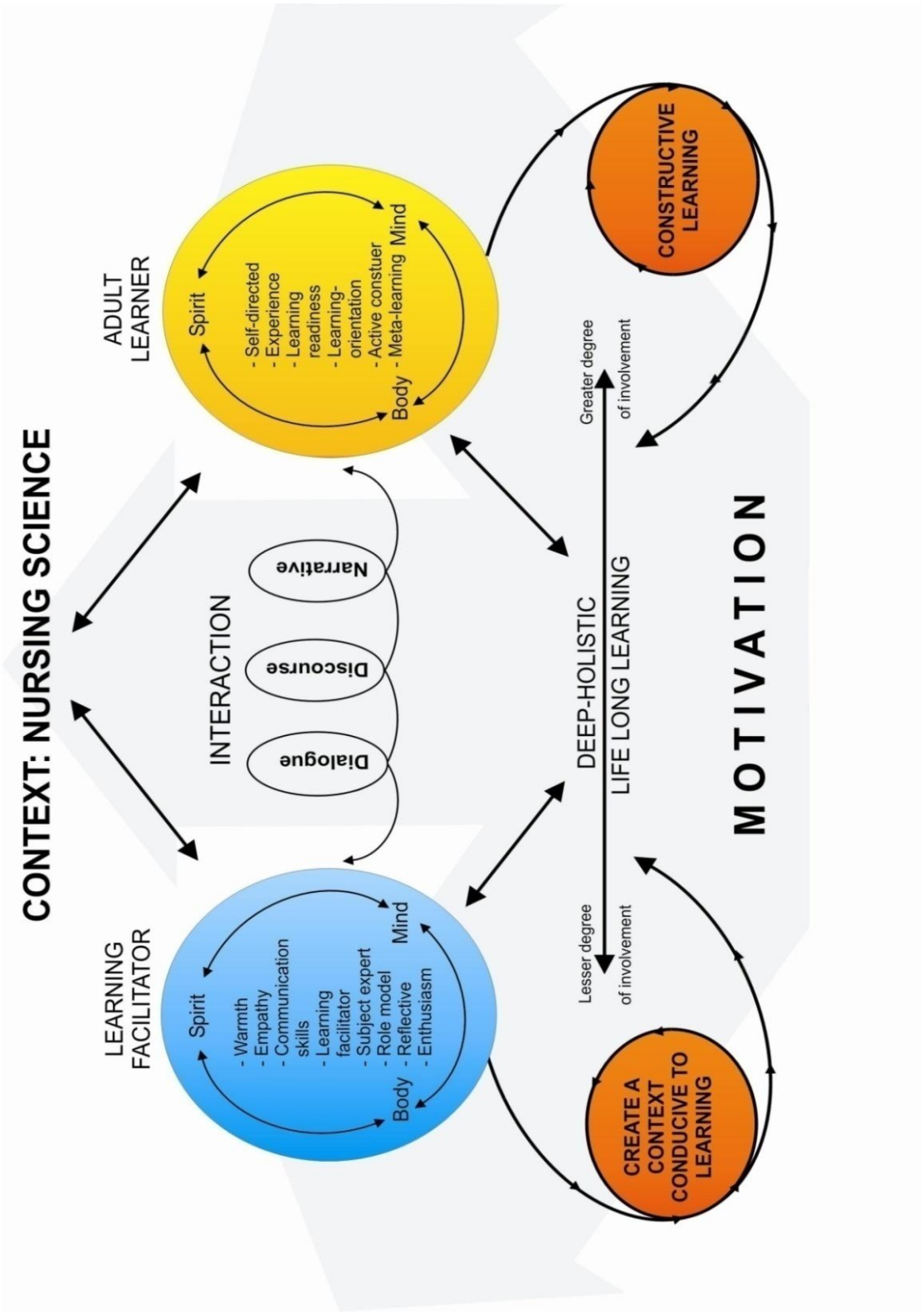


Figure 1.1: Klopper's model for constructivist learning in nursing science (Klopper, 2009:14)

The educator and the student interact during the teaching-learning process and the educator should display certain characteristics and attributes, e.g. warmth, empathy, good communication skills, subject expertise, be a skilled learning facilitator, availability, role model and reflective, enthusiastic practitioner. The student is characterized by self-directedness, accumulated experience, specific learning orientation and task and problem-centred learning readiness. Motivation is a prerequisite for the achievement of the aim of interaction. The educator should be motivated to create a context conductive to learning, and the student should be motivated to become a lifelong learner through constructivist learning.

The student and educator enter the teaching-learning situation with the same aim, and that is striving towards deep-holistic lifelong learning. The educator's approach toward teaching is student centred, and the context conductive to learning is created to facilitate deep-holistic lifelong learning. To create this context, the educator always refers to the student's existing cognitive framework to find a starting-point and to begin the relationship on an equal level. The educator uses the study guide as the core of the learning context structure.

The creation of context further takes place through an interactive approach maintained by the educator. The interaction between the educator and student is based on reflection and this requires dialogue, discourse and narrative. When creating a context conducive to learning, the educator has to keep certain aspects in mind, e.g. evaluation should be linked to the objectives and be approached holistically. Students should know the evaluation criteria that will be used. Feedback is important and opportunity for self-evaluation must be given. The educator should also use teaching methods that focus on discussion, participation and interaction and examples of teaching methods that can be used are group discussion, seminars, symposiums, case studies, simulation and role play.

- **World Health Organization's (WHO) Interprofessional Education Framework**

The researcher supports the interprofessional education framework by the WHO (2010:23-25).

Health-care and education around the world are provided by different types of educators and health workers who offer a range of services at different times and locations. This adds a significant layer of coordination for interprofessional educators and curriculum developers. Developing interprofessional education curricula is a complex process, and may involve staff from different faculties, work settings and locations.

Research done by Freeth *et al.* (2005) indicates that interprofessional education is more effective when: principles of adult learning are used (e.g. problem-based learning and action learning sets); learning methods reflect the real world practice experiences of students; and interaction occurs between students.

Effective interprofessional education relies on curricula that link learning activities, expected outcomes and an assessment of what has been learned. It is important to remember that expected outcomes will be influenced by the student's physical and social environment as well as their level of education. Well-constructed learning outcomes assume students need to know: what to do (i.e. knowledge); how to apply their knowledge (i.e. skills); and when to apply their skills within an appropriate ethical framework using that knowledge (i.e. attitudes and behavior). The WHO Interprofessional education framework is outlined in Figure 1.2.

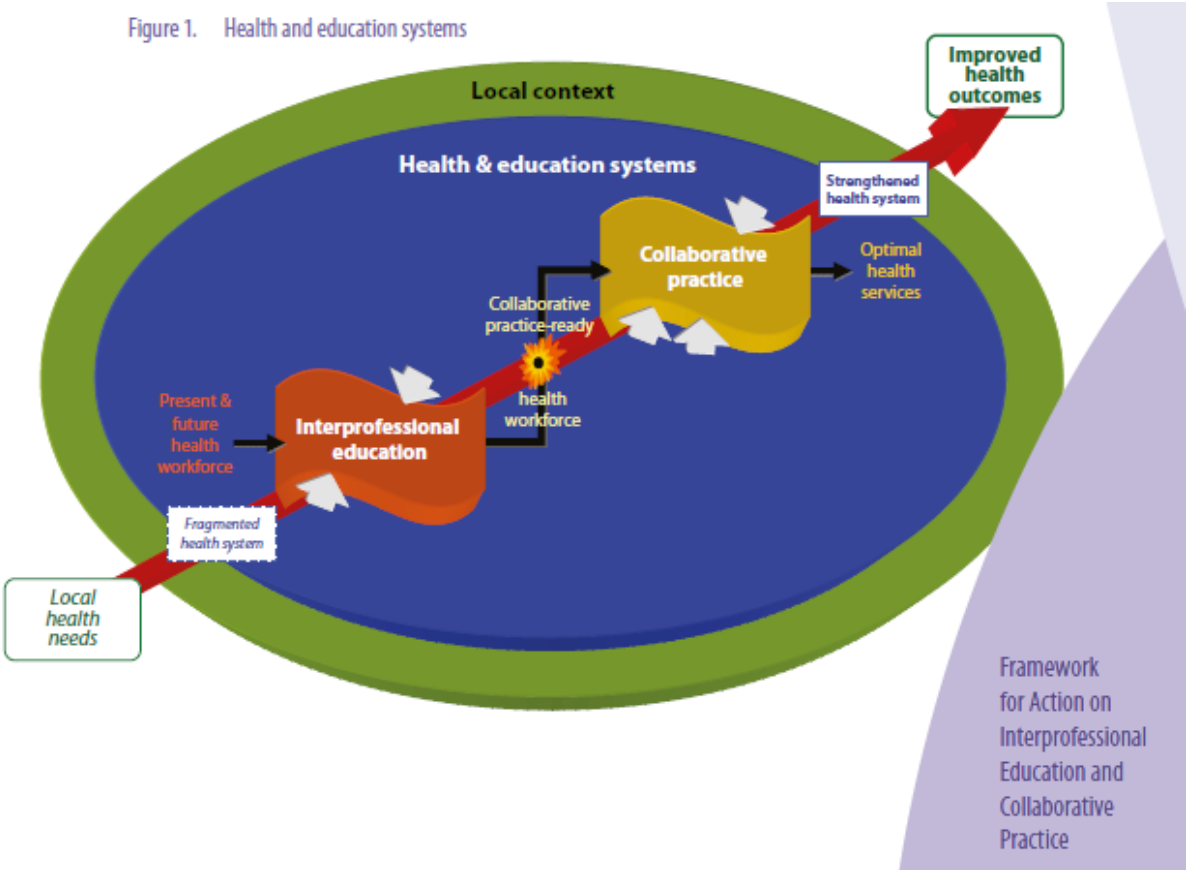


Figure 1.2: Action on Interprofessional education and Collaborative practice (WHO, 2010:9)

- **Constructivist theory**

According to the constructivist point of view students actively and uniquely construct knowledge within the framework of their own experience – construction, not absorption or unfocused discovery, enables learning. This has implications for teaching. Ramsden (1992:6) states that learning-teaching are constantly interchanging activities. It is a matter of presenting students situations which offer new problems, problems that follow on from one another. You need a mixture of direction and freedom. Students should be able to do their own experimenting and their own research. Educators, of course, can guide them by providing appropriate materials, but the essential thing is that for a student to understand something, he/she must construct it him/herself, he/she must reinvent it (Burman, 2008:161).

The researcher utilises the cognitive theorists' beliefs that state the following core assumptions from Bruning *et al*. (1999), Gredler (1997), Schunk (2004) and Yilmaz (2008:167-168):

- Believe that what happens inside the mind – mental processing of information – is an important part of learning.
- View humans as active learners; what students do with information once they receive it determines how much they learn.
- Believe that student attitudes, motivation, and beliefs can impact the learning process.
- Believe that students can self-regulate their learning through awareness of their thinking and management of learning strategies.
- Believe that the meaningfulness of knowledge determines how well it can be applied in new situations.
- Emphasize the importance of social interaction and context in the learning process.

In summary, it can be stated that constructivists emphasized the interplay between student and situation, the active role the student plays in the construction of knowledge, and the significance of social, cultural, and historical influences on the construction of disciplines of knowledge (Kretchmar, 2008:4).

The concepts will now be discussed.

1.5.2.2 Discussion of concepts

The following concepts are central to this research study and will be described briefly:

Interprofessional education: Interprofessional education (IPE) describes learning activities involving at least two professional groups (Parsell & Bligh, 1998). The common theme of shared learning appears to be a consensual agreement that each

group represents a generic term for learning activities in which students from different spheres of health and social care coalesce within a framework of common learning aims and objectives (Carlisle *et al.*, 2005:4).

In this research study interprofessional teaching-learning takes place between different professions, e.g. biokinetics, nursing and dietetic students.

Teaching: Teaching means helping a student to learn. An educator can tell students about a certain subject, can help students practise a skill (such as giving an injection), or assist students in discovering knowledge for themselves (for example, by talking to a person who has recovered from malaria). The educator can only help students to learn and make it easier for them to learn. The educator can never learn for the students. Each student must master the knowledge, skills and competencies by him- or herself (Ehlers, 2002:3-4). “Competent” means having the necessary skill or knowledge to do something successfully (Oxford English Dictionary, 2002). Although competence in nursing has been variously described in the literature, there are at least four conceptual tenets and these are knowledge, behaviour (skill), critical thinking and attitude (interpersonal) (Bruce, 2003:147).

In this research study teaching takes place between the educator and the student who attends an anatomy module at a higher education institution in South Africa.

Learning: Learning is a dynamic, active and cumulative process of knowledge construction that takes place through understanding and interpretation (Klopper, 2000:9). In this research study learning takes place between the educator and the student and between the students themselves.

Evaluation: To evaluate something means to measure it or to attach a value to it, to indicate its worth or value, or to test it. The purpose of evaluation at the end of a lesson is to find out whether the learning outcomes provided at the beginning of the lesson have been accomplished (Ehlers, 2002:134). This study concentrates on the students’ evaluation (measure) of the anatomy educator’s teaching-learning approach.

Assessment: Ehlers (2002:135) describes assessment as a process that is caring and subjective. In this process the educator aims to diagnose and facilitate (assist) the student's achievements and attempts to acquire specific learning-outcomes, knowledge, skills and competencies. Therefore, the objective of assessment is to determine the student's education needs.

Williams (2008:196-202) explains assessment as learning where the assessment outcome is deep-holistic lifelong learning that is self-directed and can be achieved by informal and formal formative assessment methods within a constructivist framework. In this research study assessment takes place continuously throughout the year in an anatomy module.

Anatomy: Anatomy, which means "a cutting open," is the study of the internal and external structure and the physical relationships between body parts (Martini & Bartholomew, 2007:4). In this study anatomy refers to the macro-anatomy of the human body.

Higher education institution (HEI): the South African government's White Paper on Higher Education, published in 1997, describes a "transformed" higher education system as one which will provide equal access and equally fair chances of success to all students, develop programmes leading to qualifications that will meet the country's employment needs in respect of highly skilled graduates, promote critical and creative thinking, tolerance and a commitmen to the common good through its teaching, and produce research of an international standard that, at the same time, will be cognisant of African contexts (Gravett & Geyser, 2004:6-7). In this research study the higher education institution is an university in the North-West Province in South Africa.

Educator: The Merriam-Webster online dictionary (2012) defines an educator as one skilled in teaching; a student of the theory and practice of education, as well as an administrator in education. In this research study the educator is the person who facilitates the anatomy modules to first year students at a higher education institution in South Africa. This concept will be refined in Chapter Six for applicability to the practice model (refer to 6.4.4.1).

Student: The Merriam-Webster online dictionary (2012) defines a student as one who attends a school; as well as an attentive and systematic observer. In this research study the student is an adult person who attends an anatomy module at a higher education institution in South Africa. This concept will be refined in Chapter Six for applicability to the practice model (refer to 6.4.4.1).

Model: Polit and Beck (2008:724) defines a model as a symbolic representation of concepts or variables, and interrelationships among them. A model is frequently described as a symbolic depiction of reality. It provides a schematic representation of certain relationships among phenomena, and it uses symbols or diagrams to represent an idea. A model helps us to structure the way we can view a situation, event or group of people (Brink, 2006:23). Kerlinger (1986:167-168) sees a model as an abstract outline specifying hypothesised relations in a set of data. Doing research is, in effect, setting up models of what "reality" is supposed to be and then testing the models against empirical data. According to Dickoff *et al.* (1968a:415) theory is born in practice, is refined in research, and must return to practice.

In this research the problem is to facilitate interprofessional teaching-learning of anatomy (practice) and therefore different methods of research are going to be used (see objectives 1-2) to lead to the development of a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa (back to practice).

1.5.3 Methodological assumptions

From hermeneutic and dialectic paradigms the variable and personal nature of social constructions suggests that individual construction of meaning can be elicited and refined only through interaction between and among the researcher and the participants. These varying constructions are interpreted using conventional hermeneutic techniques, and are compared and contrasted through a dialectical interchange. The final aim is to distill a consensus construction that is more informed and sophisticated than any of the predecessor constructions. For the first part of this research study the perceptions of students of evaluation of an educator's teaching-learning approach, the interprofessionals' perceptions of the importance of anatomy

in clinical practice, and the interprofessional peer group's opinions on the teaching-learning approach of anatomy will be described and explored, concepts will then be identified and used during the further collection of evidence through a conceptual framework and literature overview, before a practice model will be developed for the interprofessional teaching-learning of anatomy.

In the end the researcher intends to implement the practice model that will be developed for interprofessional teaching-learning of anatomy and will then take it back to the practice of education and specifically for teaching-learning of anatomy at higher education institutions that don't have a medical school/faculty in South Africa.

1.6 RESEARCH DESIGN

This study's research design utilises a theory-generative, quantitative and qualitative design (Brink, 2006:10-11; Mouton & Marais, 1996:159) to explore (Mouton & Marais, 1996:45) and describe (Mouton & Marais, 1996:46) teaching-learning of anatomy in a specific context (Klopper, 2008:68). The elements are discussed next.

1.6.1 Theory-generative design

Chinn and Kramer (2008:77) see a theory as a creative and rigorous structuring of ideas that project a tentative, purposeful, and systematic view of phenomena, while Walker and Avant (2005:3) see theory development as a way of identifying and expressing key ideas about the essence of practice. Through theory development that essence may be explored in terms of general or more delimited descriptions and explanations of person, health, environment, and nursing.

As stated, the main aim of this research study is to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning. Polit and Beck (2008:724) define a model as a symbolic representation of concepts or variables, and interrelationships among them. A model is frequently described as a symbolic depiction of reality. It provides a schematic representation of certain relationships among phenomena, and it uses symbols or diagrams to represent an idea. A model helps us to structure the way we can view a situation, event or group of people

(Brink, 2006:23). Kerlinger (1986:167-168) sees a model as an abstract outline specifying hypothesised relations in a set of data. Doing research is, in effect, setting up models of what "reality" is supposed to be and then testing the models against empirical data. Mouton and Marais (1992:142) argue, however, that the heuristic or descriptive function is the most common characteristic of models, while the explanatory function is usually attributed to theories. The researcher is using theory construction to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa. According to Dickoff *et al.* (1968a:415) theory is born in practice, is refined in research, and must return to practice (refer to Chapter 2, section 2.1.1 for a detailed discussion of the theory-generative design).

1.6.2 Retrospective, longitudinal quantitative design

According to Burns and Grove (2009:717) quantitative research is a formal, objective, systematic study process to describe and test relationships and to examine cause-and-effect interactions among variables. In retrospective studies, both the proposed cause and the proposed effect have already occurred (Burns & Grove, 2009:240). Longitudinal designs examine changes in the same subjects over an extended period (Burns & Grove, 2009:240). In this research the researcher used the retrospective, longitudinal quantitative design to evaluate the anatomy educator's teaching-learning approach by comparing the student evaluations of the educator between 2005 and 2008 (refer to objective one in 1.4 and step 1 of phase one in Table 2.1, as well as the detailed discussion on retrospective, longitudinal design in Chapter 2, section 2.1.2).

1.6.3 Qualitative

According to Denzin and Lincoln (2005:3) qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. Qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them. Qualitative research studies will be used to explore the interprofessionals' perceptions of the importance of anatomy in clinical

practice; and to evaluate interprofessional peer group's opinions on the teaching-learning approach to anatomy (refer to objectives one and two in 1.4 and step 1 of phase one in Table 2.1, as well as the detailed discussion of it in Chapter 2, section 2.1.3).

1.6.4 Explorative and descriptive

According to Burns and Grove (2009:12) description involves identifying and understanding the nature of specific phenomena, and, sometimes, the relationships among them. Through research, the researcher is able to (1) describe what exists in practice, (2) discover new information, (3) promote understanding of situations, and (4) classify information for use in the discipline. The researcher will use the emic approach that involves studying behaviours from within the culture. The culture in this research study is interprofessionals' perceptions of the importance of anatomy and the teaching-learning approach to anatomy. The researcher will explore and describe by means of email interviews the interprofessionals' perceptions of the importance of anatomy in clinical practice; and to evaluate interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy (refer to objectives one and two in 1.4 and step 1 of phase one in Table 2.1). The researcher will also describe the results from all objectives and finally describe the model as developed from the objectives (refer to phase two in Table 2.1, as well as the detailed discussion in Chapter 2, section 2.1.4).

1.6.5 Contextual

According to Klopper (2008:68) qualitative studies are always contextual, as the data is only valid in a specific context. In the description of a contextual study it is important to include a description of the context or setting in which the research will be conducted.

As already stated, there are 21 universities in South-Africa. Six of these have medical faculties that include nursing schools. The other 15 do not have medical faculties and therefore the nursing schools are incorporated in other faculties, i.e. health sciences faculties, humanity faculties, natural sciences faculties. This study

was conducted at a South African university that does not have a medical faculty and anatomy is thus taught at the School of Nursing Science. In this research study the context is a non-medical school/faculty at a higher education institution in the North-West Province, South Africa where anatomy is taught to first-year students of different professions. This may guide future research in the South African context on facilitating interprofessional teaching-learning of anatomy at other higher education institutions with no medical schools/faculties (refer to Chapter 2, section 2.1.5 for a detailed discussion).

The research method for each phase, step and objective will be discussed in Chapter 2 in detail.

1.7 RIGOUR

Rigour is of scientific value because the research outcome is associated with it (Burns & Grove, 2009:54). Klopper (2008:69) refers to rigour as the soundness of the research. Guba and Lincoln (1989:218) proposed trustworthiness in qualitative research as an alternative for validity and reliability. Qualitative and quantitative approaches conduct research according to the design and methods that are used, thus each approach must contend with different threats to validity and each has its own specific techniques to ensure validity (Botes, 2003:176).

In Table 2.5 of Chapter 2 the universal standards for trustworthiness, validity and reliability are outlined and discussed in greater detail.

1.8 ETHICAL CONSIDERATIONS

The North-West University (NWU) (Potchefstroom Campus) Ethics Committee provided written consent to the researcher to conduct this research under certificate number 07K07 (2008-2012) (refer to Appendices 1 and 2 for copies of the ethical consent certficates). The proposal was also submitted to the Postgraduate and Research Committee of the School of Nursing Science, at the Potchefstroom Campus of the NWU and approved in August 2010. The researcher accepts the responsibility to conduct this research in an ethical manner by:

- Obtaining informed consent from all participants and privacy, confidentiality and anonymity were ensured (Brink, 2006:40-42). When the students were asked to complete the questionnaires, they were informed that the results would be used and they consented when they completed the questionnaires;

- Strict adherence to the ethical principles of honesty, integrity and accuracy in reporting the studies reviewed and keeping a detailed record of review and appraisal for audit purposes;

- Complete abstinence from plagiarism by giving credit where due in the text and including bibliographic details in the list of references;

- Showing respect for copyrights where and when applicable by giving credit in the text when illustrations, diagrams or statistical graphics are used from articles or books and include bibliographic details in the list of references; and

- Following the fundamental ethical principles of respect for the information sources and databases by handling all information with confidentiality and responsibility (Brink, 2006:40-43).

Specific ethical considerations were made during the course of this research study and these considerations are now described in detail.

1.8.1 Code of ethics adhered to

The researcher selected and abided to specific codes of ethics as stipulated by local, national and international bodies. This was a conscious decision and definite awareness of ethical considerations was maintained throughout the entire research process.

1.8.2 University's code of ethics

The researcher functioned within the scientific domain as a PhD candidate, registered as a student at the NWU (Potchefstroom Campus). In this research, the student proclaimed adherence to the University's code of ethics as stipulated by the Statute. A comprehensive research proposal was submitted to the University's

Ethical Committee and research was conduced only after the Ethical Committee had granted its consent (Guidelines for postgraduate studies, North-West University, 2005:29). (Refer to Appendices 1 and 2 for copies of the ethical consent certificates).

1.8.3 National ethical governance

The researcher submitted to the Constitution of the Republic of South Africa (Act 108 of 1996). As the Constitution serves as the "South African DNA" for human rights, the researcher wished to add this law as national body that has directed the formulation of research ethics in South Africa. On a national level the researcher adhered to the code of ethics as governed by the Medical Research Council (Guidelines for postgraduate studies, North-West University, 2005:31) as well as the South African Department of Health (Ethics Committee: North-West University, 2006:1) and of the Democratic Nursing Association of South Africa (DENOSA, 1998).

1.8.4 International codes of ethics

From an international perspective, the researcher chose to adhere to the code of ethics by the International Council of Nurses (ICN) (2008:1-2) as well as the ethical principles and guidelines for the protection of human research subjects as stipulated in the Belmont Report, World Medical Association Declaration of Helsinki's ethical principles for medical research that involves human subjects and the Nuremberg Code (Guidelines for postgraduate studies, North-West University, 2005:33-34).

1.8.5 Prevention of plagiarism

The researcher acknowledged the North-West University's policy to prevent plagiarism (Guidelines for postgraduate studies, North-West University, 2005:28-29) and declared adherence to this policy.

1.8.6 Ethical principles ensured

The following ethical principles received attention in this research study and strategies for their assurance are stipulated in the paragraphs to follow.

1.8.6.1 Respect for others

The principle of respect for others rests upon the autonomy of others (Guidelines for postgraduate studies, North-West University, 2005:29) and therefore emphasises each person's right to existence. The researcher utilised members of the panel of experts' right for respect by first confirming members' availability to participate voluntarily. In the event that a member either refused or terminated participation, it was accepted without discrimination.

1.8.6.2 Benevolence

The principle of benevolence refers to the panel of experts' right to maintained well-being during the course of the research (Guidelines for postgraduate studies, North-West University, 2005:29). Besides maintaining their well-being, any form of emotional discomfort should be avoided or minimalised. Therefore the researcher submitted a research proposal and written request to the North-West University's (Potchefstroom Campus) Ethical Committee. Members of the panel of experts were informed of the intensity of the evaluation of the model, within a specific timeframe, amidst their workload.

1.8.6.3 Justice

The principle of justice (Guidelines for postgraduate studies, North-West University, 2005:29) refers to the participants' right to a fair selection as well as their right to privacy and anonymity. After purposive sampling of the members of the panel of experts was conducted, members were requested to complete an informed letter of consent, agreeing to participate in this research study voluntarily. Members were informed of the reason(s) why they were included in the sample, with specific reference to their academic qualifications and expertise in clinical practice, and/or teaching-learning of anatomy. All reports were anonymous and all measures possible were taken to ensure privacy during the data collection process, data analysis and the publication of the research results.

1.9 STRUCTURE OF RESEARCH STUDY

The researcher addressed the above questions and objectives in chapters that were planned according to the phases of model development and are outlined in Table 1.2:

Table 1.2: Outline of this research study

Main aim and objectives according to the phases and steps of model development	Chapter	Heading/Content of chapter
	Chapter 1	Overview of the research study
	Chapter 2	Research methodology
PHASE ONE (Concept identification, description and definition) **STEP 1** (To identify main and related concepts) **OBJECTIVE ONE:** To assess interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy	Chapter 3	Interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy
PHASE ONE, STEP 1 (continued) **OBJECTIVE TWO:** To explore interprofessionals' perceptions on the importance of anatomy in clinical practice	Chapter 4	Interprofessionals' perceptions of the importance of anatomy for clinical practice
PHASE ONE, STEP 2 (Concept descriptions and definitions) **OBJECTIVE THREE:** To describe a conceptual framework for interprofessional teaching-learning of anatomy	Chapter 5	Conceptual framework
PHASE TWO (Model construction), **STEP 1** (To construct relational meaning of main and related concepts), **and STEP 2** (Model construction through theory synthesis) **MAIN AIM:** To develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning.	Chapter 6	• Description of practice model for interprofessional teaching-learning of anatomy • Evaluation of the model
	Chapter 7	Evaluation of the research study, limitations and recommendations for research, education and practice

1.10 SUMMARY

In Chapter One an overview of the research study was presented. The background and rationale, problem statement, research questions, aim and objectives were discussed. The researcher then outlined the meta-theoretical, theoretical and methodological assumptions. The research design to be used as well as the rigour and ethical considerations were then outlined.

The research methodology will be discussed in detail in Chapter Two.

CHAPTER 2

RESEARCH METHODOLOGY

2.1 INTRODUCTION

An overview of each research method used for the two objectives, as well as phases during model development, will be discussed in this chapter. The research method for each objective and phases of model development will be discussed in detail in the following chapters. The results of each objective as well as phases of model development are described.

This research design utilises a theory-generative, quantitative and qualitative design (Brink, 2006:10-11; Mouton & Marais, 1996:159) to explore (Mouton & Marais, 1996:45) and describe (Mouton & Marais, 1996:46) teaching-learning of anatomy in a specific context (Klopper, 2008:68). Each of the elements is discussed next.

2.1.1 Theory-generative design

Chinn and Kramer (2008:77) define a theory as a creative and rigorous structuring of ideas that project a tentative, purposeful, and systematic view of phenomena, while Walker and Avant (2005:3) define theory development as a way of identifying and expressing key ideas about the essence of practice.

Theory at different levels on which there is general consensus by authors on their classification is explained (Fawcett, 2005:19; Rogers, 2005:19; Meleis, 2007:43; Chinn & Kramer, 2008:48; McKenna & Slevin, 2008:29; George, 2011:5; Walker & Avant, 2011:5). However, for the purpose of explaining the levels of theory, Chinn and Kramer (2008:48) and Walker and Avant (2011:6) have been selected because they best describe the development and description of a model for practice in relation to this study.

The four levels of theory are:

- **Metatheory:** At this level, Walker and Avant (2011:7) explain that broad universal issues are debated without producing grand, middle-range, or practice theories. They contend that a common theme throughout the metatheoretical literature is recurring reviews of the meaning of nursing as a practice discipline, namely nursing as both a science and a profession. In their description, Chinn and Kramer (2008:53) regard metatheory as writings that explicate what the essential and fundamental qualities of a theory and the processes for developing theory should be.
- **Grand theory:** At this level of theory, Chinn and Kramer (2008:224) and Walker and Avant (2011:12) regard the aim as expounding on a worldview in nursing that gives a global perspective of the goals and structures of nursing practice. Walker and Avant (2011:12) claim that an important function of grand theory is to contribute to the conceptual distinction between the practice of nursing and the practice of medicine by illustrating the nursing-defining perspectives of practice in a healthcare setting.
- **Middle-range theory:** Chinn and Kramer (2008:58) explain that the focus of this level is the development of theory around areas of substantive concerns in practice or concepts of interest and related phenomena. Walker and Avant (2011:16) consider this level of theory to be useful and testable in nursing research because it has a limited scope and fewer variables compared to grand theories, yet retains its scientific value in theory development. They maintain that it provides sufficient specificity for research and practice, and is therefore useful for inquiry between grand theory and practice theory.
- **Practice theory:** Chinn and Kramer (2008:58) and Walker and Avant (2011:18) explain that this level of theory has at its core a particular goal and directions for actions to accomplish the goal, and support the stance of Meleis (2007) that this level of theory focuses on nursing concepts that are grounded in a practice context. It is at this level of practice theory that this study is engaged with the research aim of

developing a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa. The specific practice phenomenon under study is the interprofessional teaching-learning of anatomy. The emergent main and related concepts on the phenomenon and their interrelatedness within the practice setting forms the essence of this study.

Walker and Avant (2011:20) point out that there are linkages between the levels of theory development, as shown in Figure 2.1, indicating how they are interrelated.

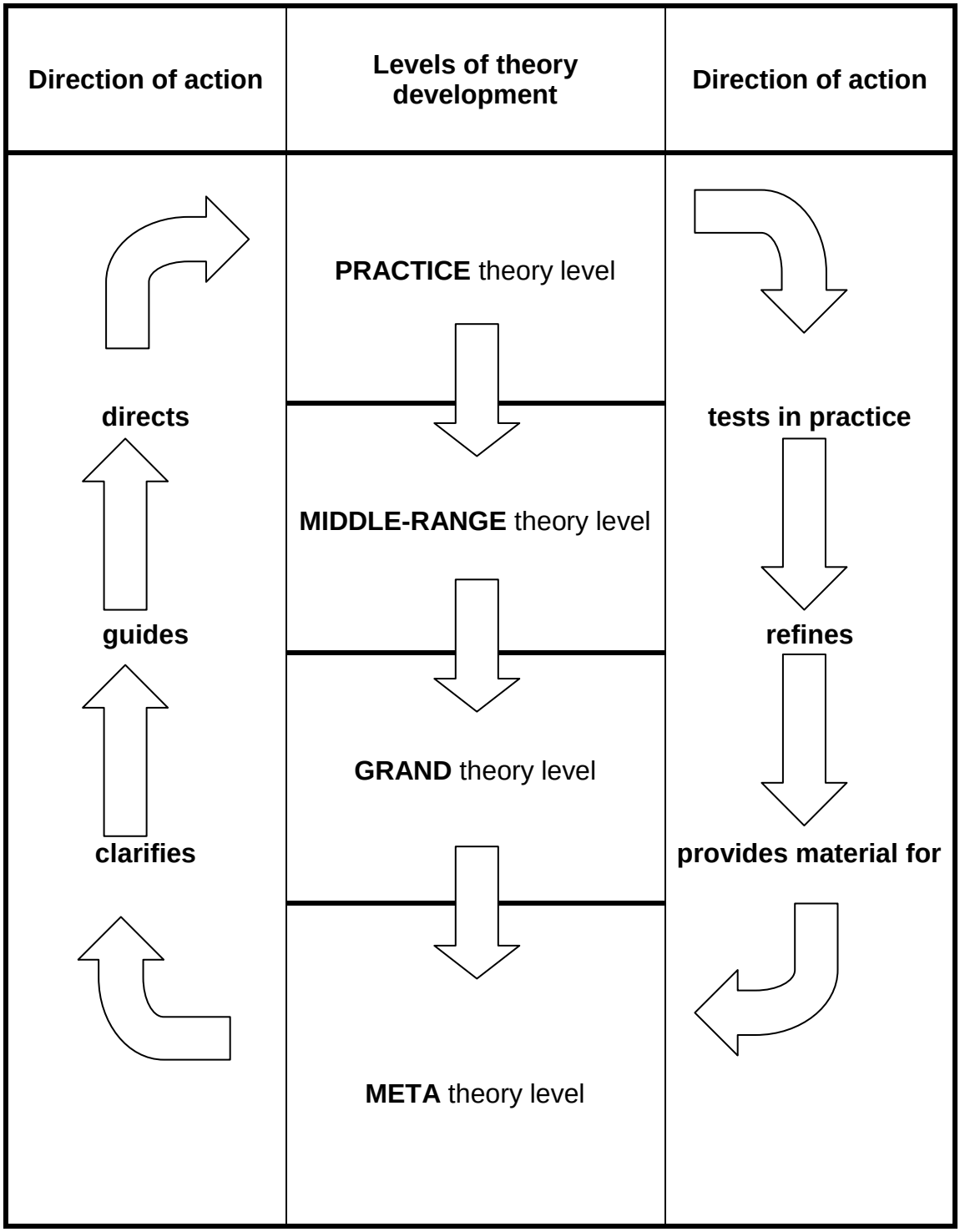


Figure 2.1: Linkages between levels of theory development (adapted from Walker & Avant, 2011:20)

The work of Dickoff *et al.* (1968a:415-435; 1968b:545-554) on practice oriented theory is extensively referred to by Walker and Avant (2011:18) when practice theory is discussed. Dickoff *et al.* (1968a:420) refer to four levels of theory at the practice level of nursing theory development, which are:

(i) Factor-isolating theories
(ii) Factor-relating or situation-depicting theories
(iii) Situation-relating theories
(iv) Situation-producing theories (or prescriptive theories).

The last level is pertinent to this study on the functional role of the nursing educator in interprofessional teaching-learning because it was the situational context in teaching-learning of anatomy that contributed to the development of a practice model. Dickoff *et al.* (1968a:421) indicate that three components are essential in a situation-producing theory. These are:

(i) Goal content that is specified as to the aim of the activity. In this study, the goal is interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning.
(ii) Prescriptions for the activity to ensure that the goal content is realized. In this study, the prescriptions are the concepts identified during objectives one and two of this study that constitute the phenomenon under study and are aimed at developing a practice model.
(iii) A conceptual framework that serves to classify the prescriptions aimed at future preparation so that the prescriptions are carried out aimed at attaining the goal content. In this study, the conceptual framework is used in Chapter Five to facilitate concept classification after concept identification from empirical data (from objectives one and two) is produced.

In Table 2.1 that follows, the levels of practice theory by Dickoff *et al.* (1968a:420) are presented and the relevant application to model development in this study is outlined.

Table 2.1: Application of the levels of practice theory by Dickoff *et al.* (1968a:420) in relation to model development in this study

Levels of practice theory by Dickoff *et al.* (1968a:420)	Application to model development in this study	Phases and steps of model development in this study
i. Factor-isolating	• Concept identification • Concept classification	Phase one, Step 1
ii. Factor-relating	• Conceptual framework • Relational statements	• Phase one, Step 2 • Phase two, Step 1
iii. Situation-relating	• Description of practice model	Phase two, Step 2
iv. Situation-producing	• Evaluation of practice model	Phase two, Step 2

The first step in theory generation is to become familiar with the elements related to theoretical ideas and their application. These elements include the concepts, definitions of concepts, relational statements, and map or model (Chinn & Kramer, 2008; Fawcett, 2005). This step will be executed under phase one of the model construction (refer to Table 2.1). Burns and Grove (2011:230) define a concept as a term that abstractly describes and names an object, idea, or phenomenon, thus providing it with a separate identity or meaning. To select concepts that are highly abstract in order to retain meaning, even when the term is removed from a specific situation, is the primary challenge that surrounds concept identification. Yet, the concept should remain identifiable and have clear boundaries (Walker & Avant, 2005:66). The next challenge is to avoid primitive terms that can only be defined by providing examples as well as umbrella terms. The latter refers to concepts that are so broad that they can encompass a variety of meanings and lead to confusion. The selected concepts should be important and

significant to the research problem and should further theoretical development (Walker & Avant, 2005:63).

Defining concepts allows consistency in the way the term is used. Concepts from theories have conceptual definitions that are developed by the theorist and often are clarified through research. A conceptual definition is more comprehensive that a denotative (or dictionary) definition and includes associated meanings the word may have (Burns & Grove, 2011:231).

Burns and Grove (2011:231) explain that statements express claims that are important to the theory. An existence statement declares that a given concept exists or that a given relationship between concepts occurs. A relational statement clarifies the type of relationship that exists between or among concepts. In theories, propositions (relational statements) can be expressed at various levels of abstraction. The identification of concepts and relational statements were done from data gathered and analysed from objectives one and two of this research study (refer to paragraph 1.4). See also step 1 under phase one in Table 2.1.

One strategy for expressing a theory or study framework is a map or model that graphically shows the interrelationships of the concepts and relational statements. The map is sometimes referred to as a conceptual or framework map that is developed to explain the concepts contributing to or partially causing an outcome. The map should be supported by references from the literature. A conceptual map summarizes and integrates what is known about a phenomenon more succinctly and clearly that does a literary explanation, thus allowing a grasp of the “wholeness”of a phenomenon (Burns & Grove, 2011:233). A conceptual map includes all of the major concepts in a theory or study framework. These concepts are linked by arrows expressing the proposed linkages between concepts. Each linkage shown by an arrow is a graphic illustration of a relational statement (proposition) of the theory. Mapping is useful in identifying gaps in the logic of the theory and reveals inconsistencies, incompleteness, and errors (Burns & Grove, 2011:233). A

conceptual framework was developed from data gathered and analysed in step 1 of phase one of the model development process (refer to step 2 under phase one in Table 2.1).

As already stated the main aim of this research study is to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning. Polit and Beck (2008:724) define a model as a symbolic representation of concepts or variables, and interrelationships among them. A model is frequently described as a symbolic depiction of reality. It provides a schematic representation of certain relationships among phenomena, and it uses symbols or diagrams to represent an idea. A model helps us to structure the way we can view a situation, event or group of people (Brink, 2006:23). Kerlinger (1986:167-168) sees a model as an abstract outline specifying hypothesised relations in a set of data. Doing research is, in effect, setting up models of what "reality" is supposed to be and then testing the models against empirical data. Mouton and Marais (1992:142) argue, however, that the heuristic or descriptive function is the most common characteristic of models, while the explanatory function is usually attributed to theories. The researcher is using theory construction to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa. According to Dickoff *et al.* (1968a:415) theory is born in practice, is refined in research, and must return to practice.

2.1.2 Retrospective, longitudinal quantitative design

Brink (2006:105) explains that, when using a retrospective design, the researcher starts with an effect and works backwards to determine what was associated with this effect in the past. Brink (2006:104) also states that the researcher plans and conducts a study with a longitudinal design when he/she wishes to examine the way in which variables change over time. The researcher is concerned not only with the existing status and interrelationship

of phenomena, but also with changes that result from significantly elapsed time.

In this research the researcher used the retrospective and longitudinal design to evaluate the anatomy educator's teaching-learning approach by comparing the student evaluations of the educator between 2005 and 2008 (refer to objective one in 1.4 and step 1 of phase one in Table 2.1).

2.1.3 Qualitative

According to Kvale (2007:x-xi) qualitative research is intended to approach the world "out there" (not in specialized research settings such as laboratories) and to understand, describe and sometimes explain social phenomena "from the inside" in a number of different ways:

- By analyzing experiences of individuals or groups. Experiences can be related to biographical life histories or to (everyday or professional) practices; they may be addressed by analyzing everyday knowledge, accounts and stories.

- By analyzing interactions and communications in the making. This can be based on observing or recording practices of interacting and communicating and analyzing this material.

- By analyzing documents (texts, images, film or music) or similar traces of experiences or interactions (Kvale, 2007:x).

Common to such approaches is that they seek to unpick how people construct the world around them, what they are doing or what is happening to them in terms that are meaningful and that offer rich insight. Interactions and documents are seen as ways of constituting social processes and artefacts collaboratively (or conflictingly) (Kvale, 2007:x). All of these approaches represent ways of meaning, which can be reconstructed and analyzed with different qualitative methods that allow the researcher to develop (more or less generalizable) models, typologies and theories as

ways of describing and explaining social (or psychological) issues (Kvale, 2007:xi). Morse (2003:833) points out that qualitative methodology is used when little is known about the topic, the research context is poorly understood, the boundaries of a domain are ill-defined, the phenomenon under investigation is not quantifiable, the nature of the problem is not clear, or the researcher suspects that the phenomenon needs to be re-examined. Qualitative research studies will be used to explore the interprofessionals' perceptions of the importance of anatomy in clinical practice; and to evaluate interprofessional peer group's opinions on the teaching-learning approach of anatomy (refer to objectives one and two in 1.4 and step 1 of phase one in Table 2.1).

2.1.4 Explorative and descriptive

According to Burns and Grove (2009:12) description involves identifying and understanding the nature of specific phenomena, and, sometimes, the relationships among them. Through research, the researcher is able to (1) describe what exists in practice, (2) discover new information, (3) promote understanding of situations, and (4) classify information for use in the discipline. For Kvale (2007:12) descriptive also involves the researcher encouraging the participants to describe as precisely as possible what they experience and feel, and how they act. The focus is on nuanced descriptions that depict the qualitative diversity, the many differences and varieties of a phenomenon, rather than on ending up with fixed categorizations. The researcher will use the emic approach that involves studying behaviours from within the culture. The culture in this research study is interprofessionals' perceptions of the importance of anatomy and the teaching-learning approach in anatomy. The researcher will explore and describe by means of email interviews the interprofessionals' perceptions of the importance of anatomy in clinical practice; and to evaluate interprofessional students' and peer group's opinions on the teaching-learning approach in anatomy (refer to objectives one and two in 1.4 and step 1 of phase one in Table 2.1). The researcher will

also describe the results from all objectives and finally describe the model as developed from the objectives (refer to phase two in Table 2.1).

2.1.5 Contextual

As already stated in Chapter One, qualitative studies are always contextual, as the data is only valid in a specific context. In the description of a contextual study it is important to include a description of the context or setting in which the research will be conducted (Klopper, 2008:68).

This study was conducted at a South African university that does not have a medical faculty and anatomy is thus taught at the School of Nursing Science. The South African academic year stretches from February to November. A professional nurse with basic anatomy knowledge lectures all the anatomy modules for the Health Sciences Faculty at this university. Three anatomy modules are included in the curriculum. Firstly, ANAM111, an eight (8) credit[1] introductory module that explores bones, muscles, joints, blood and nerves for biokinetics, psychology and students of dietetics. Student numbers for the ANAM111 module are usually between 250 and 270. The other courses are ANAB111 and ANAS121, both sixteen (16) credit modules that form part of the nursing science curriculum. ANAB111 includes content on movement anatomy of the thorax, abdomen, pelvis, back, upper and lower extremities as well as head and neck. ANAS121 concentrates on systematic anatomy of the cardiopulmonary, digestive, genito-urethral, and nervous systems. The student numbers for both these modules are usually between 25 and 35. ANAB111 is presented in the first semester (February to June) and ANAS121 in the second semester (July to November) (refer also to Table 1.1).

[1] One credit equals ten notional hours

2.2 RESEARCH METHOD

The research method for each phase, step and objective will now be discussed. In the following table the steps in developing a theory will be used for the practice model construction for interprofessional teaching-learning of anatomy at a higher education institution in South Africa.

Table 2.2: Overview of the research methods planned for this research study (adapted from Walker & Avant, 2005 and Bester, 2008:28-29)

Aim of this research is to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa				
Research Objectives	**Data Collection**	**Population and sampling**	**Data Analysis**	**Rigour**
PHASE ONE: CONCEPT IDENTIFICATION, DESCRIPTION AND DEFINITION				
STEP 1: **To identify main and related concepts:** process completed for objectives one and two of this research.	***Objective one*:** ***For IPS*[2]:** *teaching-learning feedback questionnaire.*	**Objective one:** **For IPS**: All students enrolled for an anatomy module at a higher education institute in South Africa during the 2005-2008 academic years. The population size was N = 922. The sample size was n = 552.	**Objective one:** **For IPS**: Statistical analysis of the questionnaires was conducted by the NWU's Statistical Services through the SPSS Programme™ after data was captured on EpiData™. A confirmatory factor analysis was done to validate the questionnaire. Cronbach's Alpha was utilised to investigate the reliability of the scale. Effect sizes for means (Cohen's d) were used to compare the different constructs identified for the two anatomy modules over one year. Graphic representation was provided for both anatomy modules to assess in the interpretation of results.	Deductive logic and strategies to enhance trustworthiness by Guba and Lincoln (in Polit & Beck, 2008:539). **Objective one:** **For IPS**: Internal validity, external validity, reliability and objectivity was achieved and discussed in detail in table 2.5 in this chapter.

[2] **IPS** = Interprofessional students

	***For PG[3]**: Peer review report document and portfolio.*	**For PG**: An already developed peer review report document and portfolio were used and given to the interprofessional peer reviewers to review the educator's teaching-learning approach to anatomy during 2007.	**For PG**: Content analysis.	**For PG**: The concepts of credibility through persistent observation, triangulation and peer debriefing; transferability through saturation of data, thick description and purposive sampling; dependability; and confirmability was reached and discussed in detail in table 2.5 of this chapter.
	Objective two: *Electronic interviewing.*	**Objective two:** All students that finished their bachelor's degree in different professions, with anatomy as part of their curriculum, at a higher education institute in South Africa during the 2005-2010 academic years (had anatomy module in first year of curriculum, thus in 2005-2008). The population size was N = 118. The sample size was n = 18.	**Objective two:** Content analysis	**Objective two:** The concepts of credibility through prolonged engagement, persistent observation, triangulation and peer debriefing; transferability through saturation of data, thick description and purposive sampling; dependability through inquiry audit; and confirmability was reached and discussed in detail in table 2.5 of this chapter.
STEP 2: **Concept descriptions and definitions:**	Extensive literature searches are conducted of	**Population:** The selected main and related	A conceptual framework is one that the researcher has developed through	Deductive logic and strategies to enhance trustworthiness by

[3] **PG** = Peer group

Literature control and conceptual framework were done.	all available national and international sources (Walker & Avant, 2005:64).	concepts that were identified in Phase one (Step 1). **Sampling:** Purposive sampling was done in the form of literature searches (Chinn & Kramer, 1991:154).	identifying and defining concepts and proposing relationships between these concepts. In this step a conceptual framework on interprofessional teaching-learning of anatomy was described. All the information gathered from objectives 1 to 2 as well as a literature control were used to develop and describe the conceptual framework.	Guba and Lincoln (cited in Polit & Beck, 2008:539)
PHASE TWO: MODEL CONSTRUCTION				
Research Objectives	**Data Collection**	**Population and sampling**	**Data Analysis**	**Rigour**
STEP 1: **To construct relational meaning of main and related concepts**	Results of Phase one: Steps 1 and 2	**Population:** All available national and international sources of data (Walker & Avant, 2005:67) Formulated conclusion statements of the main and related concepts. **Sampling:** Conclusion statements n = 18	Statement synthesis (Walker & Avant, 2005:85-108)	Deductive logic and strategies to enhance trustworthiness by Guba and Lincoln (cited in Polit & Beck, 2008:539)
STEP 2: **Model construction through theory synthesis**	Results of Phase two: Step 1		Model construction process through theory synthesis (Walker & Avant, 2005:135-147)	Deductive and inductive logic, strategies to enhance trustworthiness by Guba and Lincoln (in Polit & Beck, 2008:539)

2.2.1 PHASE ONE: Concept identification, description and definition

Phase one consists of two steps. Each step will be discussed.

2.2.1.1 STEP 1: Identify main and related concepts

Under step 1 there are two objectives that will be discussed with each of their research designs, population and sampling, data collection and data analysis.

2.2.1.1.1 OBJECTIVE ONE: Interprofessional students' (IPS) (population 1) and peer group's (PG) (population 2) opinions on the teaching-learning approach to anatomy

The design is descriptive in nature, designed to explore and describe interprofessional opinions on the teaching-learning approach to anatomy by means of a questionnaire and peer review reports. The data collection and data analysis were discussed in greater detail in Chapter Three, sections 3.3.2, 3.3.3, 3.4.2 and 3.4.3.

a) Research method of IPS

Retrospective, longitudinal quantitative research design (Brink, 2006:13; Mouton & Marais, 1996:159) was utilised whereby inferential statistics were used to explain the teaching-learning approach of the anatomy educator in the context (Burns & Grove, 2009:571) of a higher education institute in South Africa. However, because no random sampling was used, effect sizes were used to determine if there were important effects in practice (Steyn, 2009).

b) Population of IPS and sampling of IPS

The population consisted of all students enrolled for an anatomy module at a higher education institute in South Africa during the 2005-2008 academic years with the same educator teaching the different anatomy modules. The population size over the four year period was N = 922. The researcher used an all-inclusive sampling that included the students who attended the anatomy class on a specific day at the end of a semester over the four-year period and

completed the teaching-learning feedback questionnaire (Brink, 2006:140), thus the sample size was n = 552.

Table 2.3 presents a summary of the population that was used for this objective.

Table 2.3: Summary of the different groups that formed the population and sample

Group	Year registered for anatomy module	Population size (N)	Sample size (n)
Small group	**2005**	28	17
	2006	29	26
	2007	30	21
	2008	59	55
Large group	**2005**	233	18
	2006	252	194
	2007	253	190
	2008	38	31
TOTAL		**N = 922**	**n = 552**

As described in Table 2.3 the researcher distinguished between small and large groups. The small group consisted of students registered for the ANAB111 module. The large group consisted of students registered for the ANAM111 and ANAS121 modules (refer to Table 1.1).

c) Data collection of IPS

The researcher gave the students the teaching-learning feedback questionnaire used by the higher education institute to complete (see Appendices 3 and 4 for the questionnaires). The questionnaire is used to evaluate the students' perception of the teaching-learning experience of the specific educator who presents the anatomy modules. It is a process that is

conducted after a module is completed to provide the educator with feedback. The questionnaires were completed anonymously.

d) Data analysis of IPS

Statistical analysis of the questionnaires was conducted by the NWU's Statistical Consultation Services through the SPSS Programme™. A confirmatory factor analysis was done to validate the questionnaire. Cronbach's Alpha was utilised to investigate the reliability of the scale. Effect sizes for means (Cohen's d-values) were used to compare the difference between the two anatomy modules over one year. Graphical representation was provided for the small and large groups' anatomy modules to assess in the interpretation of results.

e) Research method of PG

Peer review is where guidelines are given to two or more reviewers to review a document or action (Burns & Grove, 2009:590). In this research study the teaching-learning approach of an educator will be reviewed.

f) Population of PG and sampling of PG

As part of the researcher's evaluation of her teaching-learning approach, the researcher was peer reviewed by a process called Institutional Teaching Excellence Award (ITEA), developed by the higher education institute the researcher is working at. Participating candidates must offer (present) at least two full semester modules during the year of participation in the ITEA process. Candidates that offer (present) more modules may select two modules to be assessed in the same semester. The researcher's teaching-learning approach to the ANAS121-module and a research module were evaluated during the second semester of 2007. An evaluation panel, consisting of three reviewers from the higher education institute, were asked to complete peer review reports on the teaching-learning approach, as well as evaluate a portfolio of the researcher's teaching-learning. The teaching/curriculum/quality committee of the relevant faculty selects, together with the campus teaching advisor, an evaluation panel consisting of three members for each participating ITEA

candidate. The evaluation panel includes the chairperson of the teaching/curriculum/quality committee or another member of the relevant faculty's teaching/curriculum/quality committee, a senior subject expert and a campus teaching advisor.

g) Data collection of PG

An already developed peer review report document and portfolio were used and given to the peer reviewers (evaluation panel) to review the educator's teaching-learning approach. Three different contact sessions were evaluated as well as a portfolio compiled by the educator (refer to Appendices 5, 6 and 7).

h) Data analysis of PG

Content analysis was used to analyse data. Analysis entails grouping similar themes together. The results of this analysis need to be verified to ensure a fair representation of the data generated by using a co-coder to analyse the data (refer to Appendices 9 and 10).

2.2.1.1.2 OBJECTIVE TWO: Explore and describe the inter-professionals' perceptions of the importance of anatomy in clinical practice

The design is descriptive in nature to explore and describe the interprofessionals' perceptions on the importance of anatomy in clinical practice by means of electronic interviews. The data collection and data analysis are discussed in greater detail in Chapter Four, sections 4.3.2 and 4.3.3.

a) Research method

The discussion of the research method in this chapter includes the population and sampling, data collection as well as the data analysis of step 1 of phase one.

Brink (2006:151) and Kvale (2007:1) describes the interview as a method of data collection in which an interviewer obtains responses from a subject in a face-to-face encounter, through a telephone call or by electronic means. They are the most direct method of obtaining facts from the respondent. They can also be useful in ascertaining values, preferences, interests, tasks, attitudes, beliefs and experience. Data-collection interviews are generally classified as either “structured”or “unstructured”. Most interviews, however, range between the two classifications and are thus referred to as “semi-structured” (Brink, 2006:151).

b) Population and sampling

The population consisted of all students that finished their bachelor’s degree in different health care professions, with anatomy as part of their curriculum, at a higher education institute in South Africa during the 2005-2010 academic years (the students that were selected was registered for an anatomy module in their first year of study and thus had anatomy module in years 2005-2008). The population size was N = 118. The names and cell phone numbers of the students was first requested from the management and administration department, of granting acess to information, of a higher education institution in the North-West Province, but no numbers were available. The second option was to request the names and cell phone numbers via the Directors of the Schools of Nursing Science, Dietetics and Nutrition, and Biokinetics of a higher education institution in the North-West Province. Only the names and cell phone numbers of students from the Schools of Nursing Science and Dietetics and Nutrition could be obtained.

The researcher used purposive sampling that included the students that completed their bachelor’s degree in different health care professions, with anatomy as part of their curriculum, during the 2008-2010 academic years (the students that were selected was registered for an anatomy module in their first year of study and thus had anatomy module in years 2005-2008). The sample size was n = 18.

Table 2.4 summarises the population that was used for this objective.

Table 2.4: Summary of the different professions that formed the population

Profession	Year completed Bachelor degree	Population size (N)
BCur (Nursing)	**2008**	19
	2009	23
	2010	26
Dietetics and Nutrition	**2009**	29
	2010	21
	TOTAL	**118**

c) Data collection

Data was first collected by means of electronic interviewing and discussions on a blog created for this purpose (Selwyn & Robson, 1998). Participants were contacted through bulk sms's that were sent to their cell phone numbers, acquired from the Directors of Schools of Nursing Sciences and Dietetics and Nutrition from a higher education institution in the North-West Province.

The initial message sent by sms was: *Miss B (of anatomy) asks you to participate in her Ph.D study by going to http://anatomyresearch.blogspot.com and register and give your comments on the "Importance of anatomy for clinical practice". If struggling to write on blog, send your comments to Belinda.Scrooby@nwu.ac.za*).

The questions on the blog to be discussed by participants were:

Students cite medical knowledge as the most important knowledge from in each phase of their training and indicate anatomy the most important science, as it prepares them for later work (Manninen, 1999:83-84; Mitchell et al., 2004:738).

1) *Please write if you agree or disagree with the above statement and motivate your answer.*

2) *Write about your perceptions on the importance of anatomy for clinical practice.*

Only one participant responded to the initial message sent by sms. The message was again sent by sms after two weeks, but only two participants responded via e-mail. A new message was created and sent by sms. The new message was: *Miss B (of anatomy) asks you to participate in her Ph.D study by going to http://anatomyresearch.blogspot.com and read the questions on the "Importance of anatomy for clinical practice". Please send your comments via e-mail to Belinda.Scrooby@nwu.ac.za. This will only take about 10 minutes of your time. Co-operation will be appreciated.*

Because of the limited response from participants on the blog, it was decided that the rest of the data will be gathered through email interviews (refer to Chapter Four, section 4.3.2 for detail discussion on email interviews used). Ethical considerations were discussed in detail under section 1.8 of Chapter One, but because the participants send their responses and/or email addresses, they were prepared to participate in the research study voluntarily and therefore the consent form (refer to Appendix 8) was send to the participants via email to complete.

d) Data analysis

As described by Brink (2006:184-185) many qualitative researchers use a series of common steps for analysing their data which begins at the start of the data-collection phase. Typical steps are coding for themes and categories, making memos about the context of and variations in the phenomenon under study, verifying the selected themes through reflection on the data and discussion with co-coders for refining the categories, recording of support data for categories and identifying propositions.

Coding and categorising are generally initiated as soon as data collection begins. Coding is used to organise data collected in interviews and other

types of documents. The researcher checked the reliability of the coding by using a co-coder that encoded the same data and then had discussions to check for agreement (refer to Appendix 9) (Brink, 2006:185).

All data were printed, a manual analysis was used that involved a thorough review of all recorded information that the researcher had obtained during the course of the data collection (refer to Appendix 11). If the margin is sufficiently wide, the coding of data can take place on the page itself. Coding involves inventing and applying a category system. Several categories or codes could be identified within the data recorded for any given participant. The researcher works with these categories to identify the ones which are most prevalent or of greatest priority for the participants. The researcher continually compares the data collected from one participant with that of another participant in the determination of the final theme (Brink, 2006:185).

2.2.1.2 STEP 2: Concept descriptions and definitions

Brink (2006:24) explains that a framework of a research study helps the researcher to organise the study and provides a context in which he/she examines a problem and gathers and analyses data. A conceptual framework is one that the researcher has developed through identifying and defining concepts and proposing relationships between these concepts. By developing a framework within which ideas are organised, the researcher is able to show that the proposed study is a logical extension of current knowledge.

In this step a conceptual framework on interprofessional teaching-learning of anatomy at a higher education institution in South Africa was described. All the information gathered from objectives 1-2 as well as a literature control were used to develop and describe the conceptual framework. This research method and results will be discussed in greater detail in Chapter Five, sections 5.3 and 5.4.

2.2.2 PHASE TWO: Practice model development for interprofessional teaching-learning of anatomy

According to Mouton and Marais (1992:145) a model is deliberately used to simplify and abstract and is typified as an “as if” framework. A model is frequently described as a symbolic depiction of reality. It provides a schematic representation of certain relationships among phenomena, and it uses symbols or diagrams to represent an idea. A model helps us to structure the way we can view a situation, event or group of people (Brink, 2006:23). A theory, on the other hand, postulates real relationships between real phenomena or variables and, for this reason, it must be empirically testable. According to Dickoff *et al.* (1968a:415) theory is born in practice, is refined in research, and must return to practice.

In this research the challenge is to facilitate interprofessional teaching-learning of anatomy (practice) and therefore different methods of research are going to be used (see steps 1 and 2 of phase one) to lead to the development of a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa (back to practice).

Step 1 of phase two, which describes a practice model for interprofessional teaching-learning of anatomy was commenced by contextualizing the relational statements within the teaching-learning context of a higher education institution in South Africa by a representation of interrelated structures in a schematic diagram that contributed to the model, which is discussed extensively in Chapter Six.

To meet step 2 of phase two, the model described was evaluated against the theoretical criteria by Chinn and Kramer (2008:234-249), which are discussed under section 2.2.2.2 in this chapter, as well as in Chapter Six, both as to the theoretical criteria and evaluation of the model.

For the development of the practice model reasoning strategies are used that form the foundation to inquiry and are now discussed.

2.2.2.1 Reasoning strategies

The main reasoning strategies used in theory development and construction according to Walker and Avant (2011:66) are induction and deduction. They expand on this perspective by stating that there is no single reasoning strategy that exceeds the other because the manner in which theory develops in practice is an iterative process between deductive and inductive reasoning strategies (Walker & Avant, 2011:67). Chinn and Kramer (2008:212) consider deduction and induction to be forms of logic that portray relational statements between concepts that are formulated. Rossouw (2003:39), Schwandt (2007:147) and Chinn and Kramer (2008:214) regard deductive logic as reasoning from the general to the specific, whereby the starting point embodies two or more concepts that are categorized in relation to one another in broad terms or descriptions with a conclusion that contains specific concepts or data on the relationship. In generating deductive arguments, it begins with a general or universal statement and moves by inference to state a specific case of the argument with a statement that contains specific data in the conclusion.

In describing inductive logic, Rossouw (2003:40), Schwandt (2007:146) and Chinn and Kramer (2008:214) consider inductive logic as reasoning in statements with data that is specific to statements that have broader and general conclusions. Therefore, when reasoning from the specific to the general, the data that emerges in the conclusion can be considered in relation to broader events or phenomena in another similar context or system. It would follow then inductive conclusions are statements may vary from weak to strong in support of data in arguments.

Schwandt (2007:147) and Chinn and Kramer (2008:215) are aligned that deductive logic and inductive logic are used widely either separately or jointly with the qualitative research process of inquiry. In this study, deductive logic was used extensively, particularly with the conclusion statements formed as explained in Chapter Five, sections 5.6.3, 5.7.2, 5.8.3, 5.9.2, 5.10.9 and 5.11.2. This chapter provides a list of empirical data that was generated from the statistical analysis of the teaching-learning feedback questionnaire,

content analysis of the peer group report and portfolio, as well as the electronic interviewing and the conceptual framework. Inductive logic was used in the study in the process of model development and model description.

The essence of reasoning strategies, therefore, irrespective of whether deductive or inductive logic is used, lies in approaching this activity in this research study in a systematic and consistent manner. In doing so, the researcher is able to generate plausible relational statements that would show linkages in the data to arrive at logical deductive or inductive conclusions that embrace the empirical reality. The reasoning strategies used in this research process is outlined in Figure 2.2.

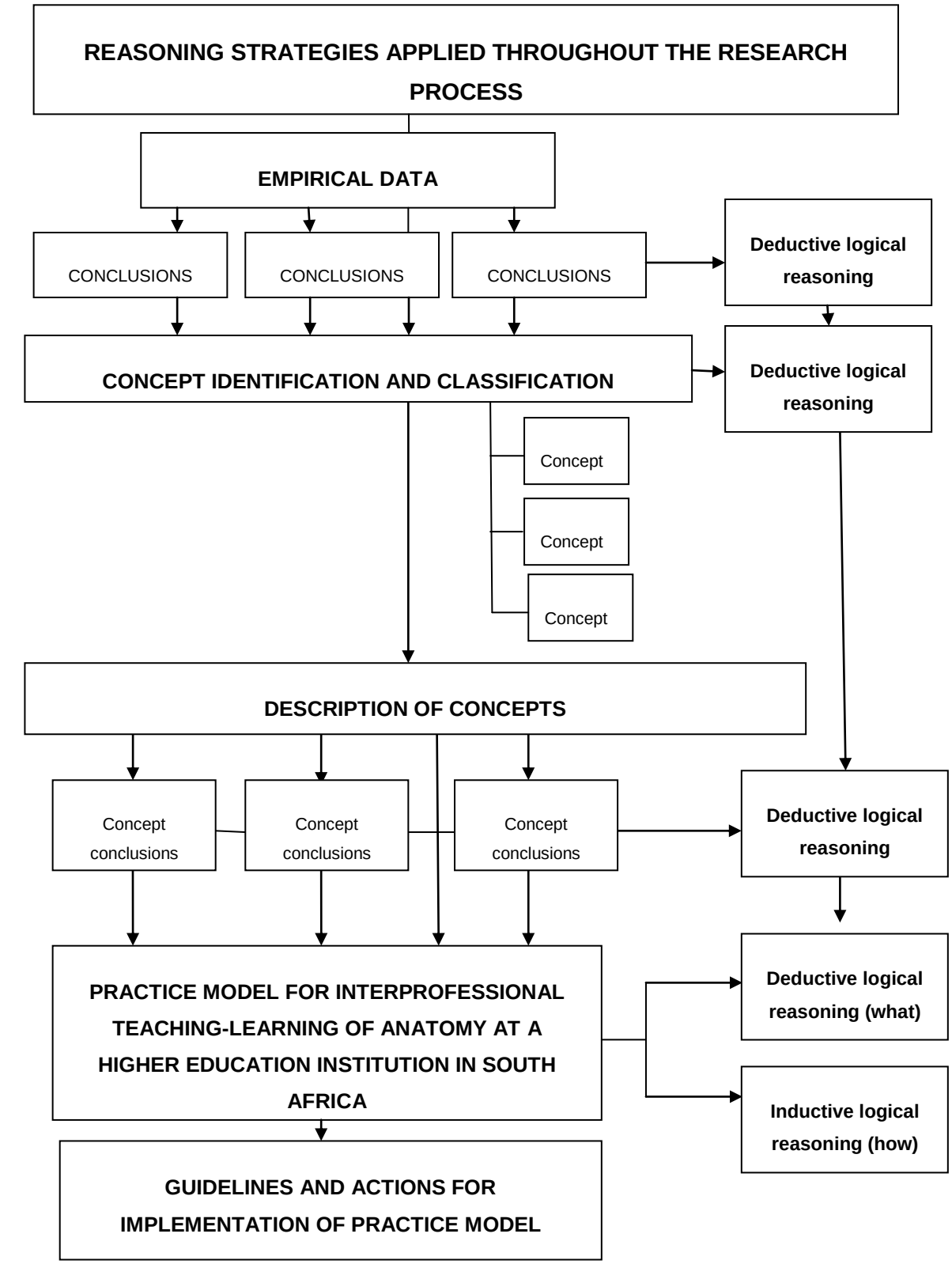


Figure 2.2: Reasoning strategies regarding the empirical research process

2.2.2.2 Evaluation of practice model

Fawcett (2005:53) maintains that the evaluation of a nursing model is accomplished by comparing its content with certain criteria, and indicates that the ultimate aim of credibility of a nursing model is to determine whether the content is appropriate for use in clinical situations and relevant to the clinical population. The evaluation tool that illustrates the array of questions denoting the criteria used by Chinn and Kramer (2008:234) to conduct the evaluation of the model in this research study is provided in Appendix 12.

Chinn and Kramer (2008:234-248) propose five components for use when evaluating a model. These are (i) clarity, which includes semantic and structural clarity, and semantic and structural consistency, (ii) simplicity, (iii) generality, (iv) accessibility, and (v) importance.

2.2.2.2.1 Clarity of the model

Clarity of the model refers to how well the theoretical components and related figures can be understood, and the consistency of the concepts in relation to semantic clarity, semantic consistency, structural clarity and structural consistency (Chinn & Kramer, 2008:238).

a) Semantic clarity

Semantic clarity refers to how understandable and coherent the definitions of concepts are in articulating the established empirical meanings within the theory (Chinn & Kramer, 2008:238). Semantic clarity would convey the essence of meaning so that the reader could envisage a similar empirical reality when the definitions of the concepts are read because they would portray comprehension of both the specific and general features of the described concepts that include the contextual sense of meaning.

b) Semantic consistency

Semantic consistency is a feature of theory wherein the concepts in the theory are used with congruency and harmony with the definitions of the concepts,

the purpose of the theory and in accordance to the stated relationships between the concepts (Chinn & Kramer, 2008:239).

c) Structural clarity

Chinn and Kramer (2008:241) indicate that structural clarity is closely associated with semantic clarity in that it refers to how understandable and coherent the connections and logical reasoning are in relation to the descriptive elements of a theory.

d) Structural consistency

Structural consistency pertains to the various structural forms that are used to illustrate the general profile of the descriptive elements of the theory for the purpose of providing a conceptual map to enhance clarity and comprehension (Chinn & Kramer, 2008:242). In effect, structural consistency can be used as a guide for discussions on structural clarity and consistency and semantic consistency aimed at overall clarity to avoid ambiguity in understanding the model and be useful in stimulating new ideas or discussions in relation to nursing experiences on the basis of the theory.

2.2.2.2.2 Simplicity of the model

The simplicity of the model refers to the number of elements in terms of descriptive aspects in relation to the concepts and interrelationships that should be kept to the lowest level of complexity without loss of core meaning (Chinn & Kramer, 2008:242). The desirability of simplicity or complexity is relative to the contextual situation being portrayed wherein the value of the simplicity or complexity of the theory is embraced by the level of understanding of the various concepts and their interrelatedness within the theory.

2.2.2.2.3 Generality of the model

The generality of the model refers to its breadth of scope and purpose that appraise the broad range of empirical experiences to a range of concepts and interrelated applications in healthcare practice (Chinn & Kramer, 2008:243).

The theory is therefore taken to have ideas that are arranged to facilitate general application to pertinent healthcare professional team members, but has sufficient application to nursing as a discipline while it addresses broad general concepts of individuals, health, environment and society.

2.2.2.2.4 Accessibility of the model

The accessibility criterion expands on the extent of identifying empirical indicators for the concepts in relation to the extent for which the purpose of the theory can be achieved through explanation of an aspect of nursing practice (Chinn & Kramer, 2008:243). Empirical indicators are defined as perceptually accessible experiences that can be used in nursing practice to assess the phenomena that the theory describes and that can be used to determine whether the purposes of the theory are realized in a manner expounded in the theory. The authors assert that increasing the complexity within theories leads to increasing empirical accessibility, and that as subconceptual categories are clarified, the empirical indicators become more precise. However, they qualify this assertion by stating that empirically accessible theories that provide a conceptual perspective on clinical practice may not need an emphasis on empirical accessibility. In specific reference to the latter, Chinn and Kramer (2008:244) point to the purpose of the theory in that if it were to be used to guide research, then empirical accessibility would be essential, whereas if the theory is to shape clinical nursing practice, then the concepts need to be empirically accessible within the clinical setting for which they create conceptual meanings.

2.2.2.2.5 Importance of the model

The criterion on importance of the model is closely linked to the clinical value or practical significance within the targeted area of nursing practice, which is not limited to current applicability but has a futuristic and pragmatic value for contributing towards a desired vision of where the theory is able to lead practice (Chinn & Kramer, 2008:245). The central question that is asked is whether the theory creates understanding that is important to nursing and is

valued on one or more of the following levels as important to nursing as a discipline:

- Guides research and practice in the discipline of nursing.
- Generates radically new ideas of nursing, health, and caring.
- Differentiates the focus or nature of nursing from other service professions.

Innate in the evaluation process on the importance of the model are the professional and personal values in relation to the central question, and the argument of discernment as to whether a theory had achieved its intended professional purposes. The application of the evaluation of the practice model will be further discussed in Chapter Six.

2.3 RIGOUR

Qualitative and quantitative research is guided by four basic epistemological standards (Lincoln & Guba, 1985:290), which are as follows:

- The truth value of the research findings refers to the degree to which the truth of the findings can be trusted.

- Applicability of the research findings refers to the degree to which the research findings can be carried over to a larger population of similar phenomena or a similar context.

- Consistency of the research findings refers to the consistency of the research findings if the research is repeated in the same context with the same participants.

- Neutrality of the research findings refers to the manner in which the research is conducted to eliminate prejudices, interests and individual view.

These four standards and rules guide the researcher to generate valid scientific knowledge. Rigour is the umbrella term used to encompass all strategies, namely trustworthiness, validity and reliability. The rigour of the

whole research study is discussed in Table 2.5, although specific strategies for each objective and step will be cross-referenced back to this chapter.

Table 2.5: Universal standards of trustworthiness, validity and reliability (adapted from Botes, 2003:178; Klopper, 1995:9 and Klopper & Knobloch, 2010:318)

Universal standards	Qualitative approach (trustworthiness)	Quantitative approach (validity and reliability)
Good definitions	**Theoretical validity** is linked to the theoretical meaning or definition of a concept. To ensure the theoretical validity of a concept these processes will be followed: • Concept analysis is a process in which all the core characteristics of a concept are identified and reflected in its definition (Botes, 2003:177; Mouton & Marais, 1996:63; Knobloch, 2007:31). The definition may be theoretical or operational or both (Wilson, 1963). • Conceptualisation is a process of describing the key concepts in the research, as well as the grounding and integration of research within the accepted body of nursing knowledge (Botes, 1995:11-12; Knobloch, 2007:31). Babbie *et al.*(2005:111) define conceptualisation as the process through which we specify what we mean when we use particular terms.	
Truth value is the confidence the researcher has in the accuracy of the findings of a particular inquiry, with reference to the research design, information, participants and the context in which the research was conducted (Lincoln & Guba, 1985:290; Klopper, 2009:17; Knobloch, 2007:31).	**Credibility** of a research study involves carrying out the research in such a way that the believeability of the findings is enhanced and credibility is demonstrated (Polit & Hungler, 1997:304-305). The following techniques will be used to ensure and document the credibility of qualitative research: • **Prolonged engagement:** sufficient time should be invested in the data collection activities, so as to gain an in-depth understanding of the culture, language or views of the participants, and to allow the researcher to test for misconceptions and misinformation. Prolonged engagement is the precondition for building trust and rapport with participants (Polit & Hungler, 1997:305; Botes, 2003:180). Prolonged engagement implies that the researcher stays in the field until data saturation occurs (Babbie *et al.,* 2005:277). The researcher has been collecting data since 2005 for this research study. • **Persistent observation:** this means consistently pursuing interpretations in different ways (Babbie *et al.,* 2005:277). It is a process where the researcher focuses on characteristics or aspects of a situation or conversation that are relevant to the phenomena being studied, so as to provide more depth to the description (Polit & Hungler, 1997:305). The researcher are using different data	**Internal validity** is the extent to which the effects detected in the research study are a true reflection of the construct being studied. The most important threats the researcher will consider and try to control are history, maturation, testing, instrumentation, selection bias, mortality and demoralisation. In this research study the history, maturation, testing, mortality and demoralisation were not applicable. For objective one the teaching-learning feedback questionnaire used by the higher education institute has never been tested before. The NWU's Statistical Consultation Services used a confirmatory factor analysis to validate the questionnaire and Cronbach's Alpha was used to check the reliability of the scale. For objective one the researcher used all inclusive sampling that included the students who attended the anatomy class on the day on which the teaching-learning feedback questionnaire was completed.

Universal standards	Qualitative approach (trustworthiness)	Quantitative approach (validity and reliability)
	collection methods like electronic interviews, questionnaires and peer review report document for this research study. • **Triangulation:** a combination of multiple methods is used in a study of a phenomenon to portray it more accurately. There are different types of triangulation, including the triangulation of multiple data sources, multiple methods of data collection, multiple investigators, multiple perspectives to interpret a single set of data and multiple methods of data analysis (Polit & Hungler, 1997:305; Botes 2003:181). As already discussed previously the researcher used different data collection methods and embedded knowledge/literature to develop the practice model for interprofessional teaching-learning of anatomy. • **Peer debriefing:** objective peers who are experts (colleagues or similar status) in either the method or the phenomenon being studied (or both), review and explore various aspects of the research process and expose the researcher to searching questions (Polit & Hungler, 1997:305; Botes, 2003:181). The researcher will use a peer group review document to evaluate the teaching-learning approach of the researcher and the researcher is also accompanied by a promoter who is an expert in research.	
Applicability is the extent to which research findings of a particular inquiry can be transferred to other contexts and settings, and the capacity to generalise from the finding to larger populations (Lincoln & Guba, 1985:297; Sliep *et al.,* 2001:69; Klopper, 2009:17; Knobloch, 2007:33).	**Transferability** refers to the generalisability of the data as well as the transferability of the practice model to other contexts (higher education institutions). In qualitative research the focus is on the quality of information obtained from the participant, situation or event, rather than the size of the sample. The depth and richness of the information provided allows for inductive generalisation from the sample to the target population (Botes, 2003:181; Burns & Grove, 2005:358). To ensure transferability the following techniques will be used: • **Saturation of data:** the number of participants is determined by the depth of information needed to gain insight into a phenomenon, describe a cultural element, develop a theory or describe a historical event. Saturation of data occurs when additional sampling provides no new information, and when themes elicited become redundant	**External validity** is concerned with the extent to which study findings can be generalised to other populations and other settings or contexts. To ensure external validity the researcher must consider and try to control the following threats, e.g. selection effects, reactive effects and researcher effects. In this research study the following threats were not applicable, namely reactive effects and researcher effects.

Universal standards	Qualitative approach (trustworthiness)	Quantitative approach (validity and reliability)
	and repetitive (Burns & Grove, 2005:358). In this research study for objective two the email interviews stop when the research question is answered: for example, consensus is reached, theoretical saturation is achieved, and sufficient information has been exchanged. • **Thick description:** the researcher provides a thorough in-depth description of the research context, transactions and processes observed during the inquiry, so as to provide another researcher with sufficient information to evaluate contextual similarity (Polit & Hungler, 1997:308). In this research study this will be done throughout by reporting all data collection and data analyses as well as findings and conclusions reached. • **Purposive sampling:** Deliberately selecting locations and participants that differ from one another. In this research study purposive sampling was constantly used in objectives one and two when sampling the participants, e.g. interprofessionals' perceptions of teaching-learning approach to anatomy and importance of anatomy for clinical practice, as well as peer group reviewers to evaluate the researcher's teaching-learning approach of anatomy.	
Consistency is the ability to reproduce the study with the same population in a similar context and yield the same or comparable results (Sliep *et al.,* 2001:69; Klopper, 2009:17; Knobloch, 2007:34).	**Dependability** refers to the stability of data over time and conditions. All the techniques that apply to the strategy of credibility, namely prolonged engagement, persistent observation, triangulation, peer debriefing, member checks and negative case analysis, all indirectly impact on the strategy of dependability. In addition, the following techniques directly impact on the strategy of dependability: • **Stepwise replication:** in this research study a step by step account was given on the whole research process, findings and conclusions. • **Inquiry audit:** an external reviewer evaluates the raw data (documents, interview notes), data reduction and analysis products, process notes and a running account of the process of inquiry, material relating to intentions and dispositions, instrument development information and data reconstruction products. This allows the dependability of	**Reliability** of a measure denotes the consistency of results obtained in the use of a particular instrument repeatedly over time on the same person (Burns & Grove, 2005:374; Brink, 2006:163-164). Researchers need instruments that are reliable, as they provide values with minimal random error and allow the researcher to detect true differences and relationships occurring in the population under study. Reliability testing focuses on the following aspects of reliability, e.g. stability, equivalence and homogeneity. As already stated under internal validity for objective one the teaching-learning feedback questionnaire used by the higher education institute has never been tested before. The NWU's Statistical Consultation Services used a confirmatory factor analysis to validate the questionnaire and Cronbach's Alpha was used to check the reliability of the scale.

Universal standards	Qualitative approach (trustworthiness)	Quantitative approach (validity and reliability)
	the data (Polit & Hungler, 1997:307; Babbie *et al.,* 2005:278). In this research study the researcher is accompanied by a promoter experienced in research and will also use a co-coder to analyse all data gathered during the research process.	
Neutrality is described as the application of impartiality in the collection, analysis and interpretation of data that are based singularly on the selected population to ensure the absence of personal biases, interests or perspectives of the researcher (Sliep *et al.,* 2001:70; Lincoln & Guba, 1985:300; Klopper, 2009:17; Knobloch, 2007:34).	**Confirmability** focuses on the characteristics of the data. The techniques used to ensure the confirmability of the data are the inquiry audit and triangulation, both already discussed under credibility and dependability.	**Objectivity** focuses on the characteristics of both the researcher and the data. The researcher aims to collect and analyse data objectively, by remaining separate and handling subjects from a real distance (Brink, 2006:13). Babbie *et al.* (2005:278) state that confirmability is the degree to which the findings are the product of the focus of the inquiry (and not the researcher) and they refer to the confirmability audit trail that was already discussed under dependability.
Logic	**Inferential validity** - an inference is defined as the logical conclusion or general truth that a researcher arrives at from the statements. The term inferential validity can thus be described as the evaluation of the legitimacy and relevance of the statements through to the conclusions (Mouton & Marais, 1996:106-107; Knobloch, 2007:32). This will be done throughout the research study by describing the whole research process in depth.	

2.4 SUMMARY

In Chapter Two the research methodology was discussed in detail. The results of the first objective, e.g. to explore and describe the interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy will be discussed in Chapter Three.

CHAPTER 3

INTERPROFESSIONAL STUDENTS' AND PEER GROUP'S OPINIONS ON THE TEACHING-LEARNING APPROACH TO ANATOMY

(Phase One: Step 1)

3.1 INTRODUCTION

In Chapters Three, Four and Five, phase one (concept identification, description and definition) of the development of the model is discussed. In Chapters Three and Four step 1 of phase one (to identify main and related concepts) is discussed and in Chapter Five step 2 of phase one (concept descriptions and definitions) is discussed.

The research method, including population and sampling, data collection, data analysis as well as rigour and the research findings of the following objective are addressed in this chapter:

Objective one: Interprofessional students' (IPS) (population 1) and peer group's (PG) (population 2) opinions on the teaching-learning approach to anatomy.

3.2 RESEARCH DESIGN

The research design for the entire research study was discussed in Chapter One (see 1.6) and Chapter Two (see 2.1.1-2.1.5). The design is descriptive in nature to explore and describe interprofessional opinions on the teaching-learning approach of anatomy by means of a questionnaire for IPS and peer review reports for PG.

3.3 RESEARCH METHOD OF IPS

The discussion of the research method in this chapter includes the population and sampling, data collection as well as the data analysis of step 1 of phase one.

As already explained in Chapter Two (refer to 2.1.2), retrospective, longitudinal quantitative research design (Brink, 2006:13; Mouton & Marais, 1996:159) was utilised to explain the teaching-learning approach of the anatomy educator in the context (Burns & Grove, 2009:571) of a higher education institute in South Africa.

3.3.1 Population and sampling of IPS

Refer back to Chapter 2, section 2.2.1.1.1 b for the discussion on the population and sampling of IPS.

3.3.2 Data collection of IPS

The teaching-learning feedback questionnaire was developed by the university's academic support services in May 1990 and was revised in January 2004. The questionnaire consists of sections A to D. Section A was used and includes 24 questions with four sections. The four sections are study material (questions 1-3), presentation (questions 4-13), assessment (questions 14-18) and general (questions 19-24). Sections B-D were not used as they assess the content of the module and questions about best and worst characteristics of the educator where the answers will be in a narrative format (refer to Appendix 3). A shortened questionnaire was developed by the university's academic support services with fifteen questions (refer to Appendix 4) picked from the original questionnaire of 24 questions and used from 2007-2008. Only the fifteen questions that were developed from the 24 questions-questionnaire were withdrawn and evaluated for the period 2005-2008.

Both questionnaires contained closed ended questions to be answered according to a nominal scale divided into five categories: 1 = do not agree at all; 2 = do not agree; 3 = neutral; 4 = agree and 5 = agree completely (refer to table 3.3). Students that were registered for ANAB111, ANAM111 and ANAS121 participated in data collection. Students' evaluation of the teaching-learning approach between small (ANAB111) and large class groups (ANAM111 and ANAS121) during 2005-2008 were compared. Of the 922 registered students that attended the anatomy lectures over the four-year

period, 552 students completed the questionnaire sufficiently for the process of statistical analysis (n=552).

3.3.3 Data analysis of IPS

Statistical analysis of the questionnaires was conducted by the NWU's Statistical Consultation Services through the SPSS Programme™ and the R statistical package version 2.13. A confirmatory factor analysis was done to validate the questionnaire. Cronbach's Alpha was utilised to investigate the reliability of the scale. Effect sizes for means (Cohen's d-values) were used to compare the difference between the two anatomy modules over one year. Graphical representation was presented in the form of graphs, barplots and histograms for the small and large groups' anatomy modules to assess in the interpretation of results.

3.3.4 Hypothesis

A hypothesis is a statement of the predicted relationship between two or more variables. A null hypothesis, also referred to as a statistical hypothesis, is used for statistical testing and interpreting statistical outcomes. It states that no difference between groups or correlation between variables exists. A research hypothesis is the alternative to the null hypothesis. It states that a difference or correlation does exist (Brink, 1996:93 and 210). The

researcher's research hypothesis is:

- The students of a large group will evaluate the teaching-learning feedback of the anatomy educator more negatively as compared to a small group. [$H_A : \mu_1 \neq \mu_2$].

The null hypothesis is:

- There will be no difference between the students of a large group evaluation on the teaching-learning feedback of the anatomy educator as compared to a small group. [$H_0 : \mu_1 = \mu_2$].

3.3.5 Results for IPS

A confirmatory factor analysis was used to validate the questionnaires and Cronbach's Alpha was used to check the reliability of our scale. T-tests were used to determine the differences between the two groups (large and small groups) for a specific year. Cohen's d value was also calculated to compare the two groups.

A confirmatory factor analysis was done on the questionnaire. The factor analysis was based on the correlation matrix. Kaiser's method was used to identify how many factors should be abstracted. This method withdraws factors with an eigenvalue greater than 1 (Field, 2005:633). The number of factors extracted was one and the cumulative percentage variance was 58.59%, as outlined in Table 3.1.

Table 3.1: Factor analysis

	Eigenvalues **Extraction: Principal components**			
Value	**Eigenvalue**	**% Total variance**	**Cumulative Eigenvalue**	**Cumulative %**
1	8.788793	58.59195	8.788793	58.59195

Only one factor was extracted for the educator's teaching-learning approach. Enough total variance was explained by the one factor. These communalities (as shown in table 3.2) varied between 0.51 and 0.70 and that is enough variance to explain each question. Thus, based on the factor analysis, the questionnaire is shown to be valid.

In Table 3.2 the communalities of each question are explained.

Table 3.2: Communalities

Variable	Communalities Extraction: Principal components Rotation: Unrotated	
	From 1 factor	Multiple R-Square
Q1	0.610896	0.608636
Q2	0.643931	0.622187
Q3	0.695094	0.661531
Q4	0.637827	0.596068
Q5	0.581488	0.590887
Q6	0.564227	0.591261
Q7	0.643391	0.656700
Q8	0.531325	0.527078
Q9	0.544653	0.539594
Q10	0.564043	0.566600
Q11	0.556685	0.555663
Q12	0.599800	0.570862
Q13	0.515311	0.526279
Q14	0.537882	0.549092
Q15	0.562239	0.536035

The factor scores were visualized using histograms, where the probability density was plotted on the y-axis, so that the histogram had a total area of one. These histograms have been plotted for each group-year combination and were presented in Figure 3.1:

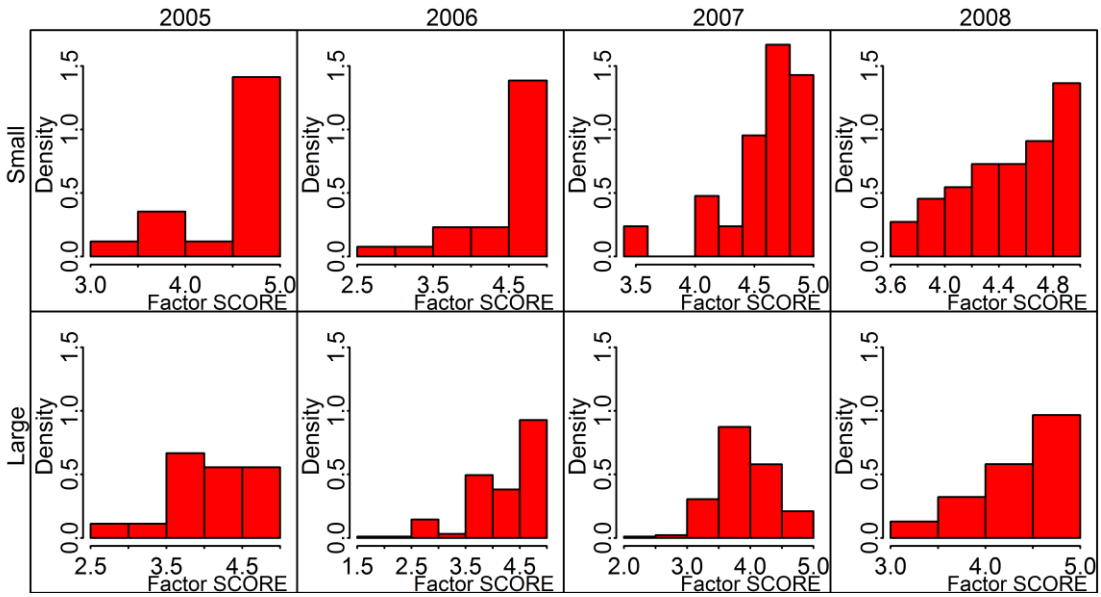


Figure 3.1: Histograms of the factor scores for each group-year combination

In addition, the researcher also presented some of the individual variables that were used to construct the factor scores. These variables were presented using relative barplots and were given in Figures 3.2, 3.3 and 3.4 for Question 6 (Q6), Question 7 (Q7), and Question 12 (Q12) respectively.

The following sliding scale (Table 3.3) was used in the questionnaire as discussed under 3.3.2, e.g.

Table 3.3: Sliding scale

1	2	3	4	5
Do not agree at all	**Do not agree**	**Neutral**	**Agree**	**Agree completely**

Certain questions displayed no significant differences between the two groups and these were not discussed. The questions that showed graphical differences between the two groups' responses, were:

The differences in the responses to question 6: **"***During contact sessions the educator makes effective use of appropriate support media, such as the*

writing board/ transparencies/ slides/ powerpoint presentations/ internet applications/ hand-outs/ videos etc" were indicated in Figure 3.2:

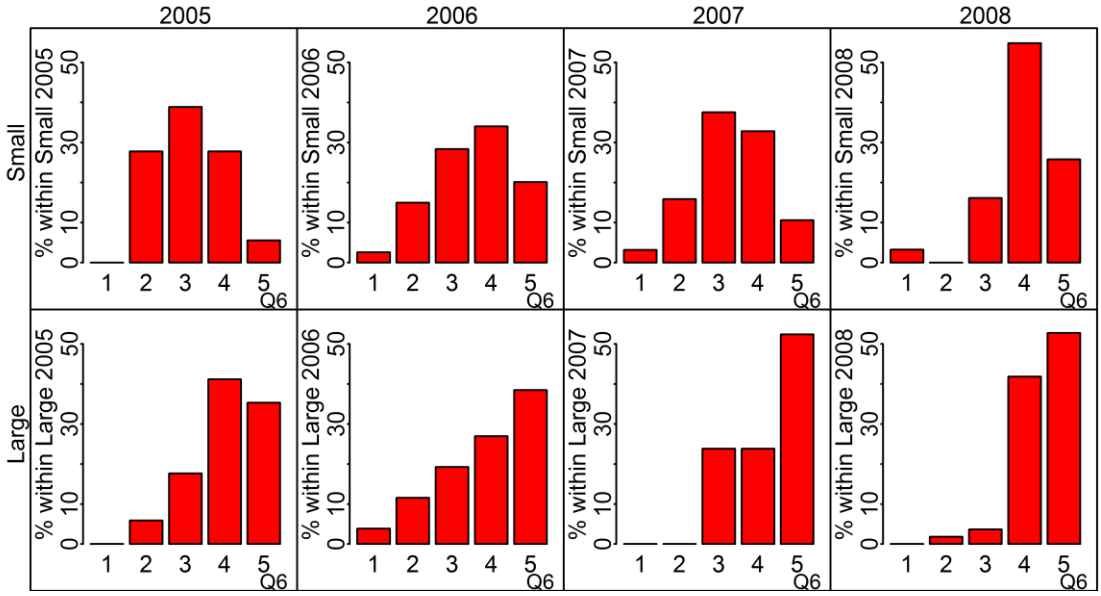


Figure 3.2: Bar plot for Question 6

The differences in the responses to question 7*: "The educator uses a variety of teaching and learning methods, for example group work, role play, problem solving, seminars, questions-and-answers, short lectures etc., and in this manner makes provision for students' preferential learning style, abilities and needs"* were indicated in Figure 3.3:

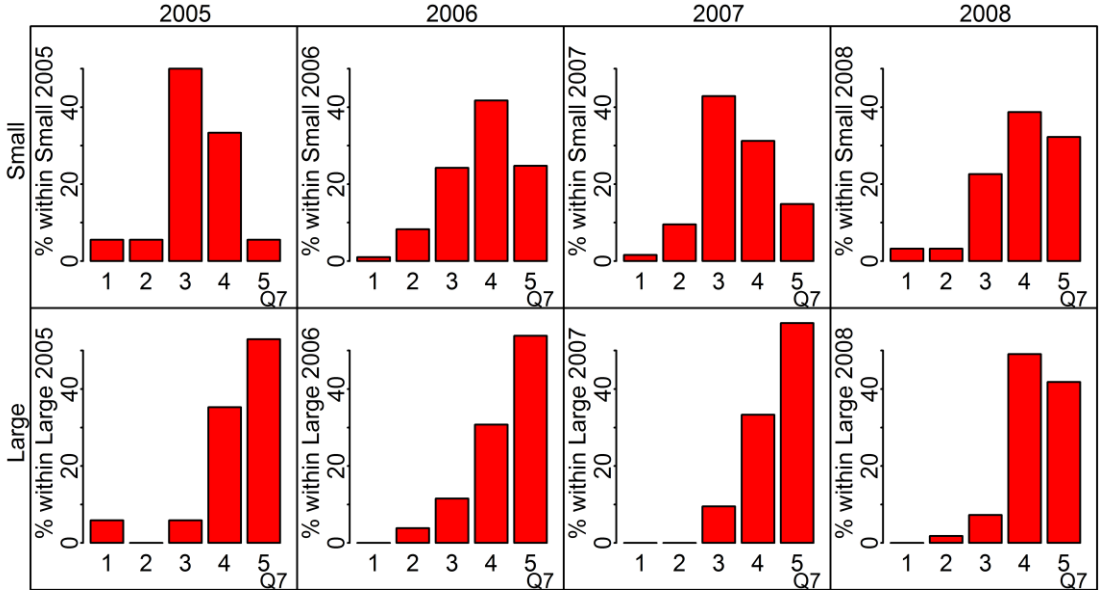


Figure 3.3: Bar plot for Question 7

The differences in the responses to question 12: *"The educator gives purposeful feedback regarding tests and assignments and this contributes towards converting assessment opportunities into learning opportunities"* were indicated in Figure 3.4:

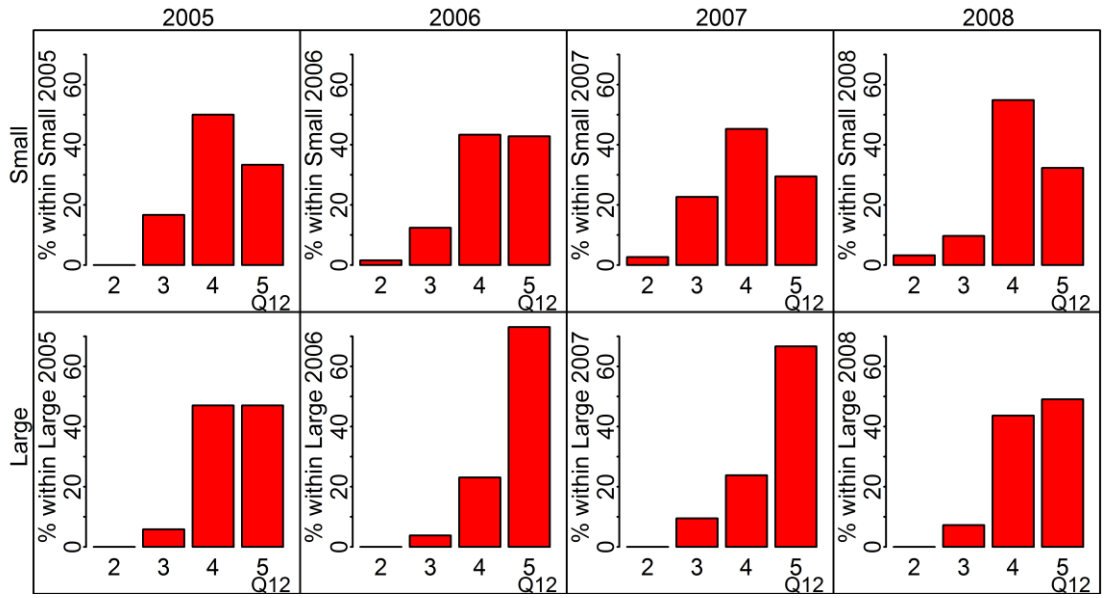


Figure 3.4: Bar plot for Question 12

We conclude that there is a difference in how students, from the large group compared to the small group, evaluated the educator, expecially on the above three identified questions. There were also differences over years between the two groups and in the researcher's opinion, possible reasons for the differences could be that the small group (refer to Table 1.1) consisted exclusive of nursing students, thus students who belong to one profession. Group work is more possible in small group classes as it includes 20-30 students. During practical classes the small group's students work in groups that include four to six students per group. The anatomy educator used more group discussions and a question-answer approach in the theoretical classes.

The large group (refer to Table 1.1) classes included biokinetics, psychology and dietetics students. This implied that three different professions had to be accommodated. It was more difficult to work in groups as there were usually between 200-250 students in class. For practical classes the large group modules were also divided into four smaller groups of 50-60 students per

practical class, and the large group students then divided themselves into even smaller groups of five to eight students per group. Literature (Smith, 2000:24; Cantillon, 2003:437) also emphasizes that more formal lecturers are used as it makes the class more controllable. The anatomy educator used a question-answer approach in theoretical classes to control the large group effectively.

The next section explores the reliability of the scale using Cronbach's Alpha. Reliability means that a scale should consistently show the construct that it measures. Good reliability implies that a respondent should achieve the same score on a questionnaire if it is completed at two different times (Field, 2005:666). Table 3.4 contains a summary of the questionnaire's reliability measures.

Table 3.4: Cronbach's Alpha

Summary for scale:

- Means = 63.6951
- Std.Dv. = 8.75556 Va
- Cronbach alpha: 0.95
- Standardized alpha: 0.95
- Average inter-item corr.: .557944

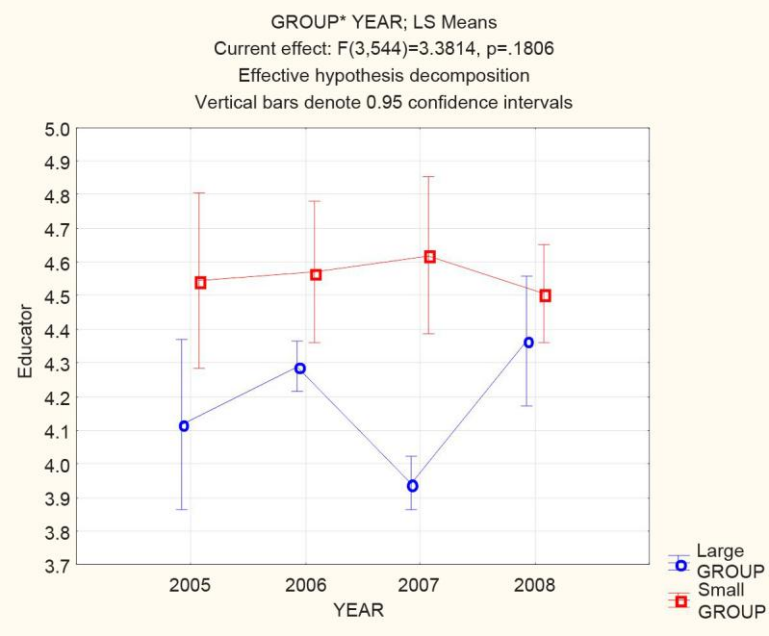
According to Field (2005:668) values of 0.7-0.8 are acceptable values. The value of 0.95 is viewed as reliable, as depicted in Table 3.4.

The two-way ANOVA on the effectiveness of educator's teaching-learning approach as experienced in different anatomy modules, and over different years is explained in Table 3.5.

Table 3.5: Two-way ANOVA

Effect	Univariate Tests of Significance Sigma-restricted parameterization Effective hypothesis decomposition				
	SS	Degree of freedom	MS	F	p
Intercept	4675.921	1	4675.921	15768.51	0.000000
Group	8.874	1	8.874	29.93	0.000000
Year	1.291	3	0.430	1.45	0.226888
Group*Year	3.008	3	1.003	3.38	0.018064
Error	161.315	544	0.297		

The following error plot (Graph 3.1) is included to illustrate the difference in the two groups:



Graph 3.1: Error plot to illustrate difference between small and large groups

After the analysis, the statistics is used to investigate the mean effectiveness value of each group for each year, as outlined in Table 3.6.

Table 3.6: Mean value and effect size (Cohen's d)

Group* Year; LS Means **Current effect: F(3,544) = 3.3814, p=.01806** **Effective hypothesis decomposition**									
Year	**Group**	**N**	**Mean**	**Std.Err.**	**Group**	**N**	**Mean**	**Std.Err.**	**Effect size (Cohen's d)**
2005	**large**	18	4.118519	0.128352	**Small**	17	4.545098	0.132073	0.78 (large effect)
2006	**large**	194	4.290034	0.039096	**Small**	26	4.569231	0.106795	0.51 (medium effect)
2007	**large**	190	3.943435	0.039506	**Small**	21	4.618594	0.118831	1.24 (large effect)
2008	**large**	31	4.364445	0.097804	**Small**	55	4.506320	0.073427	0.26 (small effect)

It can be concluded from the above table and Graph 3.1 that there was a small difference between the two groups over the four years, but there was a significant difference in the large group's evaluation in 2007 compared to the other three years of the same group. The reason for this could be that the educator changed the textbook and study guide for this group in 2007.

Since the researcher used all-inclusive sampling no classical statistical inference could be done. The data should be considered as small populations for which statistical inference and p-values are not relevant (Ellis & Steyn, 2003:51-52). Therefore, effect sizes for means (Cohen's d) were used and will be discussed. Cohen's formula that was used for this study is outlined in Table 3.7.

Table 3.7: Cohen's formula

Test	Conditions	Effect size
z or t	Population SD's σ_1 and σ_2 not necessarily equal. Take $s_{\max}$ = maximum of s_1 and s_2, the sample SD's.	$d = \frac{\lvert \bar{X}_1 - \bar{X}_2 \rvert}{s_{\max}}$

The following scale is used for interpretation, e.g. (a) small effect: d=0.2, (b) medium effect: d=0.5 and (c) large effect: d=0.8. The effect sizes were calculated by using the descriptive statistics described in Table 3.7. The effect sizes are presented in Table 3.6. The factor analysis and the above analysis of the effect size revealed that there are differences between the two groups' (large and small groups) feedback on the educator's teaching-learning approach.

3.3.6 Conclusion on results for IPS

As previously stated the researcher's research hypothesis was:

- The students of a large group will evaluate the teaching-learning feedback of the anatomy educator more negatively as compared to a small group. [$H_A : \mu_1 \neq \mu_2$].

Out of the above results it can be concluded that the researcher's research hypothesis proved to be correct (refer to Graph 3.1).

It can also be concluded that:

- The educator needs to make use of appropriate support media, such as the writing board, transparencies/ slides, power point presentations, internet applications, hand-outs and videos.
- The educator needs to use a variety of teaching-learning methods, for example group work, role play, problem solving, seminars, questions-

and-answers and short lectures, and in this manner make provision for students' preferential learning styles, abilities and needs.

- The educator needs to give purposeful feedback regarding tests and assignments so this contributes towards converting assessment opportunities into learning opportunities.

3.4 RESEARCH METHOD OF PG

As already stated in Chapter Two a peer review is where guidelines are given to two or more reviewers to review a document or action (Burns & Grove, 2009:590). In this research study the teaching-learning approach of an educator was reviewed.

3.4.1 Population and sampling of PG

Refer to section 2.2.1.1.1 f in Chapter Two where the population and sampling of PG was discussed in detail.

3.4.2 Data collection of PG

As already stated in section 2.2.1.1.1 g in Chapter Two an already developed peer review report document (see Appendices 5 and 6) and portfolio (see Appendix 7) were used and given to the peer reviewers (evaluation panel) to review the educator's teaching-learning approach.

The instrument used to evaluate the contact sessions consisted of five categories, namely category 1: course of teaching-learning; category 2: integration of education principles; category 3: appropriateness and variety of teaching-learning methods; category 4: preparation and use of teaching media; and category 5: teaching communication. The report compiled after each evaluation of the contact session consists of five parts, namely part 1: strong points; part 2: general comments during introduction, development and conclusion of teaching; part 3: development areas; part 4: general impressions; and part 5: team members of the evaluation panel. This instrument had a sliding scale of 1 to 5, where 1 = poor and 5 = excellent for the above mentioned five parts and also space for additional remarks (see

Appendices 5 and 6). One announced and two unannounced contact sessions were evaluated.

The instrument used for assessment of the teaching portfolio compiled by the educator, consisted of seven categories with their own weight attached. These were category 1: student evaluation of teaching (weight = 20); category 2: peer evaluation (weight = 20); category 3: study guides and study material (weight = 15); category 4: assessment (weight = 15); category 5: suitable choice and use of teaching media (weight = 5); category 6: variation in effective teaching-learning strategies (weight = 10); category 7: other innovative contributions in the teaching-learning environment (weight = 15); and also summative discussion (see Appendix 7). The portfolio was handed in at a certain date and evaluated according to the above instrument.

3.4.3 Data analysis of PG

Three contact session reports, as well as a report on the portfolio the educator compiled, were compiled by the ITEA team and given to the educator as feedback. Only two of the contact session reports were used for data analysis, because as already stated in Chapter Two, the evaluation was conducted on two different modules in the second semester of 2007. Only two of the three contact session reports were on the anatomy module facilitated in that period and the objective of this part of data analysis was the peer group's opinions on the teaching-learning approach to anatomy (refer to Appendix 10).

Content analysis was used to analyse data. Analysis entails grouping similar themes together. Tesch's eight steps of data analysis were utilised in this study (Creswell, 1994:155). The process was:

1. The researcher read carefully through all evaluation reports to get a sense of the whole.

2. The shortest interesting report was read and analysed.

3. Words, phrases, statements that were related to “teaching-learning approach of the educator”, were underlined and written as the potential topics.

4. A list of all topics was made and similar topics were clustered together and arranged into major topics, unique topics and leftover topics.

5. Now this list was taken and the researcher went back to the remaining reports. Topics arrived at in step four were abbreviated as codes and the codes were written next to appropriate segments of the texts in the remaining reports.

6. The most descriptive wording for the topics was found, turning topics into categories. Topics that related to one another were grouped together and lines were drawn between categories to show interrelationships in order to refine the categories further.

7. The data material belonging to each category was assembled as verification of categories. This data material is presented as quotes from reports as part of the discussion of the findings in this chapter.

8. An interpretation of the meaning of the data was made and is presented as the discussion of the findings in this chapter.

A nursing educator who is also experienced in qualitative research was appointed as an independent co-coder (refer to Appendix 9) to analyse the data. After the co-coder and the researcher had analysed the data independently, a meeting was scheduled and consensus was reached on the themes and sub-themes that emerged from the data. These themes and sub-themes are described in detail in Table 3.8.

3.4.4 Results for PG

The themes identified from data analysis, are outlined in Table 3.8.

Table 3.8: Results of PG evaluation of the educator's teaching-learning approach of anatomy

THEME 1: COURSE OF TEACHING-LEARNING	THEME 2: INTEGRATION OF EDUCATION PRINCIPLES	THEME 3: APPROPRIATENESS AND VARIETY OF TEACHING-LEARNING METHODS	THEME 4: PREPARATION AND USE OF TEACHING MEDIA	THEME 5: TEACHING COMMUNICATION	THEME 6: PORTFOLIO
Sub-theme 1.1: Introduction: • Structure of session • Outcomes of session **Sub-theme 1.2: Development:** • Answering of questions • Refer back to outcomes • Use of study material • Group work • Media used • Communication of content • Evaluation of knowledge **Subtheme 1.3: Conclusion:** • Summary of session • Evaluation of session Assignments for next contact session	• Purposefulness • Planning • Level of presentation • Individualisation • Learner self-activity • Examples/practical application • Self-assessment opportunities • Group work and/or interaction • Comprehensive view • Assessment	• Appropriateness • Variety	• Planning • Applicability/effectiveness • Readability	• Verbal • Non-verbal	**Sub-theme 6.1: Student evaluation of teaching** • Relationship **Sub-theme 6.2: Peer evaluation** • See comments under columns 1-4 of this table. **Sub-theme 6.3: Study guides and study material** • Application of anatomy knowledge • More detail on group work and different types of assessments • Module outcomes and emphasis on factual knowledge **Sub-theme 6.4: Assessment** • Achievements of student high • Emphasis on knowledge reproduction • Comments of internal

					moderator **Sub-theme 6.5: Suitable choice and use of teaching media** • Preparation of transparencies and powerpoint presentations • Computer program used • Videos **Sub-theme 6.6: Variation in effective teaching-learning strategies** • Focus on knowledge outcomes • Study guide unclear on groupwork • Role of ADAM in practical sessions **Sub-theme 6.7: Other innovative contributions in the teaching-learning environment** • E-fundi **Sub-theme 6.8: Summative** • Teaching load of educator • Relationship • Use of technology

3.4.5 Discussion of the results for PG

Each of the themes with their sub-themes identified in Table 3.8 will now be discussed in detail.

3.4.5.1 Theme 1: Course of teaching-learning

Theme 1 identified was on the course of teaching-learning during a contact session. The theme with its sub-themes are outlined in Table 3.9:

Table 3.9: Theme 1 with its sub-themes identified

THEME 1	SUB-THEMES
Course of teaching-learning	1.1 Introduction 1.2 Development 1.3 Conclusion

Conducting effective lessons is at the heart of the educator's craft. Effective lessons use many teaching methods (Slavin, 2012:184). Ehlers (2002:9) explains that the educator's task is to design the lesson so that the information can be applied in practice. Knowledge must be applied to action of daily living to have any effect on the health of a person, a family or a community. When planning a lesson, the educator must aim to involve all the students in the learning process and to deal with individual differences. Find out what the students know and believe, and combine their existing knowledge with the new information (Ehlers, 2002:9).

As indicated in Table 3.9, three sub-themes were identified under theme 1. These were introduction, development and conclusion as the process used during a contact session. The first step in presenting a lesson is planning it in such a way that the reasons for teaching-learning the lesson is clear. Setting out objectives/outcomes at the beginning of the lesson is an essential step in providing a framework into which information, instructional materials, and learning activities will fit (Slavin, 2012:188).

In support of the literature above, the ITEA evaluation panel said:

> *"Give the structure of what is planned, but work according to text book, not according to outcomes that must be reached."*

Killen (2007:124-129), Ehlers (2002:12-15) and Slavin (2012:188-201) explain the development phase of a lesson as: begin each lesson with a short statement of the outcomes that students are to achieve and provide a brief overview of the lesson; briefly review prerequisite learning at the start of each lesson; present new material in small steps, with guided student practice and corrective feedback after each step; give clear and detailed instructions and explanations; provide a high level of active, independent practice for all students; ask a large number of questions, check for student understanding, and obtain responses from all students; provide explicit instruction for group work exercises, and, where possible, monitor and help students during group work; give students homework to reinforce their learning; and periodically (weekly and monthly) review and test student learning.

In support of the literature above, the ITEA evaluation panel said:

> *"Did not refer back to the outcomes given in beginning of class."*
>
> *"Purpose of group work not clear."*
>
> *"Too much speaking between students – disorganised."*
>
> *"Throughout made sure students understand work and refer back to previous learning/knowledge."*

The summary at the end of the lesson means that the content of the lesson is restated "in a nutshell". This should not take longer than five minutes. The summary can also form part of the evaluation (testing) process, involving the class in a step-by-step summary of the lesson by asking questions (Ehlers, 2002:15). Ehlers (2002:15) also explains that the purpose of evaluation at the end of a lesson is to find out whether the learning outcomes provided at the beginning of the lesson have been realised. Students should be encouraged

to evaluate the lesson content and the presentation. They can specify which new facts they have learned, which aspects of the presentation they enjoyed, and which ones they did not like.

In support of the literature above, the ITEA evaluation panel said:

> *"A general question of 'are you happy?' has no meaning when you want to know if students reached the outcomes."*

Conclusion with regard to theme 1: course of teaching-learning

- The educator uses different phases, with their own teaching-learning methods and media, during the teaching-learning process.

3.4.5.2 Theme 2: Integration of education principles

Theme 2 identified was on the integration of education principles, e.g. purposefulness, planning, level of presentation, individualisation, learner self-activity, examples/practical application, self-assessment opportunities, group work and/or interaction, comprehensive view and assessment.

Carl (2000:31) explains that where education must be effective and where learning must take place, there is unanimity that those activities which may promote learning must be well planned. Killen (2007:70) states that what students learn is important, but how they learn is also important because their learning experiences will directly influence their motivation and their future learning strategies. Therefore, the educator has a responsibility to make every lesson a positive and productive learning experience for all students. Killen (2007:71) and Slavin (2012:188) further explain that lesson planning plays a key part in teaching well. Lesson planning is a procedure that includes stating learning objectives such as what the students should know or be able to do after the lesson; what information, activities, and experiences the educator will provide; how much time will be needed to reach the objective; what books,

materials, and media support the educator will provide; and what instructional method/s and participation structure will be used.

In support of the literature above, the ITEA evaluation panel said:

> *"The educator had a good relationship with students and with relative big class, know most of students names."*
> *"The educator is well prepared, knowledgable and enthusiastic."*

Conclusion for theme 2: integration of education principles

- Planning of a lesson is one of the crucial parts of an educator's teaching-learning approach and includes using innovative ideas and media to keep the students' attention and for them to be able to retain new knowledge.

3.4.5.3 Theme 3: Appropriateness and variety of teaching-learning methods

Theme 3 identified was on the appropriateness and variety of teaching-learning methods used during contact sessions. Ehlers (2002:4-5) explains that different students learn in different ways. Some students like listening and remember what they hear. Other fall asleep when they listen to an educator and forget everything that has been said. Most students remember what they see at the movies, on television and in real life. However, educators and students cannot wait for things to happen in real life before teaching-learning about them. Therefore it is so important to use different teaching-learning methods and media to teach health care workers.

In support of the literature above, the ITEA evaluation panel stated:

> *"Good to use models for teaching, but outdated. Use of more recent technology available."*

"The educator showed innovation by using a video for one of the contact sessions."

Conclusion for theme 3: appropriateness and variety of teaching-learning methods

- All students are different and this individualism must be considered when planning a lesson and using different teaching-learning methods and media for effective teaching-learning to take place.

3.4.5.4 Theme 4: Preparation and use of teaching media

Theme 4 identified was on the preparation and use of teaching media and included planning, applicability/effectiveness and readability of the teaching media used during a contact session.

As explained under 3.4.5.1 Killen (2007:71) and Slavin (2012:188) stated that lesson planning plays a key part in teaching well. Lesson planning is a procedure that includes stating learning objectives such as what the students should know or be able to do after the lesson; what information, activities, and experiences the educator will provide; how much time will be needed to reach the objective; what books, materials, and media support the educator will provide; and what instructional method/s and participation structure will be used.

In supporting the literature above, the ITEA evaluation panel stated:

"Lively class but too much concentrated on factual knowledge."

"Idea was good, but must be planned in finer detail and more structure use."

"Ethical aspects important with this type of video and to be discussed with students beforehand."

Conclusion for theme 4: preparation and use of teaching media

- Planning of a lesson is one of the crucial parts of an educator's teaching-learning approach and includes using innovative ideas and media to keep the students' attention and for them to be able to retain new knowledge.

3.4.5.5 Theme 5: Teaching communication

Theme 5 identified was on teaching communication (verbal and non-verbal) used during the contact session. Every day of our lives we try to share ideas, feelings, and information with other people. This is known as communication. Talking is the most common way of communicating, but there are many others, e.g. writing, making hand and body movements, drawing and singing (WHO, 1988:29; Walkin, 1990:164; Okun & Kantrowitz, 2008:30). Teaching should not be a one-way communication process, because "chalk and talk" rarely helps students to develop deep understanding of significant knowledge. Ideally, there should be a sustained interchange or dialogue between the educator and students (and among the students) about the important concepts and ideas they are encountering (Killen, 2007:23-24). Many of the educational methods that we use are in fact communication methods.

Communication is part of our normal relationship with other people. A good relationship cannot exist without some sharing of ideas, feelings, and information. Likewise sharing happens most easily between people who have a good relationship. Building good relationships with people goes hand in hand with developing communication skills (WHO, 1988:29-30; Okun & Kantrowitz, 2008:8).

Supporting the literature above, the ITEA evaluation panel said:

> *"The educator had a good relationship with students and with relative big class, know most of students names."*

"Lively class but too much concentrated on factual knowledge."

Conclusion for theme 5: teaching communication

- Different communication techniques are essential for teaching-learning to take place effectively.

3.4.5.6 Theme 6: Portfolio

Theme 6 identified was on the portfolio compiled by the educator and assessed by the evaluation panel. The theme with its sub-themes is outlined in Table 3.10:

Table 3.10: Theme 6 with its sub-themes identified

THEME 6	SUB-THEMES
Portfolio	6.1 Student evaluation of teaching (discussed under section 3.3 of this chapter) 6.2 Peer evaluation (discussed under section 3.4.5.1, 3.4.5.2, 3.4.5.3, 3.4.5.4 and 3.4.5.5 of this chapter) 6.3 Study guides and study material 6.4 Assessment 6.5 Suitable choice and use of teaching media 6.6 Variation in effective teaching-learning strategies 6.7 Other innovative contributions in the teaching-learning environment 6.8 Summative

Slavin (2012:430) and Killen (2007:102) define portfolio assessment as assessment of a collection of the student's/educator's work to show growth, self-reflection, and achievement. The educator may collect student compositions, projects, and other evidence of higher-order functioning and use this evidence to evaluate student progress over time.

The ITEA evaluation panel/team stated:

"Good relationship with students as shown from their evaluation."

"The application of the students' anatomy knowledge is not discussed."

"The reaching of module outcomes not always supported and a lot of emphasis on factual knowledge."

"The computer program of bones is outstanding when applied effectively."

"Videos are used, but how students' learning is supported is not clear enough."

"The anatomy study guide refers a lot to group work but it is not explained how used."

"Are enthusiastic and sympathetic lecturer."

Conclusion for theme 6: portfolio

- Portfolio is a useful tool to evaluate the students' as well as the educator's performance over a period of time.

From the discussion above of the results and from the peer evaluation, it is evident that the following is seen as a preferred teaching-learning approach, in general, not just specifically regarding anatomy:

- Innovation (group work, use of videos, use of models, animation);
- Outcomes should be stated during contact sessions;
- Application should be emphasized during contact sessions, e-fundi can be used as platform for self-study beforehand, contact session used for application and enrichment;
- There should be a correlation between the content of the study guide and the contact session;
- The value of evaluation/assessment should be evident, not evaluate students for the sake of evaluation. Pre-knowledge, mastery and application should be assessed; and

- The lecturer should be enthusiastic, confident in subject knowledge and have a good relationship with students.

3.4.6 Rigour

The rigour for objective one was discussed in detail in Chapter Two under 2.3 (refer also to Table 2.5).

3.4.7 Summary

In Chapter Three the first objective, e.g. to explore and describe the interprofessional students' and peer group's opinions on the teaching-learning approach to anatomy were discussed. The results of the second objective, namely to explore and describe the interprofessionals' perceptions of the importance of anatomy in clinical practice will be discussed in Chapter Four.

CHAPTER 4

INTERPROFESSIONALS' PERCEPTIONS OF THE IMPORTANCE OF ANATOMY IN CLINICAL PRACTICE

4.1 INTRODUCTION

The research method including population and sampling, data collection, data analysis as well as rigour and the research findings of the following objective are addressed in this chapter:

Objective two: Explore and describe the interprofessionals' perceptions of the importance of anatomy in clinical practice.

4.2 RESEARCH DESIGN

The research design for the entire research study was discussed in Chapter One (see 1.6) and Chapter Two (see 2.1.1-2.1.5). The design of objective two is descriptive in nature, designed to explore and describe the interprofessionals' perceptions of the importance of anatomy in clinical practice by means of interviews.

4.3 RESEARCH METHOD

The discussion of the research method in this chapter includes the population and sampling, data collection as well as the data analysis of step 1 of phase one and was already discussed in Chapter 2, section 2.2.1.1.2 a.

4.3.1 Population and sampling

The researcher used purposive sampling and the inclusion criteria for objective two were:

- all students that finished their bachelor's degree in different professions, with anatomy as part of their curriculum, at a higher education institute in

South Africa during the 2005-2010 academic years (the students had the anatomy module in the first year of the curriculum, thus in 2005-2008).

As discussed in Chapter Two, section 2.2.1.1.2 b the population size was N = 118 and the sample size was n = 18.

4.3.2 Data collection

As discussed under section 2.2.1.1.2 c of Chapter Two, data was first collected by means of electronic interviewing and discussions on a blog created for this purpose (Selwyn & Robson, 1998). Participants were contacted through bulk sms's that were sent to their cell phone numbers, acquired from the Directors of Schools of Nursing Sciences and Dietetics and Nutrition from a higher education institution in the North-West Province.

Because of the limited response from participants on the blog, it was decided that the rest of the data will be gathered through email interviews. An sms from the researcher's phone was sent to all contact numbers (to a total of 115 numbers) with the following message *"I don't know if you remember me, but I taught you anatomy in your first year. I'm currently busy with my doctoral studies and would like you to participate in my study. It will take approximately 10 minutes of your time. If willing, please send your email address via sms. Many thanks Belinda Scrooby (Miss B).*

The participants (altogether 53 participants) that responded with their email addresses, were sent an email with an overview of the research study (see Appendix 8), as well as the informed consent form to complete, and finally the questions to be answered, e.g.

"Students cite medical knowledge as the most important knowledge from in each phase of their training and indicate anatomy the most important science, as it prepares them for later work (Manninen, 1999:83-84; Mitchell et al., 2004:738).

1) *Please write if you agree or disagree with the above statement and motivate your answer.*

2) *Write about your perceptions on the importance of anatomy for clinical practice."*

Fifteen participants sent their responses and consent forms via email. Thus, with the initial three participants' responses and the 15 responses through email, a total of 18 participants responded.

4.3.3 Data analysis

As described in section 2.2.1.1.2 d in Chapter Two a content analysis was done by using Tesch's eight steps of data analysis (Creswell, 1994:155) that was described in section 3.4.3 of Chapter Three.

A nursing educator who is also experienced in qualitative research was appointed as an independent co-coder to analyse the data. After the co-coder and the researcher had analysed the data independently, a meeting was scheduled and consensus was reached on the themes and sub-themes that emerged from the data. These themes and sub-themes are described in detail in Table 4.1.

4.4 RESULTS OF OBJECTIVE TWO

With the electronic interviewing by means of a blog and emails all participants agreed with the following statement:

"Students cite medical knowledge as the most important knowledge from each phase of their training and indicate anatomy the most important science, as it prepares them for later work" (Manninen, 1999:83-84; Mitchell et al., 2004:738).

For question two, "*Write about your perceptions on the importance of anatomy for clinical practice,"* the following themes were identified and are also outlined in Table 4.1.

Table 4.1: Themes identified for interprofessionals' perceptions of the importance of anatomy in clinical practice

Theme 1: Foundation/Basis	Theme 2: Assessment, diagnosis and procedures	Theme 3: To ensure patient safety	Theme 4: Communication	Theme 5: Recommendations for curriculum
• Rely on anatomy as the basics for the new student in health profession • Basics of nursing profession	• Diagnose and treat patients well • Differentiate between normal and abnormal • Able to do a physical examination and identify abnormalities	• Make decisions without the potential of harming actual patients	**Sub-theme 4.1: In-service training** • One language **Sub-theme 4.2: Multiprofessional team** • Understand the language spoken **Sub-theme 4.3: Patients** • Explain conditions and procedures	• Not only presented in first year • Combine with physiology modules

4.5 DISCUSSION OF THE RESULTS FOR OBJECTIVE TWO (2)

Each of the themes with their sub-themes identified in Table 4.1 will now be discussed in detail.

4.5.1 Theme 1: Foundation/Basis

Two concepts were identified under theme 1, e.g. rely on anatomy as the basics for the new student in health profession; and basics of nursing profession. Briggs *et al.* (2001:9) explain that anatomy is the core subject underpinning medicine and health-related sciences. Johnston (2009:222) agrees and explains that the common expectation is that anatomy/physiology courses will scaffold nurses' understanding of pathophysiology, clinical assessment and many nursing procedures. Nayak *et al.* (2008:2) support Johnston, contending that anatomy and physiology are the foundation sciences of the medical curriculum. Understanding anatomy and physiology is essential to understand other subjects in the medical curriculum. Hence, anatomy and physiology have to be taught/learned effectively.

In supporting the literature, the participants stated:

> "*All other subjects like fundamental, physiology, pharmacy, human movements rely on anatomy as the basics for the new student in health profession."*
>
> *"It forms the foundation for nursing..."*
>
> *"Need anatomy as foundation of your knowledge and nursing interactions."*

Conclusion with regard to theme 1: foundation/basis

- Anatomy is important for any health related studies as it forms the foundation/basis needed for other subjects as well as clinical practice.

4.5.2 Theme 2: Assessment, diagnosis and procedures

Three concepts were identified under theme 2, e.g. diagnose and treat patients well; differentiate between normal and abnormal; and be able to do a physical examination and identify abnormalities. Johnston (2009:222) explicates that a good understanding of human anatomy is clinically relevant for many health care professionals. A detailed knowledge of where, as well as how, to palpate, percuss or auscultate is essential for adequate assessment, provision of treatment and ongoing care of patients. Older (2004:79) and Turney (2007:104) support this, explaining that anatomical knowledge supports examination of a patient, the formation of a diagnosis and communication of these findings to the patient and other medical professionals.

In supporting the literature, the participants said:

> *"As a nurse you should know what organs are found in the specific area of the human body to be able to diagnose the patient."*
>
> *"Anatomy helps in nursing interventions where there is no need for medical assistance."*
>
> *"Anatomy has helped me to be able to diagnose and treat patients well. It has also helped me to differentiate between normal and abnormal bodily organs and tissues in the sense that I am able to do a physical examination."*
>
> *"Helps to understand to prevent certain illnesses, to apply clinical procedures correctly, to prevent and treat conditions, can make better diagnosis and therefore apply better treatment."*

Conclusion with regard to theme 2: assessment, diagnosis and procedures

- To perform assessment, diagnosis and procedures the health care professional needs a sound knowledge of anatomy.

4.5.3 Theme 3: To ensure patient safety

One concept was identified under theme 3, namely make decisions without the potential to harm actual patients. Johnston (2009:222) explains that nursing students and newly qualified nurses report and are reported as being fearful of the biological sciences and as having difficulties in applying anatomical and physiological information. This relative inability to apply theoretical information impacts on patient care by preventing effective and efficient patient assessment and promoting communication processes that are fragmented and confusing; delaying effective treatment options. Inability to accurately "physiologically police" patients increases the risk of adverse events, increasing mortality and morbidity. Older (2004:81) agrees and explains that one of the consequences of poor, over-simplified undergraduate training is inadequate post-graduate knowledge, which will lead to misdiagnosis and even malpractice. Turney (2007:105) supports Older and says that unfortunately, the evidence suggests that the curricula and teaching have diminished too much, to an extent where safety and clinical practice might be compromised.

Supporting the literature, the participants said:

> *"If you do not know your anatomy in the nursing profession you are incompetent and you may harm your patients."*
>
> *"... and make decisions without the potential of harming actual patients".*
>
> *"Can cause patients deaths if nursing plan is not correct, that is based on anatomy."*
>
> *"This helps them to perform an even better job especially in the health care department where one mistake can cost a person's life."*

Conclusion with regard to theme 3: to ensure patient safety

- The health care professional needs a good foundation and knowledge of anatomy and biological sciences to practice safely and prevent harm to patients.

4.5.4 Theme 4: Communication

The three sub-themes that were identified under theme 4 are outlined in Table 4.2.

Table 4.2: Theme 4 with its sub-themes identified

THEME	SUB-THEME
Communication	4.1 In-service training 4.2 Multiprofessional team 4.3 Patients

Turney (2007:104-105) explains that anatomical knowledge supports examination of a patient, the formation of a diagnosis and communication of these findings to the patient and other medical professionals and that a minimum working knowledge should be that which allows an independent practitioner to practice safely, and to communicate with other medical professionals and patients effectively.

Supporting the literature, the participants said:

> *"Communication gaps can be prevented by means of in-service teaching."*

> *"It is important to know the anatomy of the human body to be able to understand the language used in practice."*

> *"Anatomy in the clinical practice is that the different medical personel – doctors, nurses, dietetians, physiotherapists, occupational therapists,*

speech therapists and all the others in the medical team – communicate better on the same case when the same terminology is used."

"Importance of anatomy for clinical practice is: give health education to patients, and can give doctors advice and suggest alternative solutions."

"… and it helps when explaining a condition to a patient or the detail of an operation".

Conclusion with regard to theme 4: communication

- Anatomy is not only important to help assess, diagnose and treat patients, but to communicate effectively with other multiprofessional members and explain procedures and treatment options with patients.

4.5.5 Theme 5: Recommendations for curriculum

Two concepts were identified under theme 5, e.g. not only presented in first year; and combine with physiology. Johnston (2009:222) explains that the common expectation is that anatomy/physiology courses will scaffold nurses' understanding of pathophysiology, clinical assessment and many nursing procedures. Johnston (2009:222) also clarifies that any method which can emphasise and reinforce anatomical knowledge and particularly the relevance of anatomical learning to nursing students should be carefully examined and, where possible, implemented. Older (2004:87) supports this and says there is evidence that repetition of topics has a beneficial effect, confirming a fundamental thesis of learning.

In support of the literature, the participants claimed that anatomy/physiology courses are

"... more valuable when continued up until 3rd year when one starts to work in the clinical setting".

"Anatomy needs to be taught in conjunction with physiology to have its full effect. These two subjects complement each other and together form a better picture of the body and its functions than having either of these subjects by itself."

Conclusions with regard to theme 5: recommendations for curriculum

- Anatomy forms the basis of physiology and both form the underpinning of other scientific subjects, e.g. pathophysiology and fundamental nursing science, that ultimately help the health care professional to perform and manage appropriate assessments, diagnoses and clinical procedures.
- The continuing repetition and revision of anatomy and physiology in other medical subjects and curricula prevents the knowledge from being lost and prevents the inability to apply them to clinical practice.

4.6 RIGOUR

The rigour for objective two was discussed in detail in Chapter Two under 2.3 (refer also to Table 2.5).

4.7 SUMMARY

In Chapter Four the second objective, e.g. to explore and describe the interprofessionals' perceptions on the importance of anatomy in clinical practice was discussed. In Chapter Five the conceptual framework for interprofessional teaching-learning of anatomy will be described.

CHAPTER 5

CONCEPTUAL FRAMEWORK

(Phase One: Step 2)

5.1 INTRODUCTION

The conceptual framework of the research study is presented in this chapter subsequent to the identification of the concepts from the empirical data, concept classification and the in-depth literature review. This chapter also denotes the beginning of step 2 of phase one (concept descriptions and definitions).

Brink (2006:24) makes it clear that a framework of a research study helps the researcher to organise the study and provides a context in which he/she examines a problem and gathers and analyses data. A conceptual framework is one that the researcher has developed through identifying and defining concepts and proposing relationships between these concepts. By developing a framework within which ideas are organised, the researcher is able to show that the proposed study is a logical extension of current knowledge.

In this step a conceptual framework on interprofessional teaching-learning of anatomy was described. All the information gathered from objectives 1-2 as well as a literature control were used to develop and describe the conceptual framework.

As elucidated by Burns and Grove (2009:146) the steps to develop a conceptual framework are: (1) selecting and defining concepts, (2) developing statements relating the concepts, (3) expressing the statements in hierarchical fashion, and (4) developing a conceptual map that expresses the framework.

Concepts are selected for a framework on the basis of their relevance to the phenomenon you are studying. Thus, the statement of the problem, which describes the phenomenon, is a rich source of concepts for the framework.

Each concept included in a framework must be defined conceptually (Burns & Grove, 2009:146-147).

The next step in framework development is to link all of the concepts through relational statements by providing evidence from the literature for the validity of each relational statement whenever available (Burns & Grove, 2009:147). The last step is constructing a conceptual map. Developing your own concept map entails the following steps: (1) arrange the concepts on the page in sequence of occurrence (or causal linkage) from left to right, with the concepts reflecting the outcomes located on the far right; (2) using arrows, link the concepts in a way that is consistent with the statement diagrams you previously developed; (3) examine the map for completeness (Burns & Grove, 2009:149-150).

An outline of constructivist theory and interprofessional education follows, as a means of positioning the practice model that evolved in this study.

5.2 CONSTRUCTIVIST THEORY AND INTERPROFESSIONAL EDUCATION AS PHILOSOPHICAL UNDERPINNING TO TEACHING-LEARNING

The philosophical underpinning to the practice model's teaching-learning, e.g. constructivist theory and interprofessional education (IPE) will now be discussed.

5.2.1 Constructivist theory

The essence of constructivist theory is the idea that students must individually discover and transform complex information if they are to make it their own (Anderson *et al.,* 2000; Fosnot, 2005; Waxman *et al.*, 2001). Constructivist theory sees students as constantly checking new information against old rules and then revising rules when they no longer work. This view has profound implications for teaching because it suggests a far more active role for students in their own learning than is typical in many classrooms. Because of the emphasis on students as active learners, constructivist strategies are often called student-centred instruction (Cornelius-White, 2007). In a student-

centred classroom the educator becomes the “guide on the side” instead of the “sage on the stage”, helping students to discover their own meaning instead of lecturing and controlling all classroom activities (Noddings, 2008; Weinberger & McCombs, 2001; Zmuda, 2008).

Ramsden (1992:6) states that learning-teaching is constantly interchanging activities. One learns by teaching. It is a matter of presenting students situations which offer new problems, problems that follow on from one another. You need a mixture of direction and freedom. Students should be able to do their own experimenting and their own research. Educators, of course, can guide them by providing appropriate materials, but the essential thing is that for a student to understand something, he/she must construct it him/herself, he/she must reinvent it (Burman, 2008:161).

As already stated in Chapter One, the researcher utilises the cognitive theorists’ beliefs that are based upon a number of core assumptions (Bruning, *et al*., 1999; Gredler, 1997; Schunk, 2004; and Yilmaz, 2008:167-168):

- Believe that what happens inside the mind – mental processing of information - is an important part of learning.
- View humans as active learners; what students do with information once they receive it determines how much they learn.
- Believe that student attitudes, motivation, and beliefs can impact the learning process.
- Believe that students can self-regulate their learning through awareness of their thinking and management of learning strategies.
- Believe that the meaningfulness of knowledge determines how well it can be applied in new situations.
- Emphasize the importance of social interaction and context in the learning process.

As a summary it can be stated that constructivists emphasized the interplay between student and situation, the active role the student plays in the co-

construction of knowledge, and the significance of social, cultural and historical influences on the construction of disciplines of knowledge (Kretchmar, 2008:4).

5.2.2 Interprofessional education (IPE)

Chan *et al.* (2010:168-169) put it that since the 1970s, many IPE initiatives have been launched internationally with the aim of developing and reinforcing the value of shared learning. The WHO started proactively to put this concept forward in 1978, as illustrated in its strategy to promote "Health for All by the Year 2000" (WHO, 1978). The researcher supports the interprofessional education framework developed by the WHO (2010:23-25).

Health care and education around the world are provided by different types of educators and health workers who offer a range of services at different times and locations. This adds a significant layer of coordination for interprofessional educators and curriculum developers. Developing interprofessional education curricula is a complex process, and may involve staff from different faculties, work settings and locations (WHO, 2010:23).

Research indicates that interprofessional education is more effective when: principles of adult learning are used (for example problem-based learning and action learning sets); learning methods reflect the real world practice experiences of students; and interaction occurs between students (WHO, 2010:23).

Effective interprofessional education relies on curricula that link learning activities, expected outcomes and an assessment of what has been learned. It is important to remember that expected outcomes will be influenced by the student's physical and social environment as well as their level of education. Well-constructed learning outcomes assume students need to know what to do (i.e. knowledge); how to apply their knowledge (i.e. skills); and when to apply their skills within an appropriate ethical framework using that knowledge (i.e. attitudes and behaviour) (WHO, 2010:24).

An IPE approach can develop opportunities for university schools, including nursing schools, to collaborate and thereby improve the efficiency of resource allocation while more effectively preparing students for their future roles as health professionals (Steinert, 2005). Although the benefits of IPE are increasingly described, implementation of IPE across university communities faces administrative, resource, structural, intellectual and cultural challenges (Kandiko & Blackmore, 2008). Bennett *et al.* (2010:3-4) claim that there was a positive perception of the many future possibilities that an IPE approach could offer: improved alignment for educational programs between schools; increased communication and collegiality within the faculty; improved research opportunities within faculty and with industry partners and the potential for power equalisation within the faculty.

5.3 PROCESS OF IDENTIFICATION OF CONCEPTS

A method was devised and justified with literature primarily from Mouton and Marais (1990) and Chinn and Kramer (2008) for systematically reviewing the conclusion statements that were generated from the themes that emerged from the participants' responses in Chapters Three and Four, to ensure consistency and congruency in the process of identifying concepts:

- Read the conclusion statement to identify what has emerged in summary of the theme, and how related action is described therein (Mouton, 1996:7). Chinn and Kramer (2008:223) advise that concepts are identified by "searching out words or groups of words" that represent the phenomena and their related actions.

- Generate a list that tentatively identifies key concepts and other concepts that appear to be interrelated (Chinn & Kramer, 2008:224).

- The list of tentative key and other concepts is reviewed by asking questions about the nature of the concepts and their interrelated organization (Chinn & Kramer, 2008:226).

- The list of tentative key and other concepts is reorganized by color-coded highlighting of concepts that surface as apparent main concepts,

and with a different color, the related concepts are highlighted as the identified concepts that are related to the main concepts. Chinn and Kramer (2008:208) refer to this step as identifying “major concepts” with “subconcepts”, and further identifying whether the major and subconcepts constitute a single related entity by their relationships and interrelationships.

- A revised list of “main” and “related” concepts is generated and put through a further review to ensure rigour in the finalization of the concepts to confirm the identification of the main and related concepts. This transaction follows Mouton and Marais (1990:126) by reviewing each of the main concepts for “connotation” by checking out what sense of meaning or intention is being conveyed by use of the main concept. In some instances, either the use of the Oxford Dictionary and Thesaurus (2007) is used so that the meanings of concepts were confirmed. A similar transaction is used to review the “denotation” in reference to the concepts, which Mouton and Marais (1990:59) state to be characteristics, actions, behaviours or processes that are linked to the phenomenon under study, and offer the following two guidelines as primary requirements in concept identification:
    - Connotations of concepts should be clearly articulated and unambiguous; and
    - Denotations of concepts should be related and an accurate reference of the connotations.
- In finalization of the list of main and related concepts that are identified, Chinn and Kramer (2008:209) advise not to become anchored in the number of main and related concepts, but rather to reconsider the qualitative features of the concepts to ensure that the central idea that links the identified concepts is congruent.

Table 5.1 that follows represents the outcome of the above method of concept identification with the listed empirical concepts that were identified in Chapters Three and Four (refer to the results of objectives one and two).

Table 5.1: Concept identification from the empirical data

Conclusion statements from *interprofessional students' (IP) opinions on the teaching-learning approach to anatomy*	**Conclusion statements from *peer group's (PG) opinions on the teaching-learning approach to anatomy***	**Conclusion statements from *interprofessionals' perceptions on the importance of anatomy in clinical practice***	**CONCEPT IDENTIFIED**
1. The educator needs to make use of appropriate support media, such as the writing board/ transparencies/ slides/ powerpoint presentations/ internet applications/ handouts and videos. 2. The educator needs to use a variety of teaching-learning methods, for example group work, role play, problem solving, seminars, questions-and-answers, short lectures and in this manner makes provision for students' preferential learning styles, abilities and needs. 3. The educator needs to give purposeful feedback regarding tests and assignments so this contributes towards converting assessment opportunities into learning opportunities.	4. Planning of a lesson is one of the crucial parts of an educator's teaching-learning approach and includes using innovative ideas and media to keep the students attention and be able to retain new knowledge. 5. The educator uses different phases, with their own teaching-learning methods and media, during the teaching-learning process. 6. All students are different and this individualism must be considered when planning a lesson and using different teaching-learning methods and media for effective teaching-learning to take place. 7. Planning of a lesson is one of the crucial parts of an educator's teaching-learning approach and includes using innovative ideas and media to keep the students' attention and be able to retain new knowledge. 8. Different communication tech-	10. Anatomy is important for any health related studies as it forms the foundation/basis needed for other subjects as well as clinical practice. 11. To perform assessment, diagnosis and procedures the health care professional needs a sound knowledge of anatomy. 12. The health care professional needs a good foundation and knowledge of anatomy and biological sciences to practice safely and prevent harm to patients. 13. Anatomy is not only important to help assess, diagnose and treat patients, but to communicate effectively with other multiprofessional members and explain procedures and treatment options with patients. 14. Anatomy forms the basis for physiology and both form the underpinning for other scientific subjects, e.g. pathophysiology and fundamental nursing science, which ultimately helps the health care professional to perform appropriate assessments, diagnosis and clinical procedures.	**INTERPROFESSIONAL EDUCATION** • Philosophy • Curriculum • Multidisciplinary approach (Statements 1 to 15) **TEACHING-LEARNING (EDUCATOR)** • Presentation • Study/teaching material • Assessment • Interaction (Statements 1 to 9)

	niques are essential for teaching-learning to take place effectively. 9. Portfolio is a useful tool to evaluate the students' as well as the educator's performance over a period of time.	15. The continuing repetition and revision of anatomy and physiology in other medical subjects and curricula prevents the knowledge from being lost and prevents the inability to apply to clinical practice.	**CLINICAL PRACTITIONER** • Foundation • Procedures • Patient safety • Communication (Statements 10 to 15)

5.4 THE PROCESS OF CONCEPT CLASSIFICATION

The process of concept classification utilized the work of Dickoff *et al.* (1968a), which Hickman, cited in George (2002:9) acknowledges to be classical work that guides theoretical thinking in theory development. According to Dickoff *et al.* (1968a:415) theory is born in practice, is refined in research, and must return to practice. The researcher's use of Dickoff *et al.'s* (1968a) work is based on their clarity in isolating concepts within the practice arena, and the emphasis that a practicing nursing educator must have knowledge to support decisions in practice that contribute to an educated, caring, competent and committed nursing educator.

This research study aimed to produce a practice model aligned to the level of theory development that Dickoff *et al.* (1968a:421) designate as "situation-producing" theory. They refer to three essential components on the nature of a situation-producing theory. These are:

- Goal content must be specified as the aim of the activity: in this research study, the goal of the situation that triggered the creation of interprofessional teaching-learning of anatomy at a higher education institution in South Africa was to facilitate deep-holistic lifelong learning.

- Prescriptions for activity to realize the goal content: at the outset of activities by the nurse educator, the researcher assessed interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy, and explored interprofessionals' perceptions of the importance of anatomy in clinical practice.

- A survey list to classify the activities or elements aimed at achieving the goal content: in this research study, these activities and elements are represented by and have been identified as concepts arising from empirical data related to the practice of interprofessional teaching-learning of anatomy, and therefore the survey list is justified as appropriate and relevant for use in classifying the emerging concepts.

Dickoff *et al.* (1968a:421) further state that the use of the survey list "calls attention" to two further actions that support the process of concept classification, and these are:

- Use of the survey list to cluster "factors, facets, and aspects of activity judged relevant to achieve situations" in practice that are simple or complex in nature, but that are still at the conceptual level without relational statements.

- Use of knowledge in the literature in appraising the concepts at whatever level deemed necessary or as a possibility for achieving the overall aim of producing a practice model.

They elaborate further that the purpose of using a survey list is to articulate a conceptual awareness that in situation-producing theory, the goal content that triggered the initial activity, and the prescriptions of activity to realize the goal content are not necessarily determinants of the practice model that emerges. Therefore, it is necessary that the survey list be utilized to classify concepts so that all related and salient characteristics are studied as to how activities and features adjust idiosyncratically within a particular situation to realize the goal content.

The survey list of Dickoff *et al.* (1968a:422) used the following six modified questions for concept classification in relation to activities and their features:

1. AGENT: who or what performs the activity?

2. RECIPIENT: who or what benefits from the activity?

3. CONTEXT: in what context is the activity performed?

4. TARGET: what is the targeted outcome of the activity?

5. PROCEDURE: what is the guiding procedure, protocol or technique of the activity?

6. DYNAMIC: what is the energy source for the activity?

Figure 5.1 that follows illustrates the coherent generation by use of deductive logic from concept identification to concept classification using the modified survey list of Dickoff *et al.* (1968a). A related outline follows to articulate how this was applied to concept classification in this research study.

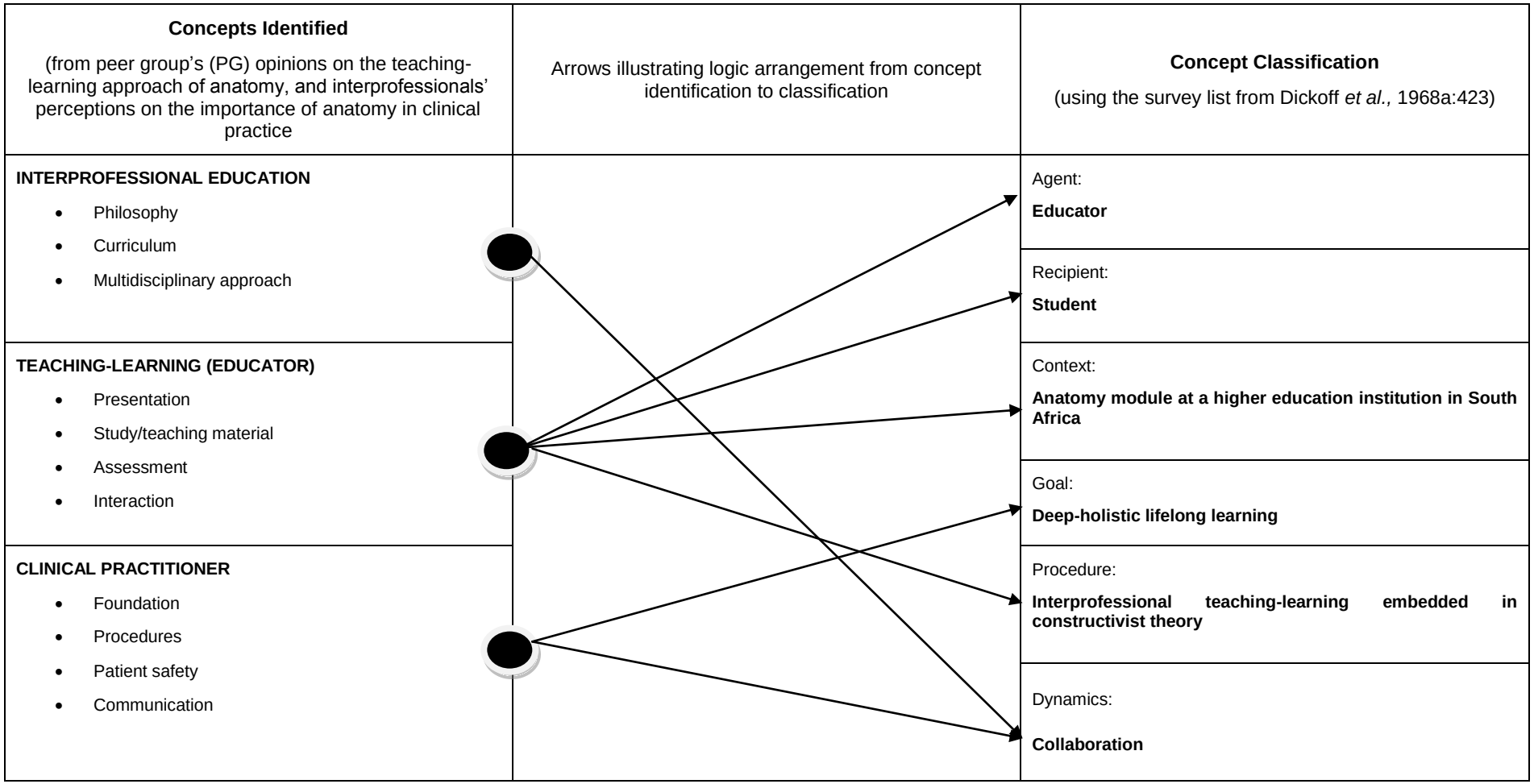


Figure 5.1: Illustration of Concept Identification and Concept Classification using the Survey list (modified) from Dickoff *et al.* (1968a:423). Figure adapted from Bodrick (2011).

5.4.1 Agent: educator

Dickoff *et al.* (1968a:425) indicate that the agent can be a person or point of service that carries out activities within an organization. The nature of the agent stimulates activities that are creative, constructive and significant within performance that is aimed at goal achievement. The agent in this research study is the educator who teaches/facilitates anatomy at a higher education institution in South Africa. She/he assumes a particular functional role to contribute specifically in attendance to students for the goal of deep-holistic lifelong learning.

5.4.2 Recipient: student

The recipient according to Dickoff *et al.* (1968a:427) can be any person or an unspecified object that is the receiver of the activity by the agent. Interestingly, it is noted that the recipient is not passive necessarily in receiving the agent's activity because there always is a reaction, although perhaps not perceived by the agent. The student is the recipient in this research study and includes idiosyncratic characteristics of the student that are contributory in defining the student as the recipient.

5.4.3 Context: anatomy module at a higher education institution in South Africa

Dickoff *et al.* (1968a:428) refer to the context as including the setting, location, the physical structure of class, time, space, or structure that constitute different elements of the situation in which the activity occurs. They note that the physical elements are arranged in a manner to support a student-centred approach that unifies all activities in which the agent is functioning towards the goal for the benefit of the recipient. The anatomy module as a higher education institution in South Africa is the context in this research study where the activities are happening.

5.4.4 Goal: deep-holistic lifelong learning

The goal is referred to as the terminus by Dickoff *et al.* (1968a:428). The root of the word “terminus” is Latin and means “the last or final point, a goal aimed for, or end point, limit or boundary” (Collins English Dictionary, 2006:1248; Oxford Dictionary & Thesaurus, 2007:1066). In essence, Dickoff *et al.* (1968a:428) regard it as the goal that represents the point of accomplishment of the activity whereby the activity is characterized in terms of its end point. The authors (p. 429) expand on the characteristics of the goal as unifying all activities as achievable through organization and structure so that the agent acts by visualizing the end product. They elaborate on visualizing the goal whereby it facilitates the performance of the agent to consider how best to describe an activity’s end point (Dickoff *et al.*, 1968a:430). The student-centred nature of the goal is given by its acceptability to the recipient. The goal in the research study is deep-holistic lifelong learning.

5.4.5 Procedure: interprofessional teaching-learning embedded in constructivist theory

Dickoff *et al.* (1968a:430) view the procedure as features along a path and/or emphasis of steps, instructions or patterns on how the activity is to be performed. They enlarge on the procedure by stating that its facets include principles, sets of rules, routine or particular features that contribute a series of actions aimed at the goal that is to the advantage of the recipient. Although the procedure does not determine the activities in detail, it offers to guide or safeguard phenomena such as policies and procedures within an organization or a higher education institution. The procedure of this research study is interprofessional teaching-learning embedded in constructivist theory.

5.4.6 Dynamic: collaboration

The dynamics are taken by Dickoff *et al.* (1968a:431) to comprise the vivacity of influence as an energy origin and an attribute associated with capacity to execute activities. The possible origin of functioning could be physical, physiological or psychological and is relevant only to persons functioning as agent, recipient or within the context. In relation to merely functioning, the

authors specify that it must be purposeful, goal-directed, have drive, impetus or direction. For the dynamics in this research study collaboration is essential for propelling the activity to goal attainment.

Prior to an in-depth discussion of each classified concept in relation to the reviewed literature, an approach will be described for conducting the literature search in support of the conceptual framework. Dickoff *et al.* (1968a:546) confirm this approach and refer to it as embracing an openness to relevant empirical reality as it exists in the literature and/or evidence.

5.5 CONDUCTING A LITERATURE REVIEW TO SUPPORT THE CONCEPTUAL FRAMEWORK

The approach to conducting a literature review to support the conceptual framework on the discussion of the concepts that were classified required a search strategy. Polit and Beck (2008:109) support this notion that is based on rapid technological and electronic advances, whereby the focus is not on finding information but how the access to information is accessed logically. They highlight four approaches to searching that are put forward by Cooper (1998), namely:

1. Searching for references using bibliographic databases;

2. The ancestry approach that follows footnotes that cite relevant studies;

3. The descendancy approach that locates a pivotal early study and tracks recent studies that cite the original key study; and

4. Grey literature tracking that involves devised methods to track limited distributions, conference papers and posters, unpublished reports, dissertations, and institutional reports.

The four approaches above were integrated and used with three modified principles by Silverman and Marvasti (2008:368) for application when undertaking a literature review:

1. Broad-mindedness in pursuit of literature that embraces earlier work whereby a connection is shown in transmitting old knowledge and classical work aimed at creating new knowledge that embraces our scholarship heritage within a professional discipline.

2. Being focused and critical while exploring the literature with a sense of scholarship to advance knowledge by employing a critical perspective.

3. Avoiding mere description in the use of literature by keeping the purpose of the literature review by balancing topics that are central to the research focus with the aim of critique and support instead of reporting.

The process of literature review was therefore informed by the above approaches and principles, and was set out in the steps described in Table 5.2 that embrace combinations of work by Creswell (2003:33), Silverman and Marvasti (2008:365), Holloway and Wheeler (2010:35), and Marshall and Rossman (2011:77).

Table 5.2: Steps used in the process of literature searching and review

Step	Activities for engagement for each step
1.	Identify key words that pertain to the search topic.
2.	From initial scanning, identify further recurring concepts or words that are common in the literature abstracts.
3.	Define the key words and concepts using dictionaries or the glossaries of textbooks.
4.	Finalize the search profile including the scope of the search and parameters.
5.	Use search engines of electronic literature sources, select publications that have supportive and non-supportive contributions on the search topics, key words and concepts.
6.	Review the selected literature specifically for perspectives that (i) discuss key concepts, (ii) define the research approaches used, (iii) describe theoretical components, and (iv) include expert opinion.
7.	Consider the analysis of the selected literature within the specified and related context of the research study.
8.	While analyzing literature be aware of (i) areas that would require further clarification or more research, (ii) gaps in knowledge or unanswered questions, (iii) controversy or inconsistency in the literature, (iv) aspects from past experience or logic that are possibly relevant to the phenomenon under study, and (v) perspectives that are common or uncommon in occurrence.
9.	Make a judgment on the component parts that are analyzed, then utilize these to generate justifications and arguments using deductive and inductive reasoning in relation to the points of focus.
10.	Synthesize the ideas by combining points, themes, opinions and arguments into a logical complex whole that integrates judgment and theory into a single flow of reasoning in response to the dimensions of the search topics that comprise the key words and concepts.

The specialized electronic search engines that were used included CINAHL, MEDLINE, EBSCO Host and Science direct. Multiple Boolean operators of the AND, OR and NOT functions were used that included key words and concepts in a recognizable arrangement for an advanced level of searching (Bryman & Bell, 2007:662; Sandelowski & Barroso, 2007:48). Concurrent to

the review of published literature, the researcher noted the experts who were repeatedly quoted by authors. This led to the activity of purchasing a vast and wide range of textbooks on qualitative and quantitative research, theory development in nursing and other relevant topics associated with practice of nursing, education and research. Parallel acquisitions of dictionaries of the English language (and thesauri), and for philosophy were attained, which were helpful in the analysis of the literature and the synthesis of arguments.

The literature search strategy was not exclusive to the conceptual framework, but was literative in the early design and conceptual stage of this study, during data collection and data analysis, and in the results phase which included the conceptual framework and model development and description. This approach in model development follows Chinn and Kramer (2008:267) who assert that in theory-generating research, the literature search and review extends beyond the background and justification for a study, and therefore is continuous and comprehensive. Chinn and Kramer (2008:267) suggest that as concepts and ideas emerge from the data, the researcher uses the data to guide further explorations in the literature, which contributes to the model development process of refining and delineating central concepts and the relations between them.

Walker and Avant (2011:110) state that a careful examination of the literature is required and term it as a literary synthesis aimed at acquiring new insights about the phenomena of interest. They offer two techniques within literary methods for statement synthesis in theory construction (Walker & Avant, 2011:131). These are:

- Making the meaning of the concepts included in a statement more general; and
- Expanding the scope of the phenomena of interest to include a wider variety of related situations.

The approaches above to literature searching and review converged on the requirements of a conceptual framework of the classified concepts that were derived from the empirical data in this research study. Mouton (1996:195)

refers to a conceptual framework as functional for the classification of characteristics of the phenomenon being studied. The three major characteristics in Table 5.3 that follows were used to guide the activity of generating a conceptual framework.

Table 5.3: Defining characteristics of a conceptual framework and related activities

Major characteristics	Activities of engagement
1. **Description of the ideal type** as a basic unit of typology	• Exclusion of inconsequential or incidental characteristics • Retention of the most common and outstanding characteristics by abstraction from the most concrete levels of experience to the most abstract • Identification of the most common characteristics and emphasize above the specific
2. **Consequence of abstraction** in that no single type of characteristic of the phenomenon can be exactly reproduced	• Endorsement of the process of selection by uniqueness of abstraction • Involvement of references of abstraction and the relationship that combines the concept and the typified phenomenon
3. **Criteria for good classification**, which are exhaustiveness and mutual exclusiveness	• Inclusion of all the conceivable and relevant characteristics associated with the phenomenon • Distinction of differences between characteristics by mutual exclusiveness • Where overlap is noted, a further process of refinement occurs for distinctiveness

Mouton (1996:198) states that the identification of the above major characteristics contribute to a conceptual framework in which phenomena are classified in terms of their concepts. Mouton and Marais (1990:137) and Polit and Beck (2008:141) echo this definition of a conceptual framework, while the latter authors add that the concepts are arranged by virtue of their relevance to a common theme.

The sections that follow will provide an in-depth literature-based description of each of the classified concepts according to their order on the previous survey

list as shown in Figure 5.1 and discussed in section 5.4 on concept classification. Each of the classified concepts will also be displayed visually after each section to show the building of the conceptual framework for interprofessional teaching-learning of anatomy at a higher education institution in South Africa (see Figures 5.2, 5.3, 5.4, 5.5, 5.6 and 5.7.)

5.6 AGENT: EDUCATOR

To pinpoint the educator as an agent in the anatomy class at a higher education institution in South Africa, it is necessary to determine the professional foundations of this role.

5.6.1 Educator

As described in Chapter One on the context of this research study, the nurse educator is the person who facilitates the anatomy modules (ANAM, ANAB and ANAS) to first year students at a higher education institution in South Africa. Therefore the nurse educator is defined as a registered nurse whose primary area of interest, competence and professional practice is the education of nurses at the higher education level. Minimum education required is a Master's in science in nursing (Mosby's Dictionary of medicine, nursing & health professions, 2009).

Klopper (2000:6) describes an educator as a facilitator and creator of a learning climate who accompanies the student on his/her learning path, who acts supportively and who intentionally creates a context conductive to learning within the nature and guidelines of constructivist learning.

5.6.2 Characteristics and skills of an educator

There is still little agreement of the educator skills required for effective IPE (Promoting interprofessional education (PIPE), 2003; Parsell & Bligh, 1998). Generally, when literature concerning the characteristics and skills of an educator involved with adult learning are reviewed, similarities with regard to the most prominent characteristics are found, with slight nuance differences

(Klopper 2000:22). The characteristics and skills of effective educator are (as described by Klopper, 2000:22-23, and Killen, 2007:36-38):

- **Knowledgeable:** Educators continually seek to improve their knowledge and understanding of the modules they teach, of teaching, of learning and of students.

- **Enthusiastic:** Educators are passionate about their subject and about teaching their subject. When students can see that their educator is enthusiastic, this influences their motivation and their perceptions of other educators' behaviours (such as how clearly the educator explains things), which in turn positively influences learning (Killen, 1991).

- **Confident:** educators feel secure about their knowledge, understanding and skills, and about their ability to help students learn. There are clear links between educator confidence and student achievement (Killen, 1991; Price & Raiker, 1999). Educators who give students the impression that they are not confident appear to reduce students' motivation and, ultimately, their achievement.

- **Effective communicators:** They relate well with students, explain clearly, make their expectations explicit, and engage students.

- **Committed:** Educators are dedicated to teaching and to helping students learn well. The most common indicators of educator commitment are their loyalty to the norms and standards of the profession, their support of students beyond official expectations (perhaps through mentoring or coaching), their upholding of the philosophy and values of the higher education institution, their remaining in the profession (even when it is demanding and stressful), and their continually extending subject knowledge and teaching expertise (Day, 2000; Tsui & Cheng, 1999; Tyree, 1996).

- **Compassionate:** Educators care about their students. Educators should respect all students, be concerned about their welfare, have empathy with them and make them feel accepted and important (all

factors that help to build the positive self esteem of students). “Effective educators have friendly, mature relationships with their students, and demonstrate caring, humour and commitment” (Ayres *et al.,* 2004:146).

- **Curious:** Educators have questioning minds and are interested in finding out more. Curious educators do not simply accept things as they are. They are never satisfied with what they know; they always want to learn more. Educators who do not have this drive will probably do little more than pass on to students a body of knowledge that they themselves have accepted uncritically. If students are not curious they will probably do little more than try to remember and reproduce the things that they think will be assessed.

- **Patient and persistent:** Educators are steadfast in their endeavours. Exceptional educators do not give up easily (or look for lame excuses) when things do not go well or when students are not achieving the high standards that are required. Educators don’t expect every student to be successful the first time the student tries something new, but they do take responsibility for the ultimate success of all students in their class.

- **Willing to share and collaborate:** Educators tend to work together with others to achieve goals. Such educators are willing to share their ideas and learn from one another because they have a “student learning orientation” to their teaching and appreciate that “to enhance another is to enhance yourself” (Spady, 2001:37).

- **Resourceful and inventive:** Educators are not content to simply do what others have done – resourceful educators continually look for new ways of solving the daily challenges of teaching. They make creative use of whatever physical resources are available (such as newspapers), involve the community, and make optimal use of conventional resources (such as textbooks). In so doing, they create the best possible, most advantageous conditions for learning and continually try to make learning as easy as possible for students. There might be limitations (such as large class sizes and limited equipment),

but resourceful educators make the most of the conditions and opportunities available to them. In particular, they do not rely upon someone else to provide them with teaching materials or creating opportunities for them. They do it all themselves, often without the benefits of formal in-service training programmes (Ayres *et al.,* 2004).

- **Well organised:** Educators put systems and processes in place to bring order to all aspects of their teaching. Education is a very demanding occupation that requires dedication and organisation. If, as an educator, you are not well organised you will never get everything done. Most importantly, students learn better from well-organised educators than from poorly organised educators (Killen, 1991).

- **Optimistic:** Educators are expectant and encouraging. There is no point being an educator if you are a pessimist. You have to believe that students can and will learn; you have to believe that even the most complicated concepts can be explained in terms that students will understand; you have to believe that you can make a difference to students' lives; you have to believe that the world (and the education system within which you work) can be a better place and that you have a role to play in transforming it.

- **Ethical:** Educators work to high standards of honesty and integrity and are respectful and protective of their students. Educators must understand all the laws, rules, policies and guidelines that have to be followed, both inside and outside the higher education institution, and always maintain the highest possible standards of behaviour in their interactions with students and colleagues. They must respect and protect the rights of students, including the right to privacy in matters such as test results.

A great variety of characteristics and skills that an educator should have, have been discussed. However, most of these characteristics centre upon the educator's subject expertise, skills as a learning facilitator, effective communication skills, approachability and positive attitude toward the

students. Klopper (2000:25) regards the aspects that are important in terms of the educator's attitude to students as:

- A sense of humour;
- Warmth and empathy;
- Acknowledgement of the uniqueness of each student; and
- Respect for the students' points of view.

5.6.3 Conclusion statements on the agent: educator

The following deductive conclusion statements relate to the agent concept of the educator:

- The educator is the person who teaches an anatomy module at a higher education institution in South Africa.
- The educator's attitude towards students consists of a sense of humor, warmth and empathy, acknowledgement of the uniqueness of each student, and respect for the students' points of view to ensure that effective teaching-learning can take place.
- The characteristics and skills of an effective educator are to be knowledgeable, enthusiastic, confident, effective communicators, committed, compassionate, curious, patient and persistent, willing to share and collaborate, resourceful and inventive, well organised, optimistic and ethical to promote effective teaching-learning of anatomy for the overall purpose of deep-holistic lifelong learning.

The following legends displayed in Table 5.4 explain each concept that forms part of the conceptual framework for interprofessional teaching-learning of anatomy at a higher education institution in South Africa.

Table 5.4: Legends for Figures 5.2, 5.3, 5.4, 5.5, 5.6 and 5.7

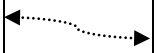
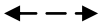
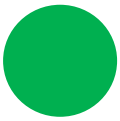
	Interaction between the educator and student.
	The educator and student work towards the same goal, namely deep-holistic lifelong learning.
	Interprofessional teaching-learning leads to deep-holistic lifelong learning and this is achieved and implemented by a competent clinical practitioner/ in clinical practice.
	Continuous dynamic of collaboration.
	Agent and recipient: educator and student with their own set of characteristics.
	Procedure of interprofessional teaching-learning embedded in constructivist theory used by both the educator and student in their interaction with each other.
	Goal of deep-holistic lifelong learning as implemented by a competent clinical practitioner.

Figure 5.2: An educator as agent for interprofessional teaching-learning of anatomy at a higher education institution in South Africa

5.7 RECIPIENT: STUDENT

Klopper (2000:6) defines the student/adult learner as a nursing student or nursing practitioner who finds himself/herself in a didactic situation/learning context. In this research study the student is a health sciences student or health professional registered for an anatomy module at a higher education institution in South Africa.

5.7.1 Characteristics of a student

The literature on adult student characteristics is extensive. Accordingly, many "lists" of characteristics exist, depending on the research background and/or theoretical orientation of the authors. These characteristics were synthesised from the literature on adult students, but also the ones that manifested clearly in my interaction with adult students:

- The students are adult by definition;
- Adult students bring accumulated experience with them into educational events; and
- Adults' readiness to learn is linked to their life roles and life tasks (Gravett, 2005:8).

Gravett (2005:9) further explained that the concept of adulthood includes a collection of norms and values and is therefore multifaceted. However, when different views on adulthood are considered, it appears that aspects such as autonomy, responsibility and self-determination are generally perceived as significant attributes of adulthood. Thus, adults have a self-concept of being responsible for their own lives and decisions, coupled with a need to be seen by others and treated by others as responsible human beings (Knowles *et al.*, 1998:133).

Adults enter education events with much experience that varies from individual to individual. The heterogeneous life experiences of adults hold several implications for teaching. Life experience is linked intimately to an

adult's identity – "to adults their experience is who they are" (Knowles *et al.*, 1998:66). As mentioned previously, students also bring prior educational experience into the educational setting, including pre-set ideas of what it means to be a student (Galbraith, 1998:3). Therefore, the need to explore students' views on and expectations of education, and to engage in negotiation with students about the educational process, is evident.

The reasons why adults participate in educational activities are complex. From the literature it seems that many adults readily engage in organised learning if the learning can be linked to some life-changing events (Zemke & Zemke, 1995:31) or perplexing circumstance in their life-worlds – problems, challenges and needs arising from their social or vocational roles (life tasks) (Knowles *et al.,* 1998:133). They seek to enhance their identity "through learning that further develops their competence" (Wlodkowski, 1999:12). This competence can be related to specific life tasks, but can also be linked to a quest for personal enrichment – "the promise of increasing or maintaining their sense of self-esteem or pleasure" (Zemke & Zemke, 1995:33). Because adults generally involve themselves in educational activities to pursue their "personally relevant goals" (Wlodkowski, 1999:33), they want to be able to apply what they learn in their life-worlds. They want to experience the immediate usefulness of new learning (Vella, 1994a:5).

Knowles (1990:64) taught us that adults learn differently (andragogy) from children (pedagogy), and that we should let go of our grade school notions of teaching for adult education. This notion is especially true for health education. Tough (1985:21) did research that was particular to adults and reported findings concerning the concept of self-directed learning. Mezirow (1991:27) described transformative dimensions of learning, how adults learn from making meaning of their experience. Brookfield (1987:71-88) and Wlodkowski (1986:564-576) added to the adult learning literature by providing practical interventions to enhance adult motivation to learn and change behaviour. Adult education theory has evolved over the last several decades from Knowles' incorporated concepts, which included performance-centred, need-to-know, experiential learning. A more recent theoretical framework of

cognitive evaluation includes competence, desire for mastery, and self-esteem (Walker, 1999:18). The following time-honoured adult learner principles are used:

- Self-directed learning enhances autonomy;
- Adults must have a felt need to know;
- Problem-oriented learning is more acceptable to adults;
- Incorporating life experiences enhances motivation; and
- Active participation is essential for behaviour change.

Klopper (2000:14) avers that the adult student displays self-direction, has experience, demonstrates a specific learning readiness and a learning orientation which is task-oriented and problem-directed, approaches learning intentionally, is an active constructor of own knowledge and acquires meaning and understanding through reflection. The adult student constructs knowledge, transforms concepts (conceptual change), while the study guide serves as learning accompaniment instrument for learning activities, objectives, self-assessment, reflection and evaluation.

Klopper (2000:44-49) summarises the characteristics of the student as:

- **Self-concept:** Knowles (1980:44) indicates that it is a normal process that a person's self-concept changes from dependence to increased self-direction during the process of maturing. Self-direction implies that the adult wants to make his/her own decisions and take control of his/her life. To take responsibility for his/her own actions is an explicit characteristic of the adult student. It can thus be concluded that adults as students want to be regarded as self-directing students who take responsibility for self-learning.

- **Experience:** As people develop and grow, an accumulative reservoir of experience is collected which is an expanding source of learning – for the self and others. People also value learning from experience

more than learning from being passive (Knowles, 1980:44). Brookfield (1988:320) mentions that the accumulative experience of the adult student is the highest contributing factor in the learning process (compare Gravett, 1991:38). Brundage and Mackeracher (1980:35) and Gravett (1991:38) agree with this and state that adults as students learn in the most productive way if they can establish a relationship between the learning content and their experiences of the past and how to directly apply these to the new situation. In the context of health care it is essential that students are aware of the relation between theory and practice.

- **Learning readiness:** According to Knowles (1980:44) adults show learning readiness when they experience a need to learn something in order to be able to handle real-life tasks or problems (compare Cross, 1981:189; Darkenwald & Merriam, 1982:86-87). An adult may be ready for learning when achieving a goal is important, or when he/she is ill-equipped for his/her profession. Adults, however, have various reasons/needs for taking part in learning activities, and Houle (1981:148) lists the seven most important ones:

    1. Personal growth, intellectual development and the joy experienced through learning;
    2. Achieving a personal goal that is only possible by gaining further knowledge;
    3. Improved fulfilment of a social role in a community;
    4. Fulfilling a religious purpose;
    5. Fulfilling the formal requirements of a profession or membership of a certain group;
    6. The social interaction of learning activities; and
    7. Escaping from boring activities.

From the literature it is clear that various reasons and needs are indicative of adults' readiness to learn, but these centre essentially on being equipped for life's tasks.

- **Learning orientation:** According to Knowles (1984:11), Gravett (1991:42) and Darkenwald and Merriam (1982:86), adults are problem and task-oriented and they show a need to apply the study content immediately. Knowles (1980:44) and Brundage and Mackeracher (1980:36) indicate that adults want to apply the knowledge and skills they learn today in tomorrow's real-life situations. Interest in a particular subject is also a determining reason why the learning orientation of adults centres on a subject.

The literature above on the generalised characteristics of adult students provides valuable insights into ways in which adult students can best be assisted in their learning endeavours. However, it is necessary to always bear in mind that even though students might share characteristics, they remain individuals with unique life histories and needs.

5.7.2 Conclusion statements on the recipient: student

The following deductive conclusion statements relate to the recipient concept of the student:

- The student is a health sciences student or health professional registered for an anatomy module at a higher education institution in South Africa.

- The adult student displays self-direction, has experience, demonstrates a specific learning readiness and a learning orientation which is task-oriented and problem-directed, approaches learning intentionally, is an active contructor of own knowledge and acquires meaning and understanding through reflection.

The student as recipient is displayed visually in Figure 5.3 below.

Figure 5.3: The application of recipient concept for interprofessional teaching-learning of anatomy at a higher education institution in South Africa

5.8 CONTEXT: ANATOMY MODULE AT A HIGHER EDUCATION INSTITUTION IN SOUTH AFRICA

The context of this research study is an anatomy module at a higher education institution in South Africa. The different concepts, e.g. anatomy and higher education institution, will now be discussed.

5.8.1 Anatomy

Anatomy, which means “a cutting open,” is the study of the internal and external structure and the physical relationships between body parts (Martini & Bartholomew, 2007:4). In this study anatomy refers to the macro-anatomy of the human body and anatomy is presented at higher education institutions in the health sciences curriculum.

5.8.2 Higher education institution

Judging from articles published on the restructuring of higher education internationally, there is little doubt that the past decade was a period of substantive change (Cabal, 1993:145; Teichler, 1993:9; Farnham, 1999:158-173). Many of the higher education systems in developed countries have reached mass-status (Guskin, 1996:26) and in terms of demand, the sector has never been in a better shape globally. Mass higher education, however, has forced institutions to adhere to some principles of mass production. Personalised interaction has been replaced by mass modes of delivery and crowded tutorials; scholarly contemplation and leisurely reflection has given way to forms of rote learning, and market-like analogies have become commonplace within and among institutions and national governing systems. The basic explanation for most of the above is economic rationalism (De Boer *et al.,* 1998:103). Governments, and thus society, were not prepared to bear massive expansion costs in higher education. At the same time, however, they were not prepared to lower their expectations of what the sector could be contributing to national development goals either. The effects of all this were rather predictable. Higher education was to cater for increasingly diverse constituencies, and deliver more, in spite of fewer resources. Consequently, as highlighted by De Boer *et al.* (1998:104) :“… with remarkable agility,

universities jumped on the bandwagon of total quality management, performance-based funding, benchmarking, product diversification, venture capital and strong, executive leadership." During the past decade, many countries introduced new legislation or amended legislation regarding the governance and management of higher education. These developments were most obvious in the United Kingdom (UK) and Australia during the early 1990s, and were to be followed later in the decade by European countries such as Norway, Denmark, the Netherlands and Austria (Farnham, 1999:158-173). Most of the changes in higher education had a similar thrust, namely to introduce a more corporate form of decision-making in higher education, to streamline the system and to locate authority at the apex of both the national and institutional structures.

The South African government's White Paper on Higher Education, published in 1997, describes a "transformed" higher education system as one which will provide equal access and equally fair chances of success to all students, develop programmes leading to qualifications that will meet the country's employment needs in respect of highly skilled graduates, promote critical and creative thinking, tolerance and a commitment to the common good through its teaching, and produce research of an international standard that, at the same time, will be cognisant of African contexts (Gravett & Geyser, 2004:6-7). Bitzer (2000:143-144) points out that a number of universities and technikons in South Africa experienced serious management and financial problems during the latter half of the1990s – mainly due to legacies from the previous political dispensation and weak control mechanisms. Structural and conjunctural problems characterised the higher education system. Structurally, issues such as fragmented geographical location, excessive competition amongst institutions for students, inefficiency, skewed student distributions among various fields of study and low output levels were obvious problem areas. Conjunctural problems included an unexpected decline in student enrolments within the public higher education system, accompanying financial constraints on certain institutions, fragile governance capacities at several institutions and inadequate information systems. The Minister of Education requested the Council on Higher Education (CHE) during the latter

part of 1999 to provide him with advice on the reconfiguration of the higher education system in order to meet the high-level human resource needs of the country. In a memorandum produced in December 1999, the CHE proposed a number of key principles and bases upon which the reconfiguration of higher education should take place. It also proposed the establishment of a Task Team to develop details of a framework and strategies for the reconfiguration of the higher education landscape.

Bitzer (2000:144) asserts that the report seeks to reconfigure the South African higher education landscape in such a way that it delivers effectively and efficiently, based on the principles of equity, quality and a responsiveness to democratic values. It strives to provide a framework for the promotion of a coordinated system which will ensure that the knowledge and human resource needs of a developing democracy are effectively met. One of the important goals of higher education is that of assisting in the process of eroding the legacy of socio-structural inequities, while providing opportunities for social advancement through equity of access and opportunity. By means of research, teaching and learning, as well as by way of community service programmes, higher education must produce the knowledge and personpower for national reconstruction and economic and social development. This would enable South Africa to engage proactively with and participate in a highly competitive global economy.

Once the shift to democracy allowed South Africa to rejoin the international community, the context in which the higher education system had to operate inevitably involved global as well as local considerations (Gravett & Geyser, 2004:3). Historically, higher education institutions have evolved from institutions that primarily provided education (during the Middle Ages) to institutions that conduct research (post-Humboldt). Presently, higher education institutions are learning institutions that focus on both education and research (Council on Higher Education, 2004:11). In South Africa today, higher education is characterised by constant demands. Such demands require that educators should supervise more research students, motivate students to complete their studies faster, conduct more research, publish

research articles, acquire increased external funding and manage larger student groups in classes. These requirements increase stress as academic staff has more responsibilities and less time in which to complete these tasks. As a direct result of this context, the educator can no longer assume sole responsibility for preparing the student for the demands that he/she faces. It is therefore vital that students systematically develop their own abilities towards life-long-learning and acquiring a creative approach to scientific knowledge. A shift in focus from providing education to managing learning is required (Le Grange *et al.,* 2006:72; Lategan, 2005:182; Liebenberg & Barnes, 2004:7; Klopper, 2000:2-3).

The tension between teaching and research at universities is a timeless issue that has received fresh attention in recent years through investigation of the teaching-research nexus (Jenkins & Healy, 2005:70). Serow (2000:449) has pointed out that in recent years research has been occupying an ever more pivotal position within university structures, while earlier Gibbons (1995:90-104), Slaughter and Leslie (1997:31) and Court (2000:3-16) indicated that one reason for this was that many institutions have responded to reduce financial reliance on governments by encouraging professorial enterprise in contract research, product development and other forms of corporate consulting and collaboration.

In spite of the centrality of research, few members of the academic professions are exempted from teaching responsibilities, while there is increasing evidence that educators also need to teach undergraduate modules for the academic benefit of students. Studies by Altbach and Lewis (1997:3-48) have revealed that substantial proportions of educators in Russia, the United States and several Latin American countries identify teaching rather than research as the cornerstone of their professional lives. As a result of mass higher education systems that have evolved throughout the world, universities have had to devote more staff to the teaching function. In this regard Trow (1999:303) has pointed out that the new student has been oriented chiefly toward gaining useful skills and knowledge rather than toward

membership in a cultural elite marked by bodies of arcane knowledge and cultivated ways of thinking.

All of these trends present the modern university with a dilemma. On the one hand it has to confirm its academic and scholarly standing by increasing its research output and recognition, but on the other hand scholarly teaching, which cultivates young minds that form the basis of good research, ought not to be neglected. If a university appoints, acknowledges and rewards its academc staff for research, but not for teaching, it will probably increase its research output and standing. This will not be for long, however, since it seems inevitable in such a case that the teaching function will be neglected or marginalised, resulting in poorer undergraduate teaching and learning, which in turn will negatively affect postgraduate studies and consequently research as well (Bitzer, 2006:3). This does not alleviate the dilemma that most higher education institutions in South Africa face today, namely that institutional standing is mostly determined by research output while education authorities, students and other parties expect good results in terms of student success and throughput. How this balance should be achieved in practical terms needs to be constantly re-evaluated and researched (Bitzer, 2006:11).

5.8.3 Conclusion statements on the context: anatomy module at a higher education institution in South Africa

The context in which the agent and recipient engage for the activity to occur is an anatomy module at a higher education institution in South Africa. The following deductive conclusion statements relate to the context of an anatomy module at a higher education institution in South Africa:

- Anatomy is a subject/module that forms a part of the health sciences student's curriculum to prepare him/her for his/her profession.
- Higher education institutions are learning institutions that focus on both education and research.

An anatomy module at a higher education institution in South Africa as context is displayed visually in Figure 5.4 that follows.

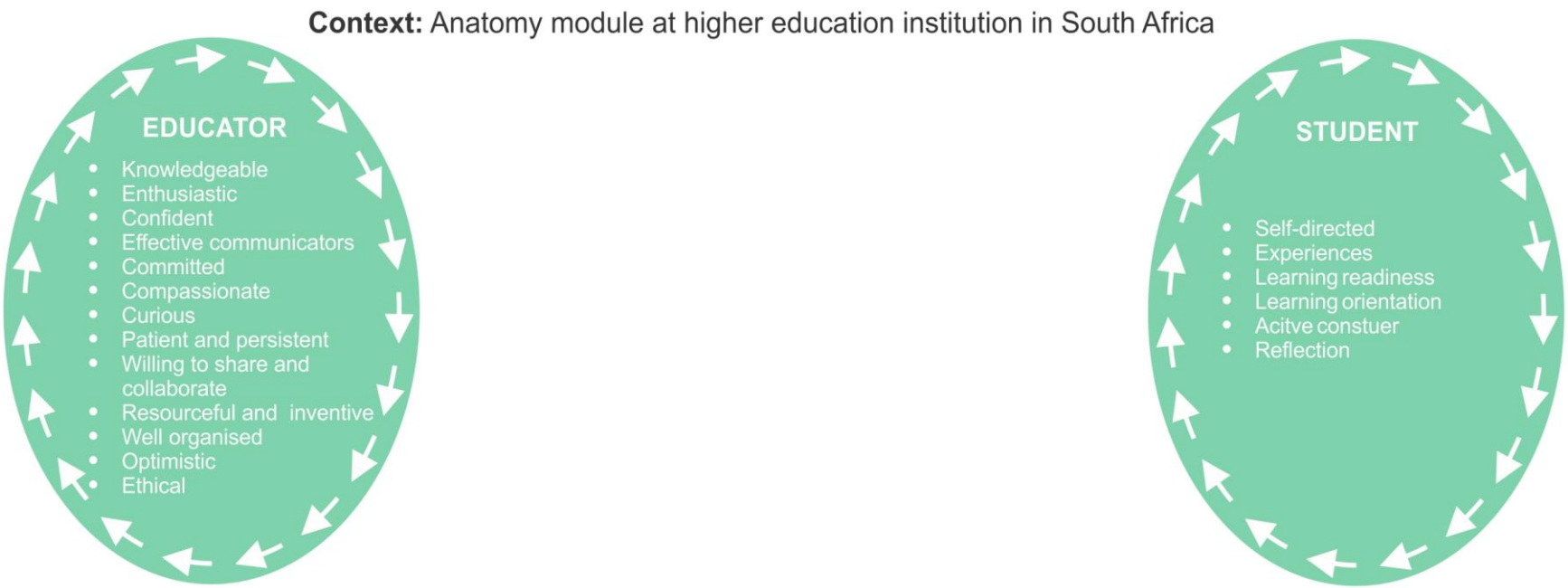


Figure 5.4: The application of context concept for interprofessional teaching-learning of anatomy at a higher education institution in South Africa

5.9 GOAL: DEEP-HOLISTIC LIFELONG LEARNING

The need for large numbers of highly skilled workers in a knowledge-based global economy leads to the idea that learning should not be limited to formal education and thus to childhood and early adulthood. This construct of "lifelong learning" is then often linked to yet another idea that in the future, individuals will be required to change career several times within a lifetime because of shifting economic contexts (Gravett & Geyser, 2004:8). The ability to learn on an ongoing basis, often outside formal educational structures, and at the same time to receive credit for that learning in the form of qualifications, thus becomes important. In a country like South Africa, where millions of people have been denied the right of formal study in childhood and early adulthood, lifelong learning is even more important for reasons of equity as well as economic efficiency (Gravett & Geyser, 2004:8).

Klopper coined the concept in 1994 and defines deep-holistic lifelong learning as a dynamic process during which the student approaches the learning process intentionally in an active search for meaning through interaction (Klopper, 2000:6). The student manifests a qualitative perception of learning by demonstrating critical thought and reflection. The learning approach is related to learning outcomes, which implies that the student should manifest a motivated attitude. The student accepts responsibility for his/her own learning. Deep-holistic lifelong learning takes place through continuity and articulation that represent democratisation and can take place in formal and informal education. Deep-holistic lifelong learning can be presented on a continuum from a lesser degree of involvement to a higher degree of involvement.

Knowles (1973:164) visualized that the student would be gradually weaned away from the perception that he/she is engaged in schooling, and that when he/she has acquired the skills of learning appropriate to his/her aspirations he/she will come to see himself/herself as a self-directed student, making use of the learning resources centre as a resource that is available to him/her on his/her terms for the rest of his/her life. There will be no such thing as graduation. There will be no such things as adult education. There will only be lifelong education.

For deep-holistic lifelong learning to take place, Ramsden (1992:42) explicitly points out the difference between a deep-holistic approach and a superficial-atomistic approach: deep-holistic approach has as its aim association and active searching for meaning, while the superficial-atomistic approach is aimed at memorising isolated information and facts. Svensson (1984:56) distinguishes the ways in which the students construct the learning task as atomistic (superficial) and holistic (deep). The atomistic approach points to a fragmentation of the learning task versus the holistic approach where the student integrates parts of the whole and searches for underlying associations in the structure (compare Gravett, 1993:55).

In Table 5.5 the differences between the superficial-atomistic approach and the deep-holistic approach are outlined:

Table 5.5: Differences between the superficial-atomistic and deep-holistic approaches (Klopper, 2000:88-89)

	Superficial-atomistic approach	Deep-holistic approach
Intention	• Extrinsic motivation • Merely has reaching goal in mind (pass an examination) • Focuses on isolated parts of the study matter	• Intrinsic interest in learning task • To develop comprehension and understanding • Approaching learning task in holistic way
Process	• Shows a quantitative perception of learning • Regards learning as a task with requirements to be met • Focuses on the concrete and literal aspects rather than on meaning • Regards the components of the task as discrete, non-relevant and does not draw any associations • Focuses on memorising in order to produce • Avoids personal meaning that the learning task may have	• Shows a qualitative conception of learning • Learning task is interesting • Personal involvement • Focuses on underlying meaning rather than on the literal aspect • Integrates the components of the associated constructed knowledge • Theorises about the learning task • Forms hypotheses about related aspects of existing knowledge with new information • Uses learning task for personal enrichment • Finds learning to be emotionally satisfying
Strategy	• Accurate reproduction by rote learning	• Maximises comprehension (understanding) • Reads widely • Discusses • Reflects

In this research study the main goal is to achieve deep-holistic lifelong learning and this can only be accomplished by a competent clinical practitioner where he/she applies the knowledge of anatomy in practice.

5.9.1 Competent clinical practitioner

According to Brooker (2006:52) clinical is defined as pertaining to a clinic or the observation, nursing and treatment of patients. The clinician is further described as part of a nursing/midwifery/specialist community public health nursing context. The word is used to designate those individuals who work with patients/clients as opposed to those who indirectly serve patients, e.g. managers and educators. Also used to describe all those involved directly with patient care, such as podiatrists, dentists, dieticians, doctors, medical laboratory scientific officers, optists, physiotherapists, radiographers and speech and language therapists (Brooker, 2006:52). Practitioner is defined in a nursing context by Brooker (2006:192) as a clinician (see above). In a wider health context, a practitioner is any professional who works with patients/clients.

Dall'Alba (2004:679-680) declares that traditionally, professional skill has been investigated in terms of attributes, such as knowledge, skills and competencies that professionals possess and apply in practice. These attributes are typically identified and described in a manner that is decontextualised from the practice to which they refer. Similarly, when developing professional skill in formal education and in workplaces, the point of departure is usually a formalised body of knowledge, skills and competencies, often described in textbooks. For example, in formal professional education, the curriculum design typically assumes progressive accumulation of a body of knowledge, skills and competencies. Aspiring professionals are initially expected to acquire basic knowledge, skills and competencies relevant to the profession and then obtain more advanced knowledge, skills and competencies later (Bridges, 2006:375).

The particular knowledge, skills and competencies that we develop and utilise in professional practice depend on how we understand that practice. In other

words, the way in which we understand professional practice is fundamental to how we both perform and develop that practice (Dall'Alba, 2004:680; Bridges, 2006:375).

The goal of interprofessional teaching-learning between the educator and student is deep-holistic lifelong learning that is applied by a competent clinical practitioner in practice. Competence has always been at the heart of the debate about the purpose of higher education and what professionalism entails (Watson *et al.,* 2002:421-431; Bines, 1992:6). Hence, theoretical perspectives of competence and the conceptualisation of professional competence are integrated in the discussion that follows.

i) The notion of competence

"Competent" means having the necessary skill or knowledge to do something successfully (Oxford English Dictionary, 2002). Therefore, competence refers to the quality of being competent. Although competence in nursing has been variously described in the literature, there are at least four conceptual tenets common to the writings of Eichelberger and Hewlett (1999:204-208) and Wright (2001:223-254). These are:

- Knowledge
- Behaviour (skill)
- Critical thinking
- Attitude (interpersonal)

Despite these conceptual tenets and their use in competency-based assessment, competence remains poorly defined. In their systematic review of literature published over a twenty-year period, Watson *et al.* (2002:421) concluded that there is still considerable confusion about the definition of (clinical) competence, and that current methods to measure or define competence have not been developed systematically.

Pre-empting this conclusion, Fish and Twinn (1997:52) suggest that the notion of competence is not the same as competency. Competence, is the wider, more holistic of the two, and entails the deliberate exercise of principled

judgment based on rational knowledge and understanding (Carr, cited in Fish & Twinn, 1997:52). In contrast, competency is narrower and more reductionistic in nature, and entails the performance of tasks/skills. This is consistent with the pre-technocratic (apprenticeship) model of education (Bines, 1992:6) where the emphasis is on skills training in the absence of independent thinking and decision-making. In a more progressive model of education a focus on competence will enhance both the rigour and the relevance of professional education (Bines, 1992:6). Such a focus forms the basis of competency-based education.

ii) Conceptualisation of professional competence

The literature, although it is inconsistent in its definitions, is replete with discussions on clinical competence. These discussions focus mainly on the performance of behaviours or practical tasks. Based on empirical evidence, retrospective and current, a more encompassing, contextual view of competence is conceptualised. The idea of competence involves both behavioural and interpretive approaches (Benner, 1982:402; Bines, 1992:6). An interpretive approach is synthetic rather than analytic, and focuses on the meaning of the learning experience as shaped by the context. The processes used by specialist nursing students to create and clarify meaning are reflection-on-action and reflection-in-action, collectively known as reflective learning (Schön, 1987:5; Palmer *et al.,* 1996:5-6) in a situation-dependent learning context called the practicum. An interpretive approach allows for economical yet rich description of the behaviours in practice, clarifying Bines' (1992:6) assertion that behavioural aspects must be included. The interpretive approach is thus congruent with a situation-dependent, holistic approach, which allows the development of those skills crucial to the profession or discipline. Examples of such professional skills include the ability to collaborate and relate to others, clinical and ethical decision-making, caring and the ability to empathize. These skills may be assessed in the domains of critical thinking (or intellect), interaction and technique. It is concluded that professional competence involves behaviour and interpretation based on the combination of two premises:

- Premise 1 – performance, which includes advanced knowledge and skills, and appropriate attitude; and
- Premise 2 – clinical judgment, which includes critical thinking, clinical/technical skill and interactive skill.

Conceptualising the development of competence is juxtaposed on Benner's (1984:20) work on the "novice to expert" continuum. Hogston (1993:168) coined the phrase "a novice competent practitioner" for students entering post-registration programmes. The student moves through competence at specialist level (professional competence), ultimately achieving proficiency or "expert competence" (Hogston, 1993:168), which according to Benner (1984:1480) is accrued by experience over time. Hence, the immediate goal of this practice model is deep-holistic lifelong learning through professional competence, which is to develop along a continuum, ultimately attaining proficiency or expertise.

Professional competence is thus defined as having the ability to integrate knowledge, skills, attitude and values in clinical judgment, and critical thinking, clinical/technical skills and interpersonal skills in their performance (Bruce, 2003:150).

iii) Critical thinking

Klopper (2000:39) maintains that critical thinking is both an attitude and a process of reasoning concerned with intellectual skills – useful mental activities within which ideas are produced, evaluated and judged (Wilkenson, 1991:24). Critical thinking is disciplined, self-directed, rational thinking which "...certifies what we know and makes clear wherein we are ignorant..." It is the art of reflecting about one's own thinking, while the individual tries to make his own thinking clearer, precisely accurate, relevant and consistent (Wilkenson, 1991:24).

According to Wilkenson (1991:25-26) the characteristics of critical thinking are:

- Critical thinking includes conceptualisation. Conceptualisation is the intellectual process of forming concepts. A concept is a mental image of reality.

- Critical thinking is rational and reasonable. Reasonableness and rationalisation refer to thinking based on reasons, rather than on bias, self-interest, preferences or fears.

- Critical thinking is reflective. It implies that the person does not hastily draw conclusions but that he/she collects data, thinks it through (inner dialogue and discourse), and weighs up the facts and evidence (reflection-in-action).

- Critical thinking is inherently an attitude. A critical thinker who is reflective has an attitude of inquiry.

- Critical thinking is autonomous thinking. A critical thinker thinks for himself/herself, does not passively accept the views of others and analyses and decides about the validity of a matter.

- Critical thinking includes creative thinking. Creative thinking is a productive mental skill which creates original ideas by determining relationships between thoughts and concepts.

- Critical thinking is fair thinking. Critical thinking avoids being one-sided and acknowledges others.

- Critical thinking focuses on the decision of what to believe or what to do. Critical thinking is used to evaluate arguments and conclusions in developing new ideas, reaching clear conclusions and solving problems.

Furthermore, Klopper (2000:70) contends that critical thinking is not a strategy and does not consist of a sequence of operations and subordinate procedures. Critical thinking is a collection of specific operations that may be used singly or in any combination or in any order. These critical thinking operations as defined by Beyer (1987:27) are: distinguishing between

verifiable facts and value claims; distinguishing relevant from irrelevant information, claims, or reasons; determining the factual accuracy of a statement; determining the credibility of a source; identifying ambiguous claims or arguments; identifying unstated assumptions; detecting bias; identifying logical fallacies; recognising logical inconsistencies in a line of reasoning; and determining the strength of an argument or claim. Therefore, a critical thinker approaches information, assertions and experience with a healthy scepticism about what is really true or accurate or real as well as with a desire to search through all kinds of evidence and engage in considerable analysis to determine that truth (Beyer, 1987:35).

Anatomical knowledge supports examination of a patient, the formation of a diagnosis and communication of these findings to the patient and other medical staff professionals. Anatomy provides a platform of knowledge suitable to all health sciences careers (Turney, 2007:104). This may ultimately lead to improved patient outcomes that include foundation, procedures, patient safety and communication. Each of these concepts will now be discussed.

5.9.1.1 Foundation

Briggs *et al.* (2001:9) explain that anatomy is the core subject underpinning medicine and health related sciences. Johnston (2009:222) agrees with the above statement and explains that the common expectation is that anatomy/physiology courses will scaffold nurses' understanding of pathophysiology, clinical assessment and many nursing procedures. Nayak *et al.* (2008:2) support Johnston affirming that anatomy and physiology are the foundation sciences for the medical curriculum. Understanding anatomy and physiology is essential to understand other subjects in the medical curriculum. Hence, anatomy and physiology have to be taught/learned effectively.

5.9.1.2 Procedures

Johnston (2009:222) explains that a good understanding of human anatomy is clinically relevant for many health care professionals. A detailed knowledge of where, as well as how, to palpate, percuss or auscultate is essential for

adequate assessment, provision of treatment and ongoing care of patients. Older (2004:79) as well as Turney (2007:104) support the author above and explain that anatomical knowledge supports examination of a patient, the formation of a diagnosis and communication of these findings to the patient and other medical professionals.

5.9.1.3 Patient safety

Johnston (2009:222) explains that nursing students and newly qualified nurses report and are reported to be fearful of the biological sciences and as having difficulties in applying anatomical and physiological information. This relative inability to apply theoretical information impacts on patient care by preventing effective and efficient patient assessment and promoting communication processes that are fragmented and confusing; delaying effective treatment options. Inability to accurately “physiologically police” patients increases the risk of averse events, increasing mortality and morbidity. Older (2004:81) concurs and explains that one of the consequences of poor, over-simplified undergraduate training is inadequate post-graduate knowledge, which will lead to misdiagnosis and even malpractice. Turney (2007:105) supports Older, claiming that unfortunately, the evidence suggests that the curricula and teaching have diminished too much, to an extent where safety and clinical practice might be compromised.

5.9.1.4 Communication

Every day of our lives we try to share ideas, feelings, and information with other people. This is known as communication. Talking is the most common way of communicating, but there are many others, e.g. writing, making hand and body movements, drawing and singing. Many of the educational methods that we use are in fact communication methods. Communication skills are needed in health education (WHO, 1988:29; Killen, 2007:23-24; Okun & Kantrowitz, 2008:30).

Communication is part of our normal relationship with other people. A good relationship cannot exist without some sharing of ideas, feelings, and information. Likewise sharing happens most easily between people who have

a good relationship. Building good relationships with people goes hand in hand with developing communication skills (WHO, 1988:29-30). Three important skills needed for communication, as described by WHO (1988:30-31; Killen, 2007:24; Okun & Kantrowitz, 2008:8) are:

- **Talking and presenting clearly**

The goal of communication is to make sure that people hear, see, and understand the message (idea or feeling) that is being shared with them. Therefore it is important to talk, write, or present this message clearly and simply. First, use words that people will understand. Another aspect of clear communication is using as few words as possible.

- **Listening and giving attention**

Communication involves both giving and receiving. Not only should the health professional speak clearly, he/she must listen carefully to understand the other's interests and ideas.

- **Discussing and clarifying**

After listening, it is important to make sure you have heard the other person correctly. Similarly, after talking, you should find out if the other person has heard you correctly. Asking questions helps to clarify what someone said. Never be afraid to ask questions. Questions can make communication between people more accurate. It is also good to summarize. After listening, try briefly to tell the other person what you think was said. This kind of discussion between people leads to good communication.

Turney (2007:104-105) makes clear that anatomical knowledge supports examination of a patient, the formation of a diagnosis and communication of these findings to the patient and other medical professionals. Also, that a minimum working knowledge should be that which allows an independent practitioner to practice safely, and to communicate with other medical professionals and patients effectively.

5.9.2 Conclusion statements on the goal: deep-holistic lifelong learning

The following deductive conclusion statements relate to the goal concept of deep-holistic lifelong learning:

- Deep-holistic lifelong learning is a dynamic process during which the student approaches the learning process (anatomy module) intentionally in an active search for meaning through interaction (to apply knowledge in practice).

- The particular knowledge, skills and competencies that we develop and utilise in professional practice depend on how we understand that practice.

- Anatomical knowledge supports examination of a patient, the formation of a diagnosis and communication of these findings to the patient and other medical staff professionals and a minimum working knowledge should be that which allows an independent practitioner to practice safely, and to communicate with other medical professionals and patients effectively.

The goal of deep-holistic lifelong learning is displayed visually in Figure 5.5 that follows.

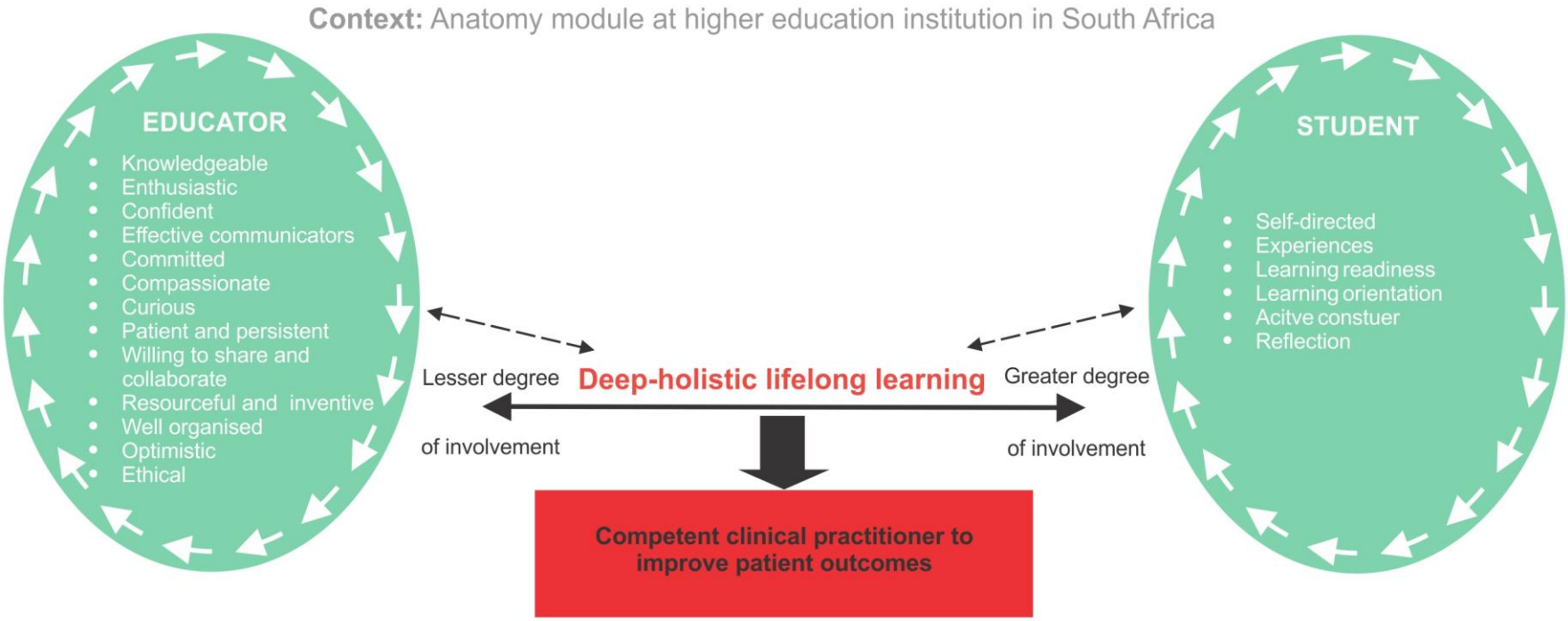


Figure 5.5: An application of the goal concept of deep-holistic lifelong learning

5.10 PROCEDURE: INTERPROFESSIONAL TEACHING-LEARNING EMBEDDED IN CONSTRUCTIVIST THEORY

Gravett (2005:9) suggests that the ideal adult teaching-learning transaction will accommodate the students' adult attributes, preferences and psychological needs, as well as the adult educator's expertise and guidance. This requires an "adult" teaching approach that confirms and promotes adulthood by fostering independence, responsibility and self-direction through a disposition of mutuality between the educator and students as cooperative inquirers engaged in dialogue. The approach that will be used in the conceptual framework and ultimately the practice model will be interprofessional teaching-learning embedded in constructivist theory. These two concepts will now be discussed.

5.10.1 Interprofessional education (IPE)

As explained in Chapter One and in more detail in section 5.2 of this chapter, interprofessional education (IPE) describes learning activities involving at least two professional groups (Parsell & Bligh, 1998). The common theme of shared learning appears to be a consensual agreement that each represents a generic term for learning activities in which students from different spheres of health and social care coalesce within a framework of common learning aims and objectives (Carlisle *et al.,* 2005:4). The WHO (2010:13) supports the above authors' definitions and state that interprofessional education occurs when two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes.

The WHO (2010:17) stresses that the educational benefits from implementing IPE are: students have real world experience and insight; staff from a range of professions provide input into programme development; and students learn about the work of other practitioners. Health policy benefits from implementing IPE are: improved workplace practices and productivity; improved patient outcomes; raised staff morale; improved patient safety; and better access to health-care. Research indicates that IPE is more effective when: principles of adult learning are used (e.g. problem-based learning and action learning

sets); learning methods reflect the real world practice experiences of students; and interaction occurs between students (WHO, 2010:24). The WHO (2010:24-25) further declares that effective IPE relies on curricula that link learning activities, expected outcomes and an assessment of what has been learned. Well-constructed learning outcomes assume students need to know: what to do (i.e. knowledge), how to apply their knowledge (i.e. skills), and when to apply their skills within an appropriate ethical framework using that knowledge (i.e. attitudes and behaviour).

In this research study interprofessional teaching-learning takes place between different professions, e.g. biokinetics, nursing and dietetics students.

5.10.2 Constructivist theory

As described in Chapter One and section 5.2 of this chapter constructivism rests on the assumption that learning is a process of constructing meaning derived from the student's action in the world or, put differently, a process of knowledge construction (Gravett, 2005:19). Learning is an active process of constructing meaning and transforming understandings in interaction with the environment. When you learn, you assign meaning (or sense) to something and develop and build ideas around it. When you are confronted with new information that you need to learn, this new information is understood and learned through your pre-existing cognitive structures, in other words, through your existing knowledge framework (Gravett, 2005:19-20).

Gravett (2005:20) also emphasises that meaning is arrived at through constructing relationships between information and facts and one's existing knowledge, resulting in coherent knowledge structures. Meaningful learning goes hand in hand with the construction of an integrated conceptual framework (connected knowledge). When learning (the construction of meaning) occurs, students actively connect new information or ideas to their existing knowledge. Therefore, students can best meaningfully construct personal knowledge when they are able to confront new information from the perspective and awareness of their existing knowledge base (Garrison & Archer, 2000:87-105). If students can link new information to their existing

conceptual framework, and they can construct new, meaningful interconnections so that their existing conceptions are transformed (enriched or revised) in one way or another, then conceptual change occurs. Thus, existing conceptions are transformed during knowledge construction (construction of understanding) (Gravett, 2005:21).

Killen (2007:70) avows that what students learn is important, but how they learn is also important because their learning experiences will directly influence their motivation and their future learning strategies. Therefore, the educator has a responsibility to make every lesson a positive and productive learning experience for all students. Killen (2007:71) and Slavin (2012:188) further explain that lesson planning plays a key part to teach well. Lesson planning is a procedure that includes stating learning objectives such as what the students should know or be able to do after the lesson; what information, activities, and experiences the educator will provide; how much time will be needed to reach the objective; what books, materials, and media support the educator will provide; and what instructional method/s and participation structure will be used.

This may ultimately lead to improved teaching-learning that includes the concepts of teaching, learning, presentation, study/teaching material, assessment and interaction. Each of these concepts will now be discussed.

5.10.3 Teaching

Teaching means helping a student to learn. An educator can tell students about a certain subject, can help students practise a skill (such as giving an injection), or assist students in discovering knowledge for themselves (for example, by talking to a person who has recovered from malaria). The educator can only help students to learn and make it easier for them to learn. The educator can never learn for the students. Each student must master the knowledge, skills and competencies by him- or herself (Ehlers, 2002:3-4). “Competent” means having the necessary skill or knowledge to do something successfully (Oxford English Dictionary, 2002). Although competence in nursing has been variously described in the literature, there are at least four

conceptual tenets of nursing competence and these are knowledge, behaviour (skill), critical thinking and attitude (interpersonal) (Bruce, 2003:147).

5.10.4 Learning

Learning is a dynamic, active and cumulative process of knowledge construction that takes place through understanding and interpretation (Klopper, 2000:9). D'Eon (2005:50) contends that there are three generally accepted broad areas or domains of human behaviour in which learning can take place: thinking (cognitive domain), doing (psychomotor), and feeling (affective) (Bloom, 1956:1). Especially relevant to interdisciplinary learning, is a fourth domain that encompasses relating in groups (social/relational) (Mackway-Jones & Walker, 1999:24). D'Eon (2005:51) also avers that the end point of training is the ability of health professionals to perform their roles as part of a team in the care of patients. This entails a whole range of competences within each of the four domains. To be able to transfer their learning in each of the domains to novel cases and situations they must add to their repertoire increasingly complex skills and knowledge.

5.10.5 Presentation

The lesson is where teaching-learning takes place. Conducting effective lessons is at the heart of the educator's craft. Effective lessons use many teaching methods (Slavin, 2012:184). Ehlers (2002:9) states that the educator's task is to design the lesson so that the information can be applied in practice. Knowledge must be applied to action of daily living to have any effect on the health of a person, a family or a community. When planning a lesson, the educator must aim to involve all the students in the learning process and to deal with individual differences. To do this, the educator needs to find out what the students know and believe, and combine their existing knowledge with the new information (Ehlers, 2002:9).

Ehlers (2002:12-15) elucidates the development process as follows: the learners' knowledge of the topic must serve as the foundation for new

knowledge. It must be tested immediately after the introduction to the lesson; the expected outcomes for each lesson must be spelt out to the learners. The content must agree with the learning outcomes and proceed in the same order as the learning outcomes; the key words (most important aspects) of the lesson should be written on a blackboard, a transparency or a poster, to give the class an idea of the new lesson content. The educator should present the information in small bits, focus on one idea at a time; distinguish between those aspects that are important and those that are less important; plan explanations together, along with any blackboard work and other teaching media. Explaining something means restating it or giving examples that make sense to the learners; it is necessary to allow the learners a few seconds to absorb difficult words after they have been explained; allow enough time for learners to make notes; it is essential that learners ask questions during the lesson.

5.10.6 Study/teaching material

Ehlers (2002:4-5) explains that different students learn in different ways. Some students like listening and remember what they hear. Others fall asleep when they listen to an educator and forget everything that has been said. Most students remember what they see at the movies, on television and in real life. However, educators and students cannot wait for things to happen in real life before teaching-learning about them. Therefore it is vital to use different teaching-learning methods and media to teach health care workers.

5.10.7 Assessment

Where there is teaching-learning, there must be a fair way of assessing the type and amount of learning that has occurred. Measuring the extent of students' learning and evaluating the merits of it are two of the more significant and difficult aspects of being an educator (Hamachek, 1995:374). According to the South African Department of Education (2002:18) assessment should also help students to make judgments about their own performance, set goals for progress and provoke further learning.

Cannon and Newble (2002:165) explain that active involvement in the students' assessment is one of the educator's most critical tasks. Assessment is more than a selection of techniques; it is a systematic process and a critical education component. Firstly, it is important to understand what concept assessment entails. Assessment, according to the Council on Higher Education (2004:121), Ehlers (2002:134) and Klopper (2000:117) is a method used to measure something, to add value to it or to test it. Therefore, assessment could be defined as assessment based on values, norms and criteria. Assessment is usually based on abilities (knowledge, skills, competencies and values) and attitudes according to a prescribed level. The assessment process should be dynamic, continuous and open-ended. An education and/or learning programme is only complete when one establishes the extent of the learning that occurred. The assessment results could also guide decisions regarding future teaching. Ehlers (2002:135) describes assessment as a process that is caring and subjective. In this process the educator aims to diagnose and facilitate (assist) the student's achievements and attempts to acquire specific learning outcomes, knowledge, skills and competencies. Therefore, the objective of assessment is to determine the student's education needs.

Educators take assessment seriously. However, there are gaps in the quality of assessment procedures. In order to improve assessments educators should be clear about the objectives of assessments. Various objectives for assessments were evaluated. These include: measuring essential skills, knowledge and competencies, measuring improvement over time, diagnosing the students' problems, providing the students with feedback, evaluating the course's effectiveness and motivating the students to study. Although an assessment method could achieve more than one of the above objectives, assessments are too often used to achieve unsuitable objectives and do not successfully provide valid and reliable data. One should also not forget the assessment's potentially powerful impact on the student, especially if their future relies on the assessment. It could have a positive, negative or even damaging effect on the student (Cannon & Newble, 2002:165-166).

Different assessment processes exist and could be formative (continuous) or summative (final). Formative assessment provides students with feedback on their progress and the outcomes achieved. Summative assessment is conducted at the end of a semester or year to assign a percentage to the student's abilities (Ehlers, 2002:134-135; Cannon & Newble, 2002:167; Friedrich-Nel *et al.,* 2005:880). In this research study a distinction is drawn between evaluation and assessment:

- **Evaluation:** To evaluate something means to measure it or to attach a value to it, to indicate its worth or value, or to test it. The purpose of evaluation at the end of a lesson is to find out whether the learning outcomes provided at the beginning of the lesson, have been accomplished (Ehlers, 2002:134). This study concentrates on the students' evaluation (measure) of the anatomy educator's teaching-learning approach.
- **Assessment:** Ehlers (2002:135) describes assessment as a process that is caring and subjective. In this process the educator aims to diagnose and facilitate (assist) the student's achievements and attempts to acquire specific learning outcomes, knowledge, skills and competencies. Therefore, the objective of assessment is to determine the student's education needs.

Williams (2008:196-202) sees assessment as learning where the assessment outcome is deep-holistic lifelong learning that is self-directed and can be achieved by informal, formal formative assessment methods within a constructivist framework.

5.10.8 Interaction

Klopper (2000:13) describes interaction as the circular and reflexive process between the educator and the student, as well as between the interprofessional educators and also between the interprofessional students. Interaction takes places by means of dialogue, discourse and narrative. Dialogue refers to the exchange of ideas by means of reflection in order to construct new understanding and meaning and implies discussion. Dialogue

can also be internal. Discourse implies discussion, debating, language, thought and actions that are in a complex way related to social relationships within a specific context. Dialogue is inherently part of discourse. Narrative refers to relating a series of events/episodes/interaction within a specific context. The story being told is constructed within a certain structure and is an expression of the educator's and/or student's experience. Dialogue and discourse are inherently part of narrative.

Interaction includes communication between the educator and the student as well as communication between the different interprofessional students.

5.10.8.1 Communication

Communication was discussed under section 5.9.1.4 of this chapter. Group work forms an essential part of interprofessional teaching-learning as this is where the different interprofessional students can learn with and from each other.

5.10.8.2 Group discussions

The WHO (1988:108-109) define a group as a gathering of two or more people who have a common interest. There are two main kinds of groups. Those that are very well organized, such as groups in anatomy practical class, are formal groups. Those that are not organized, such as the people attending anatomy class on a particular day, are informal gatherings. The people in an informal gathering have some features in common, but no special goal that they are trying to achieve together. Formal groups fulfil two major needs, the need to accomplish a task, and the need to belong (WHO, 1988:110).

Slavin (2012:210) explains that like any discussion, most small-group discussions should follow the presentation of information through educator-directed lessons, books, or videos, or following an opportunity for students to find information for themselves in the library or online. Each group should have a leader that the group appoints. Leaders should be responsible, well-organized students but not necessarily the highest-achieving students.

Groups may all discuss the same topic, or each may discuss a different subtopic of a larger topic that the whole class is studying. Slavin (2012:211) further makes it clear that the leader's role in each discussion group is to make sure that the group stays on the topic and questions assigned to it and to ensure that all group members participate. A group recorder could be appointed to write down the group's ideas. At the end of the discussion, the group members prepare a report on their activities or conclusions to present to the rest of the class.

Research on small-group discussions indicates that these activities can increase student achievement more than traditional lessons if the students are well prepared to work in small groups and if the group task is well organized (Sharan *et al.,* 1984:137; Sharan & Shachar, 1988:58). D'Eon (2005:50) explains that learning in teams is best facilitated by the progressive mastery of more and more complex tasks incorporating the best practices of cooperative learning as part of an experiential learning process.

i. Cooperative learning (CL)

D'Eon (2005:53) states that considerable investigation over a long period of time has shown that cooperative learning (CL) is very effective in promoting learning to work in teams (Biggs, 1999:221-238; Griffiths, 1999:95; Harden, 1998:402; Johnson *et al.,* 1998:26-35; Nilson, 1998:145) and for transfer (Abercrombie, 1969:67-82; Campione *et al.,* 1995:35; Crosby & Hesketh, 2004:16). Best practice CL has five necessary features: positive interdependence, face-to-face promotive interaction, individual accountability, interpersonal and small-group skills, and group processing (Johnson *et al*., 1998:26-35; Nilson, 1998:145).

Positive interdependence means being interconnected. The students strive together to reach a common goal or share resources, or have roles that complement each other, or even celebrate their successes together. Face-to-face promotive interaction means close, usually synchronous, purposeful activity such as discussion, debate and joint decision-making. Individual accountability means that each individual is tested for the mastery of the

material and is held responsible for contributing a fair share to the success of the group. Interpersonal and small-group skills involve teaching members the team skills needed to succeed. Group processing is reflecting on the actions (both group and individual) that contribute (or not) to the effectiveness of the group process and deciding what to do or not to do about it (D'Eon, 2005:53).

D'Eon (2005:53-54) further states that these five essential elements are clearly important aspects of healthy interprofessional teams in the workforce (Levin *et al.,* 2001:25). Those teams will share common goals centred on the care of patients and will all have skills from discipline-specific training to bring to the team (positive interdependence). They will often work in the same room creating management plans, operating, and solving other problems and challenges together (face-to-face interaction). Interdisciplinary teams will expect each member to make a contribution and be responsible for his or her part of the work (individual accountability). Teams need development in teamwork and group skills (interpersonal and small-group skills). Finally, teams, if they are to function well and improve, need to reflect on what they are doing and look to ways that they can function more effectively (group processing). The CL model, since it is a very good match to actual teamwork, can simulate and serve as a vehicle to train functional, real-life interprofessional teams.

ii. Experiential learning (EL)

Experiential learning is learning that takes place as a result of an encounter with an experience that is planned by educators within a course, program or curriculum (Kolb, 1984:20). The best learning, many theorists would argue, is in real-life contexts (Brown *et al*., 1989:32; Candy, 1991:309; Blumenfield *et al.,* 1997:819). Moving from paper cases to simulated patients and even to real cases with real people (as with service learning) makes the EL opportunities more valuable and better training opportunities.

D'Eon (2005:55-56) elucidates the EL process as beginning with an experience. Students first plan a response to the situation and then they carry out their plans and implement their solution(s). The cycle continues to an

observation or data-collection stage and finally on to reflection and the creation of general rules and principles. Stage one is planning what they will do, what investigations or management they will attempt first. Stage two is for instance carrying out the plan, engaging in the management and doing the investigations. Stage three is making notes of the outcomes of the interventions undertaken by the students and others. In stage four the students reflect on the information gathered in stage three and the situation and consider what they might do in the future when a similar situation is encountered - they generalize. Finally the cycle arrives back at the beginning as the students are prepared to encounter another experience and plan to solve the problem, meet the challenge or manage the case.

To apply the above stages of EL the interprofessional education (IPE) teams of students from two or more health professional schools encounter a real-life situation. They plan what they are to do, carry out the plan (all under some level of supervision), gather from many sources observations of the outcomes, and create generalizations that reinforce, modify or change the way they would handle similar cases in the future. They are given the time to do this and they incorporate all of the elements of best practice CL (as discussed above in i) into the group deliberations. They share the common goal of better patient care and learning. They each bring something valuable to the team from their respective professional and personal abilities. Each one is responsible for certain aspects of care and is held to a high personal standard by the group and the educators and they are individually held to learn certain competencies. They are trained to work closely together and to hold team meetings that are well run and patient focused. Finally, they take the time to consider the group process, what has worked, and how relationships and processes could be improved. Students are then well prepared to more effectively meet similar challenges and generalize to novel situations, which is the whole purpose of their training and education.

5.10.9 Conclusion statements on the procedure: interprofessional teaching-learning approach

The following deductive conclusion statements relate to the procedure concept of the interprofessional teaching-learning approach:

- What students learn is important, but how they learn is also important because their learning experiences will directly influence their motivation and their future learning strategies.
- The educator has a responsibility to make every lesson a positive and productive learning experience for all students and therefore the educator's task is to design the lesson so that the information can be applied in practice.
- Assessment should help students to make judgments about their own performance, set goals for progress and provoke further learning.
- There should be a sustained interchange or dialogue between the educator and students (and among the students) about the important concepts and ideas they are encountering.
- Learning in teams is best facilitated by the progressive mastery of more and more complex tasks incorporating the best practices of cooperative learning as part of an experiential learning process.

The procedure of interprofessional teaching-learning embedded in constructivist theory is displayed visually in Figure 5.6.

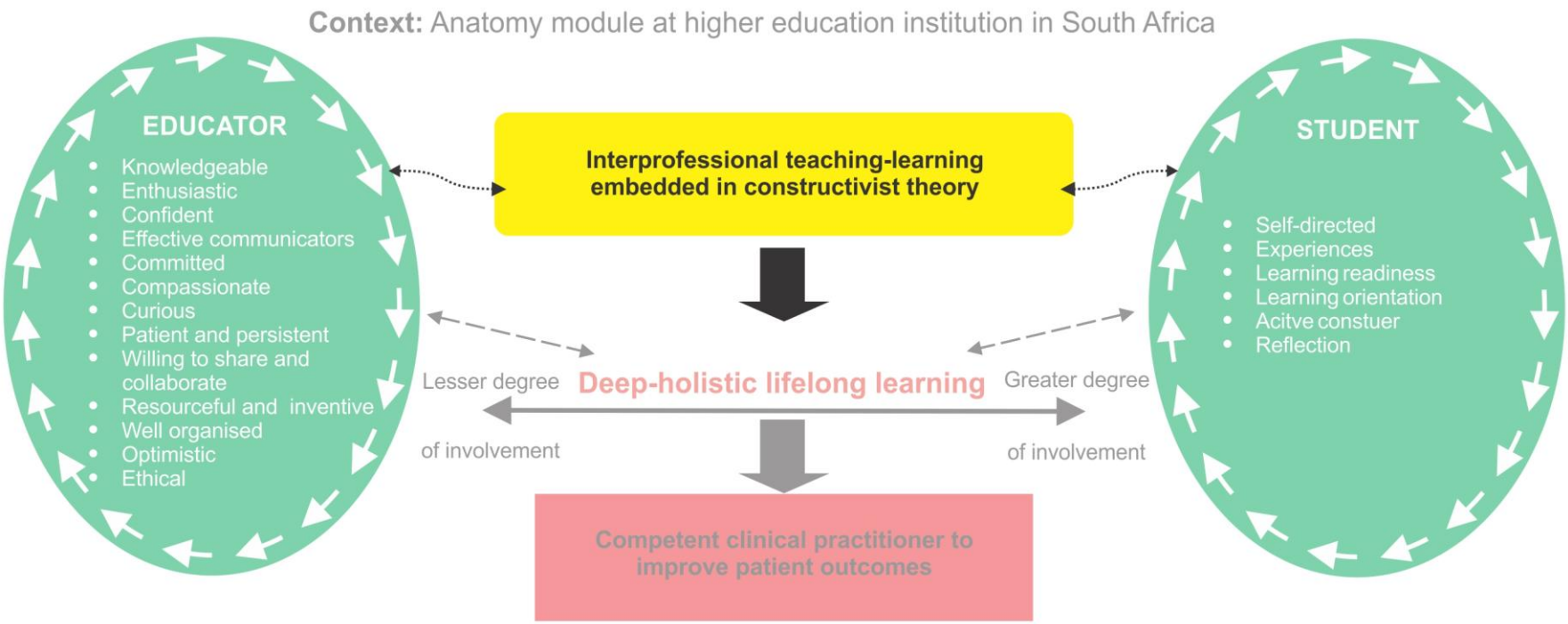


Figure 5.6: The application of the procedure concept of interprofessional teaching-learning embedded in constructivist theory for an anatomy module at a higher education institution in South Africa

5.11 DYNAMIC: COLLABORATION

Collaboration is a dynamic process of power sharing between partners that work together on a project (South African Concise Oxford Dictionary, 2002:226) that originated from needs and problems to reach desired outcomes/or common purpose successfully (Sullivan, 1998:6; Winge *et al.,* 2005:2) through well-functioning communication. Collaboration creates a sense of shared autonomy between groups (partnerships) to achieve either explicit or implicit mutually identified goals (Crist & Escandon-Dominguez, 2003:266) that would otherwise not be possible. According to Leddy and Pepper (cited in Hutchison & Quataro, 1995:112) collaboration means "shared responsibility for planning, problem-solving and evaluation with clients and others in the health care delivery system". Slavin (2012:373) defines collaboration as the process in which professionals work cooperatively to provide educational and health services. Bruce (2003:181) defines collaboration as the cooperation between people at different levels in the collaborating institution for the purpose of deep-holistic lifelong learning and producing competent clinical practitioners. At macro level collaboration is between the departments of education and health, at meso level between the departments/schools within a university, as well as between the university and clinical setting and at micro level between the educator and the student. Levels of cooperation and hence, collaboration are based on shared power vested in knowledge and expertise as opposed to positional power.

Collaborative practice in health-care according to the WHO (2010:13) occurs when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across different settings. Ateah *et al.* (2010:1-2) explain that, increasingly, interprofessional collaborative practice in health care is being viewed as essential for the provision of patient-centred, responsive and high-quality care. There is growing awareness and developing momentum to improve the quality of patient care, patient safety, the retention of health-human resources, and cost efficiencies within the health care system. A number of factors are known to

affect the formation of collaborations and their effectiveness, including perceptions and an understanding of one's own and others' professions. Ateah *et al.* (2010:6) state that working together as an effective team requires mutual respect and a knowledge of the skills and abilities of each team member. Without a concerted effort to educate health care professionals with and about each other, it is unlikely that such teams can function effectively in the manner desired by programming and accreditation or expected by the public.

D'Amour *et al.* (2004:64) make it plain that the key determinants for collaborative practice as health professionals is to develop knowledge of each other's roles, better communication, a willingness to work together, trust related to self-competence and confidence in others' abilities and mutual respect. For health workers to collaborate effectively and improve health outcomes, two or more from different professional backgrounds must first be provided with opportunities to learn about, from and with each other. The study by Ateah *et al.* (2010:6) shows that through the inclusion of planned interprofessional experiences during education programs, and a focus on patient-centred care, there is a real potential to make a positive transformation in the way we think about and work with others as we care for patients and their families at every level of health care. Thus interprofessional education (IPE) is essential for the development of a collaborative practice-ready health workforce, one in which staff work together to provide comprehensive services in a wide range of health-care settings (WHO, 2010:13).

For collaboration to be implemented on all levels there need to be changes made to the curriculum used for the teaching-learning of anatomy. The concept of curriculum will now be discussed.

5.11.1 Curriculum

Stenhouse (1976:1-5) states that the curriculum is the way in which educational aims are realized in practice. These include contents and methods and in their broadest sense also review of the implementation thereof, institutions and the accompanying problems. Carl (2000:32) explains

that the curriculum is thus a broad concept which includes all planned activities and thus also subject courses which take place during the normal school day. It also includes after-school planned activities such as societies and sport. This all takes place within a specific system, it is continuously subject to evaluation and aims to lead and to accompany the child to adulthood, so that he can be a useful citizen within the community.

Carl (2000:32) also outlines the following characteristics of a curriculum, e.g.:

- The curriculum is content.
- The curriculum is a programme of planned activities.
- The curriculum is specific learning results.
- The curriculum is the cultural reproduction of a community reflecting the relevant culture.
- The curriculum is experienced, in other words specific activities and experiences leading to learning.
- The curriculum sets out tasks and concepts which must be achieved, or a predetermined purpose which e.g. is the mastery of a new task or an improvement of a previous task.
- The curriculum is an intrument for social reconstruction where values and skills are acquired which may help to improve the community.
- The curriculum is “currere”. The focus is on the individual so that self-discovery may take place through self-activity and individuals may get to know themselves – who, how and why they have developed in this way. Greater self-understanding is a crucial aspect in this regard. The crucial focus is autobiographical.

Oliva (1988:8-9) makes a very meaningful contribution by giving a classification of definitions. Theoreticians often define “curriculum” as one of the following:

1. As objectives or what is intended or what it should do (purpose), e.g. to contribute to the development of thinking skills;
2. As context, i.e. the particular context or perspective within which it develops, for example, a specific word or philosophy of life which may

serve as a starting point and which eventually determines the nature of the curriculum;

3. As strategies utilized during the process. The particular teaching-learning strategy, for example, a problem-solving strategy is followed throughout as the crucial strategy.

Walters (1985:1-3) alleges that the word “curriculum” in education and in practical teaching has undergone a change of meaning, so that it has become necessary to differentiate at least among:

1. Institutional curriculum (for example, a higher education institution’s curriculum), i.e. the courses and their compositional subjects offered by the institution;
2. Course curriculum (for example, the four-year nursing science curriculum), i.e. the subjects and subject compositions offered for a particular course;
3. Subject curriculum (for example, the curriculum for anatomy), which is a description and systematic ordering of the objectives, goals, objects, content, methods, teaching-learning activities, curriculum material and evaluation procedures for a subject.

5.11.2 Conclusion statements on the dynamic: collaboration

The following deductive conclusion statements relate to the dynamic concept of collaboration:

- Collaboration involves the exchange of information or services between persons to resolve patient care concerns aimed at satisfying patient healthcare needs.

- The range of actions that constitute collaboration include interprofessional education and curriculum development that become synergizing forces in the momentum towards the target of a particular situation to elicit the input of the healthcare team in the direction of the best patient outcome.

- The nature of collaboration is multidimensional as a means of communication interchange, exchange of information and attainment of quality patient care.

The dynamic concept of collaboration for interprofessional teaching-learning of anatomy at a higher education institution in South Africa is represented visually in Figure 5.7.

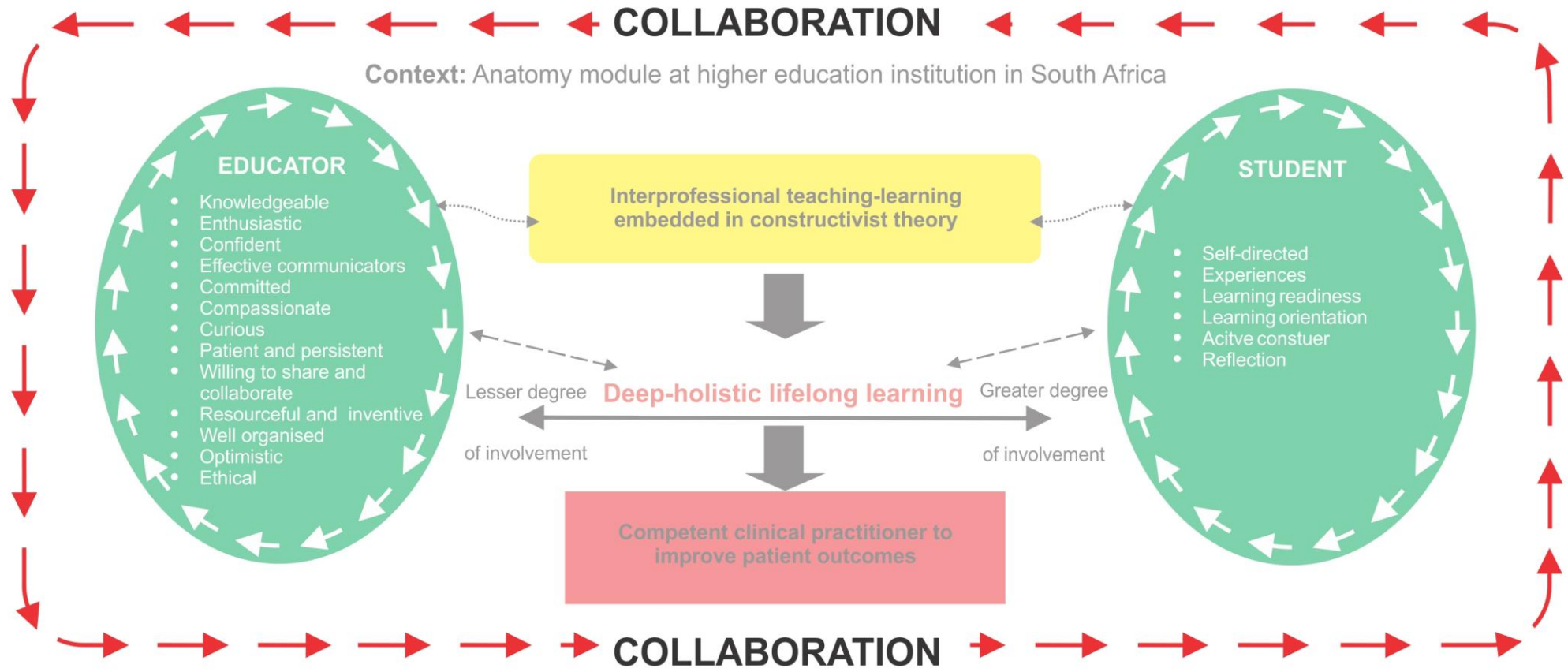


Figure 5.7: Conceptual framework for interprofessional teaching-learning of anatomy at a higher education institution in South Africa

5.12 SUMMARY

In this chapter, the approach to generating a conceptual framework was positioned in the scientific context of the existence of knowledge. The identification of concepts was described from critical incidents and empirical data from interprofessional students' and peer group's opinions on the teaching-learning approach to anatomy in Chapter Three and interprofessionals' perceptions of the importance of anatomy in clinical practice in Chapter Four. Thereafter, in Chapter Five, the concepts were classified and a comprehensive literature review was presented to support arguments on the concepts and relationships on the functional role of the interprofessional educator and student in an anatomy module at a higher education institution in South Africa context. Chapter Six that follows includes the process of model description, evaluation and theory critique.

CHAPTER 6

PRACTICE MODEL FOR INTERPROFESSIONAL TEACHING-LEARNING OF ANATOMY

(Phase Two: Steps 1 and 2)

6.1 INTRODUCTION

The main aim of the research study is to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa in order to facilitate deep-holistic lifelong learning and is presented in this chapter. This chapter denotes phase two (model construction), step 1 (to construct relational meaning of main and related concepts) and step 2 (model construction through theory synthesis).

Chapter Six commences with the science philosophy underpinning the research design and process of model description, the assumptions of the model followed by a comprehensive discussion and presentation on the description of the model. Thereafter, the model is critiqued using preset evaluation criteria.

6.2 SCIENCE PHILOSOPHY: UNDERPINNINGS OF THE RESEARCH DESIGN AND THE PROCESS OF MODEL DESCRIPTION

Science philosophy pertains to values that focus on scientific development and validation within a professional discipline (Fawcett, 2005:12; Meleis, 2007:36). However, Fawcett (2005:11) expands on philosophy, claiming it is a statement that embraces ontological claims about the phenomena of central interest to a discipline, epistemic claims about how those phenomena become known, and ethical claims about what is valued by members of a discipline.

The abstraction that conveys the components of science philosophy is referred to as a paradigm (Kuhn, 1996:10; Meleis, 2007:35; Schwandt, 2007:217; Holloway & Wheeler, 2010:24). Holloway and Wheeler (2010:23) attribute the paradigm shift in thinking about qualitative research to the ideas

of Kuhn (1970:139-156) who argued on the rationality of scientific inquiry (Schwandt, 2007:217). The authors concur that a paradigm consists of an aggregate of beliefs, values, theoretical ideas, techinical procedures, methods, stances, and perspectives that a community of scientists adopt within a professional discipline that has a transforming impact on scientific approaches to research inquiry (Kuhn, 1996:18; Meleis, 2007:35; Schwandt, 2007:217; Holloway & Wheeler, 2010:24). Moreover, Kuhn (1996:24) states that the paradigm is reflected in language and terminology that portrays a particular worldview and roots of the scientific stance.

The dimensions in science philosophy that guided this study as the paradigm are presented in Table 6.1 that follows, and are evidenced in the social science philosophical stances that are adopted from Mouton and Marais (1990:7), Denzin and Lincoln (2005:25), Fawcett (2005:12), Schwandt (2007:37), Corbin and Strauss (2008:10), Denzin and Lincoln (2008:31), Denzin and Lincoln (2008:5), and Guba and Lincoln (2008:255). The philosophical underpinnings of the constructivist paradigm guided the researcher.

Table 6.1: Science philosophy dimensions in the constructivist paradigm that guided this study

Dimension	Constructivist paradigm applications
1. Ontological	
• Focus on a specific aspect of reality	• Exploratory, descriptive and interpretive research on the interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy, and interprofessionals' perceptions of the importance of anatomy in clinical practice.
• Answer "what is?"	• Descriptive of a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa.
2. Epistemological	
• The quest for truth	• The researcher's relationship to the setting is described.
• Makes valid and reliable judgments	• Concept identification and concept classification
• Answers "what can be learnt?" and "where is the researcher in the research setting?"	• Conceptual framework of the interprofessional teaching-learning of anatomy.
	• Practice model that describes interprofessional teaching-learning of anatomy at a higher education institution in South Africa.
3. Sociological	
• Involves collaborative activity to reflect the nature of the discipline	• Relational statements that portray links between concepts.
• Considers impact by society on scientific activity	• Interactions between researcher and interprofessional students and peer group, the researcher and research supervisor, the researcher and co-coder in collaboration and cooperation for a common purpose.
• Answers "who is involved?" and "who is influenced?"	• Research participants that included interprofessional students' and peer group.

Dimension	Constructivist paradigm applications
4. Methodological • Refers to the planning, structure and implementation of procedures and processes • Answers “how can this be done?”	• Data collection methods that used teaching-learning feedback questionnaire, peer review document and portfolio, electronic interviewing and the process of model development. • The process of model development that utilized empirical data derived from participants.
5. Ethical • Concerns morality, reasoning and human purpose • Answers “who and why” of participation and involvement	• Ethics consent from the university. • Informed consent from the research participants.
6. Teleological • Focused on intentions and outcomes that are goal-directed • Refers to overall purpose and functions that are criteria-driven • Answers “what and why” of the research goals	• Model evaluation and theory critique of the practice model developed in this study.

Denzin and Lincoln (2008:7) clarify that the researcher follows a scientific process of inquiry that includes the following descriptions:

- Ability to construct interpretations that build on one another as an inquiry unfolds;
- Multilogical thinking that is simultaneous, instead of unilateral thinking that is sequential in nature;
- Alert to different textures of experience such as different voices, different stances, different points of view and different approaches;
- Dexterity and congruence in the use of combinations when executing activities and strategies such as methodological practices, empirical materials, perspectives and observations that include bracketing; and
- Mastery in qualitative crafting that adds rigour, richness, depth, complexity, and breadth to the process of inquiry.

6.3 ASSUMPTIONS OF THE MODEL

Assumptions are essential statements of truth that are given or accepted as the basis for theoretical reasoning (Chinn & Kramer, 2008:231), and are to be disclosed in a study so that the reader is informed of what the writer takes as an accepted truth. Moreover, Chinn and Kramer (2008:231) indicate that the assumptions can be stated explicty after the purpose of a model is determined. Here, the concepts have been structured by the relational statements, and the definitions have been described. In this regard, the authors suggest that assumptions may be expressed in the (i) form of actual assertions, or (ii) may echo value positions. For the former (i), these factual assumptions are known or became known during the experience in the study, whereas in the latter (ii), the value assumptions uphold or connote what is taken as right, good or ought to be (Chinn & Kramer, 2008:232).

The assumptions of the model, as discussed in Chapter One, section 1.5 on the science philosophy that guided this study, are best aligned with the constructivist paradigm, as well as interprofessional education framework (Guba & Lincoln, 2008:257) in which the ontology of scientific inquiry was relativism in the local and specific construction and reconstruction of realities and the epistemology was

transactional in the portrayal of findings. Also, the inquiry aim of the research study was focused on understanding and reconstruction which contributes to identification in the constructivist paradigm. Consequently, the departure point of this research study was based on Klopper's model for constructivist learning in nursing (Klopper, 2000; 2009) and the WHO's interprofessional education framework (WHO, 2010) and constructivist theory (Kretchmar, 2008). The model was generated in qualitative and quantitative processes of scientific inquiry that used the constructivist approach of eclectic aspects of interprofessional education of an anatomy module at a higher education institution in South Africa in practice. The methodology used in the study gave a voice to various human experiences in an exploratory, descriptive and interpretive context of how the interprofessional educator practices in the setting of an anatomy module at a higher education institution in South Africa. The following assumptions are therefore postulated in reference to the model:

- The educator is the person who facilitates an anatomy module to first-year students at a higher education institution in South Africa.
- The student is a health sciences student or health professional registered for an anatomy module at a higher education institution in South Africa.
- What students learn is important, but how they learn is also important because their learning experiences will directly influence their motivation and their future learning strategies. Therefore, the educator uses interprofessional teaching-learning that is embedded in the constructivist theory to make every lesson a positive and productive learning experience for all students.
- The main goal in this research study is to achieve deep-holistic lifelong learning and thus to apply knowledge of anatomy in practice where the student is practising his/her profession and become a competent clinical practitioner.
- For health workers to collaborate effectively and improve health outcomes, two or more from different professional backgrounds must first be provided with opportunities to learn about, from and with each other. Thus interprofessional education is essential to the development of a collaborative practice-ready health workforce, one in which staff work together to provide comprehensive services in a wide range of health-care settings.

Table 6.2 that follows is a summary of statements concluded from the conceptual framework in Chapter Five, as well as the process described on reasoning strategies in Figure 2.2 in Chapter 2, that lead onto the model depicted as Figure 6.1.

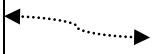
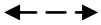
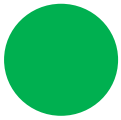
Table 6.2: Summary of conclusion statements from the conceptual framework

Educator *(Agent)*	**Student** *(Recipient)*	**Anatomy module at a higher education institution in South Africa** *(Context)*	**Deep-holistic lifelong learning as competent clinical practitioner** *(Goal)*	**Interprofessional teaching-learning embedded in constructivist theory** *(Procedure)*	**Collaboration** *(Dynamics)*
1. The educator is the person who teaches/facilitate an anatomy module at a higher education institution in South Africa. 2. The educator's attitude towards students consists of a sense of humour, warmth and empathy, acknowledgement of the uniqueness of each student, and respect for the students' points of view to ensure that effective teaching-learning can take place. 3. The characteristics and skills of an effective educator are knowledgeable, enthusiastic, confident, effective communicators, committed, compassionate, curious, patient and persistent, willing to share and collaborate, resourceful and inventive, well organised, optimistic and ethical to promote effective teaching-learning of anatomy for the overall purpose of deep-holistic lifelong learning.	4. The student is a health sciences student or health professional registered for an anatomy module at a higher education institution in South Africa. 5. The adult student displays self-direction, has experience, demonstrates a specific learning readiness and a learning orientation which is task-oriented and problem-directed, approaches learning intentionally, is an active constructor of own knowledge and acquires meaning and understanding through reflection.	6. Anatomy is a subject/module that forms a part of the health sciences student's curriculum to prepare him/her for his/her profession. 7. Higher education institutions are learning institutions that focus on both education and research.	8. Deep-holistic lifelong learning as a dynamic process during which the student approaches the learning process (anatomy module) intentionally in an active search for meaning through interaction (to apply knowledge in practice). 9. The particular knowledge, skills and competencies that we develop and utilise in professional practice depend on how we understand that practice. 10. Anatomical knowledge supports examination of a patient, the formation of a diagnosis and communication of these findings to the patient and other medical staff professionals and that a minimum working knowledge should be that which	11. What students learn is important, but how they learn is also important because their learning experiences will directly influence their motivation and their future learning strategies. 12. The educator has a responsibility to make every lesson a positive and productive learning experience for all students and therefore the educator's task is to design the lesson so that the information can be applied in practice. 13. Assessment should help students to make judgments about their own performance, set goals for progress and provoke further learning. 14. There should be a sustained inter-	16. Collaboration involves the exchange of information or services between persons to resolve patient care concerns aimed at satisfying patient healthcare needs. 17. A range of actions that constitute collaboration include interprofessional education and curriculum development that become synergizing forces in momentum towards the target of a particular situation to elicit the input of the healthcare team in the direction of the best patient outcome. 18. The nature of collaboration is multidimensional as a means of communication interchange, exchange of information and attainment of quality patient care.

Educator *(Agent)*	**Student** *(Recipient)*	**Anatomy module at a higher education institution in South Africa** *(Context)*	**Deep-holistic lifelong learning as competent clinical practitioner** *(Goal)*	**Interprofessional teaching-learning embedded in constructivist theory** *(Procedure)*	**Collaboration** *(Dynamics)*
			allows an independent practitioner to practice safely, and to communicate with other medical professionals and patients effectively.	change or dialogue between the educator and students (and among the students) about the important concepts and ideas they are encountering. 15. Learning in teams is best facilitated by the progressive mastery of more and more complex tasks incorporating the best practices of cooperative learning as part of an experiential learning process.	

The legends that are used in the model are presented in Table 6.3 below.

Table 6.3: Legends used for the practice model as described in figure 6.1

	Interaction between the educator and student.
	The educator and student work towards the same goal, namely deep-holistic lifelong learning.
	Interprofessional teaching-learning leads to deep-holistic lifelong learning and this is achieved and implemented by a competent clinical practitioner/ in clinical practice.
	Continuous dynamic of collaboration.
	Agent and recipient: educator and student with their own set of characteristics.
	Procedure of interprofessional teaching-learning embedded in constructivist theory used by both the educator and student in their interaction with each other.
	Goal of deep-holistic lifelong learning as implemented by a competent clinical practitioner.

The depiction of the practice model for interprofessional teaching-learning at a higher education institution in South Africa follows in Figure 6.1.

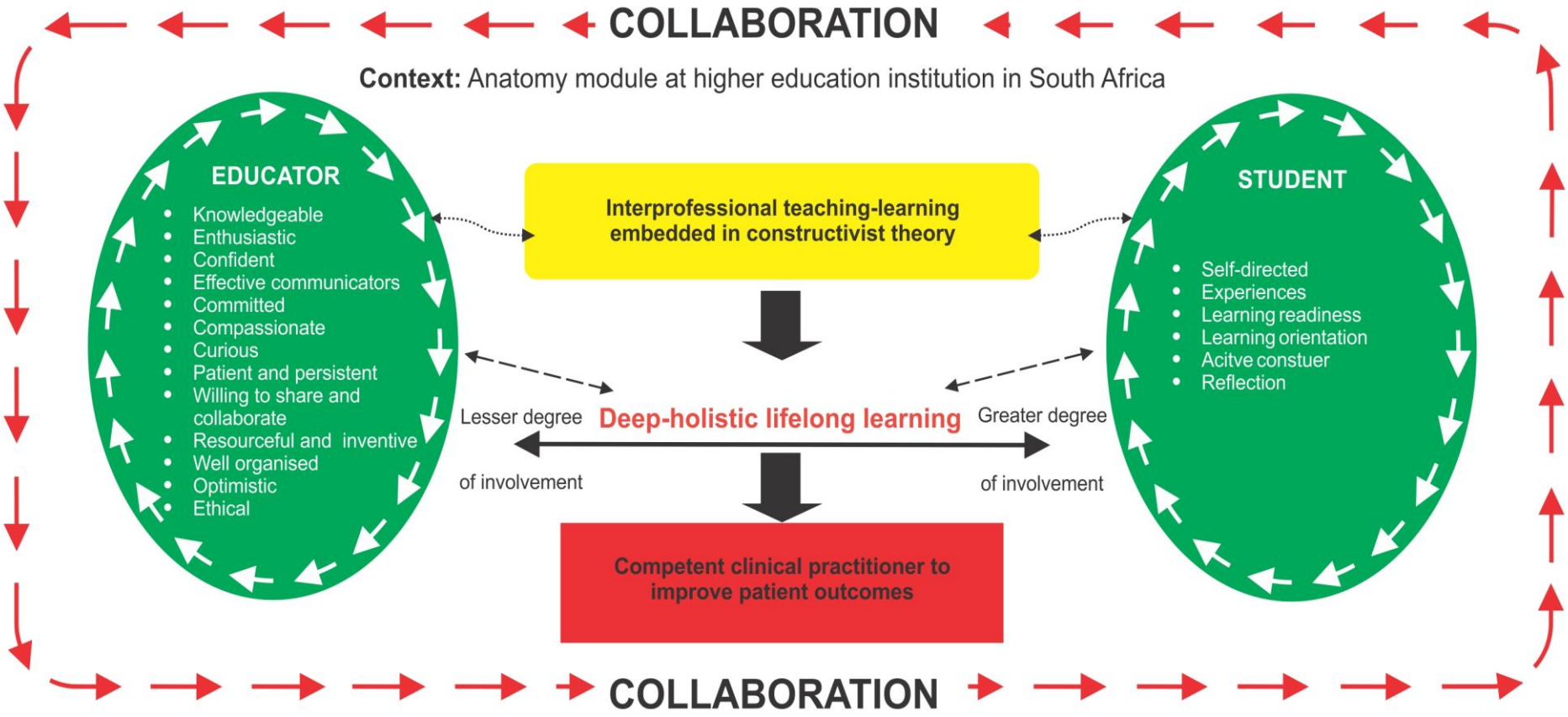


Figure 6.1: Practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa

6.4 DESCRIPTION OF THE MODEL

The description of the model is set out using the components advocated by Chinn and Kramer (2008:220) to include the purpose, context, overview, structure and process of the model. Furthermore, the description of the model (as shown in Figure 6.1) and relational statements are in fulfilment of the research objectives of this research study (as stated in section 1.4).

6.4.1 Purpose of the model

The purpose of the development of this practice model is to provide a schematic outline that represents the interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning. In so doing, the contribution of this important interprofessional teaching-learning of anatomy would be determined within the larger context of higher education institutions as a value-based sub-discipline of greater discipline of the nursing education practice. The purpose and concepts of a model are key elements in describing the scope of the model, which refers to the range of phenomena or breadth to which the model applies in practice (Chinn & Kramer, 2008:222).

6.4.2 Context of the model

Chinn and Kramer (2004:92) and Chinn and Kramer (2008:212) indicate that the context of the model imparts insight into the background of the socio-political circumstances that triggered and influenced the creation of the model. This context includes the researcher's experience, the setting in which the model was formulated, community or societal trends and underpinning philosophical ideas that gave form to the purpose as to why the model was developed.

In this research study and for the application of the practice model, the context is a non-medical school/faculty at a higher education institution in the North-West Province, South Africa where anatomy is taught to first-year students of different professions. The higher education institution where this practical model will be implemented consists of three campuses and the campus where the educator is working has eight faculties with more than 30 schools and centres. The Health

Sciences faculty, where the anatomy module is taught, consists of five schools, e.g. School of Biokinetics, Recreation and Sport Science, School of Pharmacy, School of Physiology, Nutrition and Consumer Sciences, School of Psychosocial Behavioural Sciences, and School of Nursing Science. After implementation of this practice model in above context, the model may also guide future research in the South African context on facilitating interprofessional teaching-learning of anatomy at other higher education institutions with no medical schools/faculties.

6.4.3 Overview of the model

The overview of the model is intended for descriptive purposes to capture a snapshot view (Ely *et al.*, 1997:74) of the model in the practice setting. Therefore, the overview presents a brief portrayal of the main attributes that assists gaining greater perspective ahead of the detailed attributes that follow in the structural and process descriptions of the model (see Figure 6.1).

The core attribute of the practice model is the educator who is centrally positioned to respond to a student as part of an overall organizational endeavour to provide interprofessional teaching-learning during an anatomy module in a higher education institution in South Africa to facilitate deep-holistic lifelong learning. The educator (with his/her own set of characteristics) is in interaction with a student (with his/her own set of characteristics) through interprofessional teaching-learning that is embedded in constructivist theory. The educator and student strive towards deep-holistic lifelong learning that is implemented in practice by a competent clinical practitioner to improve patient outcomes. The multiple actions that occur are shown by the various arrows that are initiated by the educator and student with a range of healthcare team members through the process of collaboration (see Figure 6.1).

6.4.4 Structure of the model

Chinn and Kramer (2008:228) state that the structure of the model gives overall form to the conceptual relationship of which it is comprised, and therein emerges the structure that illustrates the relationships within the model. They expound on relationships and indicate that there is an identifiable relationship between individuals and the setting that is portrayed as the environment of the model, and therefore all structural elements of the model are to be depicted aimed at

determining the strength, direction and quality of the model, which includes the concepts (main and related concepts) and the relational statements.

6.4.4.1 Definition of concepts

The definition of the concepts as described below is based on the main concepts outlined in Chapter One and related concepts identified from the empirical data and concept classification as shown in Table 5.1 that was undertaken by using the survey list of Dickoff *et al.* (1968a:423).

a. Main concepts

The main concepts identified are as follow:

- **Educator:** the person who facilitates an anatomy module to students registered at a higher education institution in South Africa.
- **Student:** a health sciences student or health professional registered for an anatomy module at a higher education institution in South Africa.
- **Anatomy:** a subject/module that forms a part of the health sciences student's curriculum to prepare him/her for his/her profession.
- **Higher education institutions:** the South African government's White Paper on Higher Education, published in 1997, describes a "transformed" higher education system as one which will provide equal access and equally fair chances of success to all students, develop programmes leading to qualifications that will meet the country's employment needs in respect of highly skilled graduates, promote critical and creative thinking, tolerance and a commitment to the common good through its teaching, and produce research of an international standard that, at the same time, will be cognisant of African contexts.

- **Deep-holistic lifelong learning:** a dynamic process during which the student approaches the learning process (anatomy module) intentionally in an active search for meaning through interaction (to apply knowledge in practice).

- **Interprofessional education (IPE):** describes learning activities involving at least two professional groups. Interprofessional education occurs when two or more professions learn about, from and with each other to enable effective collaboration and ultimately improve health outcomes.

- **Collaboration:** involves the exchange of information or services between persons to resolve patient care concerns aimed at satisfying patient healthcare needs.

b. Related concepts

The related concepts identified are:

- **Teaching:** means assisting a student to learn. An educator can tell students about a certain subject, can help students practise a skill (such as giving an injection), or assist students in discovering knowledge for themselves (for example, by talking to a person who has recovered from malaria). The educator can only help students to learn and make it easier for them to learn. Each student must master the knowledge, skills and competencies by him- or herself.
- **Learning:** is a dynamic, active and cumulative process of knowledge construction that takes place through understanding and interpretation.
- **Assessment:** a method used to measure something, to add value to it or to test it. Therefore, assessment could be defined as assessment based on values, norms and criteria. Assessment is usually based on abilities (knowledge, skills, competencies and values) and attitudes according to a prescribed level. The assessment process should be dynamic, continuous and open-ended. An education and/or learning programme is only complete when one establishes the extent of the learning that occurred. The assessment results could also guide decisions regarding future teaching. Assessment is a process that is caring and subjective. In this process the educator aims to diagnose and facilitate (assist) the student's achievements and attempts to acquire specific learning-outcomes, knowledge, skills and competencies. Therefore, the objective of assessment is to determine the student's education needs.

- **Evaluation:** To evaluate something means to measure it or to attach a value to it, to indicate its worth or value, or to test it. The purpose of evaluation at the end of a lesson is to find out whether the learning outcomes, provided at the beginning of the lesson, have been accomplished (Ehlers, 2002:134). This study concentrates on the students' evaluation (measure) of the anatomy educator's teaching-learning approach.

6.4.4.2 Structural form of the model

Chinn and Kramer (2008:101) describe the structural forms of models as powerful devices for shaping our perceptions of reality, and mention that description of a model may not necessarily fit onto one structure as theory could be expressed in several competing structures that cannot be reconciled into a single discernible structure. Therefore, all concepts may not inevitably fit into a coherent structure to represent all concepts and the relational components. In this regard, Figure 6.1 above depicts interprofessional teaching-learning of an anatomy module diagrammatically in the context of a higher education institution in South Africa because the interchanges between the educator and student are fundamental to dynamics of collaboration used by the competent clinical practitioner to improve patient outcomes. In this research study a visual presentation was formulated by using circular -, square and linear structures. The visual presentation of the model is in colour. The selection of the colour is to exhibit the visual presentation clearly and there is no additional meaning to the use of colour.

- **Circular structures in the model:** (as illustrated by a)

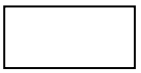
Circular structures in the model represent parts of the model that is a unit with definite boundaries and continuous activity. The educator, student, interprofessional teaching-learning embedded in constructivist theory, and collaboration are circular structures.

The educator is presented as a circular structure with his/her own set of characteristics, e.g. knowledgeable, enthusiastic, confident, effective communicator, committed, compassionate, curious, patient and persistent, willing to share and collaborate, resourceful and inventive, well organised, optimistic, and ethical. The student is another circular structure who also contains a set of characteristics, e.g.

the adult student displays self-direction, has experience, demonstrates a specific learning readiness and a learning orientation which is task-oriented and problem-directed, approaches learning intentionally, is an active constructer of own knowledge and acquires meaning and understanding through reflection. The educator and student are in constant interaction with himself/herself as well as other educators and students.

Interprofessional teaching-learning embedded in constructivist theory is the next circular structure that refers to the interaction that takes place between the educator and the student and this process can change with new developments in teaching-learning, the process of recurriculation and new research.

The final circular structure is collaboration that continues and is continuously changing on micro-, meso- and macro-levels. Collaboration takes place between interprofessional educators, educator and students, and between interprofessional students themselves to lead to better collaboration between health professionals in a clinical setting where health professionals are working toward quality patient outcomes.

- **Square structure in the model:** (as illustrated by a )

The square at the bottom of the module represents the implementation of deep-holistic lifelong learning through the competent clinical practitioner who's aim is to ultimately improve patient outcomes.

- **Linear structure in the model:** (as illustrated by an ⟷)

The use of lines and arrows are described as linear structures in this model. The two-way linear structure running under deep-holistic lifelong learning shows that deep-holistic lifelong learning can be represented on a continuum from a lesser degree of involvement to a greater degree of involvement.

6.4.4.3 Relational statements

Relational statements are essential from the perspective of model development because they are ingredients that assert an association between two or more

concepts in the process of constructing a scientific body of knowledge (Walker & Avant, 2011:59). Furthermore, Walker and Avant (2011:197) advise that the process of construction occurs subsequent to major concepts being identified and examined by commencing with explicit relational statements, then examining the concepts closely to determine further relational linkages by the use of deduction. In so doing, Walker and Avant (2011:198) advise that the empirical support for the relational statements be assessed and indicated.

Therefore, the relational statements that follow are derived explicitly from deduction from the empirical conclusion statements aimed at the portrayal of associations between the major concepts. Each relational statement will be supported in parentheses commencing with the abbreviation "v:" indicating "vide" in reference (Collins Dictionary & Thesaurus, 2006:1346) to the conclusion statement number(s) indicated by cross-referencing Table 6.2 wherein the empirical statements are given. The relational statements are as follows:

- The educator as a facilitator and creator of the learning climate should possess certain characteristics and skills (knowledgeable, enthusiastic, confident, effective communicator, committed, compassionate, curious, patient and persistent, willing to share and collaborate, resourceful and inventive, well organised, optimistic, and ethical) in the creation of a context conducive to learning, by using the student's existing cognitive framework as starting point (v: 1, 2, 3, 4, 5, 6, 7, 11, 12, 13, 15, 16, 17).
- The student as an adult learner displays self-direction, has experience, demonstrates a specific learning readiness and a learning orientation which is task-oriented and problem-directed, approaches learning intentionally, is an active construer of own knowledge and acquires meaning and understanding through reflection, and the health professional student is in constant interaction and/or with the health professional educator and/or with other health professional students sharing and working towards the same goal/objective/outome (v: 4, 5, 11, 14, 15, 16).
- The educator continually interacts with the student, through interprofessional teaching-learning embedded in constructivist theory in the development of

critical thinking in order to facilitate deep-holistic lifelong learning (v: 8, 9, 10, 11, 12, 13, 14).

- The interprofessional teaching-learning embedded in constructivist theory takes place in the context of an anatomy module at a higher education institution in South Africa with all the dimensions of education which are context bound, intentionally meaningful, interpersonal relationship bound, dynamic, multi-dimensional and value bound (v: 6, 7, 11, 12, 13, 14).
- Collaboration is entwined in the educator's and student's attempts towards the goal of deep-holistic lifelong learning and ultimately functioning as competent clinical practitioners, working together, to ultimately improve patient outcomes (v: 8, 9, 10, 15, 16, 17).
- Deep-holistic lifelong learning varies on a continuum and is an essential element in acting as a competent clinical practitioner to ultimately improve patient outcomes (v: 8, 9, 10, 15, 16, 17).

6.4.5 Process description

The process description is a series of events or development that reveals a course of action in the practice model on interprofessional teaching-learning of anatomy at a higher education institution in South Africa as shown in Figure 6.1.

As described in paragraph 6.4.2 in this chapter the context for this model is a non-medical faculty (Health Sciences faculty) at a higher education institution in South Africa. As stated earlier, when anatomy is taught at a higher education institution without a medical school/faculty, it becomes the responsibility of non-medical schools/faculties (in this case the School of Nursing Science). Therefore there can be challenges to effectively teach/facilitate anatomy to all health professionals registered at a non-medical school/faculty where anatomy forms the foundation for other modules that ultimately guide the student to be able to work as a competent clinical practitioner.

The educator, the person who facilitates an anatomy module to students registered at a higher education institution in South Africa, should display the following characteristics and attributes: knowledgeable, enthusiastic, confident, effective communicators, committed, compassionate, curious, patient and persistent, willing to

share and collaborate, resourceful and inventive, well organised, optimistic and ethical. The educator is in constant interaction not only with the student, but also with himself/herself and other health professional educators.

The student, registered for an anatomy module at a higher education institution, that normally forms part of a health profession curriculum, is charactherised by self-directness, accumulated experiences, learning readiness, learning orientation, active construction and reflection. The student is in constant interaction not only with the educator, but also with himself/herself and other health professional students.

The educator and the student enter the teaching-learning context with the same aim, and that is striving towards deep-holistic lifelong learning. Interprofessional teaching-learning embedded in constructivist theory forms the interaction method used between educators from different health professions, between the educator and the student, as well as between the health professional students themselves. In order to use interprofessional teaching-learning embedded in constructivist theory, the educator always refers to the student's existing cognitive framework to find a starting point and to begin the relationship on an equal level. The educator utilises the study guide as the core of the teaching-learning structure. The study guide is a written guide that serves as a clue, map, guide and framework by means of which the educator undertakes his/her teaching, reflects it to the student and structures teaching-learning activities. It is a means of communication that, as the educator's instrument, probably stimulates and motivates the student to become independent on an individual basis.

When creating a context conducive to teaching-learning, there are certain aspects that should enjoy the educator's attention. Evaluation should be linked to the objectives and be approached holistically. Students should always know what the evaluation criteria are. Feedback to students takes place on a continual basis, and there is opportunity for self-evaluation to encourage reflection and motivation. The educator should utilise teaching-learning methods that focus on discussion, participation and interaction. Teaching-learning methods that satisfy these requirements are group discussions, seminars, symposiums, case studies, simulation and role play. The creation of a context of teaching-learning is a circular and reflective action and a dynamic process.

The educator's and student's approach towards teaching-learning is aimed at pursuing deep-holistic lifelong learning. Deep-holistic lifelong learning can be represented on a continuum from a lower to a higher degree of involvement. The educator should constantly be involved in this continuum in order to be a reflective practitioner. The student should also to a lesser or greater extent be involved in the continuum in order to practice as a competent clinical practitioner and to be a critical thinker. The aim is that the educator and the student should, to a lesser or greater extent, be involved with deep-holistic lifelong learning. What we learn is ultimately shown in what we do, and thus deep-holistic lifelong learning will be implemented by the competent clinical practitioner with the ultimate goal of improving/facilitating patient outcomes.

For interaction to take place between the educators, students and competent clinical practitioners, collaboration must be introduced as early as possible into the curriculum of health professionals. This collaboration will lead to better collaboration between health professionals in the clinical setting and ultimately improve/facilitate patient outcomes.

6.5 EVALUATION OF THE MODEL

Fawcett (2005:53) maintains that the evaluation of a nursing model is accomplished by comparing its content with certain criteria, and indicates that the ultimate aim of credibility of a nursing model is to determine whether the content is appropriate for use in clinical situations and relevant to the clinical population. Meleis (2007:242) concurs with the perspective of Fawcett (2005:53), suggesting that criteria are required for comparing the content of a nursing model, and endorses the entire of Chapter Four in the sixth (6th) edition of Chinn and Kramer (2004:91-119) that sets out questions for critical reflection on a nursing model. Meleis (2007:242) affirms that the set of questions provided by Chinn and Kramer (2004:91-119), corresponding to Chapter Eight of the seventh (7th) edition of Chinn and Kramer (2008:219-249), would guide the evaluation of integrated knowledge, and confirms that the questions are driven by the approach to the definition of a model as theory that contains a creative and rigorous structure of ideas that projects a tentative, purposeful and systematic view of phenomena.

The evaluation tool is provided in Appendix 12 that illustrates the array of questions denoting the criteria used to conduct the evaluation of the model in this research study. A review of this evaluation of the model was outlined in Chapter Two in section 2.2.2.2 and are now discussed.

6.5.1 Self-evaluation synopsis using the criteria of Chinn and Kramer (2008)

Dickoff *et al.* (1968a:415-435) state that if a practice model is developed and it is functional/operational, the theory is "true". Therefore, it is not deemed necessary by Dickoff *et al.* to evaluate the model but rather implement the model and if it is functional the purpose with the model has been achieved. The evaluation is provided as a synopsis using the criteria of Chinn and Kramer (2008:246) (see Appendix 12). The criteria are congruent to the Chinn and Kramer approach to model description that was used in this research study. It was realized that the evaluation of the model was an iterative process with section 6.4 on model description as a process of refinement. The aspects that were addressed in the model description in section 6.4 are indicated in Table 6.4 that follows in this section. The revisions and changes were effected iteratively and directly with the text on model description aimed at the outcome of having a model in this research study that would be operationalized and will be discussed in section 6.7 of this chapter that provides guidelines and actions for implementation of the model.

Table 6.4 provides a synopsis of the evaluation review with comments on what was addressed and refined in the description of the model.

Table 6.4: Synopsis of the self-evaluation of the model using the criteria of Chinn and Kramer (2008)

CRITERIA FOR EVALUATION with trigger questions	SELF-EVALUATOR COMMENTS
1. CLARITY of the model **a. Semantic clarity** • Are the concepts clearly defined? • Are the definitions understandable and coherent?	• Concepts were defined from emperical data as well as literature review.
b. Semantic consistency • Are the concepts congruent and in harmony with the definitions, purpose and aligned to the relationships featured in the theory?	• All main concepts required greater depth of text by means of literature review to portray a descriptive vividness.
c. Structural clarity • Are the illustrated connections and logical reasoning coherent with the descriptive elements of the theory?	• Changes were made to the text subsequent to professional editing of this thesis, which enhanced the clarity.
d. Structural consistency • Do the structural forms used for illustration as a conceptual map enhance clarity and comprehension of the descriptive elements of the theory?	• Additional figures were added to illustrate progressive development of concepts, connectedness in relationships and congruency.
2. SIMPLICITY of the model • Are the number and differentiation of concepts and interrelationships least in simplicity or acceptable in complexity? • Does the contextual situation warrant the various concepts to enhance understanding of the concepts and their interrelatedness in the theory? • Does the theory serve to describe, explain and/or predict concepts or their interrelatedness in practice?	• Chapter Five shows the figures from a simple diagram in Figure 5.2 with progressive and incremental concepts and their relationships in Figures 5.3, 5.4, 5.5, 5.6 and 5.7 including the final and complete version of the model in Figure 6.1.

CRITERIA FOR EVALUATION with trigger questions	SELF-EVALUATOR COMMENTS
3. GENERALITY of the model • Do the breadth of scope and specificity of purpose appraise the broad empirical experiences of concepts for the purpose of nursing? • Are ideas arranged to facilitate application to practice and the health care team while embodying nursing as a discipline? • Are the concepts of the individual, health, environment and society featured broadly in the general application of the model?	• The text describing the main concepts and relationships were refined in an iterative process as figures and tables were added incrementally for clarity. • The model may also guide future research and used for implementation in the South African context on facilitating interprofessional teaching-learning of anatomy at other higher education institutions with no medical schools/faculties.
4. ACCESSIBILITY of the model • Would the concepts be identifiable as empirical indicators in practice within the realm of nursing? • Does the definitions of the concepts adequately manifest their meanings in the nursing practice setting that is specified? • Despite either the simplicity or complexity of the model, do the concepts create conceptual meanings in the clinical practice setting?	• The concepts in this model can be used as empirical indicators for education practice of the interprofessional teaching-learning of anatomy on the descriptions of the model that are based on empirical evidence in this research study and the literature. • The definitions and meanings of the concepts, although contextualized in education practice, are specified for higher education institution in South Africa. • This model can be made accessible to other higher education institutions with no medical schools/faculties by means of publishing of articles and presentations at conferences.
5. IMPORTANCE of the model • Does the model have clinical value or practical significance in the targeted area of clinical nursing practice? • Is there futuristic and pragmatic value in the applicability to lead future practice of nursing in the targeted area? • Does the theory in the model create understanding and the potential for nursing education and research? • Does the theory differentiate the focus or nature of nursing as a discipline separate to other service professions?	• This is the first model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa and at various levels of nursing practice, administration, education and research, this practice model has the potential for further research especially when implemented in the education practice setting.
SUMMARY COMMENTS	• Unless there are major changes to systems, this practice model would be applicable and related while minor revisions to the description could be embraced on the proviso that the entire practice model must always be checked for comprehensiveness using the evaluation criteria as set out in Appendix 12.

6.6 THEORY TESTING

Theory testing is regarded by Meleis (2007:264) as the continuous development and advancement of a theory for the purpose of collecting further empirical data as evidence of the theory being tested in practice, as well as the replication of testing in other settings of similar context. McKenna and Slevin (2008:168) specify that theory testing research is designed to determine how accurately the depiction of the real-world phenomena is portrayed in theory. Theory testing is outside the scope of this research study and will be done as part of the post-doctoral work of the researcher.

6.7 GUIDELINES AND ACTIONS FOR IMPLEMENTATION OF THE MODEL IN INTERPROFESSIONAL TEACHING-LEARNING OF ANATOMY

The guidelines and actions for operationalisation are divided into three categories, namely the micro-, meso- and macro-levels. These levels are briefly described, followed by guidelines for operationalisation of this model.

6.7.1 Micro-level guidelines and actions for operationalisation

The micro-level refers to the psycho-social dimension of the educator and student. The psychological dimension refers to the intra-personal dynamics present within a person (educator and student). The social dimension refers to the interpersonal dynamics between people (between the educator and educator, between the educator and student, and between the students themselves). Please refer to Table 6.5.

6.7.2 Meso-level guidelines and actions for operationalisation

The meso-level refers to the time-spatial context on higher education institution level and the practice setting in which the educator and student are occupied with health care. This implies that higher education institution factors are taken into consideration in the formation of the guidelines. The following organisational factors are found on the meso-level:

- Organisational structure;
- Mission and vision;

- Organisational culture and values;
- Organisational governance;
- Specific organisational issues; and
- Organisation policies, structures and procedures (decision-making, accountability, communication, information flow).

Please refer to Table 6.6 for the meso-level guidelines and actions for operationalisation of this model.

6.7.3 Macro-level guidelines and actions for operationalisation

The macro-level for operationalisation guidelines and actions refers to the socio-political and national context. The following factors were taken into consideration with regard to the macro-level:

- National social and political climate (democracy and transformation) and rival philosophies;
- Social partnerships and coalitions;
- National education and health sector and the National Education and Health Plan;
- South African civil society; and
- Corporate governance

The macro-level guidelines and actions for operationalisation are listed in Table 6.7.

Table 6.5: Guidelines and actions for operationalisation on micro-level

GUIDELINES	ACTIONS
Enhance the development of a micro-curriculum for interprofessional teaching-learning	1. The study guide must be organised and structured to enable the student to prepare for contact sessions. 2. There is a direct connection between learning outcomes, learning activities and test and examination questions. 3. It is clear what marks are awarded for in tests and assignments. 4. The continuing repetition, revision and application of anatomy and physiology in other medical related subjects and curricula prevents the knowledge from being lost and stimulates the application of the knowledge to clinical practice.
Enhance the interprofessional teaching-learning dynamics between the educator and the student	1. The educator's attitude towards students should consist of a sense of humour, warmth and empathy, acknowledgement of the uniqueness of each student, and respect for the students' points of view to ensure that effective teaching-learning can take place. 2. The educator must explain difficult or abstract learning content in a comprehensive way by the use of practical examples. 3. Meaningful learning events follow as a result of the interaction between the educator and students. This means that there should be activities during contact sessions that promote two-way discussions between the educator and the student as this aids the student in learning. 4. The educator must explain and discuss the learning content and/or specific learning outcomes according to real and practice-oriented examples and applications. 5. During contact sessions the educator must make effective use of appropriate support media, such as the writing board/ transparencies/ slides/ PowerPoint presentations/ internet applications/ hand-outs and videos. 6. The educator must use a variety of teaching-learning methods such as group work, role play, problem solving, seminars, questions-and-answers, short lectures, and in this manner provide for the student's preferential learning style, abilities and needs. 7. The educator has a responsibility to make every lesson a positive and productive learning experience for all students and therefore the educator's task is to design the lesson so that the information can be applied in practice.

	8. Assessment should help students to make judgments about their own performance, set goals for progress and provoke further learning. 9. There must be a sustained interchange or dialogue between the educator and students (and among the students) about the important concepts and ideas they are encountering. 10. The educator must communicate clearly and audibly. 11. The educator must give a turnaround time for feedback regarding tests and assignments and this will contribute towards converting assessment opportunities into learning opportunities. 12. Reiterate the importance of supportive trust relationships among educators as part of the teaching-learning context. 13. Use effortless and free communication as a mechanism to enhance open and transparent, supportive relations between the educator with the teaching-learning context. 14. The adult student must display self-direction, have experience, demonstrate a specific learning readiness and a learning orientation which is task-oriented and problem-directed. 15. The adult student must approach learning intentionally, be an active constructer of own knowledge and acquire meaning and understanding through reflection. 16. Students must give feedback after each semester to educators on their teaching-learning. 17. Students must have the opportunity to evaluate each other's work. 18. Trust to be concretised as an important dynamic that needs to be identified, restored, maintained and enhanced between the educator and the student. a. Training to educators as well as other members of the teaching-learning context with specific focus on self-trust and organisational trust, the necessity and implications of trust in their working environment and mechanisms to restore, maintain and enhance trust. b. The focus in intrapersonal and interpersonal relationships amongst educators and others should be that of personal accountability to enhance their own trustworthiness. c. Set the norms of the accepted behaviour of educator as integrity, results-focus, capabilities on individual performance and credibility. 19. Motivate teamwork that is based on excitement, creativity and that is purposive. 20. Employ the importance of active listening as a mechanism to restore, maintain and enhance trust.

Enhance collaboration between the educator and educator, educator and the student, and between the students themselves	1. The focus in health team collaboration should be on cooperation rather than competition. 2. Replace suspicion between team members with trust and respect. 3. Active mechanisms that can assist in the construction of social networks as a measure to enhance the activation and accumulation of collaboration. 4. Members of the health team to be more humble and to seek win-win relationships. 5. Learning in teams is best facilitated by the progressive mastery of more and more complex tasks incorporating the best practices of cooperative learning as part of an experiential learning process.

Table 6.6: Guidelines and actions for operationalisation on meso-level

GUIDELINES	ACTIONS
Enhance the development of a meso-curriculum for interprofessional teaching-learning between faculties/schools in a higher eduation institution	1. Establish a unit for interprofessional teaching-learning within the higher education institution. 2. Use the guidelines described from health professional councils as well as from higher education council when developing a meso curriculum. 3. Work together as an interprofessional team to form a curriculum where all health professionals in the faculty/school of a higher education institution can benefit from each other's input. 4. Share ideas and take responsibility for your module/subject by means of scheduled meetings and set target dates. 5. First begin with workshops/seminars to get the feel of one shared curriculum by means of a case study/problem. 6. Have a workshop/seminar quarterly to start developing a meso curriculum that can be shared in the faculties/schools annually to enhance collaboration between health professionals to prepare them for collaboration in the clinical practice.
To establish collaboration and trust levels between faculties/schools in a higher education institution	1. Establish a caring atmosphere where educators, although working very hard, still enjoy their work. 2. Performance appraisals should include the educator taking responsibility for personal empowerment. 3. Empower educators by means of training to understand the pillars of healthy relationships. 4. Mechanisms to establish and maintain personal integration by means of self-awareness, enhancement of self-knowledge, self-evaluation of one's ability of empathy towards others and information on emerged and submerged emotions as part of the self. 5. Self-care of the educator as a form of respect to self and others. 6. Establish a culture of respect that should stretch beyond personal gain but to have respect for all levels of employees within the higher education institution. 7. Be realistic about challenges and problems and not afraid to name the real issues. 8. Take responsibility for actions and outcomes and don't blame poor results on others.

Table 6.7: Guidelines and actions for operationalisation on macro-level

GUIDELINES	ACTIONS
Enhance the development of a macro-curriculum for interprofessional teaching-learning between higher education institutions in South Africa	1. Develop policy guidelines for interprofessional teaching-learning on governmental level, e.g. on educational level working with the Minister of Higher Education and Training, Minister of Health and other team members from education institutions in South Africa. 2. Develop the macro-curriculum with input from educators, health professionals and other applicable members of the public, as well as the policy guidelines set by the health professionals councils.
To establish collaboration and trust levels between higher education institutions in South Africa	1. Application of collaborative and conscious effort to change the behaviour of managers and leaders with regard to interprofessional teaching-learning. 2. Prevent the presence of denial by starting face up to reality and face the reality of the current socio-economic status of South Africa within the global economy. 3. Through effective result-based communication, enhance the higher education institution's reputation with the public. 4. Government and corporate society's declaration of the support towards higher education. 5. Members on national boards to have integrity, intent and capability. 6. Corporate support from private sector to the public sector with regard to technology. 7. Launch national awards and workshops/seminars whereby interprofessional teaching-learning are rewarded with sufficient media cover.

6.8 SUMMARY

In this chapter, the practice model was presented in a description that was enhanced by graphics. The evaluation of the model was reviewed using selected evaluation criteria by nursing theory experts. The approach to operationalization for implementation of the practice model in the interprofessional teaching-learning of anatomy at a higher education institution in South Africa was finally discussed. The evaluation of the research study, limitations and recommendations for research, education and practice follows in the final Chapter (Seven) of this study.

CHAPTER 7

EVALUATION OF THE RESEARCH STUDY, LIMITATIONS AND RECOMMENDATIONS FOR RESEARCH, EDUCATION AND PRACTICE

7.1 INTRODUCTION

The evaluation of the research study, the limitations, recommendations and transferability of the research study are presented prior to the penultimate personal reflection that leads to the summary of this thesis.

7.2 EVALUATION OF THE RESEARCH STUDY

In this section, each chapter is separately evaluated.

7.2.1 CHAPTER 1: Overview of the research study

In Chapter One an overview of the research study was given to familiarise the reader with the introduction and background of the research that lead to the description of the statement of the problem. The overall aim of this research study was to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa. The ethical considerations for the research study and universal standards for trustworthiness, validity and reliability were also discussed.

7.2.2 CHAPTER 2: Research methodology

In Chapter Two an in-depth discussion of the research methodology was elucidated. This study's research design utilised a theory-generative, quantitative and qualitative design (Brink, 2006:10-11; Mouton & Marais, 1996:159) to explore (Mouton & Marais, 1996:45) and describe (Mouton & Marais, 1996:46) teaching-learning of anatomy in a specific context (Klopper, 2008:68). The research process consisted of two phases and three objectives; both inductive and deductive research strategies were used to achieve these objectives, which were:

Objective 1: to assess interprofessional students' (IPS) and peer group's (PG) opinions on the teaching-learning approach to anatomy.

Objective 2: to explore interprofessionals' perceptions on the importance of anatomy in clinical practice.

Objective 3: to describe a conceptual framework for interprofessional teaching-learning of anatomy.

Phase one consisted of the concept identification, description and definition of the three objectives. Step 1 under phase one consisted of identifying main and related concepts and this process was completed for objectives one (this objective was described in Chapter Three) and Two (this objective as described in Chapter Four). All data gathered, synthesized and concepts identified from objectives one and two lead to step 2 of phase one, e.g. concept descriptions and definitions that were completed through objective three, and was described in Chapter Five.

Phase two (model construction), step 1 (to construct relational meaning of main and related concepts) and step 2 (model construction through theory synthesis) was completed from the concept descriptions and definitions identified from phase one, as well as the model evaluation criteria was also described. The relevant research methods for each objective were, however, discussed in each chapter.

7.2.3 CHAPTER 3: Interprofessional students' and peer group's opinions on the teaching-learning approach to anatomy

(Phase one: step 1: objective one)

Objective one of phase one, step 1 explored and described the information gathered through statistical and content analysis of the interprofessional students' (IPS) and peer group's (PG) opinions on the teaching-learning approach to anatomy. The realisation of the data, including the choice of research method, population and sample, data collection and data analysis, was described. In Chapter Three six themes and sub-themes identified for

peer group's (PG) opinions on the teaching-learning approach to anatomy were outlined (in Table 3.8).

7.2.4 CHAPTER 4: Interprofessionals' perceptions on the importance of anatomy for clinical practice

(Phase one: step 1: objective two)

Objective two of phase one, step 1 explored and described the information gathered through content analysis of the interprofessional students' perceptions of the importance of anatomy in clinical practice. The realisation of the data, including the choice of research method, population and sample, data collection and data analysis, was described.

In Chapter Four five themes and sub-themes were identified for interprofessionals' perceptions on the importance of anatomy in clinical practice and was outlined in Table 4.1.

7.2.5 CHAPTER 5: Conceptual framework

(Phase one: step 2: objective three)

Objective three of phase one, step 2 presented the conceptual framework for interprofessional teaching-learning of anatomy at a higher education institution in South Africa subsequent to the identification of concepts from the empirical data (from Chapters Three and Four), concept classification and an in-depth literature review.

The survey list of Dickoff *et al.* (1968a:422) was used for concept classification and was outlined in Figure 5.1.

7.2.6 CHAPTER 6: Practice model for interprofessional teaching-learning of anatomy

(Phase two: steps 1 and 2: main aim)

The unique contribution of this thesis is the development of a practice model for interprofessional teaching-learning of anatomy at a higher education

institution in South Africa. The model is innovative as it provides the education sector with knowledge of what interprofessional teaching-learning entails. In Chapter Six the practice model was developed, explained and evaluated. Guidelines and actions for operationalisation in micro-, meso- and macro-levels were also outlined.

This practice model is unique as it was the first research study conducted on the interprofessional teaching-learning of anatomy at a higher education institution in South Africa without a medical school/faculty. An in-depth literature review was conducted on the concepts identified from the empirical data (refer to Chapter Five) and triangulation, deductive and inductive reasoning strategies were used to describe the conceptual framework and ultimately the practice model. This practice model may guide future research in the South African context on facilitating interprofessional teaching-learning of anatomy at other higher education institutions with no medical schools/faculties.

7.3 LIMITATIONS OF THE RESEARCH STUDY

The limitations of the research study relate to the contextual aspect of the research setting and some methodological and professional considerations.

- The research study was conducted with participants from one higher education institution in South Africa, thus limiting the findings to higher education institutions without a medical school/faculty. However, it is foreseen that this model is transferable to other higher education institutions with/without medical schools/faculties.

- Although the response rate of the interprofessional students participating in the research study did not influence the reliability of the study findings, the response rate was not high. In particular, the difficulty in getting the contact numbers of participants, especially for biokinetics students, made this process feel longer than needed.

- Trying to be more technologically informed by creating a blog created for participants to respond to the importance of anatomy in clinical

practice, proved to be problematic as not all the participants had the technological knowledge and equipment to respond on the blog. Therefore the method was changed to email interviewing, which appeared to be successful.

Despite the limitations of this research study, its purpose, namely to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa, was achieved.

7.4 RECOMMENDATIONS OF THE RESEARCH STUDY

The recommendations for research, education and practice are given below.

7.4.1 Recommendations for research

- Evaluate the practice model after implementation to make changes, if necessary.
- The difference in teaching-learning at higher eduation institutions in South Africa should be determined.
- Present this practice model at educational conferences as well as the publishing of articles on this research study.

7.4.2 Recommendations for education

- This practice model must first be implemented in the faculty of health sciences, where the researcher is currently working.
- This practice model, when successful and changes have been made, can be implemented by other higher education institutions in South Africa.
- Interprofessional teaching-learning should form part of the nursing education, and education curriculum in general.

7.4.3 Recommendations for practice

- Make the guidelines and actions for operationalisation of the practice model on micro-, meso- and macro-levels available to all higher education institutions in South Africa.
- Increase awareness of interprofessional teaching-learning and collaboration through presentations to the management of higher education institutions in South Africa.
- Encourage health professionals (educators and students) to take action and participate in the development of policies in higher education institutions in South Africa.

7.5 PERSONAL REFLECTION

In this research study the path I followed was somethimes smooth and sometimes strewn with obstacles. Despite the challenges, I was also blessed with wonderful opportunities. I met champions in the research and education practice that guided me to develop this model, because I believe that my role as educator is to build a bridge between the knowledge (concepts) of anatomy to the practice (skills, knowledge and competencies used in nursing or other health professions). I have also learned that education constantly changes and therefore we as educators and students need to work together through collaboration to implement these changes, so that we can ultimately apply what we've learned in clinical practice.

7.6 SUMMARY OF THE RESEARCH STUDY

In this final chapter, the operationalization of the practice model was described, and the evaluation of the research study, its limitations and recommendations, and a final stop at reflexivity were made. This chapter also heralds the conclusion of the research study and this thesis, which is difficult at some levels because of the years of engagement, but also exhilarating because this is not a stop, but is the point of starting again so that evidence always underlies my education practice with the student and clinical practice at the centre of all my actions.

I have reached the end, but it is only the beginning of operationalizing the model for interprofessional teaching-learning of anatomy at higher education institutions in South Africa.

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APPENDICES

APPENDIX 1: Consent form to conduct study from the ethical committee of North-West University (Potchefstroom Campus)

Potchefstroomse Universiteit
vir Christelike Hoër Onderwys

Ontstaan 1869
50 jaar selfstandig 2001

Die Etiekkomitee

Privaatsak X6001 Potchefstroom 2520
Tel (018) 299 1111 Faks (018) 299 2799
Sel: 0822331411/22 (sel na sel)
http://www.puk.ac.za
Psigologie
Tel (018) 299 1735

12 April 2007

ETIESE BEOORDELING VAN KWALITATIEWE NAVORSING

PROJEKLEIER: BELINDA SCROOBY
MEDEWERKERS: PROF. HC KLOPPER
TITEL: ***Facilitating effective instruction and evaluation/assessment of anatomy***

Die voorgenome projek voldoen aan basiese etiese vereistes. Daar word aanbeveel dat die studie voortgaan.

Groete

Dr. Karel Botha
Departement Psigologie

APPENDIX 2: Consent to conduct qualitative research

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Mej B Scrooby
Bussie 520
Potchefstroomkampus
Noordwes-Universiteit

Etiekkomitee
Tel (018) 299 2564
Faks (018) 297 5308
E-pos Estelle.LeRoux@pnwu.ac.za

14 April 2007

Geagte me Scrooby

GOEDKEURING VIR EKSPERIMENTERING MET MENSE (KWALITATIEWE NAVORSING)

Hiermee wens ek u in kennis te stel dat u projek *"Facilitating effective instruction and evaluation/assessment of anatomy"* goedgekeur is met nommer 07K07.

Gebruik asseblief die nommer genoem in paragraaf 1 in alle korrespondensie rakende bogenoemde projek en let daarop dat daar van projekleiers verwag word om jaarliks in Junie aan die Navorsingsetiekkomitee verslag te doen insake etiese aspekte van hulle projekte asook van publikasies wat daaruit voortgespruit het.

Goedkeuring is vir 'n termyn van hoogstens 5 jaar geldig (volgens Senaatsbesluit van 4 November 1992, art 9.13.2). Vir die voortsetting van projekte na verstryking van hierdie tydperk moet opnuut goedkeuring verkry word.

Sterkte met al u werksaamhede.

Vriendelike groete

ESTELLE LE ROUX
SEKRETARIAAT

APPENDIX 3: Teaching-learning feedback questionnaire

YUNIBESITI YA BOKONE-BOPHIRIMA
NORTH-WEST UNIVERSITY
NOORDWES-UNIVERSITEIT

Teaching-learning feedback questionnaire

Please note:

This questionnaire is the property of Academic Support Services. After use, please return it to Academic Support Services, room 107 J Chris Coetzee Building (E8) or place in internal box 598.

Dear student

The intention with this questionnaire is to provide your lecturer with feedback on how you experience his/her teaching skills, and if he/she succeeds in helping you to become an active learner. This information is used by your lecturer in an attempt to improve his/her teaching skills; therefore you should please give your honest opinion. Please approach this questionnaire seriously, even if you have recently completed a similar one for another lecturer. Concentrate on the skills of this particular lecturer and not on lecturers in general Your name and student number need not appear on the computer card or answer sheet.

SECTION A

Indicate how you experience the lecturer's teaching-learning according to the five-point scale below **by simply darkening the corresponding number with a pencil on the answer card**.

1	2	3	4	5
Do not agree at all	**Do not agree**	**Neutral**	**Agree**	**Agree completely**

Study material

1. The study material, such as the textbook(s), lecturer's notes, workbooks, articles etc., contributes to my learning process and is indispensable for achieving the learning outcomes.

2. The study material has been updated recently, where applicable.

3. The study guide enables me to prepare for contact sessions.

Presentation

4. The lecturer's presentation gives evidence of thorough planning.

5. The lecturer has the skill to help learners think analytically.

6. The lecturer has the skill to help learners to work in a problem-solving manner.

7. The lecturer has the ability to explain difficult or abstract learning content in a comprehensible way.

8. The lecturer presents his/her contact sessions enthusiastically.

9. Meaningful learning events follow as a result of the interaction between the lecturer and students. This means that there are activities during contact sessions that promote two-way discussions between the lecturer and the student and this aids the student in learning.

10. The lecturer explains and discusses the learning content and/or specific learning outcomes according to real and practice-oriented examples and applications.

11. During contact sessions the lecturer makes effective use of appropriate support media, such as the writing board / transparencies / slides / PowerPoint presentations / internet applications / hand-outs / videos etc.

12. The lecturer uses a variety of teaching-learning methods, for example group work, role play, problem solving, seminars, questions-and-answers, short lectures etc., and in this manner makes provision for students' preferential learning style, abilities and needs.

13. The lecturer speaks at an acceptable tempo and is clearly audible.

Assessment

14. There is a direct connotation between learning outcomes, learning activities and test and examination questions.

15. There is regular assessment in the form of teaching tests, class tests, practical work, assignments, or anything else for which marks are awarded or for which feedback on the quality of work is received.

16. It is clear what marks are awarded for in tests and assignments.

17. The lecturer gives purposeful feedback regarding tests and assignments and this contributes towards converting assessment opportunities into learning opportunities.

18. Tests and assignments are marked and returned on time, taking into account the size of the class.

General

19. The lecturer motivates students to work hard.

20. The lecturer demands a high standard from students.

21. The lecturer is tolerant and shows respect towards students of all cultures and religions.

22. An individual learner has the opportunity to discuss and solve personal academic problems (e.g. by means of e-mail, appointments with the lecturer, facilitation).

23. The lecturer gives guidance regarding ethical issues in the area of the subject.

24. This is an excellent lecturer.

SECTION B

The questions in section B deal with the content of the module or the part of the module presented by this lecturer.

If you are requested to complete this section as well, indicate your opinion on the answer card according to the scale below, in the same manner as you have done for the previous section:

1	2	3	4	5
Do not agree at all	**Do not agree**	**Neutral**	**Agree**	**Agree completely**

25. The module outcomes and learning outcomes are clearly formulated.

26. The prescribed/estimated study time, as indicated in the study guide, is a reliable indication of how long it actually takes to achieve the identified outcomes by completing assignments and preparing for contact sessions and tests.

27. The learning content of this module (or parts thereof) is logically structured.

28. The learning content of this module (or parts thereof) is practice-oriented and applicable.

29. In the area of study of this module (or parts thereof) theory and practice are presented in an integrated fashion.

30. In terms of my programme this module complied with my expectations.

SECTION C

If the lecturer requires it, please answer questions 31 and further on the answer card. The lecturer will put these questions to you.

SECTION D

If the lecturer requires it, please answer this section on a separate piece of paper.

1. What do you regard as the best feature of the lecturer's teaching skills and his/her ability to engage you actively in the learning process?

2. What do you regard as the poorest feature of the lecturer's teaching skills and his/her ability to engage you actively in the learning process?

3. The lecturer will provide you with more questions if there are any other issues about which he/she would like to have your written response, such as hints to improve teaching skills or structuring contact sessions.

Thank you very much for your attention on this very important issue.

Academic Support Services – Original version: May 1990

Revised: January 2004 p:\wwdata\verslae\studentevaluering van onderrigleer.doc

APPENDIX 4: Shortened teaching-learning feedback questionnaire

YUNIBESITI YA BOKONE-BOPHIRIMA
NORTH-WEST UNIVERSITY
NOORDWES-UNIVERSITEIT

Teaching and learning Feedback questionnaire

Please note:

This questionnaire is the property of Academic Support Services. After use, please return it to Academic Support Services, J Chris Coetzee Building (E8) or place in internal box 598.

Dear student

The intention with this questionnaire is to provide your lecturer with feedback on how you experience his/her teaching skills, and if he/she succeeds in helping you to become an active learner. This information is used by your lecturer in an attempt to improve his/her teaching skills; therefore you should please give your honest opinion. Please approach this questionnaire seriously, even if you have recently completed a similar one for another lecturer. Concentrate on the skills of this particular lecturer and not on lecturers in general. Your name and student number need not appear on the computer card or answer sheet.

SECTION A

Indicate how you experience the lecturer's teaching and learning skills according to the five-point scale below **by simply darkening the corresponding number with a pencil on the computer card.**

1	2	3	4	5
I do not agree at all	**I do not agree**	**I do not know**	**I agree**	**I agree completely**

1. The study guide enables me to prepare for contact sessions.

2. The lecturer's presentation gives evidence of thorough planning.

3. The lecturer has the ability to explain difficult or abstract learning content in a comprehensible way.

4. The lecturer explains and discusses the learning content and/or specific learning outcomes according to real and practice-oriented examples and applications.

5. Meaningful learning events follow as a result of the interaction between the lecturer and students. This means that there are activities during contact sessions that promote two-way discussions between the lecturer and the student and this aids the student in learning.

6. During contact sessions the lecturer makes effective use of appropriate support media, such as the writing board / transparencies / slides / PowerPoint presentations / internet applications / hand-outs / videos etc.

7. The lecturer uses a variety of teaching and learning methods, for example group work, role play, problem solving, seminars, questions-and-answers, short lectures etc., and in this manner makes provision for students' preferential learning style, abilities and needs.

8. The lecturer communicates clearly and audible.

9. The lecturer presents his/her contact sessions enthusiastically.

10. There is a direct connotation between learning outcomes, learning activities and test and examination questions.

11. It is clear what marks are awarded for in tests and assignments.

12. The lecturer gives purposeful feedback regarding tests and assignments and this contributes towards converting assessment opportunities into learning opportunities.

13. The lecturer demands a high standard from students.

14. The lecturer is tolerant and shows respect towards students of all cultures and religions.

15. This is an excellent lecturer.

SECTION B

Please answer this section on the back of the computer card.

1. What do you regard as the best feature of the lecturer's teaching skills?

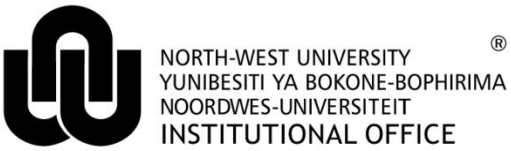
2. What do you regard as the poorest feature of the lecturer's teaching skills?

Thank you very much for your attention on this very important issue.

Oorspronklike gegewens: BASEJVH p:\wwdata\verslae\verkorte vraelys van studeval in engels 2005.doc 2005-05-18

APPENDIX 5: ITEA guidelines for assessment of teaching-learning during contact opportunity with students

Director: Teaching-Learning



ITEA: Guidelines for assessment of teaching and learning during the contact opportunity with students

The NWU is aware that teaching and learning differ between small and large class groups, as well as between faculties and different subject disciplines. These differences should as far as possible be taken into account during the assessment of submissions. It is proposed that subject experts serve on the assessment panel, so that the uniqueness of each subject may be adequately dealt with.

It is also proposed that teaching and learning in the class situation and other teaching opportunities should be evaluated according to the guidelines below. For each category the bottom and top ends of success are indicated to serve as a guideline for the awarding of a score on a five-point scale.

Course of teaching

Introduction

The material was not linked to students' prior knowledge; there was no problem description / introduction to the subject; no clear objective and learning outcomes were identified. The lecturer plunged into the new material.

There was efficient linking with previous contact periods by means of the testing of prior knowledge; students were motivated and interest was stimulated; the problem description / introduction was clearly formulated; the objective and learning outcomes of the contact session were logically explained and well formulated.

Development

There was no logical structure / pattern; less relevant contents were not distinguished; core concepts and essences were not provided; no familiar examples were used to which new contents could be linked. Learning activities were not referred to at all in the study guide.

During the presentation of new learning content clear structure and relationships were identified; core concepts were repeatedly highlighted and essences were emphasised; perspective was provided; sufficient and very appropriate examples (pegs) were used to establish links with new contents. There was continuous feedback regarding learning activities in the study guide, as well as additional applications. Students see the specialist in action.

Conclusion

No summary and application of the discussed subject content were provided; learning gains were not assessed; no follow-up activities were given. Contents were left hanging in the air.

Discussed contents were summarised and applied; achievement of identified learning outcomes (learning gains) was assessed; thoroughly planned follow-up activities (assignments) were given.

Integration of education principles

Purposefulness

Vague; nobody knows what the lecturer is trying to achieve.

Clear learning outcomes were identified and all learning activities are directed at achieving the learning outcomes.

Planning

Presentation was incoherent and disordered.

The entire presentation reflected thorough planning – the content was presented in a logically ordered manner. Learning activities during the contact session logically linked up with information as explained in the study guide.

Level of presentation

Development was slow, level of content low and simple, outcomes incorrectly pitched and students were uninvolved and disinterested.

An outstandingly high level of content presentation with the outcomes correctly pitched. Students literally had no choice but to be interested and to pay attention.

Individualisation

The class was treated as a homogenous entity and students were not involved as individuals.

The lecturer also worked with and put questions to individuals. Recognition was clearly given to different learning styles and abilities. The lecturer knows the students in smaller classes by name.

Learner self-activity

Students were totally passive. There is no guarantee that learning took place.

The lecturer constantly involved students. Ample opportunity was created to experience theoretical knowledge in practical form.

Examples and / or practical application

The content was restricted to the theoretical level. Facts, descriptions and information were simply communicated verbally.

The content was explained by means of examples, demonstrations, illustrations etc. The students experienced the content in practical “work situations”.

Selfassessment opportunities

The lecturer does not accept that mastering of the subject material is his responsibility as well. He / she took no steps to ensure that students had mastered the work.

The lecturer went to considerable trouble to ensure that mastering took place, by asking questions, incorporating selfassessment opportunities, summarising, revising, etc.

Group work and / or interaction

There was a rigid, formal atmosphere in which no or little interpersonal reactions took place.

The lecturer created much opportunity for interpersonal reaction and exchange of ideas in the class and in small groups. Two-way communication between lecturer and students and between students was encouraged.

Comprehensive view

Only the essential information was provided, without making any connections whatsoever.

The lecturer made a real attempt to explain the relevance of every piece of information in the context of the more comprehensive structure.

Assessment

No assessment was done. It was simply taken for granted that the students learned something.

The lecturer constantly assessed the mastering of the identified learning outcomes. After the contact session summative assessment was done.

Appropriateness and variety of teaching-learning methods

The lecturer is lecture-oriented. The teaching-learning methods used are in general not appropriate for achieving the learning outcomes.

The lecturer used a variety of strategies, such as group work, video teaching, case studies, lecturing, discussion, questions-and-answers, visual representation etc. The methods used by the lecturer promoted learning and the mastering of learning outcomes.

Preparation and use of teaching media

A logical scheme did not unfold on the writing board. Transparencies are mostly hand-written. Information could just as well have been written on the board.

The lecturer used the most appropriate teaching medium for the presentation and discussion of learning contents. Transparencies and other media contributed to the promotion of learning, the achieving of outcomes and the clear transmission of the

message. During the presentation and discussion a logical scheme unfolded on the writing board.

Teaching communication

Verbal communication

There were defects in the lecturer's speech, such as talking too loudly, too softly and / or too fast or swallowing words. Strange terms and expressions were used to the point of irritation, such as "good", "right", "okay" etc.

The lecturer could be heard clearly. Language use was exquisite and marked by good expression.

Non-verbal communication

Certain irritating habits which distract students' attention were displayed. No contact with students could be observed.

Appropriate facial expressions and body movements were used. The lecturer made eye contact and achieved constant contact with students.

Approved: IM – 26 April 2006

Approved by Institutional Senate on 10 May 2006

Formatted in official style sheet: 4 September 2009

Original details: Muki(22553959) L:\8. ONDERRIG-LEER\8.3 Aka Personeel Ontwikkel\8.3.1 ITOU\ITOU Bylaes\Engels\ITEA Appendix G-Guidelines assessment contact opportunity_2011.docm
25 March 2011

File reference: 8P-8.3.1

APPENDIX 6: ITEA score card and remarks for contact opportunity

ITEA: Score card and remarks for contact opportunity

CANDIDATE:		EVALUATOR:		Date:
FACULTY:		SUBJECT GROUP/DEPARTMENT:		

CATEGORY	FACTORS	Score						REMARKS
		Poor	Below average	Aver-age	Good	Excel-lent	Total	
		1	2	3	4	5		
Course of teaching-learning	• Introduction							
	• Development							
	• Conclusion							
Integration of education principles	• Purposefulness							
	• Planning							
	• Level of presentation							
	• Individualisation							
	• Learner self-activity							
	• Examples/practical application							
	• Selfassessment opportunities							
	• Group work and/or interacton							
	• Comprehensive view							
	• Assessment							
Appropriateness and	• Appropriateness							

variety of teaching-learning methods	• Variety							
Preparation and use of teaching media	• Planning							
	• Applicability/effectiveness							
	• Readability							
Teaching communication	• Verbal							
	• Non-verbal							
TOTAL								

APPENDIX 7: ITEA score card for assessment of teaching portfolio

Director: Teaching-Learning

ITEA: Score card for assessment of teaching portfolio

Name of participant: ----------

School / Department: ----------

Faculty: ----------

Name of panel member: ----------

Mafikeng Campus		**Potchefstroom Campus**		**Vaal Triangle Campus**	

Category	Weight		Mark	Comments
Student evaluation of teaching	**20**	Average achieved on questionnaire – see Appendix F		**Comments from evaluation panel will be added at appropriate time**
Peer evaluation	**20**	The average mark awarded by evaluation panel (3 members) will be added at appropriate time		**Comments from evaluation panel will be added at appropriate time**
Study guides and study material	**15**	1. Module information: outcomes on correct NQF–level (2), suitable list of action words (1), assessment plan (1), study material in context of credits for the module (1) (total 5) 2. Teaching and learning design: Study unit outcomes (2), contextualisation (1), exercises (1), feedback (1), monitoring and self assessment (1), assignments (1) (total 7) **3.** Relevance and variation of material and interfaces in the learning environment (3)		
Assessment (exam papers, memorandums, marks etc.)	**15**	Fairness and validity of assessment in general: 1. Sufficient, suitable and creative formal and informal formative assessment to assess mastering of outcomes (4) 2. Suitable and creative summative assessment to assess mastering of outcomes: Project and question papers: NQF-level, balance between higher and lower order skills, relation with module outcomes, suitable mark allocation, suitable time duration, use of language (5). 3. Memorandum: available, accurate, clear allocation of marks (1) 4. Moderation reports (1)		

Category	Weight		Mark	Comments
		5. Students' performance (1) 6. Examples of students' work and feedback to enhance learning (3)		
Suitable choice and use of teaching media	**5**	1. Quality of media 2. Effectiveness to promote learning 3. Variation: tranparancies, video material, slides, powerpoint slides, computer programmes, simulations, black board, etc.		
Variation in effective teaching and learning strategies	**10**	1. Describing the teaching and learning approach: outcomes based/PBL/PjBL (2) 2. Describing methods to promote mastering of outcomes: active learning, problem solving, debate, role play, question and answer, discussion, seminar, project, collaborative learning etc. (5) 3. Explain how the study guide is used to promote active and self study (3)		
Other innovative contributions in the teaching and learning environment	**15**	1. Innovation in designing and developing the learning environment as well as innovation in the use of eFundi (5) 2. Design / development of a new/ existing program/module (2) 3. Innovation in acquisition of critical and specific outcomes (4) 4. Proof of attendance of work sessions or other relevant activities with focus on teaching and learning development (2)		

Category	Weight		Mark	Comments
		5. Research regarding teaching and learning in the particular field of study. (2)		
TOTAL	**100**			

Approved: IM – 26 April 2006

Approved by Institutional Senate on 10 May 2006

Formatted in new style sheet: 4 September 2009

Original details: Muki(22553959) L:\8. ONDERRIG-LEER\8.3 Aka Personeel Ontwikkel\8.3.1 ITOU\ITOU Bylaes\Engels\ITEA Appendix D-Score card_assessment teaching portfolio_2011.docm
24 March 2011

File reference: 8P-8.3.1

APPENDIX 8: Information and consent form for participants

Title: Model for interprofessional teaching-learning of anatomy

Information Sheet

Study purpose: the main aim of this research is to develop a model for interprofessional teaching-learning of anatomy to facilitate deep-holistic lifelong learning.

Overall research objectives:

1. To explore interprofessionals' perceptions on the importance of anatomy in clinical practice;

2. To assess interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy; and

3. To describe a conceptual framework for interprofessional teaching-learning of anatomy.

Participation:

You are asked to participate in an interview to provide perceptions on the importance of anatomy in clinical practice.

Risks: You do not have to answer any questions or take part in the interview if you feel questions are too personal or if talking about them makes you uncomfortable. The researcher minimise this risk by ensuring that your participation in this study remains confidential, anonymous, and completely voluntary.

Benefits: The information you share will help the researcher to identify concepts important to develop a model for interprofessional teaching-learning of anatomy.

Confidentiality and anonymity: Any information you share will remain strictly confidential, and will only be discussed within the researcher's promoter and co-coder. To ensure anonymity, your name will not be recorded with your responses or identified in any way.

Conservation of data: All information collected (interview transcripts, notes) will be kept in a locked filing system. All computers on which study data will be stored will be password-protected. The data will be accessible only to the researcher, her promoter and co-coder. After completion of the study all electronic documents will be destroyed and questionnaires, paper transcripts and code books will be shredded.

Voluntary participation: You are under no obligation to participate and if you choose to participate, you can withdraw from the study at any time, for any reason, without consequences.

For more information:

If you have any other questions or require more information about the study itself, contact Belinda Scrooby (researcher) at the North West University, Potchefstroom Campus. Telephone +27(0)82 924 6060 or email at Belinda.Scrooby@nwu.ac.za.

If you have any questions regarding the ethical conduct of this study, you may contact the researcher, Belinda Scrooby, at the North West University, Potchefstroom Campus. Telephone +27(0)82 924 6060 or email at Belinda.Scrooby@nwu.ac.za.

Please fill out the next sections and FAX OR MAIL the page to:

Belinda Scrooby

School of Nursing Science
Potchefstroom Campus
Tel: +27 (0) 82 924 6060
Email: Belinda.Scrooby@nwu.ac.za
Fax: +27 (0) 18 299 1827

CONSENT FORM

I (please print your name): _____ ,

agree to participate in the above-mentioned study "Model for interprofessional teaching-learning of anatomy".

Please initial one of the following:

I agree to be quoted but all personally-identifying information shall be removed to protect my anonymity _____

I do not agree to be quoted at all _____

I have retained a copy of this information Sheet and Consent Form for my records.

YES _____ NO _____

Your signature in this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate. In no way does this waive your legal rights nor release the investigators, or resolved institutions from their legal and professional responsibilities.

Participant's signature: _____

Date: _____

Participant's contact information:

Tel: _____ Fax: _____

E-Mail: _____

APPENDIX 9: Letter to co-coder

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

Dr E du Plessis
Co-coder: School of Nursing Science
Private Bag x6001
Potchefstroom
2520

Private Bag X6001, Potchefstroom

School of Nursing Science
Tel: (018) 299-1833
Fax: (018) 299-1827
Email: Belinda.Scrooby@nwu.ac.za

Dear Dr Du Plessis

Co-coder for Ph.D research study

You have agreed to assist me as co-coder for the Ph.D research study with title: **Practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa**. The main aim of this research is to develop a practice model for interprofessional teaching-learning of anatomy at a higher education institution in South Africa to facilitate deep-holistic lifelong learning.

The main aim will be obtained at achieving the following objectives:

- To assess interprofessional students' and peer group's opinions on the teaching-learning approach of anatomy;
- To explore interprofessionals' perceptions on the importance of anatomy in clinical practice; and
- To describe a conceptual framework for interprofessional teaching-learning of anatomy.

Two sets of data have to be analysed, e.g.

First set of data is for objective 1:

As part of the researcher's evaluation of her teaching-learning approach, the researcher was peer reviewed by a process called ITEA (Institutional Teaching Excellence Award), developed by the higher education institute the researcher is working for. The researcher's teaching-learning approach was evaluated during the second semester of 2007. Three reviewers from the higher education institute were asked to complete peer review reports on the teaching-learning approach, as well as evaluate a portfolio of the researcher's teaching-learning.

Second set of data is for objective 2:

The data were collected through electronic interviewing (blog and emails). The following quote and questions were sent to participants, via blog and emails, to be answered, e.g.

Students cite medial knowledge as the most important knowledge from in each phase of their training and indicate anatomy the most important science, as it prepares them for later work (Manninen, 1999:83-84; Mitchell, McCrorie & Sedgwick, 2004:738).

1) Please write if you agree or disagree with the above statement and motivate your answer.

2) *Write about your perceptions on the importance of anatomy for clinical practice.*

Protocol for data analysis:

Content analysis must be use to analyse data. Analysis entails grouping similar themes together. Tesch's eight steps of data analysis are utilise in this study (Creswell, 1994:155). The process is as follows:

1) The researcher read carefully through all email interviews to get a sense of the whole.

2) The shortest, interesting interview was read and analysed.

3) Words, phrases, statements that were related to "the perceptions on the importance of anatomy for clinical practice", were underlined and written as the potential topics.

4) A list of all topics was made and similar topics were clustered together and arranged into major topics, unique topics and leftover topics.

5) Now this list was taken and the researcher went back to the remaining transcripts. Topics derived at in step four were abbreviated as codes and the codes were written next to appropriate segments of the texts in the remaining transcripts.

6) The most descriptive wording for the topics was found, turning topics into categories. Topics that related to one another were grouped together and lines were drawn between categories to show interrelationships in order to refine the categories further.

7) The data material belonging to each category was assembled as verification of categories. This data material is presented as quotes from interviews as part of the discussion of the findings.

8) An interpretation of the meaning of the data was made and is presented as the discussion of the findings.

All data were printed and then manual analysis was used and involves a thorough review of all recorded information that the researcher has obtained during the course of the data collection. If the margin is sufficiently wide, the coding of data can take place on the page itself. Coding involves inventing and applying a category system. Several categories or codes could be identified within the data recorded for any given participant. The researcher works with these categories to identify the ones which are most prevalent or of greatest priority for the participants. The researcher continually compares the data collected from one participant with that of another participant in the determination of the final theme (Brink, 2006:185).

If you have any problems or questions, please don't hesitate to contact me at cell: 0829246060 or email: Belinda.Scrooby@nwu.ac.za.

Yours sincerely

Miss B Scrooby
Researcher and Senior lecturer: Anatomy

APPENDIX 10: Data for objective one (1)

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

ITOU 2007: Terugvoerverslag van 1ste kontakgeleentheid

Potchefstroomkampus

Kandidaat: Belinda Scrooby

Fakulteit: Gesondheidswetenskappe

Tipe geleentheid (aangekondig/onaangekondig) : Aangekondig

Datum : 21 Augustus 2007

In hierdie verslag word vervolgens ‘n uiteensetting gegee van kwaliteite in u onderrig-leerbenadering wat tot die bevordering van studente se leer bydrae en ook van dié aspekte waaraan u aandag kan gee met die oog op verbetering van u fasiliteringsvaardighede en ontwikkeling van die betrokke leeromgewing.

Sterk punte

- U het ’n baie goeie verhouding met die studente en dit was duidelik dat hulle die klas geniet het.
- In die relatief groot klas ken u die meeste studente op hul name.
- U was goed voorbereid, oortuig as vakkundige en kom entoesiasties oor.

Algemene kommentaar en wenke

Aanloop

- Die sessie is begin met terugvoer oor ’n toets wat die studente geskryf het. Let daarop dat dit nie veel waarde het indien net antwoorde gegee word nie, want waarde word eers toegevoeg wanneer studente verstaan waarom ‘n vraag verkeerd of reg beantwoord is. Waarom het byvoorbeeld net 5 studente een van die vrae korrek beantwoord. Bespreek die korrekte antwoord en verduidelik waarom u dink so baie studente nie die antwoord geweet het nie, want dan word terugvoer ’n leergeleentheid. Dit is belangrik om by multikeusevrae te motiveer waarom ’n sekere antwoord korrek is. Gee

ook soms aan studente geleentheid om te verduidelik waarom ‘n antwoord reg of verkeerd is.

- Oorweeg om die memorandum op eFundi beskikbaar te stel. Dan kan u in die klas net aandag aan die probleemvrae gee.

- U het die struktuur van die beplande verloop van die sessie aan die studente deurgegee, maar eintlik het u net streng volgens die inhoud van die handboek gewerk. Beplan die struktuur volgens die uitkomste wat bereik moet word. Probeer meer innoverend wees in u aanbieding.

- Aanvanklik het u met die deur in die huis geval, maar later wel duidelike uitkomste gestel. Waak egter daarteen om die bemeestering van te veel uitkomste te wil bereik en konsentreer eerder net op die toepassing van kennis. Laasgenoemde het tydens hierdie sessie nooit ter sprake gekom nie.

- Let daarp dat uitkomste wat bereik moet word in konteks geplaas behoort te word. Verduidelik aan die studente waarom hulle bepaalde uitkomste moet bemeester en wat hulle daarmee moet kan doen.

Verloop

- Wanneer ’n student ’n vraag vra, beantwoord dit dadelik en moenie beloof om dit later te doen nie. Dit word gewoonlik vergeet. Indien u steeds verkies om dit nie dadelik te beantwoord nie, verwys dan terug na die vraag wanneer u by dié werk kom.

- Beplanning rakende die bemeestering van uitkomste is nie goed gedoen nie. Terugkoppeling na bepaalde uitkomste behoort deurlopend te geskied.

- U gebruik ’n uitstekende handboek en die vraag ontstaan dus oor wat u in die klas doen om waarde toe te voeg tot dit wat die studente op hul eie en met die hulp van studieleding in die studiegids, kan bemeester. Oorweeg die gebruik van die studiegids voor, tydens en na die kontakgeleentheid.

- Wat was die doel van die groepwerk? Hou in gedagte dat die keuse van ’n onderrig-en-leermetode bepaal word deur die uitkomste wat bereik moet word.

- Daar is te veel in die bondel gepraat en baie studente het in die proses net weggeraak. Eintlik het die studente nooit opgehou met praat nie en u behoort te waak teen wanorde.

- Inligting op die aanvanklike transparante was te klein en dus oneffektief. Latere transparante was netjies en professioneel.

- Alhoewel u met die studente op hulle vlak wil kommunikeer, moet u steeds waak teen slordige taalgebruik.

- U het deurlopend studente se bemeestering van leerinhoude getoets en daar is gereeld terugverwys na vorige leer. Maak egter seker dat studente die betekenis van terme wat gebruik word ken. Dit is werk wat hulle selfstandig kan bemeester en u kan deur ’n kort toets of enkele vrae seker maak dat hierdie tipe voorkennis in plek is.

Afloop

- Gebruik interessante onderrig-en-leermetodes om vas te stel of uitkomste wel bemeester is. ’n Algemene antwoord op ’n vraag soos “is julle happy?” is van geen waarde nie.

- Studente ontvang opdrag om bepaalde werk vir die volgende sessie voor te berei.

Ontwikkelingsareas

- Vlak van leer is te laag, want hier is deurgaans net aan die feitelike aandag gegee. Neem kennis van die vereistes soos deur die NKR-vlakbeskrywer voorgeskryf.

- Dit is goed om modelle as onderrigmedia te gebruik, maar dit is dalk verouderd as al die moontlikhede wat tans bestaan in ag geneem word. Dink byvoorbeeld aan animasie en powerpointskyfies.

- Neem kennis van verskeie onderrig-en-leermetodes wat gebruik kan word om bemeestering van uitkomste op die korrekte NKR-vlak te ondersteun.

Algemene indruk

- ’n Lewendige klas waar te veel klem gelê is op feitekennis. Ongelukkig het toepassing van hierdie kennis asook oplos van probleme nooit ter sprake gekom nie. Gebruik van toepaslike onderrig-en-leermetodes sal diepgang kan verbeter.

Evalueringspaneel

(1) Prof Chris Venter

(2) Me Mada Watson

(3) Dr Estelle van Hamburg

Sterkte met die verdere verloop van die ITOU-proses

Oorspronklike gegewens: BASEJVH c:\itou2007_meester.doc
2007-07-27

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOMKAMPUS

ITOU 2007: Terugvoerverslag van 3de kontakgeleentheid

Potchefstroomkampus

Kandidaat: Belinda Scrooby

Fakulteit: Gesondheidswetenskappe

Tipe geleentheid (aangekondig/onaangekondig) : Onaangekondig

Datum : 9 Oktober 2007

In hierdie verslag word laastens 'n uiteensetting gegee van kwaliteite in u onderrig-leerbenadering wat tot die bevordering van studente se leer bydra en ook van dié aspekte waaraan u aandag kan gee met die oog op verbetering van u fasiliteringsvaardighede en ontwikkeling van die betrokke leeromgewing.

Sterk punte

- U het innovering getoon ten opsigte van die gebruik van die video. Die vraag is egter of u die onderrigmedium so gebruik het dat dit die bemeestering van die uitkomste op doeltreffende wyse moontlik gemaak het.

Algemene kommentaar en wenke

Aanloop

- Duidelike uitkomste behoort gestel te word en hierdie tipe van les behoort ook baie goed in konteks geplaas te word. Die studente moet die nut van die leerinhoud goed verstaan om dit te kan verwerk en uit die aanbieding te leer.

- Dit is u taak as fasiliteerder om die studente voor te berei oor wat hulle te wagte moet wees wanneer hulle na die video gaan kyk.

Verloop

- Om die vertoning van 'n video as onderwysmedium te gebruik hou in dat die studente gelei moet word om presies te weet waarna hulle gaan/moet kyk en ook hoe hulle na die inligting moet kyk. U sou dit kon doen aan die hand van byvoorbeeld leidende vrae wat studente na die vertoning in groepe kan beantwoord Terugvoer van die groepe met u insette as fasiliteerder kan van die sessie 'n dinamiese leergeleentheid maak. U sou ook die video kort-kort kon stop om eers bepaalde sake aan die orde te stel en te bespreek.

- Dit is goed om altyd terugvoer uit groepe neer te skryf. Dit is dan visueel sigbaar en maak bespreking van die punte net soveel makliker. Maak seker

dat die penne wat u gebruik nie droog is nie, want dan is die skrif op die bord onleesbaar en dus oneffektief.

Afloop

- ’n Samevatting van al die belangrikste leerinhoude en vaardighede is by hierdie tipe van les uiters belangrik. Dit sal ook sinvol wees om die bemeestering van uitkomste wat aan die begin gestel is te evalueer. Hoe beplan u om verdere verdieping te bewerkstellig?

Ontwikkelingsareas

- Oorweeg die rol van die studiegids in die aanbieding van die klas en hantering van die tema.

- U behoort u te vergewis van die rol van uitkomste binne die uitkomsgebaseerde onder-en-leerbenadering.

- Indien ’n klas soos hierdie aangebied word is etiese aspekte belangrik en moet dit vooraf met die studente bespreek word.

Algemene indruk

- Die idee was goed, maar die klas behoort in fyner detail beplan en meer gestruktureerd aangebied te word. Die aanbieding het enorme potensiaal gehad wat ongelukkig nie gerealiseer het nie.

Evalueringspaneel

(4) Prof Chris Venter

(5) Me Mada Watson

(6) Mnr Schalk Fredericks

Oorspronklike gegewens: BASEJVH c:\itou2007_scrooby(2).doc
2007-11-01

ITOU 2007: Finale verslag rakende die onderrigleerportefeulje

Fakulteit Gesondheidswetenskappe: Me Belinda Scrooby

Kategorie	Kommentaar
Studentevaluering van onderrig	U het ‘n besondere goeie verhouding met u studente soos ook blyk uit hul evaluering.
Eweknie-evaluering	Verslae oor kontaksessies het u reeds ontvang.
Studiegidse en studiemateriaal	Enkele probleme rakende die inhoudelike van die studigidse word hier aangedui: Toepassing van die verpleegkunde studente se Anatomie-kennis word nie bespreek nie en hierdie tipe vakinhoude is juis van besondere belang vir die studente. Paragraaf 1.1.4 in ANAB111 is byvoorbeeld ideaal vir toepassing in gevallestudies. Volgens die studiegids vir ANAM111 vind assessering net plaas deur middel van toetse. Oorweeg byvoorbeeld klein projekte om bemeestering van inhoude interessant en van toepassing te maak. In die gids vir VPNP471 is geen uitkomste gestel nie. Daar word soms in die studiegidse na groepwerk verwys, maar geen verdere leiding word hieromtrent gegee nie. Gee aandag aan die betekenis van aksiewerkwoorde soos in die gidse uiteengesit en die gebruik daarvan in vraestelle. Vergelyk byvoorbeeld die betekenis van “identifiseer” soos in die gidse gegee en hoe dit in eksamenvraestelle gebruik word. Bemeestering van moduleuitkomste word nie altyd sinvol ondersteun nie en daar is deurgaans te veel klem op kennisverwerwing. Hou in gedagte dat eerstejaars ook reeds hoërorde kognitiewe vaardighede volgens die voorskrifte van die HOKR-vlakbeskrywer behoort aan te leer.
Assessering (eksamenvraestelle, memoranda, punte, ens.)	Die evalueringspaneel is bekommerd omdat die studente se prestasie so hoog is. U behoort seker te maak dat die standaard en vlak van die toetse en eksamenvraestelle op die korrekte HOKR-vlak is. Wees ook versigtig vir te veel klem op kennisreproduksie en die assessering daarvan terwyl aanleer en assessering van die hoërorde denkvlakke nie die nodige aandag geniet nie. Neem kennis van die kommentaar van die moderator in verband met assessering en groepwerk.

Kategorie	Kommentaar
Gepaste keuse en gebruik van onderrig-media	Dit kom nie voor asof besondere moeite gedoen word met die voorbereiding van transparante en powerpointskyfies nie. Inligting op transparante en powerpointskyfies behoort duidelik en maklik leesbaar te wees en dit moet die studente se leer ondersteun. Oorweeg om in hierdie verband ‘n werksessie by te woon oor die ontwikkeling van effektiewe powerpointskyfies. Die rekenaarprogram rakende bene is uitstekend indien dit effektief toegepas word. Video’s word gebruik, maar hoe dit die studente se leer ondersteun is nie duidelik nie. Maak seker dat studente die waarde hiervan verstaan en gebruik opnames om studente se kognitiewe vaardighede te verbeter.
Keuse en afwisseling van effektiewe onderrig en leermetodes	Dit is duidelik dat hoofsaaklik op die bemeestering van kennisuitkomste gefokus word, terwyl min of geen aandag aan die bemeestering van uitkomste op die hoërorde denkvlakke afgestaan word nie. Sien die voorskrifte van die HOKR se vlakbeskrywer. In die Anatomie studiegidse word baie na groepleer verwys, maar geen bewyse kon gevind word dat hierdie onderrigmetode wel gebruik word nie, behalwe by VPNP471 waar groepwerk goed toegepas is met goeie resultate soos gesien in die navorsingsprojekte. Die rol van ADAM by prakties is onduidelik. Dit is ook nie in die studiegidse duidelik uitgespel nie, alhoewel daarna verwys word.
Ander innoverende bydraes in die onderrig en leeromgewing en hoe dit tot studente se leer bydra	Die navorsingsmodule bied goeie geleentheid aan 4de jaars om in groepe saam te werk. Kommentaar van paneelevaluering asook eksterne evalueerders was buitengewoon positief oor hierdie module en die aanbiedingswyse. In u portefeulje word wel na eFundi verwys. Oorweeg om hierdie elektroniese platform op innoverende wyse te gebruik om studente se bemeestering van kennis te ondersteun sodat tydens kontaksessies aandag aan die bemeestering van hoërorde denkvaardighede gegee kan word.
Samevattend	Dit is duidelik dat u ‘n hoë onderriglading het en dat u ‘n besondere goeie verhouding met al u studente handhaaf. U oortuig as ‘n entoesiastiese en meelewende dosent. Die evalueringspaneel beveel aan dat u dit oorweeg om eFundi te gebruik om studente se leer te ondersteun in terme van die groot hoeveelheid kennis wat bemeester moet word. Dit beteken dat die studente op hul eie deur middel van eFundi die nodige kennis onder die knie moet kry wat u dan geleentheid bied om tydens kontaksessies eerder aandag aan die bemeestering van hoërorde denkvaardighede te gee soos voorgeskryf deur die HOKR se vlakbeskrywer.

Kategorie	Kommentaar
	Volgens die universiteit se onderrigbeleid volg die NWU die uitkomsgebaseerde onderrigleerbenadering. In die lig daarvan word aanbeveel dat u werksessies bywoon oor die ontwerp van innoverende leeromgewings waarbinne die studente se leer deur u gefasiliteer word terwyl hulle hul eie leer konstrueer. Baie geluk met u toekenning. ITOU - Evalueringspaneel.

APPENDIX 11: Data for objective two (2)

PARTICIPANT RESPONSES:

Participant 1:

Ek stem saam dat dit absoluut nodig is vir anatomie, en selfs gevorderde anatomie as deel van die verpleeg ciriculum.

1. As deel van opleiding is dit nodig, aangesien 'n student die anatomie en sekere abnormaliteite en siektetoestande wat behandel word, moet kan identifiseer.

2. In die praktyk is dit belangrik om 'n goeie anatomie agtergrond te hê (soos wat ons by mev. ontvang het), om pasiënte se anatomie aan hulself te kan verduidelik.

3. Om ook begrip te kan hê as die dokter met jouself of 'n pasiënt praat oor ’n sekere toestand of anatomie.

Participant 2:

I agree with the statement. Anatomy is important in clinical practice in the sense that being exposed to bodily organs has mimic real-life situations by giving us the opportunity to reason through a clinical problem or exercise and make decisions without the potential of harming actual patients. As a qualified professional nurse, anatomy has helped me to be able to diagnose and treat patients well. It has also helped me to differentiate between normal and abnormal bodily organs and tissues in the sense that I am able to do a physical examination when a patient present with a problem. When delivering a baby, after I have made the mother comfortable, I do physical examination to check whether the baby was born with abormal organs or to check for any bone deformities. I also help women how to examine their breast daily to be able to exclude any abnormalities and the one's who come with breast problems I am able to detect it easily by doing breast examination since I know how a normal one looks like. Patients who come to the hospital with swollen lymphs, pigeon chest, being cynosed, being dyspneic and having clubbing, one is able to realize that they are having lung problems and are put in oxygen before one calls a doctor. Men who are complaining of pain in their reproductive organs, are examined and referred to the hospital if there is a problem and if not, medication is given and they are taught how to examine themselves to exclude prostate cancer. Patients who complain of stomach cramps or come with swollen stomach are being examined by doing inspection, palpation, percussion and auscultation. There after, a problem is identified and dealed with. Women who are complaing of lower abdominal pains are helped by doing inspection, palpation, percussion and auscultation. After that I pass a speculum through the vagina to check any abnormality. If there is any problem such as infection, offensive smell, I

give medication and If its something that is not within my scope of practice I refer the patient. If I didn't do anatomy all this were not going to be possible.

Participant 3:

1) I do agree, to know human anatomy is the most important basics of health studies. All other subjects like fundamental, physiology, pharmacy, human movements and etc they rely on anatomy as the basics for the new student in health profession. For example if you teach students about giving injection in the large muscles of the body, they should know where in the body is the large muscle. Knowing human anatomy (structure) is very important knowledge for studying in health science field.

2) Importance of anatomy for clinical practice: In nursing profession you can not help your patient if you do not know your anatomy. For example if the patient come in clinic or hospital for consultation, then she tell you that she is having a pain on the right side below the ribs, as a nurse you should know what organs are found in the specific area of the human body to be able to diagnose the patient. Anatomy helps in nursing interventions where there is no need for medical assistance, for example if patient experiencing a minimal shortness of breath, by knowing your anatomy, you will put your patient on semi fowlers position to open the lungs to allow sufficient oxygen. For every procedure that you have to do as nurse practitioner on the patient you must know your anatomy very accurate, for example insertion of drips; insertion of naso-gastric tubes; giving injections subcutaneous, intra-muscular, intra-venous; caring for the patient with fracture; helping with delivery of the baby or midwifery you have to understand anatomy; and etc. Anatomy to me is the basics of nursing profession, if you do not know your anatomy in nursing profession you are incompetent and you may harm your patients.

Participant 4:

1) **Please write if you agree or disagree with the above statement and motivate your answer/s.**

Agree, though I do feel that anatomy could be more valuable when continued up until 3rd year when one starts to work in the clinical setting. It does prepare one for later work, I had one case where a guy's leg was dismantled and because of anatomy knew which parts of the leg was damaged.

2) Write about your perceptions on the importance of anatomy for clinical practice.

Anatomy is very important as the whole body is complex, this meaning there are many parts and bones one should know before able to understand the body and how it all fits together. In clinical practice it really helps to know beforehand the specific muscle, organ or bone involved in the case at hand. Anatomy is a valuable tool to be able to use in the clinical practice.

Participant 5:

Ek dink anatomie is baie belangrik in die kliniese veld omdat daar so vinnig verwarring kom as daar nie na 'n spesifieke area verwys word nie. Bv met die gee van 'n inspuiting kan daar verwarring kom oor die spesifieke area waarin dit ingespuit moet word.

Anatomie dra ook by tot die verstaan van die menslike liggaam en al sy sisteme. Dit help ons om die areas wat toestande aanval en hulle effekte op liggaams funksie baie beter te kan verstaan.

ek dink tog word anatomie in die praktyk afgeskeep omdat daar nie na die tegniese terme verwys word nie maar praat meer van die geheel bv die maag ipv die spesigieke deel van die maag. Anatomie is dus omvattend en vergemaklik ons werk maar slegs as almal "dieselfde taal praat". Ek dink daar word nie altyd na die korrekte terme ens verwys nie omdat almal nie dit altyd verstaan nie.

Dus is dit nodig dat ons almal in die praktyk begin anatomie inkorpereer en so 'n eenvormigheid terug kry. Daar moet deurlopend kommunikasiegapings vermy word bv deur indiensopleiding.

Participant 6:

Statement 1: I do agree that medical knowledge is the most important knowledge form. However Anatomy needs to be taught in conjunction with physiology to have it's full effect. These two subjects compliment each other and together form a better picture of the body and it's functions than having either of these subjects by itself. Statement 2: Anatomy is important to have an overall and in-dept understanding of the human body as well as it's functions. It helps one understand the structure of the body, illness associated with different organs and treatments done in hospital. It also provides a scientific prospective of the body. It is an important part of any medical/clinical field to have this knowledge. It is a pity that only give first year Anatomy to the dietetic students as I really enjoyed the subject and how it was taught.

Participant 7:

1) Stem saam, anatomie is een van die belangrikste vakke in verpleegkunde. Dit vorm 'n grondslag vir verpleeging, sonder die kennis wat anatomie vir 'n mens bied kan 'n mens nie korrekte en effektiewe verpleging en mediese behandeling op pasiente toepas nie. 'n Mens moet kennis he oor anatomie en bv. fisiologie om te begin in jou verpleeg beroep, sonder dit het jy 'n lee basis om mee te begin.

2) In die praktyk moet 'n mens kennis he van anatomie, dit is waar 'n mens begin met jou verpleging. Om in te spuit is bv. een van die algemeenste goed wat 'n verpleegkundige doen elke dag in die praktyk, maar hoe kan 'n mens 'n pasient wil inspuit as jy nie die verskillende spiere ken nie? Hierdie lewens belangrike kennis leer ons in anatomie. Om die mens se liggaam van binne af te leer, bv spiere en

bene vorm vir 'n verpleegkundige die basis van haar verpleeg beroep, sonder dit sal en kan 'n mens nie verpleeg nie.

Participant 8:

1) Please write if you agree or disagree with the above statement and motivate your answer/s.

Agree

Anatomy provides the basic foundation of human body knowledge

2) Write about your perceptions on the importance of anatomy for clinical practice.

To interact with a medical team in clinical practice, you have to be able to understand the language spoken. Clinical practice requires knowledge of human physiology and anatomy, and anatomy serves as base to understand physiology.

Participant 9:

Ek stem 100% saam met die stelling dat anatomie 'n belangrike deel van mediese opleiding is. Jy het anatomie nodig as 'n basis of "hoeksteen" van jou kennis en verpleegaksies. Alle verpleegaksies wat jy wil toepas, moet jy die liggaam se anatomie ken en weet watter verpleegplan om saam te stel vir jou pasient. Jy het anatomie nodig om sekere siekte toestande te kan identifiseer. Jy het dit nodig om farmakologiese werkings te verstaan en te verduidelik. Jy het dit nodig om die liggaam se biochemiese samestelling te verstaan. Sjoe, daar is soveel redes waaraan mens kan dink waarom anatomie uiters belangrik is!

Hoekom ek dink dit so belangrik is:

As jy weet waar elke liggaamsdeel is en hoe 'n spesifieke deel/stelsel werk (in samewerking met fisiologie, biochemie en algemene verpleegkunde), kan jy beter diagnoses maak en 'n beter verpleegplan saamstel om ten einde jou pasient beter te verpleeg. Dit help jou om meer spesifiek te verpleeg.

Hoekom anatomie so belangrik is vanuit my ervaring tot dusver: anatomie is nodig om te weet en te verstaan hoekom sekere siekte toestande voorkom. Dit help jou om kliniese prosedures korrek uit te voer. Dit help jou om kondisies te voorkom of te behandel. Jy kan beter diagnoses maak en sodoende beter behandeling toepas. Dit is van belang vir indiensopleiding aan mede kollegas. Anatomie vorm die grondslag vir verdere mediese studies. Jy kan nie jou meestersgraad in borskanker gaan doen as jy nie die anatomie van die bors ken nie. Jy kan nie 'n CVP lyn opsit as jy nie die arteries en venas se anatomie ken nie. Jy kan nie 'n kateter insit as jy nie die verskil ken tussen die anus, vagina en uretra nie. Jy kan nie pneumonie diagnoseer as jy nie die longe ken nie. Jy kan nie voluven gee as jy nie weet watter effek dit op die ligaam gaan hê nie. Jy kan pasiente se dood veroorsaak as jou verpleegplan nie reg is nie, wat gebasseer is op anatomie.

Dis net 'n paar van derduisende voorbeelde hoekom jy nie kan verpleeg as anatomie nie deel was van jou opleiding nie.

Participant 10:

1) Please write if you agree or disagree with the above statement and motivate your answer/s.

agree

2) Write about your perceptions on the importance of anatomy for clinical practice.

it is important to know the anatomy of the human body to be able to understand the language used in practice. if you do not know were the parts of the body are you will not be able to do procedures correct. anatomy is the building block of nursing science and is needed as a foundation.

Participant 11:

My opinie op die vrae is die volgende:

1) Ek stem saam met die stelling. Elke mens het op een of ander stadium mediese raad of hulp nodig en maak dit aktueel in elke mens se lewe. Anatomie is verseker 'n baie belangrike leerarea in die mediese veld, omdat dit 'n goeie fondasie skep vir die mediese werk. Anatomie is 'n kommunikasie-middel om beskrywend en spesifiek te wees sonder enige verwarring oor wat of waar die probleem is en die intervensie gaan plaasvind. Anatomie is ook die fondasie vir die Fisiologiese vakgebied.

2) My persepsie oor die belangrikheid van Anatomie in die kliniese praktyk is dat die verskillende mediese personeel - dokters, verpleegsters, dieetkundiges, fisioterapeute, arbeidsterapeute, spraakterapeute en al die ander in die mediese span - beter kommunikeer oor 'n geval as dieselfde terme gebruik word. Indien enige van die mediese personeel nie die taal verstaan nie, kan hy nie sy deel effektief uitvoer nie.

Participant 12:

1) I agree with the fact that medial knowledge and anatomy is important, but not necessarily **most** important. Simply because anatomy doesn't give enough detail into the human body to distinguish you from someone else. I would rather put physiology as the most important subject, especially in the medical profession. For example, when reading blood values, it is physiology that will tell what the importance of the varied values are, not anatomy. And your interpretation of the blood values will / will not help the patient. Anatomy might benefit a surgeon to a certain extent, but not general clinical practice.

2) Anatomy is important in clinical practice to understand the basics of the human body and how it fits together. It helps with a general understanding of diagnosis and it helps when explaining a condition to a patient or the detail of an operation. You have to understand anatomy in order to be able to help someone who doesn't even know where the kidneys are situated or that you have a small and large intestine. And you cannot do physiology properly without an understanding of anatomy. And of course anatomy is important when doing any invasive procedure on a patient. From my point of view as a Dietician, anatomy is very good baseline information, but your anatomical knowledge will not necessarily distinguish you from another health worker/dietician. The detailed knowledge of the working of the body will - knowledge of physiology and pathophysiology.

Participant 13:

1. I will definitely agree with this statement as medial konwledge is the knowledge where we take all the life experiences and facts that we obtain during our daily lifes and we then store as long term memory. This is why it is seen as the most important form of knowledge because without our long term memory, all our experiences and facts we studied, is useless.

   Anatomy is the study of the human body and is one of those few subjects that one can make use of in life,even if you are not a health care professional. Anatomy is also not just a lot of facts that we have to study and know of by heart, but it also contains practicals during which the actual human body is studied. Man made dolls, cadawers and clips on a projector, is just few of the methods used to perform practicals. This combination of facts with practicals make it even easier and more fun to understand the human body and functioning of it. Anatomy is thus a subject which use different ways to help every day knowledge, be stored as long term knowledge.

2. As mentioned above, anatomy is not only the study of facts on the body but it also incorporates practicals during which students also get to experience the human body first hand. This help the students to be familiar with the human body and its functions so that it is not all new to them when they get into practice one day. This helps them to perform an even better job especially in the health care department where one mistake can cost a person's life.

Participant 14:

The relationship between the importance of anatomy and clinical practice depends entirely on what your job description entails. I for example, am working in a primary health care clinic where a doctor only comes in two days a week for two hours, therefore my anatomical knowledge is of utmost importance as I am expected to make basic clinical diagnosis unassisted. I can only make a diagnosis by knowing what is the norm, and then recognising deviations from that. If I did not have basic anatomical knowledge, I would not

be able to recognise deviations from the norm. Therefore anatomical knowledge is of utmost importance of any multidisciplinary team training, as we would not be able to correct a failure in the human body if we do not know how the human body should anatomically function pragmatically.

Participant 15:

Question 1:

I agree with the statement. I believe that sound knowledge over anatomical and physical science helps you develop critical thinking abilities as you grow and develop as a professional entity. Your critical thoughts are formed because you want to know the 'how and why'. In my opinion anatomical studies expose the young and inexperienced student to a 'fact of the matter' kind of thinking because the anatomical structures are facts and real structures rather than debatable opinions (sociology etc.).

Question 2:

When you function within the multidisciplinary team, anatomical terms serve as the 'language' between health care professionals.

Clinical anatomy is universal and will enable the health care professional to work in multiple environments.

Sound knowledge of Clinical anatomy will help the health care professional to identify any pathology because the health care professional should first know what 'normal' is to be able to identify the 'abnormal'.

During the scientific nursing process the nursing practitioner will use all clinical data to 'assess' the patient thus she needs to be able to differentiate between normal and abnormal.

Participant 16:

1) Please write if you agree or disagree with the above statement and motivate your answer/s.

Ja ek stem saam. Ek werk tans in teater en sonder my anatomie as agter grond sal dit maar moeilik gegaan het. Dit help ook om operasies beter te verstaan, wat volgende benodig word, voorbereiding en dan uit eindelik my kennis rondom alternatiewe metodes uit te brei. Dit kom ook handig te pas wanner pasiente vir jou vrae vra en jy vir hulle die menslike sisteem moet verduidelik. As jy jou anatomie ken is dit soveel makliker om in nood situasies op te tree soos om te weet waar sit belangrike are, watter medikasie gegee kan word en watter invloed dit gaan he asook wat om nie te gee nie.

2) Write about your perceptions on the importance of anatomy for clinical practice.

- voorligting aan pasiente te gee

- berei jouself voor vir nood situasies

- begrip hoekom dokters sekere operasies doen en hoekom nie

- help om die werking van medikasie te verstaan en dus kan die beste medikasie aan die pasient gegee word

- inpak wat verlies van sekere funksies van die liggaam op ‘n persoon het en hulle dan psigies daarvoor kan voorberei

- Versnel spoed van operasies want ken die sisteem en orgaan dus kan jy deeglik daarvoor voorberei wat uit eindelik ‘n korter narkose tyd vir die pasient inhou en dus minder newe effekte

- Kan dokters raad gee en alternatiewe oplossings voorstel

Participant 17:

1) Agree, It is important to know about your body in order to give the correct treatment, be it for medical purposes for medical and allied proffesionals. It is also important to know the medical science and anatomical structures of the body in order to teach the patient to understand his body and how to effectively keep it healthy to treat and/or prevent diseases later in life. Thus, it is important for you to effectively treat and care for the patient as well as teaching patients.

2) If it was not for anatomy and the medical knowledge that I recieved at university whilst studying dietetics, I would not have understood the diseases that I am working with. It is important to know how the body function, how it looks like in order to make your work more sucessfull and give more effective treatments. You need to know this in order to also teach your patients so that they also know how to effectively manage their disease. For example, when I counsel a diabetic patient it is important for him to understand where his pancreas is situated, how it works, etc. so that he can understand why the is it important to follow a healthy lifestyle. There is alot of disease where this is very important e.g lung disease (smoking), renal failure, etc. However, anatomy should be combined with physiology.

Participant 18:

1) Please write if you agree or disagree with the above statement and motivate your answer/s.

Agree. Without anatomy as base nothing else makes sense. You need to know how something is put together before you can know how it works. And if you don't know how something works how are you going to know if its not working? And how are you going to fix it? And knowing how something is put together is half of knowing how it works.

2) Write about your perceptions on the importance of anatomy for clinical practice.

Anatomy is the base of medical science. You need to know where and how the structures of the body is and how it fits into each other. If you know this you can workout how the basics of anything works. So you need anatomy if you want to learn anything about the body from the mechanical workings to the cellular movement of elements.

You also need it as bases of communication in the medical world. If you don't know the anatomy of the body how do you tell someone of an injury without showing it.

APPENDIX 12: Evaluation tool for a nursing model

EVALUATION TOOL FOR A NURSING MODEL

CHINN AND KRAMER (2008) EVALUATION CRITERIA FOR A NURSING MODEL	
CRITERIA FOR EVALUATION with trigger questions	**EVALUATOR COMMENTS**
1. CLARITY of the model **a. Semantic clarity** • Are the concepts clearly defined? • Are the definitions understandable and coherent?	
b. Semantic consistency • Are the concepts congruent and in harmony with the definitions, purpose and aligned to the relationships featured in the theory?	
c. Structural clarity • Are the illustrated connections and logical reasoning coherent with the descriptive elements of the theory?	
d. Structural consistency • Do the structural forms used for illustration as a conceptual map enhance clarity and comprehension of the descriptive elements of the theory?	
2. SIMPLICITY of the model • Are the number and differentiation of concepts and interrelationships least in simplicity or acceptable in complexity? • Does the contextual situation warrant the various concepts to enhance understanding of the concepts and their interrelatedness in the theory? • Does the theory serve to describe, explain and/or predict concepts or their interrelatedness in practice?	

3. GENERALITY of the model • Do the breadth of scope and specificity of purpose appraise the broad empirical experiences of concepts for the purpose of nursing? • Are ideas arranged to facilitate application to practice and the health care team while embodying nursing as a discipline? • Are the concepts of the individual, health, environment and society featured broadly in the general application of the model?	
4. ACCESSIBILITY of the model • Would the concepts be identifiable as empirical indicators in practice within the realm of nursing? • Does the definitions of the concepts adequately manifest their meanings in the nursing practice setting that is specified? • Despite either the simplicity or complexity of the model, do the concepts create conceptual meanings in the clinical practice setting?	
5. IMPORTANCE of the model • Does the model have clinical value or practical significance in the targeted area of clinical nursing practice? • Is there futuristic and pragmatic value in the applicability to lead future practice of nursing in the targeted area? • Does the theory in the model create understanding and the potential for nursing education and research? • Does the theory differentiate the focus or nature of nursing as a discipline separate to other service professions?	
SUMMARY COMMENTS	
Chinn and Kramer (2008:234-249)	