

**AN EDUCATIONAL PROGRAMME TO
FACILITATE CRITICAL THINKING OF
STUDENT NURSES IN NAMIBIA**

BY

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November 2008

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CRITICAL THINKING BY THE STUDENT NURSE IN
NAMIBIA**

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**Submitted in accordance with the requirements for the degree of
DOCTOR IN NURSING SCIENCE**

**At the
UNIVERSITY OF NAMIBIA**

**Supervisors: 1. Prof A van Dyk
2. Prof L F Small**

November 2008

DECLARATION

I, Louise Pretorius, hereby declare that this study is a true reflection of my own research, and that this work, or part thereof, has not been submitted for a degree at any other institution of higher education.

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ACKNOWLEDGEMENTS

My sincere gratitude and appreciation for the following:

- All my friends and colleagues for their encouragement
- Prof Agnes van Dyk, UNAM, for her continuous support and encouragement over a period of 22 years
- Prof Louis Small for his unconditional support, encouragement and assistance as a friend and colleague
- Prof Chris Myburgh and Prof Marie Poggenpoel of the University of Johannesburg (UJ) for their continuous input, guidance and valuable advice
- Ms Sandra Mills, language editor, of the University of South Africa (UNISA)
- Alfreda Kloppers for her support, assistance and encouragement
- Lucille v/d Westhuizen for her support of various kinds
- Anna Kaduma for statistical advice and analysis and her willingness to make herself available
- Ms H Iita for assisting in data collection for phase 1
- Ms N Shifiona for her assistance during phases 3 and 4 of the study
- Althea Walters for her assistance, continuous support and encouragement as a colleague and personal friend
- All the nursing students who participated in the study during 2005 and 2006, for their contribution
- My mother, Max Burger, for her support and encouragement in many ways
- My husband Elric and children, Elmi and Elric, for their encouragement and support
- My sister, Annemarie, for psychological support

☞ ☞ **To God Almighty all the glory for the opportunity, strength, time and patience to complete the study!** ☞ ☞

DEDICATION



This study is dedicated to all the nurses in Namibia and Africa in the hope that it will contribute to a high standard of nursing care.

SUMMARY

The focus of this study was to develop an educational programme to facilitate the development of critical thinking in student nurses in Namibia.

The study was conducted in four phases, beginning with a needs assessment in phase 1 through which the researcher determined the needs of student nurses in terms of critical thinking. The deductive data analysis of phase 1 served as the conceptual framework for the development of an educational programme in phase 2.

Phase 2 consisted of the development of an educational framework to facilitate critical thinking in student nurses. Specific educational approaches and a philosophical framework were employed during the development of the programme. An expert opinion on the programme was obtained before the implementation could be conducted in phase 3.

Phases 3 and 4 of the study were conducted simultaneously. Phase 3 covered the implementation of the educational programme and phase 4 the evaluation of the programme. A quasi-experimental design was implemented which focused on active participation by the participants in the programme. The quasi-experimental design incorporated an experimental and a control group and both groups underwent a pretest before the programme commenced. The experimental group followed the programme

and the control group continued with normal classes. After the completion of the programme, both groups underwent the posttest.

The participants were also expected to complete a programme assessment after the posttest to indicate to the researcher how they perceived the programme.

The data of the pretest and posttest of both the experimental and the control group were statistically analyzed by means of a t-test analysis which enabled the researcher to determine whether the programme had made any difference to the critical thinking of the participants compared to the critical thinking of the control group who did not follow the programme. The results indicated that there is a significant difference between the scores of the participants of the experimental group and the scores of the control group. The participants of the experimental group fared better than the control group.

Recommendations based on the findings of the study were made.

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CHAPTER 1

OVERVIEW OF THE STUDY

1.1 Introduction

Nations around the world face “mounting problems in health care”, which include rising costs, challenges in the access to services and calls for safety and quality, especially in developing countries such as Namibia. This phenomenon has been the incentive for nursing practice to change from being medically driven to being increasingly nurse-led (Banning, 2005, p.502; Kyrkjebo & Hage, 2005, p.167; Uys & Gwele, 2005, p. vii).

By implication this meant that nurses were expected to assist patients to protect, maintain, improve or gain optimal levels of health. Nurses, however, unlike many other professionals, find themselves in a complex world with different health care situations that call for certain skills to enable them to cope with these situations. As Alfaro-LeFevre (2004(a), p.1) puts it, “today’s fast-paced health care setting is full of surprises – nothing is simple anymore!” The question is how to respond to the challenges?

This tendency is also applicable to Namibia. Namibia has a very complex and extensive health care delivery system, in which professional nurses are expected to make discretionary judgments autonomously. Professional nurses in Namibia are expected to act decisively and correctly, displaying critical thinking, in order to handle problematic and complicated nursing situations. They should also be able to debate issues around and solve the problems of clients/patients and communicate their knowledge to others in the

profession. The nurse needs to bridge the gap between the technological aspects of care and the human responses to illness and disease by caring. The complex legal, educational and professional problems confronting nurses today emphasize the need for more than rote memory, knowledge of skills and the ability to follow directions. Critical thinking is undoubtedly one of the skills and competencies that is required from a nurse to cope with day to-day practice.

Critical thinking is a concept that is difficult to define because of its complexity and the different opinions surrounding it. Thus, the important first step of establishing a clear conceptual definition of critical thinking has not been accomplished and studies are still being undertaken to reach consensus on exactly what critical thinking is.

However, critical thinking is fast becoming the new focus for education at all levels of the educational system and it should be realized that critical thinking is not exercised in a vacuum but forms part of the educational milieu (Miller & Malcolm, 1990, p. 69).

Nevertheless, the view is that critical thinking is the process that helps a nurse to decide what really matters and what is important in different situations. It is also the ability to argue a case until the best solution for the problem is reached (Bandman & Bandman, 1988, p. 2; Burnard, 1989, p. 272; Jones & Brown, 1991, p. 529; Glen, 1995, p.170; Fonteyn, 1998, p. 305; Feingold & Perlich, 1999, p. 42)

The expression “critical thinking” has become so popular that people who are unable to agree on most of the important things in life can agree that they think critically. Critical thinking has been covered by a wide array of disciplines that cite specific reasons why critical thinking is important within their field and nursing is one of the disciplines which have realized that appropriate critical thinking skills are important for nurse practitioners (Thurmond, 2001, p. 3; Carroll, 2007, p.7).

Nurses caring for patients need to be skilled critical thinkers because the nurse is the one who is in contact with the patient for 24 hours. All other members of the health team come into contact with the patient for only fractions of the day. This scenario leaves the nurse to carry out fragmented instructions and prescriptions from every member of the health team who has seen the patient. The nurse has to be able to organize all these elements into a holistic nursing care plan that will enable her to meet the needs of the patient. In order to coordinate all the inputs from different health team members, she/he needs to be an analytical critical thinker. This will enable the professional nurse to stay focused and thereby render quality care to individual patients (Pretorius, 2001, p.12).

The rapidly changing conditions of patients in the clinical set-up often necessitate that nurses think critically. The realities of the new millennium have made it essential to teach nurses to think independently within the health team and the community (Uys & Gwele, 2005, p. vii).

Rowles and Brigham (1998, p. 249) emphasized that every patient deserves caregivers who are able to think critically and by so doing solve problems that might crop up during the patient's care. Nurses should formulate nursing problems by weighing up evidence, clarifying beliefs and evaluating conclusions, as well as by examining nursing assumptions, clues and data. This would make it possible to handle each patient's case on merit and plan and deliver care tailored to the individual (Bandman & Bandman, 1988, p. 3). Green (2000, p.3) is also of opinion that once nurses have been engaged in exercises that focus their attention on attitudes during the process, they will become aware of how such attitudes affect their own thinking.

1.2 Background to the problem

The concept of the development of critical thinking skills poses a challenge to nurse educators because it is their responsibility to educate and train students in this regard. Critical thinking skills will enable students to render quality nursing care once they have become registered nurses.

It is therefore imperative that nurse educators assist students, through role-modelling, coaching and mentoring, to strengthen and develop their thinking skills.

Applegate (1998, p. 202) states very clearly that students can no longer be the receptacles for knowledge acquisition. Instead, students should learn how to obtain and

manage information. Teaching students how to obtain, organize and use information to solve complex problems in nursing is an empowering activity that prepares them for lifelong learning. If nurse educators do not emphasize those skills in their teaching sessions, a lack in problem solving and critical thinking skills will be apparent when nurses have to provide nursing care. This will put the patient at a disadvantage.

The challenges for nurse educators in Namibia became apparent when the researcher did a Master's degree on the role of the clinical instructor in the development of the critical thinking skills of student nurses in Namibia.

It was found that professional nurses in training hospitals in Namibia do not understand the concept of critical thinking, nor do they know how to apply critical thinking skills in nursing practice and therefore they do not focus on the development of critical thinking in student nurses. A need was therefore identified to make student nurses aware of critical thinking in nursing practice since they are the professional nurses of tomorrow, and they will be expected to solve complex problems by thinking critically.

The skills that were found to be lacking in student nurses were both cognitive and affective in nature. In the cognitive sphere, the ability to analyze and evaluate, and see things in perspective, along with creativity, contextual sensitivity and alertness to the use of critical thinking were absent. This need could be addressed by means of an educational programme, in which the student nurse could be assisted to develop his/her own critical thinking.

Student nurses need to be encouraged to ask questions about nursing practice and be willing to attempt to seek answers about practice, because critical thinking in nursing means to constantly strive to find a better way by focusing on two key issues: What are the outcomes? And how can I do better? Paul (1995, p.ix) wrote that critical thinking is essential for education and that it is a highly systematic way of shaping and applying one's thinking within daily learning.

It was also found that nurses were not able to interpret and assign meaning and significance to what they observed and to draw reasonable conclusions on the basis of their results or to discriminate between observation and inference.

For the nursing profession of Namibia, it is imperative that nurses develop the affective domain of critical thinking. According to the previous study conducted among nursing students and nurses in Windhoek training hospitals, as mentioned, nurses did not have organized judgment, intellectual courage, open-mindedness or the reflective ability to ponder on findings in order to plan the best nursing care for their patients. Neither did nurses display persistence through difficult decisions and complex scenarios.

1.3 Problem statement

Against the background sketched above, and through regular contact with student nurses in the health services, the researcher identified the following problem: student and professional nurses in Namibia are not critical thinkers in nursing practice and therefore do not confront problem scenarios with an inquisitive and open mind but rather choose the “easier” and comfortable familiar way of handling problems. The implication of this is that patients will suffer as a result because superficial care will be rendered to them instead of well-thought out and focused care of high quality. The complex legal, educational and professional problems confronting nurses today underline the need for more than just a superficial approach and the ability to follow orders. Nurses are called upon to practise higher order thinking skills in a critical spirit (Green, 2000, p.1). According to Burnard (2005, p.86) the time has come for nurse educators to wake up to the current need for critical thinking in nursing practice.

The research question that emerged was:

- **How can critical thinking in student nurses in Namibia be facilitated to enable them to render quality care to patients in the health care settings of Namibia?**

1.4 Purpose of the study

The general purpose of nursing research is to answer questions or solve problems relevant to the nursing profession (Polit & Beck, 2006, p. 19). The specific purpose of this study was to develop, implement and evaluate an educational programme that will

promote critical thinking among student nurses in order to empower them to practise critical thinking as professional nurses after completing their studies.

1.5 Research objectives

The objectives of the study were to:

- Conduct a needs assessment on the needs of the student nurse in Namibia regarding critical thinking in nursing practice
- Develop an educational programme to facilitate critical thinking among student nurses in nursing practice
- Implement and evaluate an educational programme to facilitate critical thinking among student nurses in nursing practice

1.6 Significance of the study

The study is considered to be in the interests of the nursing profession of Namibia, since it will contribute to the development of critical thinking in nursing practice, which will ultimately lead to improvement in nursing care.

The researcher considers critical thinking to be the skill that could enable and empower Namibian nurses to approach problems in the health care situation of Namibia differently – with extensive benefits for the patients.

The development of an educational programme to facilitate critical thinking among student nurses was in line with the challenge of nursing education in general to move

students from lower-order thinking to higher-order thinking to optimize their ability to solve problems in nursing practice (Hagerman, 2004, p.1).

In 1992 the National League for Nurses (NLN) was already emphasizing the development of critical thinking skills as an essential element of nursing practice and suggesting that nursing curricula should focus in their practical component on the development of critical thinking skills, including reasoning skills, in order to allow nurses to develop as critical thinkers (Inouye & Flannely, 1998, p. 68).

Authors agree that critical thinking can give “nursing a lifeline” into future development. An intense interest in the teaching and assessment of critical thinking in nursing education has emerged owing to the fact that nurse educators realize the profound need to improve students’ critical thinking skills and clinical judgment so that they will be better prepared for the demands of clinical nursing practice (Jones & Brown, 1991, p. 553; Wilkinson, 1996, p. 29; Fonteyn, 1998, p. 305; NLN, 2003, p.1)

1.7 Paradigmatic perspective

A paradigm is defined as a “world view, a general perspective on the complexities of the “real world” or “reality” (Polit & Beck, 2004, p.13; Polit & Beck, 2006, p.13). Paradigms for human inquiry are often characterized in terms of the way in which they respond to basic philosophical questions.

This study was conducted within a positivistic paradigm which directs research activity to understanding the causes of phenomena. The positivistic paradigm allows the researcher to be orderly and disciplined in the procedures followed during the study to acquire information (Polit & Beck, 2006, p.13). For this study the researcher worked according to a specific and logical plan of action and conducted the research in a series of steps.

1.7.1 Metatheoretical assumption

1.7.1.1 Ontological assumptions

Ontology refers to the study of “being” or “reality” (Mouton, 1998, p. 46; Polit & Beck, 2006, p.14) and for the purposes of this study the reality in question is critical thinking within nursing practice in Namibia.

Thinking and decision making are continuous activities for the future professional nurse because people are living longer, and living with more chronic and complex problems, all of which is more challenging for nurses. The researcher is of the opinion that the need to cope with these problems makes it essential to develop critical thinking in nursing education of any kind. In hospitals, homes and communities nurses are expected to take on added responsibilities and make independent judgments and decisions, which they can only do if their everyday judgments are based on critical thinking. Therefore,

the researcher considers critical thinking to be an essential competency for nurses wherever they are in the world.

Critical thinkers are people who know how to make crucial judgments in nursing. Professional nurses who are able to think critically can see beyond the obvious and analyze data to render the best possible care to the patient. These professional nurses possess intellectual autonomy, in that they refuse to accept conclusions without evaluating the evidence (facts and reasons) for themselves (Delaune & Ladner, 2002, p. 80).

For this study it was important to the researcher to focus on the student nurse as a unique individual and future professional nurse who will be involved in the rendering of comprehensive health care to meet the health needs of the nation of Namibia and render a service, especially in the domains of preventive, promotive, curative and rehabilitative health. An important focus was the development of essential critical thinking skills in student nurses.

The development of student nurses takes place in an ever-changing environment where the nurse and patient are in continuous interaction with each other. Nursing education in theory and practice is the process through which student nurses in Namibia should be developed into critical thinkers to ensure nursing care of high standard is rendered to patients in Namibia. It is furthermore expected from nurses that their everyday

judgments should be derived from critical thinking. Critical thinking helps nurses to see the larger picture instead of only focusing on the details.

1.7.1.2 Epistemological assumptions

The goal of social inquiry is to produce knowledge as close as possible to the truth and despite the difficulties the goal of getting to the truth remains important (Mouton, 1998, p. 28). This relates to the relationship between the researcher and the subjects being studied (Polit & Beck, 2006, p. 14).

As a nursing lecturer involved in the teaching and guidance of students, the researcher has observed that students cannot focus on one patient and analyze the patient's condition individually. It was also clear that student nurses simply followed orders from professional nurses, who followed orders and prescriptions from medical doctors. It was further observed that professional nurses are seldom or never capable of answering complex questions about patients and their treatment because they have a narrow approach to patient care. The researcher then began to ask why trained professional nurses had still not mastered the skills of critical thinking.

It was evident from a previous study by Pretorius (2001) that professional nurses in Namibia do not facilitate critical thinking of student nurses during clinical instruction,

with the result that neither the novice nurse nor the more senior student nurse learns how to think critically. Student nurses are therefore unable to apply critical thinking skills once they have completed their training. The underlying reason for this is that the professional nurses do not apply critical thinking in their nursing practice.

With the given background, the researcher also wished to integrate epistemological assumptions that focused on constructivist learning, since that could be used as the point of departure in the implementation of the programme. These assumptions are that knowledge is physically constructed by learners who are involved in active learning, knowledge is symbolically constructed by learners who are making their own representations of action, knowledge is socially constructed by learners who convey their meaning-making to others and knowledge is theoretically constructed by learners who try to explain things they do not completely understand (Gagnon & Collay, n.d, p. 1).

1.7.1.3 Axiological assumptions

Axiological assumptions refer to the role of values in the inquiry on hand (Polit & Beck, 2006, p.14). Critical thinking is of great value in nursing practice, since it enables the nurse to cope with the increasingly complex nursing scenarios. It is important that professional nurses should be committed to constantly broadening their skills in order to make their current practice more efficient and effective. Continuous improvement and professional growth are imperative in nursing

It is accepted that individuals have freedom of choice and that the development of critical thinking in professional nurses remains a personal choice.

Humanistic existentialism as a philosophical approach to the study implies that a student nurse

- should achieve self-awareness in order to realize his/her potential
- should have freedom of responsibility
- in relation to others, should strive to find him/herself in this process of developing critical thinking
- should see him/herself as part of a world of complexities and possibilities, with the responsibility to make the most of this existence

Existentialism is particularly applicable to nursing because of its emphasis on self-determination, freedom of choice and self-responsibility (Praeger, 1995, p. 302). This approach could also serve as the foundation for the development of the programme.

1.7.1.4 Methodological assumptions

Methodology refers to the description of the specific techniques employed and specific measuring instruments utilized and all other specific activities conducted during the study (Fouche, 2002, p.120). It further refers to seeking the best methods by which to gain knowledge (Polit & Beck, 2006, p.14). The study was quantitative and descriptive

in nature and employed a quasi-experimental design. It was conducted in the following four phases:

The initial phase of the research (phase 1) consisted of a needs assessment to determine the critical thinking ability of senior student nurses by answering questions about an imaginary case scenario. Based on the data of phase 1, an educational programme to facilitate critical thinking in student nurses was developed in phase 2, where phases 3 and 4 comprised the implementation and evaluation of the programme.

1.7.2 Theoretical assumptions

An eclectic approach was followed in the selection of a theoretical framework for the study. The study was conducted by applying the following approaches/theoretical principles, which were found to be best, suited to the study:

- Principles of adult learning as explained by Knowles
- Model of curriculum development by Nichols and Nichols
- Videbeck's model of teaching critical thinking
- Duldt's principles on critical thinking
- Theoretical principles of constructivism

The theoretical framework as stated above is described in chapter 6 which deals with the development of the educational programme.

1.8 Definitions of concepts

- Programme:

A programme is defined as a plan of things to be done or included in the development of something. Another sense of “programme” is an educational course in which material to be learned is presented in small graded amounts (Hornby, 2005, p. 1161). For this study an educational programme will be offered over a period of time, to be indicated, in which the main objective will be to facilitate critical thinking in nursing practice. The participants of this educational programme will be senior student nurses in their fourth year of study at the Faculty of Medical and Health Sciences at Windhoek.

- Critical thinking

Different definitions exist for this term, which makes it difficult to apply a single suitable definition. Critical thinking is the rational investigation of ideas, inferences, assumptions, principles, arguments, conclusions, issues, statements, beliefs and actions that covers scientific reasoning and includes the nursing process, decision making and reasoning on controversial issues (Bandman & Bandman, 1988, p. 5; Green, 2000, p.3)

Facione (1998, p. 3) considers a critical thinker to be “habitually inquisitive, well informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking information, reasonable in

selection of criteria, focused in inquiry and persistent in seeking results which are as precise as the subject and the circumstances of inquiry admit. Critical inquiry is considered an important quality for safe practice.”

It is the opinion of Wilkinson (1996, p.11) that critical thinking is goal-oriented, purposeful thinking that involves a number of mental skills, such as determining what data are relevant, evaluating the credibility of sources and drawing inferences. It further requires that a person make clinical judgments.

For the purposes of this study the researcher will consider all the above-mentioned definitions as part of the study.

- Facilitate:

The term refers to an action or process that will make things function more smoothly and easily (Hornby, 2005, p. 523). For the purposes of this study, “to facilitate” refers to the action by means of which the critical thinking abilities of student nurses will be promoted during an educational programme. Facilitating is furthermore conceptualized as the nurse’s ability to create and accommodate a specific climate in which practice takes place (Cilliers & Terblanche, 2000, p. 90). For the purposes of this study, “facilitating” refers to the climate in which the programme will be conducted in order to facilitate critical thinking among student nurses.

- Facilitator:

The term indicates a “person who helps somebody to do something more easily by discussing problems, giving advice rather than telling them what to do” (Hornby, 2005, p. 523). In this study the term “facilitator” refers to the researcher who will conduct the programme to facilitate the development of critical thinking among student nurses.

- Professional nurse :

This refers to a person registered as a nurse in Namibia under section 20 of the Nursing Professions Act 8 of 2004. For the purposes of this study the term “professional nurse” will be used to refer to a registered nurse at the functional level in all disciplines of nursing (Nursing Professions Act 8 of 2004, p.31).

- Student nurse

This indicates a student nurse registered under section 21 of the Nursing Professions Act 8 of 2004 (Nursing Professions Act 8 of 2004, p.31) .For the purposes of this study, a student nurse refers to a nursing student registered with the Namibian Nursing Board as well as at the University of Namibia, in the Faculty of Medical and Health Sciences. This study will further focus on student nurses in their final year (4th year) of study for the Comprehensive Diploma in Nursing and Midwifery.

1.9 Division of chapters

The study is divided into the following chapters:

- Chapter 1: Overview of the study
- Chapter 2: Literature review
- Chapter 3: Research design and methodology
- Chapter 4: Description of Needs assessment results and discussion of results
- Chapter 5: Concept synthesis and development of framework
- Chapter 6: Development of the educational programme
- Chapter 7: Implementation of the educational programme
- Chapter 8: Evaluation of the educational programme
- Chapter 9: Conclusions, limitations, original contribution and recommendations
- Reference list
- Addenda

1.10 Summary

Chapter 1 gave an overview of the research that will be discussed in detail in the other chapters. The assumptions which apply to this study were also discussed in this chapter.

Although critical thinking is a diverse topic that is of interest to researchers, there is a consensus among nurse educators about the importance of critical thinking in nursing practice (Thorpe & Loo, 2003, p. 566).

In order to develop as a critical thinker, one must be motivated to develop the attitudes and dispositions of a fair-minded thinker. Critical inquiry is an important quality for safe practice and nurses should realize that sloppy, superficial thinking leads to poor nursing practice. To accomplish the goal of providing excellent nursing care, students will be required to develop as critical thinkers in order to serve the nation well. Since critical thinking is considered an important aspect of professional practice in nursing, nurse educators need to facilitate the development of critical thinking (Quinn & Hughes, 2007, p.68). If the development of critical thinking is not facilitated, “a wrong decision, an unasked question, a forgotten task and an incomplete analysis can kill” a patient! (Hammond, 2004, p.1).

Chapter 2 deals with an extensive literature review on the term “critical thinking”, its relevance to and application in nursing practice and its facilitation within an educational programme.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The previous chapter, chapter 1, provided an overview of the study as a whole, the problem statement, phases of programme development and an outline of the chapters as they appear in the study.

A literature review helps to lay the foundation for a study (Polit & Beck, 2004, p. 88). It aims to contribute towards gaining a clearer understanding of the nature and meaning of the problem that has been identified (Fouche & Delport, 2002, p.127). A literature review was done for this study, to demarcate the concept of critical thinking within the domain of nursing practice.

In this chapter the concept of critical thinking within the nursing context will be explained and an extensive literature review on this topic will be discussed to explain not only critical thinking as such but also the integration of critical thinking into nursing practice within the daily care of patients. The denotations of the six cognitive core critical thinking concepts will also be described since that formed the basis of the questions compiled from the case scenario which was presented as pretest and posttest during phase three and four of the study.

2.2 Critical thinking – in perspective

2.2.1 The concept of thinking

It is accepted that everyone thinks since it is our nature to do so. Thinking is a dynamic, everyday, non-static process which may change daily or hourly and which may have a major impact on one's life. For daily activities one relies on different modes of thinking. One may rely on past experience or may decide to approach a case in a new way. It is important to realize that just about everything one does requires thinking, although not all thinking is the same (Rubinfeld & Scheffer, 1999, p.4).

Rubinfeld and Scheffer (1999, p.5) are of the opinion that the better one understands thinking, the easier it is to develop and nurture one's thinking, especially when it comes to situations that demand more than superficial thinking.

Thinking is a primary skill for all scientific disciplines and professions, including nursing. Thinking makes it possible for the nurse to execute nursing activities for the benefit of her/his client (Lindberg, Hunter & Kruszewski, 1998, p. 4; Rubenfeld & Scheffer, 1999, p.5). However, for the nurse it is necessary to realize that a higher level of thinking than that required by daily activities is required to solve nursing problems, because solving these problems involves the processing of complex data and the making of intelligent decisions concerning the planning, management and evaluation of health care (Shin, 1998, p. 415).

One can then ask what the difference between thinking and critical thinking is. The difference lies in “purpose” and “control”. Thinking can be mindless and mere daydreaming, whereas critical thinking is purposeful and controlled and focuses on well-reasoned strategies directed towards a specific outcome (Alfaro-LeFevre, 2004 (b), p.4). It is a range of abilities and qualities that inform direct and control our thinking and actions (Brown & Rutter, 2004, p.3).

2.2.2 The concept of critical thinking

The concept of critical thinking has been defined by different people over the years and yet it has never been possible to produce a single definition. The expression “critical thinking” has become so popular that people who are unable to agree on most of the important things in life are likely to claim that they think critically (Carroll, 2007, p.1). Critical thinking has been covered by a wide array of disciplines that cited specific

reasons why critical thinking was important within their field, and still it is difficult to come up with a single definition for critical thinking. The ability to think critically has been identified by researchers, both past and present, as a skill that is reflective of higher order thinking (Thurmond, 2001, p.377; Hagerman, 2004, p.1).

It is, however, necessary to emphasize that critical thinking in day-to-day activities cannot be thought of as something that seeks out perfect solutions but rather as a process and mental orientation that includes cognitive and affective domains of reasoning. Critical thinking in daily activities is thinking with a purpose, and with skill and confidence. It is also about paying careful attention to what we hear and read so that we can understand and respond appropriately. As critical thinkers we are not striving to become unfeeling or emotionless people, but rather to make judgments in which our feelings and emotions are properly expressed (Jones, 2001, p. 2; Simpson & Courtney, 2002, p. 93; Salmon, 2002, p. 2; Brown & Rutter, 2004, p. 3; Howard College, 2006, p. 1).

Critical thinking means that we take nothing for granted, but rather ask questions so that we become informed about situations around us and are willing to examine conflicting positions in a fair-minded way and accept that even beliefs that we have held all our lives might be wrong! Once an individual has used the critical thinking process in one area of life or work, it is more likely that the same individual will apply the process in other domains (Robinson, 1998, p.3; Potter & Perry, 1999, p. 65; Carroll, 2007, p. 2).

Makathini (1992, p.24) has described an ability to think critically as an antecedent to problem solving. Furthermore, critical thinking is regarded as a practical activity that helps learners develop a broad understanding of situations that are meaningful to them (Mpaka & Uys, 1999, p.16). Buchanan (n.d., p.1) describes the term “critical thinking” as intimidating, but concludes by saying that critical thinking, by definition, is “what you generate, is what you know”.

During a quantitative study conducted by Facione (1990, p. 4) 46 critical thinking experts participated in a Delphi study. Critical thinking was then conceptualized in terms of cognitive skills and affective dispositions. Consensus have been reached that critical thinking is purposeful, self regulatory judgment which results in interpretation, analysis, evaluation and inference, explanation as well as self -regualtion. The author also indicated that the critical thinker is habitually inquisitive, well-informed, trustful in reason, open0minded, flexible, fair minded in evaluation, honest in facing personal biases, prudent in making decisions and willing to reconsider. The critical thinker is also reasonable in selection of criteria, keep focused on criteria and remain persistent in seeking results. Nurturing the developing of critical thinking encompasses the six core critical thinking concepts as well as the sub skills that serve as support to the main concepts (Facione 1990, p.6).

A clear and accurate conceptualization of these concepts is necessary for the development of effective instructional programmes. In this study, the six core critical thinking concepts and its sub skills have been conceptualized in Chapter 5. it also served as the foundation to the educational programme that was developed in phase 3 of the study.

Though the panel strove to characterize certain core concepts, the experts did not claim that a person should be proficient in all the core concepts to be perceived as a critical thinker. The panel furthermore considered these concepts as essential to the design and implementation of critical thinking instruction (Facione, 1990, p.16). For this study the core skills and their sub-skills have been defined, described and conceptualized in chapter 5. The consensus of core critical thinking concepts and its sub-skills as were reached by the experts of the Delphi study can be described as indicated in Table 2.1.

Table 2.1: FACIONES' CONSENSUS LIST OF CRITICAL THINKING COGNITIVE SKILLS, SUB-SKILLS AND AFFECTIVE DISPOSITIONS

<i>CONSENSUS LIST OF CRITICAL THINKING COGNITIVE SKILLS , SUB-SKILLS and AFFECTIVE DISPOSITIONS</i>		
<i>Core concept</i>	<i>Sub skills</i>	<i>Affective dispositions (not put in order of importance. Integral to more than one core concept)</i>

<p>Interpretation</p> <p><i>To comprehend and express the meaning or significance of experiences, beliefs, procedures</i></p>	<ul style="list-style-type: none"> • Categorization – to formulate a framework of understanding • Decoding significance – to detect and describe the information content • Clarifying meaning – to make the meanings of concepts , words or paraphrases clear 	<ul style="list-style-type: none"> • Fair-minded analysis • Rational autonomy • Intellectual freedom • Inquisitiveness • Well-informed • Opportunistic
<p>Analysis</p> <p><i>The identify the intended and actual relationships among statements and questions clear</i></p>	<ul style="list-style-type: none"> • Examining ideas by defining & comparing • Detect arguments • Analyze arguments 	<ul style="list-style-type: none"> • Trust • Self confidence • Flexibility • Understanding • Honesty
<p>Evaluation</p> <p><i>To assess the credibility of statements or other descriptions</i></p>	<ul style="list-style-type: none"> • Assessing claims • Assessing arguments 	<ul style="list-style-type: none"> • Prudence in making or altering judgements • Willingness to reconsider • Clarity • Orderliness
<p>Inference</p> <p><i>To identify and secure elements that are needed to draw conclusions</i></p>	<ul style="list-style-type: none"> • Querying evidence • Conjecturing alternatives • Drawing alternatives 	<ul style="list-style-type: none"> • Diligence • Reasonableness • Care in focusing attention • Persistence
<p>Explanation</p> <p><i>To clarify and justify</i></p>	<ul style="list-style-type: none"> • Stating results • Justifying procedures 	<ul style="list-style-type: none"> • Precision

(Facione, 1990, p.16-30)

To develop and nurture the preceding core concepts, sub-concepts and dispositions in order to be considered a “critical thinker” it is necessary to follow a certain process approach.

2.2.3 Process of critical thinking

In many instances critical thinking is referred to as a process. A process is defined as a series of “things” done in order to achieve a particular result (Hornby, 2005, p. 1157). Firstly, the process of critical thinking refers to the series of thoughts and concepts utilized and employed to think purposefully.

Secondly, critical thinking engages both an attitude of inquiry and a reasoning process involving a number of intellectual skills and other concepts without which the process would not be complete (Alfaro-Le Fevre, 2002, p. 29; Botes , 2000, p.28)

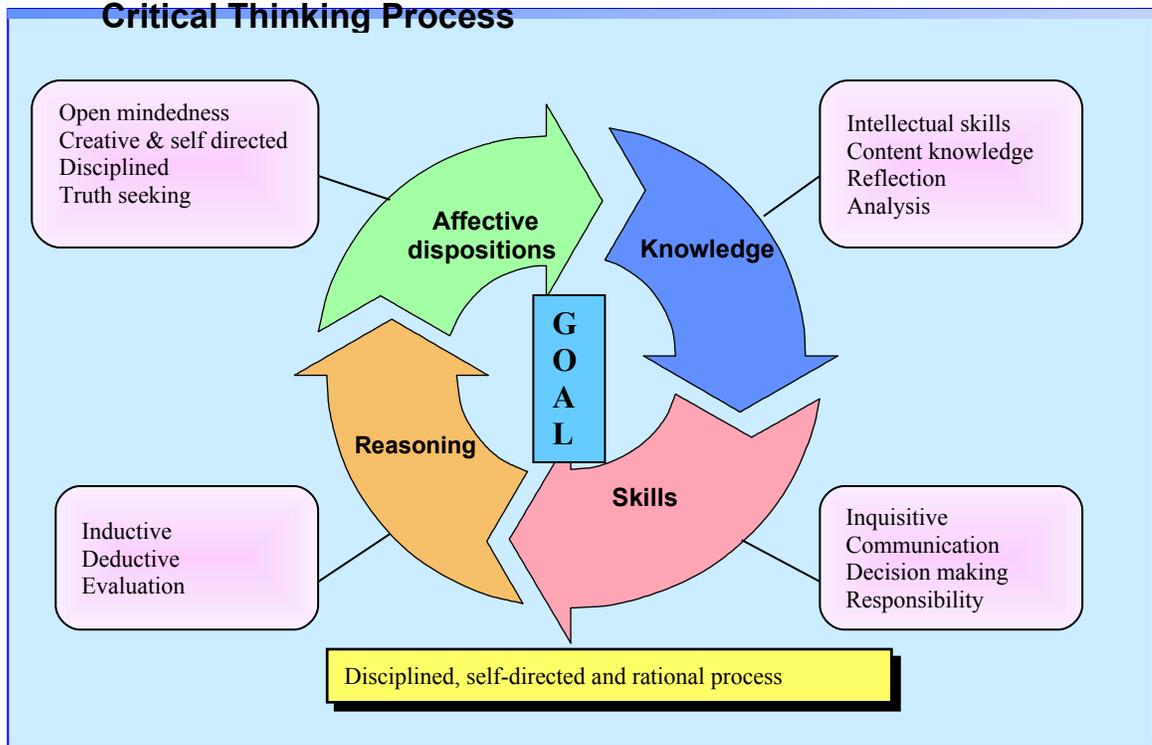
Thirdly, the critical thinking process refers to a disciplined, self directed and rational thinking process that certifies what we know and reveals what we are ignorant of. It is also the art of thinking about one’s thinking to make it clearer, precise, accurate, relevant, consistent and fair (Wilkinson, 1996, p. 27; Alfaro-Le Fevre, 2002, p. 29).

Fourthly, critical thinkers need an open mind which includes reflective thinking as part of the process and lastly they must be autonomous and responsible for their own decisions (Botes, 2000, p.28).

Although the researcher has demonstrated an understanding of the process of critical thinking, it should be emphasized that the process is complex and not easy to define. The process of critical thinking is viewed differently by authors and may also be described as a process that proceeds in stages. The stages of this process involve the reasoned consideration of evidence, contexts, conceptualizations, methods and criteria. The critical thinker could also find him/herself asking who? why? what if? when? and where? What needs to be emphasized is the interrelatedness of the different concepts employed to meet a desired goal. Moreover, critical thinking is not a step-by-step process but rather a process of continuation where the thinker proceeds to meet the goal set for a certain situation. The order in which the thinker proceeds depends on the nature of the situation (Botes, 2000, p. 27; Lipe & Beasley, 2004, p.3).

Figure 2.1 reflects the critical thinking process as explained by the researcher.

Figure 2.1: EXPLANATION OF THE CRITICAL THINKING PROCESS



For the purposes of this discussion the process of critical thinking refers to the utilization and interrelatedness of all the subconcepts and skills which constitute critical thinking. It will also become clear that the term itself is meaningless unless it is interpreted within a given context with reference to other important skills substantial to the term.

2.2.4 Critical thinking – a holistic approach

Critical thinking is considered one of the essential tools for coping with everyday life crises. As life progresses, nothing becomes simpler; in fact life only becomes more complicated and if we want to survive we must be able to think critically. It is argued that the ability to think critically is fundamental to the ability to function as a competent

member of society. Critical thinking encompasses a number of skills, which means that the term is holistic in nature. “Holistic” refers to the idea that the whole of something needs to be understood in terms of its parts.

In addition, critical thinking involves the whole of a person, namely body and mind. To think critically there must be a certain amount of self-awareness and other characteristics present to enable the critical thinker to explain the processes of analysis and interpretation (Applegate, 1998, p. 202; Cooke & Moyle, 2002, p. 330; Walker, 2003, p.263; Alfaro-LeFevre, 2004 (b), p.2; Hornby, 2005, p. 714).

As members of society, people are involved in different professions and contexts where critical thinking skills can be exercised. Critical thinking is considered the style of thinking that is necessary for success with all other processes and an activity that will empower people to adhere to standards relating to a specific context. The value of critical thinking lies in its ability to result in better plans and actions in a specific context (Pond, Bradshaw & Turner, 1991, p.21; Alfaro–LeFevre, 2002, p. 23; Lipe & Beasley, 2004, p. 3)

It became clear that the promotion of critical thinking is a key element in meaningful, responsible and soulful learning. By teaching people to make good decisions, one equip them to achieve a better future and become contributing members of society rather than burdens on society (Murchù & Muirhead, 2005, p. 1; Facione, 2006, p.1).

The facilitation and development of critical thinking in members of society is considered an educational ideal whereby students can be empowered to control their own destiny. It is also in line with the desire to not only develop individuals but to develop the nation (Finke, 1998, p.4 ; Bandman & Bandman, 1988, p.3).

The context within which this study was conducted is the clinical nursing environment within a health care delivery system in Namibia.

2.3 Critical thinking in nursing

The essence of critical thinking in nursing cannot be underestimated. Just as critical thinking is important in addressing everyday problems, it is imperative in nursing practice. Many authors have developed their own description of the phenomenon to suit their own understanding of the concept of critical thinking, equally so in nursing. Critical thinking in nursing requires individuals to process complex data about the client/patient while planning, managing and evaluating patient care in the clinical setting (Longacre, n.d, p. 7). It has furthermore been described as the “balance between framework thinking and flexible viewing of the situation” and as “universally expected behaviour” (Shin, 1998, p. 415) of professional nurses engaged in practice. One area where nurses are expected to perform well is the comprehensive nursing care of a client/patient. This includes promotive, preventive, curative and rehabilitative care (Case, 1998, p. 240; Lindberg et. al., 1998, p. 4).

Caring for a client/patient refers to a highly individualized, complex activity that involves distinct ideas, emotions and perceptions and is therefore an ideal term to explore in the nursing profession. In some of the literature the term “reasoning” is seen as synonymous with the term critical thinking in nursing because nursing care involves active, focused, persistent and purposeful activities, which are performed to address the needs of the client/patient. Reasoning in nursing care involves activities such as choosing the best option to relieve the symptoms of a client/patient or deducing which position would enhance a patient’s breathing where more than one option exists but only the best must be chosen. However, the focus of critical thinking in nursing should remain on how we can improve the patient’s care (Kyzer, 1996, p. 66; Alfaro- LeFevre, 1999, p.8; Alfaro- LeFevre, 2004, p.2).

2.3.1 Critical thinking – essential to the concept of caring in nursing

Caring has been part of society for as long as human beings have existed, from the time when the first person became unwell or injured. Watson (Talento, 1995, p.317) believes that caring for a patient is the most valuable attribute a nurse has to offer to humanity, yet caring has, over a period of time and due to a number of factors like the development of technology, been compromised. However, caring responses accept the whole person not only as he is but also for what he will become. The focus of caring is derived from a humanistic perspective combined with a scientific base to support ill people and help them to reduce their health problems. Nursing is furthermore considered a unique blend

of art and science applied within the context of the interpersonal relationship of caring (Talento, 1995, p.317; Wilkinson, 1996, p.4).

Furthermore, nursing concerns human beings in need and refers to the specific body of knowledge necessary to care for the needs of other people. Although the human caring role is under threat from technology and medical advances, the human touch in caring can never be replaced.

In these circumstances, where nurses have to care for clients/patients, they frequently find themselves in very complex situations with many problems which they are responsible for solving. Since caring embraces the whole person in all phases of life, superficial actions and interventions are not sufficient to address these problems. Instead, a nurse is needed who possesses the necessary up-to-date knowledge and skills (Mellish & Paton, 2000, p.3).

Critical thinking seems to be one of these skills which serve as the key to resolving these problems. This makes critical thinking an inseparable part of caring in nursing. Moreover, Reilly and Obermann (1999, p.217) consider critical thinking to be discipline-specific, which implies that nurses may engage in critical thinking differently from philosophers or teachers. If nurses fail to think critically, they become part of the problem instead of the solvers of the problem (Alfaro-LeFevre, 1999, p.4; Mellish & Paton, 2000, p.3).

In their role as problem solvers, nurses work in many different roles and settings that are related either directly or indirectly to client/patient care. Nursing includes the making of judgments and decisions. The providers of clinical care do this when they engage in direct patient care and aspects of their roles outside direct patient care.

Judgment can be influenced by many factors in nursing care. This in turn influences the nurse's outside role with regard to client/patient care, for example the nurse must consider the family of the client/patient and their feelings.

Therefore, sound critical thinking in the professional domain of nursing is essential to problem solving, clinical reasoning, clinical judgment and decision making and cannot just be switched on occasionally. Much emphasis is placed on the connection between critical thinking and clinical judgment in the clinical setting. Such thinking needs to be nurtured and developed. Critical thinking is essential in this development process to ensure safe, competent, skillful nursing practice (Eichhorn, n.d, p.3; Case, 1998, p. 240; Fonteyn, 1998, p.12; Kozier, Erb, Berman & Snyder, 2004, p. 245; Hoffman & Elwin, 2004, p. 8; ADEA, 2006, p.930).

However, critical thinking can be hampered by the fact that nurses have not escaped the dramatic advances and transformation in health care during the past few years. Some of the changes faced by the nurse are the rapid growth in technology, consumer demand, decreased length of hospitalization, increase in the aging population and increase in

complex disease processes while the expectation exists that patients need to be cared for in the best way possible (Simpson & Courtney, 2002, p.90).

To determine the best methods of care is in their everyday practice, nurses are constantly required to make decisions about the care they will deliver to the patients assigned to them. It may be asked how nurses make decisions about care that are effective and appropriate.

If nurses want to face up to and cope with these challenges, they are required to be multi-skilled in higher order thinking and reasoning, to address the challenge of safe, competent and effective care, and to formulate sound clinical judgments as the basis of safe client care while minimizing clinical errors. Nurses must be able to sift through the wealth of information that is available to them and make judgments that are based on sound reasoning skills (Simpson & Courtney, 2002, p.90; Tiwari, Chan, Sullivan, Dixon & Tang, 2000, p.1; Cronin & Rawlings-Anderson, 2004, p.116).

The development of sound critical thinking will enable the nurse to be clear in any situation in order to reach the best outcome by making the right decisions. It has to be emphasized that if workers (professionals) are good critical thinkers – who can identify, analyze and solve problems in collaboration with one another, this will add value to the workplace (nursing practice). In this regard it has to be emphasized that nursing is an applied discipline, and knowledge is of little use if it has no implication for or impact on

practice. It should furthermore be emphasized that the application of thought processes that allow a professional to base accurate decisions in patient care on the deliberate and open-minded review of all available options have become the cornerstone of professional practice (Cronin & Rawlings-Anderson, 2004, p.iv; ADEA ,2006, p.926).

It is therefore clear that decision-making is central to the concept of caring in nursing. This was highlighted by a study conducted by Hoffman and Elwin (2004, p.8) on the relationship between critical thinking and confidence in decision making. They emphasized the fact that nurses continuously have to make decisions while planning and delivering care. The researchers discovered that there may not necessarily be a direct link between confidence and critical thinking. They did, however, recommend that continuous development courses be conducted to raise awareness among nurses of the importance of a questioning attitude to patient care delivery.

2.3.2 Critical thinking in nursing care

Nursing is never a superficial, meaningless activity. It involves deeply significant activities that must be carried out by a nurse fully engaged in the practice of nursing. The opinion has often been expressed that critical thinking in nursing is imperative if the demands and challenges of nursing practice are to be met. Brookfield as quoted by Simpson and Courtney (2002, p. 93) proposed however that critical thinking involves not only cognitive skills but also emotions while the critical thinker continuously questions fixed ideas on right and wrong. It was also argued that with increased patient

acuity and the movement of patient care to community settings, the demand for nurses who can think critically, reason logically and quickly choose patient care strategies is greater than ever. Therefore, learning to think critically in nursing practice involves expanding a person's thought processes within decision making and professional judgment when gathering and analyzing patient data, and planning and evaluating direct patient care (Case, 1998, p. 240; Sedlak & Doheny, 1998, p. 42).

Other definitions and descriptions of the concept of critical thinking that fit perfectly into the framework of the nursing profession refer to knowing how to learn, creative thinking, generation and evaluation of new ideas and the ability to visualize outcomes. In addition, critical thinking also involves decision making and problem solving in order find the best way to manage a situation, based on most current research and practice, statements and arguments. Critical thinking in nursing includes the identification of reasons and beliefs on which the nurse can base his or her actions (Bandman & Bandman, 1988, p.1; Reilly & Obermann, 1999, p.217; Alfaro-LeFevre, 1999: p. 8; Alfaro- LeFevre, 2004, p.8).

Although all the above descriptions are applicable to the nursing milieu, over decades authors have agreed that critical thinking refers to the art of thinking about your own thinking while you are thinking. This would enable you to make it better, clearer, more accurate and defensible – to be purposeful and goal directed in this process of problem solving and decision making (Alfaro-LeFevre, 1999, p. 9).

Having said all this, it may well be asked what critical thinking in nursing involves.

In nursing critical thinking is particularly important because of its potential impact on patient care. Critical thinking in nursing entails that purposeful, outcome-directed (results-oriented) thinking which is driven by the needs of the client/patient, the family and community, and which needs to be addressed by a knowledgeable, skilful and experienced nurse, guided by professional standards and ethical codes. It requires strategies that maximize human potential and compensate for problems created by human nature. Critical thinking becomes the skill no nurse can be without (Alfaro–Le Fevre, 1999, p.9; Thurmond, 2001, p. 375).

Hence, while engaging in all the above strategies the critical thinker constantly re-evaluates, and corrects him/herself through practice, while at the same time striving to improve and to avoid mistakes in thinking. This is made possible for the nurse because in nursing critical thinking sharpens self-awareness. However, it requires a concerted effort, a good deal of practice and diligence from the practitioner (Andolina, 2001, p. 3; Bandman & Bandman, 1988, p.1; Alfaro-LeFevre, 1999, p.4; Salmon, 2002, p.6)

Critical thinking in nursing care encompasses cognitive and affective facets that will fit perfectly into the “helping trust relationship” (Talento, 1995, p. 320) which the nurse has to establish while solving the patient’s problems and making decisions that may have a lifelong impact on the patient’s wellbeing. Allowance for existential phenomenological factors, as in Watson’s carative factor 10, allows the nurse to understand people in terms

of the way things appear to them, from their frame of reference. This corresponds to the affective dispositions of critical thinking. The researcher is of the opinion that should a nurse apply this part of Watson's theory on caring it would be a very successful integration of critical thinking into caring for the whole person while utilizing the scientific nursing process as discussed in 2.3.3.

Within the context of nursing practice, the clinical setting is the ideal place to develop critical thinking skills as it provides the basis for facilitating the cognitive development that is requisite to individual nursing care. Within the care of the client/patient, critical thinking is the skill that enables a nurse to think a client/patient's case through in order to manage it effectively (Conger & Mezza, 1996, p.11; Sedlak & Ludwick, 1996, p.19).

The researcher is of the opinion that the above understanding and description of the concept of critical thinking in nursing care is ideally suited to the Namibian situation, and imperative in caring for the client/patient. It will enable the nurse in Namibia to "think on her feet" in such a way that problems can be resolved instantly to secure satisfaction for the client/patient within situations that may well be very complex. Since the nurse may find the challenges presented by health care in Namibia demanding owing to the geographical composition of the country, she/he needs to be prepared for any unforeseen circumstances. One of the ways to prepare Namibian nurses is to sensitize them towards the term critical thinking and its application in nursing practice and to facilitate the development of their critical thinking skills. Poor thinking in nursing can

easily be as costly as inexperience or inadequate knowledge of the professional field (Facione, Facione & Giancarlo, 1997(b), p.1).

On the other hand, critical thinking skills give the nurse a broader outlook, creative solutions and the multiple pathways needed to care for the patient in a successful way, especially since changes to the profession have produced challenges that the nurse has to cope with (Reilly & Perrin, 1999, p. 1; Simpson & Courtney, 2002, p. 91).

Although these challenges may be of a diverse nature, it is necessary to prepare the nurse to deal with these problems. A qualitative study on critical thinking was conducted by Botes (2000, p. 26) amidst ethical dilemmas in nursing practice. The emphasis of this study was an assessment of the ability of the nurse to engage in decision-making to meet a desired goal. The study concluded that nurses did not think critically about the ethical problems they were confronted with. They lacked open-mindedness and inquisitiveness. The researcher recommended that the development of critical thinking be included in nursing education so that nurses became effective decision makers in the care of patients.

One of the ways to include critical thinking in nursing education is to teach students about the scientific nursing process in nursing.

2.3.3 Critical thinking and the nursing process

The scientific nursing process is an objective systematic approach to problem identification and problem solving in all health care situations and consists of the following phases: assessment, diagnosis, planning, implementation and evaluation.

The assessment phase is the pathway to the assessment of the client/patient's problem and/or needs. Assessment is the first step in making a proper nursing diagnosis, after which a plan of action can be formulated. During all these phases intellectual operations such as problem solving, decision making and critical thinking, value judgments and psychomotor skills necessary for the assessment of patients' problems are employed (Alfaro-LeFevre, 2002, p.4).

The scientific nursing process is the tool that is then used to ensure appropriate and efficient nursing care. In order to render efficient and appropriate care, certain competencies are required, one of the most important of which is critical thinking. Wilkinson (1996, p. vi) linked the execution of critical thinking to the scientific nursing process by describing it as that special way of thinking, planning and acting while caring for the client/patient. The author is clear on the fact that critical thinking in nursing cannot be mastered just by memorizing facts and principles, but that it is linked to exercises (during the process of nursing care) in practice that promote high-level thinking skills such as the skills required to utilize the scientific nursing process. The scientific nursing process enables the nurse to identify, prevent and treat actual or

potential health problems and promotes wellness, for example by making a proper nursing diagnosis after a thorough assessment (Wilkinson, 1996, p.4).

In order to utilize the scientific process in nursing care nurses need to master the principles behind the nursing process and become thinking-oriented rather than task-oriented. As mentioned previously, one of the thought processes essential in the nursing process is critical thinking, whereby the ultimate aims in the nursing of a client/patient can be achieved (Alfaro-Le Fevre, 2002, p.4).

It is nevertheless necessary to realize that critical thinking is difficult, although it might seem to be quite basic. It is a process that goes beyond solving problems. A person with a mentality that does not go beyond problem solving cannot claim to be a critical thinker (Alfaro–LeFevre, n.d, p.1; Van Gelder, n.d, p.2).

The utilization of critical thinking as part of the scientific nursing process furthermore refers to the contextual, careful, deliberate and outcome-focused (results-oriented) thinking that will help the nurse to analyze and interpret patient care situations and focus on problems the patient may encounter. It helps the nurse to be clear about the purpose of care for the patient. The question one would ask oneself in such a situation is: What exactly are the results I want? (Alfaro-LeFevre, 1999, p. 9; Alfaro-LeFevre, 2002, p. 23; Lipe & Beasley, 2004, p. 9).

However, others have argued that it is essential to realize that the nursing process in itself can no longer meet nursing's current needs because it is a linear approach that moves from questions to answers. Nursing goes beyond that. Critical thinking seems to be the more appropriate way to go about things because it fosters the exploration of alternative solutions and can be employed outside the framework of the scientific nursing process (Thurmond, 2001, p. 379; Alfaro-Le Fevre, 2002, p.4).

It is when the nurse thinks outside the nursing process that she/he is able to respond to the demands posed when multiple clients encounter the same health care needs but respond differently to these needs. This requires the nurse to think about how to address these needs. Therefore, the scientific process has the potential to care for a client/patient individualistically. During the planning of care for an individual, nurses are required to use their holistic nursing knowledge base to think through each individual situation in order to provide structures and effective individualized care (Rowles & Brigham, 1998, p.248).

2.5 Critical thinking as the focus in nursing education

Nursing education, as part of the teaching profession, draws upon many other disciplines for its body of knowledge. One of the aspects that are common to different teaching disciplines is critical thinking. Many countries all over the world are looking for better ways to educate their people and organize their education systems. Nursing education is no exception. "There is a global need for a competent nurse practitioner with critical

thinking skills” to address the needs of society (Mangena & Chabeli, 2005, p.292; Quinn & Hughes, 2007, p. 6).

The development of critical thinking skills has become one of the main goals of education, including theoretical and clinical nurse education, because it has become evident through research that students do not acquire these skills as they could and should, and that something needs to be done to facilitate the development of critical thinking skills (Burnard, 2005, p. 86). A model for facilitation in nursing education was developed in this regard by Lekalakala-Mokgele and du Rand (2005, p.23). The model evolved through a qualitative research study which depicted a need for facilitation in nursing education, to enhance client/patient care. The hope was expressed by the researcher that nurse educators will thoroughly prepare themselves for their role as facilitators in clinical practice.

Critical thinking is regarded as a systematic way to shape and apply one’s thinking within daily learning. It was furthermore established that allocating students with inadequate knowledge and insufficient clinical experience of clinical practice situations where proficient problem solving skills are required could harm patients. The time has come for nurse educators to wake up to the current need for critical thinking in nursing practice (Paul, 1995, p. ix; Van Gelder, n.d, p.1; Weiss & Guyton-Simmons, 1998, p.30; Burnard, 2005, p. 86).

Schoenly (1998, p. 202) contends that in the 21st century, more than ever, the fast-paced and high-acuity health care setting requires all care providers to think critically. She furthermore links the execution of critical thinking skills to a horizontal thread within the nursing curriculum to allow for the application of critical thinking skills within the practice area of nursing. Critical thinking, clinical judgment and technical capabilities are the predominant competencies that experts predict will be needed in future and that must be developed in nursing practice by nurse educators. Critical thinking has gained a lot of ground in nursing since it is the only way a nurse will be able to confront the complexities in the health care of the new millennium (Simpson & Courtney, 2002, p.98; Khosravani, Manoochehri & Memarian, 2005, p.2).

Critical thinking is therefore increasingly being recognized as the cognitive engine driving the processes of knowledge development and professional judgment in a wide variety of professions including nursing. However, to comply with the demands of nursing practice in terms of judgment and knowledge development, it is required that critical thinking be set as a required outcome of nursing education (Facione & Facione, 1996, p. 129; Abegglen, 1997, p. 452).

There is no doubt that to survive and thrive in today's (and tomorrow's) workplace, one is going to need highly developed abilities, especially critical thinking skills. Education programmes, including nursing programmes, will have to address these needs. It is important that researchers and nurse educators understand what it means to think

critically and the role this plays in day-to-day learning and activities. In everyday situations, critical thinking can make the difference between success and failure in any given task, and this is certainly true of nursing (Inouye & Flannely, 1998, p. 67; Alfaro-LeFevre, 1999, p. 4; Andolina, 2001, p.2; Alfaro-LeFevre, 2004, p.1, Hagerman, 2004, p.1).

In the light of the above, it is necessary to realize that critical thinking is not just a concept that can be used occasionally. The traits that are essential to critical thinking are best developed simultaneously by means of education. Moreover, critical thinking requires considerable effort on the part of the learner if excellence is to be achieved. According to Applegate (1998, p. 202) “the heart and soul of critical thinking acquisition” lies in practising the skill, and the success in teaching the skill depends on the learning strategies applied. Some nurses may feel initial resistance to developing their thinking because they are convinced that nursing is mostly about learning technical skills and performing skilled tasks (Lindberg, Hunter & Kruszewski, 1998, p.4).

In view of changing social demands the challenge to nurse educators is to ascertain how well critical thinking is fostered in nursing education (Tiwari et. al., 2000, p.1). The role of the educator, and in particular the nurse educator, has changed as well to address the increasingly complex situations encountered in nursing practice in order to prepare students for future roles as they practise in a health care system that is increasingly client

centred, wellness oriented, community focused and technologically advanced (Stokes, 1998, p. 281; Finke, 1998, p. 3).

Educators, administrators and experienced nurse practitioners often ask the question: How do I get a professional to think actively rather than to passively accept what is observed? In order to be prepared for the future, the nurse should be able to think for him/herself and be actively involved in planning patient care (Robinson, 1998, p.1). Nurse educators often accompany students in clinical practice to guide them in and prepare them for the planning of client/patient care. Facilitation of critical thinking during clinical accompaniment is imperative to enhance patient care. Uys and Meyer (2005, p. 11) conducted a quantitative research study to investigate the methods of clinical accompaniment used by nurse educators as clinical facilitators. In spite of the results indicating that a variety of methods were used, the researcher also determined that the term “critical thinking” and “facilitation” were not correctly understood and therefore hampered the facilitation of critical thinking in nursing practice. The researchers recommended that clinical facilitators first gain the necessary knowledge about critical thinking and then draw up guidelines to facilitate critical thinking in student nurses in clinical practice.

During the clinical accompaniment of student nurses the clinical facilitator is in a perfect situation to pose questions to the student to determine his or her level of understanding of the situation on hand. In this regard, Philips and Maxine (2001, p. 523) conducted a

study to explore and describe the questions asked by clinical facilitators during the clinical accompaniment of students. The findings of the study suggested that although clinical facilitators ask questions at a higher cognitive level, they should raise the level and increase the number of questions they ask to encourage nursing students to develop inquiring minds. They also recommended that further studies be conducted into the questioning skills of clinical facilitators.

Facilitation of critical thinking among nurses in Namibia is just as important because of the complex health care scenario in the country, which requires that nurses render care of a high quality to the clients/patients. However, critical thinking is a basic skill that is underdeveloped by the public education most students receive prior to entering nursing education programmes, and it must therefore be made a priority in the nursing education of those who choose to join the profession (Lindberg, Hunter & Kruszewski, 1998, p. 4).

In nursing education, an intense interest in teaching and assessing critical thinking has emerged, owing to the fact that in some countries it is required for accreditation but also because some educators realize that there is a profound need to improve the critical thinking skills of students to better prepare them for the demands of practice (Fonteyn, 1998, p. 305).

Although many nurses choose to remain at the patient's bedside, there is room for development in the area of thinking, so that the nurse is able to think creatively and rise

to the challenges of nursing the patient (Lindberg, Hunter & Kruszewski 1998, p.4). Nurses who demonstrate critical thinking at the bedside are nurses who ask vital questions, collect relevant information, arrive at well-reasoned conclusions, consider alternative systems of thinking and communicate effectively with others (Howard College, 2006, p.1).

One way to enable nurses to meet the challenges they are faced with is to focus on teaching and learning critical thinking. Critical thinking suggests questioning *how* and *why* things are as they are and how they could be improved or done differently (Robinson, 1998, p.1). A qualitative and contextual study among student nurses was conducted to determine guidelines for the use of a problem-based case study as a strategy for the teaching of critical thinking skills. The aim of the study was to suggest an alternative to the traditional lecture method, which does not stimulate critical thinking, and get lecturers to consider a strategy that would inculcate critical thinking in student nurses. The adoption of a problem-based approach to teaching critical thinking would enhance inquisitiveness and active participation on the part of the students. The students also described their experiences after exposure to the problem case study and their reports were mostly positive (Mogale & Botes, 2001, 28).

In an information and technology driven world, critical thinking could play an influential part in coping with the realities of society and should therefore be addressed in school and nursing curriculums, health care realities and legislation. To stay focused on the

development of critical thinking skills in student nurses, the nursing education faculty should ensure that curriculums are developed with a view to inculcating critical thinking skills among students, within the demarcated discipline of nursing (De Villiers, 1999, p.62).

According to a research study done by De Villiers (1999, p.62) some criteria were formulated as guidelines for curriculum development in nursing. These criteria include the following: the goal, content, plan and implementation strategy of a curriculum should be clearly stated; the philosophy and value of the curriculum should be explained and the approaches and theories used as foundation should be described. Further, the outcomes of the curriculum and the evaluation of those outcomes should be clearly indicated to assess the intellectual performance of the students. The principles of problem-based learning should also be supported in the curriculum development (De Villiers, 1999, p.62).

By integrating all the above criteria into a nursing curriculum, critical thinking can be promoted and the students will feel a greater sense of participation in their own education.

2.4.1 Teaching strategies to facilitate critical thinking

Teaching critical thinking has been identified as an important part of higher education, and similarly much has been said and written about the teaching of critical thinking in

nursing. It is essential to highlight possible strategies for facilitating the teaching of critical thinking.

In nursing, the challenge of teaching critical thinking is directed to the nurse educator, who must determine which method is best suited to his/her discipline. Many different teaching strategies exist, but they are not all suitable for facilitating the development of critical thinking.

The main focus of the teaching of critical thinking is to enhance active involvement by the learner, provide intellectual resources and to provide an environment conducive to the facilitation of critical thinking. In addition, the nurse educator has to model critical thinking to enhance the development of critical thinking in students (Quinn & Hughes, 2007, p.68).

Another challenge to the nurse educator is to give students the chance to speak during teaching sessions and thereby reduce her own lecturing time. Most nurse teachers tend to talk too much, thereby giving the students less opportunity to speak and develop their critical thinking skills. The nurse educator must give the students more opportunities to speak, and thereby foster the development of critical thinking (Burnard, 1995, p. 54; Howard College, 2006, p. 1).

The provision of these opportunities begins with the creation of an environment in which threats and insults have no place. The atmosphere should provide psychological safety for the students. The nurse educator should listen attentively to the students and show them that she/he cares about their efforts. Since teaching of critical thinking in nursing education includes teaching in the clinical setting, a number of approaches can be employed to promote critical thinking in the clinical setting. The nurse educator should motivate the students to ask challenging questions during the care of patients, encourage students to justify or clarify their assertions, and grant them the opportunity to generate original and unconventional ideas, explanations or solutions to problems and model thoughtfulness while in contact with the students. However, continuous monitoring is essential during all these efforts to determine whether the students are progressing in their application of critical thinking skills in nursing practice and whether they understand their own learning in terms of critical thinking (Conger & Mezza, 1996, p. 13; Quinn & Hughes, 2007, p. 69).

A very effective way of teaching critical thinking is through the utilization of case scenarios. A case scenario is a realistic presentation of a client/patient case which encourages students to ask critical and probing questions. A case scenario also enhances active participation on the part of the students, especially when they have to deal with the case in a small group session. During the management of such a case scenario it is important that students should understand that one should not jump to conclusions but

rather analyse the case to find the most suitable solution to the problem on hand (Robinson, 1998, p.8).

The essence of teaching strategies that can facilitate critical thinking is to persuade the students to engage in reflection. Reflection is an action where the student can review, analyse or evaluate an experience or decision. A study by Teekman (2000, p.1127) revealed that the focus on reflection as a teaching strategy in the facilitation of critical thinking is ineffective. This resulted in the development of a model to enhance reflection and at the same time facilitate critical thinking.

Reflection can be related to any of the interventions employed during the scientific nursing process. For example, if the student admitted a client/patient it can be determined by reflection whether the admission was done comprehensively or whether more data is needed (Quinn & Hughes, 2007, p. 69).

2.4.2 Perspective on programme development as a phenomenon in education

As emphasized previously, the development of an educational programme could enhance the application of critical thinking skills by individuals. De Villiers (1999, p. 61) supports the statement by saying that a curriculum that will teach people to think is socially grounded and the logical product of a situational analysis. The author furthermore emphasized that it is essential for nurses to do research on how critical

thinking can be developed in nursing practice to empower the nurse to render holistic care to clients/patients (Redding, 2001, p.63; Souers, 2002, p.9). Jones (2001, p.5) expresses agreement by stating that critical thinking can be learned and even people who are talented in thinking can improve their thinking through education.

It can no longer be assumed that the care rendered by nurses is holistic; neither can they pretend to do their best in caring for their patients. Furthermore, nurses can no longer predict that what they learn today will serve them for a length of time, nor can they believe “that once we have finished a basic course we are adequately prepared for all future nursing situations” because of recent demands in the nursing profession (Burnard, 1989, p.271). This emphasizes that nurses as professional adults require lifelong education to stay abreast of development and changes in knowledge and skills.

In the light of the above-mentioned statement, the researcher was convinced that the development and presentation of an educational programme could enhance the facilitation of critical thinking skills in student nurses. It is a fact that students who have never learned to think need to be taught how to think, how to arrange their ideas into a pattern, how to conceive and create and lastly how to remember what they have learned (Burnard, 1989, p.271; Johns, 2002, p.1).

Moreover, it is the opinion of the researcher that because clinical time is limited, a condensed educational programme as will be discussed shortly, is imperative for the development of critical thinking skills in nursing practice. It is no longer a case of how

academically smart and technically skilled candidates are, but rather how well equipped they are with a diversity of work-related skills, in this instance, nursing-related skills. When concrete practical examples are provided and integrated into teaching critical thinking, the groundwork is thereby laid for lifelong learning (Van den Berg, 2000, p.96; Andolina, 2001, p. xi).

Therefore, the development of such an educational programme is in line with the development of a curriculum which is defined as “formal and informal content and process by which learners gain knowledge and understanding, develop skills and attitudes, appreciations and values” (Dillard & Laidig, 1998, p.71). The latter authors furthermore argued that designing a curriculum of any nature should be in line with the needs of the students and the community and that any curriculum holds a different promise for different groups of students (Grundy, 1987, p.6; Finke & Boland, 1998, p.117). Although the development of a programme differs somewhat from the traditional notion of the curriculum, it is certainly related to that. The notion of an adult education programme primarily connotes short-term learning experiences that are responsive to learner needs and that are delivered outside the traditional educational delivery system, with the emphasis not solely on content (Heimlich & Norland, 1994, p.72; Grotelueschen, n.d, p.82).

An educational programme is therefore designed to provide a sequence of learning experiences that will enable students to achieve desired outcomes as set by a Faculty. To

formulate those outcomes, it should be asked what abilities are expected from the nurse (Boland, 1998, p.135). The expected outcomes will direct the content of the programme as well as the mode of teaching that should be followed to achieve the outcomes set for the programme. It is furthermore assumed that any such programme should focus on and integrate desired competencies to be understood and applied within a given context. Competency is considered the ability to integrate knowledge, skills and abilities into actual practice (Jeska, 1998, p.121; Posner & Rudnitsky, 1997, p.35; Wright, 2002, p.105).

Since the curriculum for this study was formed with practical interests in view, it focused on the process through which the learner (nursing student) and the teacher (facilitator) interact to give meaning to the world (nursing practice). Such a curriculum is referred to as “praxis” since it generates action between humans. Such action is made possible by the fact that the human brain is designed to interact in an either a positive or a negative way. Interaction, in class and nursing practice, stimulates critical thinking as a result of opportunities that are created during these discussions. These opportunities are important to the student nurse because they cultivate an inquiring mind and thereby stimulate critical thinking (Grundy, 1987, p.69; Jeska, 1998, p. 127; Jensen, 2006, p.12).

Massello (1998, p.338) suggests that the following four ideas are vital to the successful development of a programme, namely systematic process, daily practice, system flow and “mental to automatic”). Firstly, the systematic process delivers desired results which

in the case of this research imply that students should have been able to apply critical thinking skills after going through a specific educational programme. Secondly, a programme should entail daily practice, namely nursing practice, and thirdly it should be part of the system so that it corresponds with the aspect of system flow. This educational programme complied with the last-mentioned ideas because it was developed within the Faculty of Medical and Social Sciences where the training of student nurses takes place. Fourthly, the last important requirement of a programme is the “mental to automatic” principle. This perfectly fits the concept of critical thinking since the ideal is to exercise critical thinking automatically after years of nursing practice. “Mental to automatic” refers to a point where a skill, not inborn or genetic, has been mastered (Massello, 1998, p.339). Therefore, during the educational programme the student nurse was exposed to case scenarios that allowed him/her to practice the skill in order to facilitate the development of critical thinking skills (Alfaro-LeFevre, 2004(c), p. 4).

For a programme that focuses on the development of critical thinking, one would aim to get participants actively involved in learning since active learning is more apt to stimulate higher cognitive processes such as those associated with critical thinking (Posner, 1995, p.112; Norton, 1998, p.153). On this subject, Burnard (1989, p.274) is of opinion that “most teachers talk too much” and that learners can only participate if teachers allow them to. Critical thinking offers methods to transform students into active participants in their own intellectual growth. Educators must therefore shape their lecturing programmes to build skills and accommodate levels of self-directedness. Self-

direction and interactive participation nurture and facilitate critical thinking (Bandman & Bandman, 1988, p.2; Naidoo, 1996, p.90).

2.4.3 Profile of a critical thinker

Just as critical thinking may be variously defined, there are different opinions about what characteristics or attribute should prevail in a critical thinker. Many authors have written on what a critical thinker should “look like”, actually referring to what characteristics one would see in someone who thinks critically. *But*, what would one like to see in a nurse rendering nursing care to her patients/clients with critical thinking skills and a critical spirit?

A number of characteristics and attributes of critical thinkers were mentioned in the previous discussions. What is evident in the literature is that authors and researchers agree on some common characteristics that are typical of critical thinkers. These characteristics are diligence, flexibility, fair-mindedness, honesty about personal biases and prudence in judgments. A critical thinker furthermore tends to think in an orderly, focused and persistent manner, and be inquisitive and open minded as well as well-informed although humble, creative and flexible (L'Eplattenier, 2001, p.27; Redding, 2001, p.57; Alfaro-LeFevre, 2002, p.24; Alfaro-LeFevre, 2004 (b), p. 7 ; Lipe & Beasley, 2004, p. 4).

However, for the purpose of this study the researcher would like to include the traits of mind and criteria that were described by Paul (1990, p.6) and Paul & Nosich (1991, p. 18). The authors referred to the affective dispositions, traits of mind and passions that are included in higher –order thinking. The affective dimensions as included by Paul & Nosich (1991, p.18) include independent thinking, fair-mindedness and insight into egocentricity and socio centricity. The development of intellectual humility and intellectual perseverance were also mentioned. According to the authors, without intellectual perseverance one could not solve the complicated multifaceted problems which are prominent in society and the profession per se. To address complicated and problematic situations, intellectual courage and fair-mindedness would also be essential.

Paul (1990, p.6) furthermore refers to the development of intellectual good faith and integrity, confidence in reason and the exploring of thoughts. The development of intellectual curiosity was also included. Without confidence in reason one could not “adequately address those complex and frequently ambiguous real-life problems” that require reasonable decisions (Paul & Norsich, 1991, p.18)¹

Critical thinkers never settle any matter without questioning. They look for alternatives while they are examining the total situation, trying to be informed and seeking for as much precision as the subject permits. While doing all that they remain sensitive to the

¹ Detailed description of these traits appears in Chapter 5

feelings, level of knowledge and degree of sophistication of others (McKown, 1997, p.9 Brown & Rutter, 2004, p.40).

The characteristics described are the ideal, and it is essential to realize that no critical thinker has them all and that characteristics of even the best thinkers vary. What really matters, however, is that these characteristics remain the focus of nursing education and become the pattern for critical thinking (Alfaro-LeFevre, 2004 (b), p.7).

Paul & Norsich (1991, p.18) described intellectual standards that are implicit in the assessment of higher order thinking. These standards include whether the evaluation were done in a relevant and consistent way, whether attention were given to accuracy and fairness and if completeness and precision was evident compared to the topic of assessment. To comply with these intellectual standards , the researcher in the compilation of the scoring rubric for the pretest and posttest , strove to be as accurate and precise as possible to secure a fair and complete scoring of the responses of the participants (addenda 3.2 & 3.3).

The qualities/characteristics of a critical thinker as discussed and referred to throughout the study are shown in figure 2.2.

Figure 2.2: QUALITIES/CHARACTERISTICS OF A CRITICAL THINKER



The development of critical thinking remains the focus of education in general as well as nurse education. Paul (1990, p.4) is clear that to perfect one's thinking it is necessary to develop intellectual discipline and intellectual values. He states that 'genuine education transforms the whole person by transforming one's mode of thinking' (Paul, 1990, p.4).

However, this process cannot happen without observing and eliminating the obstacles to the educational process.

2.5 Obstacles to the facilitation of critical thinking

Although the essence of critical thinking in everyday life and nursing practice is clear, traditionally, nursing practice and education have not encouraged creativity in nursing practice. Nurses were taught that there is one way to perform a procedure and that there is only one answer to a question. This, over the years, has been a huge obstacle to the development of critical thinking by nurses. In teaching and facilitating critical thinking, as in many other processes, certain obstacles must be overcome if success is to be achieved.

In their research, Mangena and Chabeli (2005, p. 292) and Pretorius (2001, p.122) have identified a number of obstacles to the facilitation of the critical thinking process. These obstacles include educators who lack the necessary knowledge about the concept of critical thinking or display a negative attitude and resistance towards change. The teaching and assessment methods that were employed were not facilitative of critical thinking. It was also found that the processes used to select students are inappropriate in terms of educational background, adequate socialization, culture and instructional competence. Some obstacles that were specifically highlighted in relation to the clinical setting are that wards are too busy to teach students or the students abscond and are not available for teaching. Furthermore, a lack of interest in facilitating critical thinking on

the part of both the clinical tutor and the student is evident (Pretorius, 2001, p.113; Mangena & Chabeli, 2005, p. 292)

The obstacles mentioned cannot be ignored and should be appropriately addressed in nurse education. Approaches to overcome the above obstacles during the presentation of the programme are discussed in chapter 7, which deals with the implementation of the educational programme. ²

2.6 Summary

This chapter dealt with the clarification of critical thinking in the nursing context as well as the explanation and illustration of how critical thinking can be employed in the execution of individual nursing care. Emphasis was also placed on how critical thinking can be taught, developed and facilitated as part of the worldwide demand for life-long learning (Finke, 1998, p.3). The main aim of this chapter was to contextualize the term critical thinking within the context of nursing practice and nursing education.

While it is conceded that critical thinking has never been easy, it is contended that with practice one can develop a critical attitude and good thinking skills. Some very important concepts and sub concepts that were highlighted in the discussions were inquisitiveness, open mindedness, analysis, inference and explanation and self awareness by the individual (Wilkinson, 1996, p. 39).

² The elimination of obstacles within the educational programme for this study is described in Table 6.2

Learning to become a critical thinker has been found to be a desirable attribute for a nurse but, although essential to nursing, development of critical thinking should be seen as a lifelong endeavour (Scriven & Paul, n.d., p. 3; Chenoweth, 1998, p. 291).

Therefore the urgent need to teach thinking skills at all levels of education continues and should never be ignored. Nursing as a profession has always demanded critical abilities and qualities from its practitioners because decisions have to be made on the spot under pressure, situations are complex and uncertain “and the consequences of any decision and action are extremely important” (Carr, 1997, p.2; Brown & Rutter, 2004, p.39).

But, learning to think critically is a difficult process that requires encouragement and support by those who teach and facilitate the process. The 21st century teacher, however, irrespective of the environment, recognizes the value of critical thinking at all levels of meaningful learning. The goal of teaching critical thinking is to develop people who are fair-minded, objective and committed to clarity. The question that can be asked about our thinking is whether “we [are] in charge of our thinking or is our thinking in charge of us?” (Mangena & Chabeli, 2005, p. 292; Murchù & Muirhead, 2005, p. 2; Eichhorn, n.d., p.1).

Chapter 3 deals with the methodology of this study and describes the design followed in the different phases of the study.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

Chapter 2 dealt with an extensive literature review on the concept of critical thinking. The aim was to define the term within nursing practice, and emphasize the utilization and facilitation of critical thinking in an educational programme.

This chapter describes the research design/approach that was followed for this study as well as the methods and techniques that were utilized. The design chosen utilized a multiphase approach which necessitates the description of certain components of the methodology under each specific phase. This was necessary because these components were not the same for each phase. The outline of these phases will be presented towards the end of this chapter. (See figure 3.1.)

The next point of discussion concerns the research design.

3.2 Research design

This study involved a **quantitative, quasi-experimental and contextual** design. A research design follows directly from the research problem and is defined as “a set of guidelines and instructions to be followed in addressing the research problem” (Mouton, 1998, p.107). The main function of the research design is to enable the researcher to

anticipate what the appropriate research decisions should be so as to maximize the validity of the eventual results (Mouton, 1998, p. 107). Burns and Grove (2005, p. 211) consider the research design to be the blueprint for conducting the study that maximizes control over the factors that could interfere with the validity of the findings.

The descriptions of the research strategy will now follow:

3.2.1 Quantitative research

Quantitative research is the formal, objective, systematic process in which empirical evidence is gathered and numerical data used to obtain information (Burns & Grove, 2005, p. 23; Polit & Beck, 2006, p. 15). A quantitative approach was selected for this study because the researcher carried out a number of orderly, disciplined procedures to acquire information and worked from a specific group of concepts through deduction to a framework for the development of an educational programme. The researcher furthermore progressed through a series of logical steps to develop the programme.

3.2.2 Quasi-experimental design

Quasi-experimental research is a type of quantitative research conducted to explain relationships and clarify why certain things happen. Quasi-experiments, like true experiments, involve the manipulation of an independent variable, that is, an intervention. However, quasi-experimental designs lack the randomization of treatment groups which is evident in true experiments (Polit & Beck, 2004, p. 181; Burns &

Grove, 2005, p.748). A quantitative approach was followed during all four phases of the research.

A detailed description of the quasi-experimental design will be discussed under phase 3. (See chapter outline.)

3.2.3 Descriptive

In support of a quantitative approach, descriptive studies are conducted when little is known about a phenomenon within a given context, and the researcher aims to describe that phenomenon. Polit and Beck (2004, p. 192) state that descriptive studies aim to observe, describe, count, delineate, and classify data and document aspects of a certain phenomenon or situation as it naturally occurs; they also sometimes serve as a starting point for hypothesis development. This description of Polit and Beck's was utilized during phases 1, 3 and 4 of the study. The way it was done is described in each phase (Burns & Grove, 2005, p. 26; Hornby, 2005, p. 381; Polit & Beck, 2006, p. 14).

3.3 Population and sample

The population for each of the phases differed and will be discussed when the phase is addressed in its relevant chapter. A detailed outlay of the different research phases appears in Table 3.1

3.4 Data collection and data analysis

The data collection and analysis procedures followed for each phase were different and will therefore be described when discussing the applicable phase in its relevant chapter.

3.5 Reliability and validity

The aspect of reliability and validity was applied in three of the phases of the study. In each of these three phases the type of reliability and validity relevant to the phase was discussed.

3.6 Pilot testing

Pilot testing was conducted in two phases, namely phase 1 and phase 3. The detailed discussion of these two pilot tests is presented in the chapters that deal with these phases as indicated below. (See 3.7.)

3.7 Research method

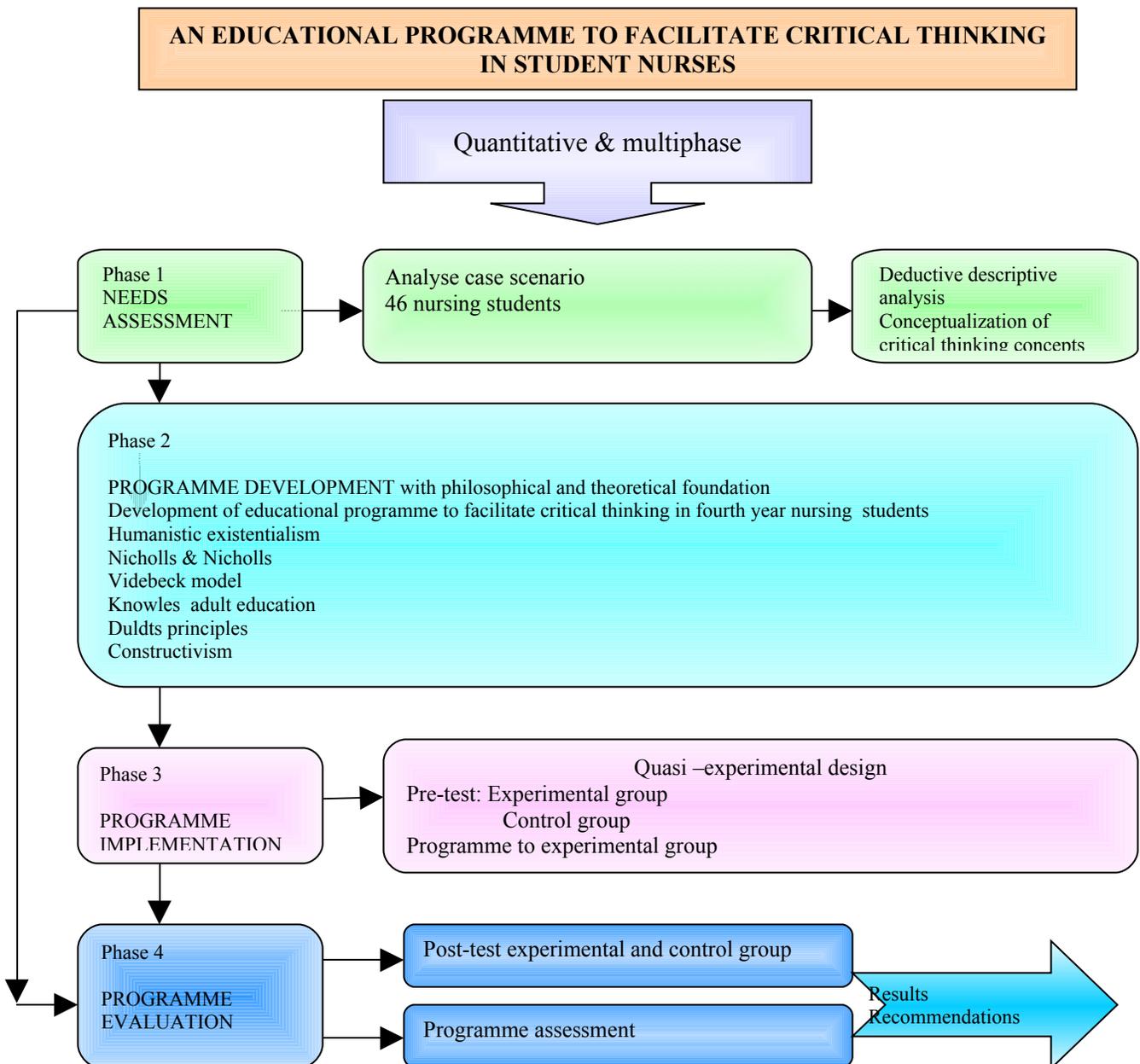
The research for this study was conducted in four phases, namely:

- Phase 1: Needs assessment and conceptualization – Chapter 4 & 5
- Phase 2: Development of the educational programme – Chapter 6
- Phase 3: Implementation of the educational programme – Chapter 7
- Phase 4: Evaluation of the educational programme – Chapter 8

Each of the phases will be discussed separately in later chapters.

Figure 3.1 represents an outlay of the phases of the study as described in the preceding text. Since the detailed methodology of the study is described through the different chapters describing the phases, the research process and its activities are indicated in Table 3.1.

Figure 3.1 OUTLAY OF RESEARCH PHASES



The phases with its detailed activities are indicated in Table 3.1

Table 3.1 OUTLAY OF RESEARCH PHASES AND ACTIVITIES

Phase	Objective	Population/ Unit of analysis	Sample Sampling method	Data collection	Data analysis	Validity/ reliability
1	Needs assessment	4 th year basic nursing students ³	46 voluntary participation by all students Windhoek and Oshakati campus	Imaginary case scenario with 15 questions in structured questionnaire	Deductive reasoning Content analysis Descriptive statistical analysis	Content validity Pilot study Inter-rater reliability
2	Development of the educational programme	Not applicable	Not applicable	The utilization of information from phase 1	Not applicable	Verification of the educational programme with experts and fit within the theoretical framework
3	Implementation of the educational programme	4 th year basic nursing students ⁴	100 voluntary participation by all students Windhoek and Oshakati campus	Pre-test : Imaginary case scenario with 11 questions in structured questionnaire	Content analysis Descriptive statistical analysis	Content validity Pilot study Inter-rater reliability
4	Evaluation of the educational programme	As for phase 3	As for phase 3	Post-test : imaginary case scenario as in pre-test Assessment of course presentation	Descriptive statistical analysis and parametric testing	Content validity Pilot study Interrater reliability

³ Two different populations were used for phase 1 and phase 3. Phase 1 involved final year nursing students from 2005 while phase 3 involved final year nursing students from 2006.

⁴ Two different populations were used for phase 1 and phase 3. Phase 1 involved final year nursing students from 2005 while phase 3 involved final year nursing students from 2006.

3.8 Ethical considerations

Since human beings were used as study participants in this study, care was exercised to protect the rights of the human participants (Polit & Beck, 2004, p.141).

The following ethical measures were adhered to during all four phases of the study:

- The principles of beneficence and non-maleficence were adhered to because the researcher strove to minimize harm and/or discomfort and maximize benefit to the participants in the research study.
- The principle of self-determination was adhered to because participants had the right to decide voluntarily whether to participate in the study (Polit & Beck, 2004, p. 147). Prior to conducting the research, the researcher entered into an agreement with participants to clarify the nature of the research and the responsibility of each participant. This served to establish voluntary, fully informed participation of the student nurses in the completion of the questionnaire on the case scenario as well as for participation in the study. The researcher refrained from any form of coercion.
- Participants were protected from exploitation and they were assured that any information provided by them would not be used against them
- Anonymity was ensured because only numbers appeared on the completed case scenario answers
- Information obtained from respondents were not identified in terms of the identity of the respondent and thereby confidentiality was ensured. The privacy of the research participants was therefore protected.

- Participation in the educational programme was voluntary.
- The participants were free to withdraw from the educational programme at any time without incurring any penalty.
- Utilization of the data was discussed with the participants, prior to conducting phase 3, by filling them in on the overall aim of the study.
- Participants in the study enjoyed benefits and freedom from harm. Full disclosure applied to participants entering phase 3 of the study.
- The participants were guaranteed anonymity and confidentiality in the pre-test for phase 3.
- Institutional approval for the study was obtained from the University of Namibia before phase 1 was conducted.
- To comply with the ethical obligation of the researcher towards the control group, study material was made available to them in the form of a self- instructional guide with clear guidelines.

3.9 Summary

As the study was multi-phased it was deemed more appropriate to discuss only the broad methodological concepts and to present detailed descriptions under each relevant phase. In this chapter the relevant phases were outlined and an indication was given on which methodological component would be dealt with under each specific phase. The methodology employed for this study was selected with the expectation that knowledge concerning critical thinking would be acquired (Burns & Grove, 2005, p.10) which

could be used to help nurses in the country (Namibia) realize that they can improve on their nursing care by thinking critically. The main focus of the study was the development of an educational programme to facilitate critical thinking, as indicated in phase 3 of the methodology.

The following chapter, chapter 4, deals with phase 1 of the study.

CHAPTER 4

NEED ASSESSMENT AND DESCRIPTION OF RESULTS

4.1 Introduction

This chapter deals with phase 1 of the study. Phase 1 focused on a needs assessment. Needs assessment is regarded as a prerequisite when developing a programme. By carrying out a needs assessment the researcher aimed to achieve what Jooste (2003, p.99) calls tailoring a programme to fit individual needs.

The next discussion will be on the methodology used for phase 1.

4.2 Methodology for phase 1: Needs assessment

In phase 1 the researcher entered the field of nursing practice in Namibia in order to do a need assessment with regard to the application of critical thinking skills by a selected group of students in nursing practice. Needs assessment in this phase is synonymous with the situation analysis that is conducted when a programme is developed.

Purpose:

The researcher's main purpose was to determine the ability of the learners to use critical thinking in practice. The results would strengthen the need for the development of a critical thinking programme. To further this purpose, specific objectives were stated.

Objectives

The objective for phase 1 was to determine the ability of student nurses, in their final year of study, to critical thinking in practice. The researcher was interested in the ability of the student nurse to apply and integrate aspects of critical thinking in the management of a nursing problem.

Design:

A quantitative, descriptive design utilizing a case scenario was employed for this phase. The way the descriptive design was employed in this phase was described in chapter 3. The researcher was able to describe the findings from the needs assessment. The data of phase 1 will be presented in a descriptive format that will be discussed further on in this chapter.

Population

The target population for this phase was senior student nurses registered at the University of Namibia, in their fourth year of nursing studies in the training hospitals of Windhoek and Oshakati. A total of 46 fourth-year nursing students, registered at the Faculty of Medical and Health Sciences in the Department of Nursing, were included for phase 1 except for the two students who took part in the pilot study. The students were from both campuses, namely the Windhoek and Oshakati campuses, doing the four-year Diploma in Comprehensive Nursing curriculum, which incorporates the principles of critical thinking.

The following inclusion criteria were set:

- The students should have completed the third-year curriculum in General Nursing at the Department of Nursing, which incorporates ear, nose and throat infections, as presented in the case scenario, as one of the areas of specialization.
- The students should have done and completed the third-year curriculum in Community Health Nursing, where physical examination of a client, examination of the ear per se, is integrated as part of the practical learning experience and requirements. Physical examinations on all body systems are done extensively during this period.
- IMCI (Integrated Management on Childhood Illnesses) where ear infection appears to be a prominent condition in smaller children that nurses in Namibia are required to manage should have been completed. During this training, the students also learn about the treatment protocol and general management of cases.
- The completion of the five-week compulsory rural placement community practice is a requirement. During this period the students were allocated to rural community health clinics where they were expected to physically examine clients, diagnose conditions and manage cases, particularly clients suffering from acute ear infections.

In the light of the above, with the emphasis on a developed base of knowledge, the researcher was of the opinion that final-year nursing students should be able to analyze the given case scenario with ease.

Sample and sampling:

No sample was drawn. All the student nurses in their fourth year of study who were registered at the University of Namibia were included in the study. The total population as described above was included. Participation in the study was voluntary.

Development of instrument for data collection

An imaginary case scenario was developed for students to analyze and answer some relevant questions to enable the researcher to determine the level of understanding and integration of critical thinking of the fourth-year nursing students. The case scenario contained a relevant condition in relation to the disease profile in Namibia. The format of the case scenario focused on a pediatric disorder that was covered in the theoretical as well as clinical curriculum and the education of the group of students concerned.

The case scenario consisted of 15 realistic questions. The questions were open-ended and students had to write their own answers as they thought best. The researcher formulated open questions in such a manner that the students were able to display creativity and initiative in their answers. Therefore, without being restricted to certain answers, the students had the opportunity to indicate how they would have managed the case. The main aim of the case scenario was to present the students with a case they were familiar with and which had been included in their theoretical and clinical instruction, as already described under the reasons for the inclusion of the questions in the study. [See addendum 1.1]

A case scenario serves as a research instrument for gathering data about a specific concept (Roberts & Stone, 2003, p. 70), in this case critical thinking.

Validity

Validity concerns the soundness of the evidence produced by the study – that is, whether the findings are cogent, convincing and well grounded. It also refers to the degree to which an instrument measures what it is supposed to measure (Polit & Beck, 2004, p. 416; Polit & Beck, 2006, p.41). The instrument based on the imaginary case scenario that was used for the data collection in phase 1, had content-related validity. Face validity was also ensured by asking relevant questions to the case scenario (Burns & Grove, 2005, p. 377), because it concerned a paediatric case which was familiar to the nursing students. The students were also expected to apply whatever critical thinking skills they had to answer open questions on the case presented, which is in line with the overall purpose of the study, namely to develop an educational programme to facilitate critical thinking of student nurses. This ensured content validity (Babbie & Mouton, 2001, p. 123).

Validity in the study was furthermore ensured by compiling a case scenario based on a common paediatric case and relevant questions. This was a means of ensuring content validity

Reliability

Reliability, on the other hand, refers to the accuracy and consistency of information obtained in a study and can be determined in different ways (Polit & Beck, 2004, p. 416; Burns & Grove, 2005, p. 374). Reliability was ensured by the two criteria, namely equivalence and consistency. Equivalence is the comparison of two versions of the same instrument measuring the same event, referred to as inter-rater reliability. It indicates the degree to which two raters or observers, operating independently, assign the same ratings or values for an attribute being measured or observed (Polit & Beck, 2004, p. 416). In the case of this research study, inter-rater reliability or equivalence was ensured by using two assessors to assess the instrument and checking inter-rater reliability.

The answers of students were analyzed by both the researcher and an independent evaluator to determine whether the evaluators interpreted the questions in the same way and to detect any discrepancies. Moreover, student answers were rated twice to determine consistency in the researcher's ratings.

Inter-rater reliability was determined by pilot testing.

Pilot testing

Pilot testing of the instrument is a small-scale version or trial run, done in preparation for a major study (Polit & Beck, 2004, p.727).

Testing the instrument forms part of the pilot study. Testing an instrument in a research study implies validity, reliability and pilot testing of the instrument. In a quantitative

research design this is important to secure accurate measurement, and reflects the truth and scientific merit of a study (Polit & Beck, 2006, p.41).

The instrument was given to two (2) fourth-year nursing students to complete, in order to detect any problems regarding the questions set. By analyzing the case scenario of the pilot test the researcher detected that some questions was not stated clearly enough and did elicit the answers anticipated. The answers of the students were also analyzed by an independent co-evaluator in order to secure inter-rater reliability. It turned out that some questions had to be more clearly stated because ratings of the answers by the two evaluators were different as a result of the ambiguity of the answers.

The instrument was then revised and extensive detailing of questions was done to exclude ambiguity. The items addressed involved verbs and questions that were misunderstood by respondents. Clearer instructions were given so that the students could understand the questions and would not have any doubt on how to answer them. The instrument was piloted again, involving the same students, and it was apparent that the students understood it. The inter-rater reliability was again determined by calling for input from an independent evaluator. The evaluations then turned out to be more similar.

After the researcher was satisfied with the compilation of the instrument, data were collected.

Data collection

Data collection refers to the precise and systematic gathering of information relevant to the research purpose or the specific objectives, questions or hypotheses of a study, indicating exactly what the researcher wants to determine and how the data will fit into the activities envisaged for the study. It is therefore considered to be the process of selecting subjects from whom data will be gathered (Burns & Grove, 2005, p. 421).

For this particular study the researcher was interested in how the fourth-year nursing students would manage a problem case on a common illness, by utilizing their critical thinking skills.

The students were given enough time to answer the questions pertaining to the scenario. Since consistency in data collection is important, all fourth-year students, on both campuses, received the same case scenario and the same questions (Burns & Grove, 2005, p. 421). The scenario was handled by the researcher at the Windhoek campus and by a research assistant (also a lecturer in the Department of Nursing) at the Northern campus.

Data analysis

Data analysis will be presented in three parts:

- **Explanatory information on the process of data analysis**
- **Approach to the analysis of the data**

- **Description of results /findings**

In this study the results from the data analysis of this phase will be utilized during conceptualization. (See chapter 5.)

Data analysis is the systematic organization and synthesis of data to present them in a logical and sensible way. It is the process whereby data are reduced, organized and described in order to give them meaning (Burns & Grove, 2005, p. 733). Data analysis includes a number of activities before the results can be presented, since data themselves do not provide any research information. They have to be broken down into constituent parts in order to be understood (De Vos, Fouche & Venter, 2002, p.222; Polit & Beck, 2004, p. 716).

In this study each student's answers were deductively analyzed by calculating central values, more specifically the mean for each question, to determine their application of critical thinking skills in the management of a nursing problem.

During the analysis of the answers to the case scenarios, the researcher tried to identify the critical thinking concepts utilized by students to answer the questions on the particular scenario. As many critical thinking concepts as possible were deduced from the students' answers and described.

The concepts arrived at formed the initial foundation of the conceptual framework for the educational programme which was developed in phase 2. However, owing to the vast

number of concepts, the researcher had to embark on a process of concept synthesis. This activity will be described in chapter five.

- **Approach to the analysis of the data**

The approach to the data analysis of this phase was deductive. The descriptive data arising from the items the students answered were analyzed from the perspective of exploring and describing participants' responses to the questions posed, and the critical thinking skills they applied in responding to the question. To answer each question, certain critical thinking abilities were required from the respondent.

Each question answered was rated on an ordinal scale of 1 – 5 that represented the following:

- 1: concept of critical thinking not applied
- 2: respondent attempted to apply concept of critical thinking
- 3: principle of critical thinking was applied but answer was theoretically wrong
- 4: concept of critical thinking successfully applied
- 5: question not answered

[See addendum 1.3.]

During the analysis of the answers to the scenario, the researcher was able to determine the understanding, utilization and application of critical thinking skills by the student nurses in the management of the case scenario presented. Analysis was done according to a mark-reading sheet [See addendum 1.2.]

Data were organized by means of a frequency distribution to determine the highest and lowest scores, the most common score and the number of students participating in the study (Polit & Beck, 2004, p.455). None of these was apparent before the data were organized.

After organizing the data per item, the mean value per item was determined. The mean is equal to the sum of all scores divided by the total number of scores. The mean is a measure that comes from univariate descriptive statistics. It is usually referred to as an average and is the most widely used measure of central tendency, owing to its stability. The mean furthermore specifies the centre of gravity of the distribution (De Vos, Fouche & Venter, 2002, p. 236; Polit & Beck, 2004, p. 460). The sum of the scores was obtained by adding all scores per item (question) on the case scenario.

The data will now be analysed per item (question on scenario), with a discussion of concepts that indicate that critical thinking was applied during the response. The discussion of the deductive analysis is presented as the questions appeared on the questionnaire, based on the imaginary case that was handed to the students.

4.3 Description of results /findings

The discussions of the findings will follow the sequence of the fifteen questions as presented to the students in the case scenario. For easy comparison the numbering format in the text corresponds with the numbering of the questionnaire.

Question 1: What risk factors, in your opinion, does Sarah have for developing acute ear infection? Give reasons for your answer.

The students were expected to identify and give reasons for the risk factors that could have contributed to the child's condition, namely acute ear infection. It was possible to pick up some of the answers from the scenario, but the student should also have reasoned from the given information to determine the risk factors.

To answer this question successfully, the following critical thinking skills could have been applied:

The students obtained a mean value of 1.8 out of a possible 5 for analytical reasoning and 2.1, out of a possible 5 for independent thinking. The latter implies that students attempted to think for themselves but could not bring analytical thinking to bear on the exercise, and were therefore unable to assess the child's situation, as stated in the scenario, successfully.

Question 2: Comment on the possible association between passive cigarette smoke and ear infections. Give reasons for your answer.

In order to answer this question, the students had to rely on what they know about the anatomy of the ear but most of all they were supposed to give a reasoned opinion on the possible relation of the child's condition and circumstances. The following critical thinking concepts were incorporated into this question and could be utilized to answer the question:

- Divergent thinking

- Focus on the “relation”

Divergent thinking implies that they should have drawn a conclusion from existing data by focusing on the association as asked in the question and by deleting irrelevant data (Green, 2000, p. 7; Lipe & Beasley, 2004, p. 6). A mean of 1.7 out of a possible 5 was obtained for divergent thinking, where a mean of 2.0 out of a possible 5 was obtained for their ability to focus. Scores of this order indicated that the students were not able to think more deeply about the question, since the answer to the question was not indicated directly in the scenario. They could only focus, to a certain extent, on what was presented to them.

Question 3: Distinguish between the clinical picture of acute ear infection and chronic ear infection.

The above question required students to recall theoretical knowledge about the condition of “acute ear infection” in order to state the difference between acute and chronic ear infection. This specific theoretical knowledge was covered repeatedly in their third and fourth years of study, as indicated in the inclusion criteria.

When the question was analyzed it seemed that students did not have much difficulty in writing the theoretical explanation, as is evident from the mean of 2.6 out of a possible 5. Students were expected to obtain fairly good scores for this question since they had been through three theoretical sessions on different occasions within one year, as discussed in the inclusion criteria, where this condition featured prominently and should not have been difficult for students at their level to recall.

The other critical thinking concepts that were applicable in answering this question were clarification of and discrimination between theoretical facts. With this higher order thinking where the theoretical knowledge merely served as support, the students obtained a mean value of 1.8 in clarification and 2.1 in discrimination, out of a possible 5. It is therefore clear that the students found it hard to explain or substantiate what they had written about the distinction between acute and chronic ear infection.

Question 4: Discuss the association between upper respiratory infection and ear infection. Give reasons for your answer.

In this question students were expected to interpret the theoretical knowledge they possess and then use it to substantiate their explanation of the association between two anatomical structures that are directly involved in the condition of acute ear infection. Theoretical knowledge only would not be enough to answer this question, which required an interpretation and application of the knowledge.

The critical thinking concepts that applied to this question were:

- Reflection
- Analytical explanation to clarify the relation

Students performed weakly in answering these questions. For reflection, where they really had to argue about “if this ...then that” a mean value of 1.8 out of a possible 5 was obtained and for the analytical explanation a mean value of 1.7 out of a possible 5 was obtained. The analysis of this question indicated that students did not have the ability to

argue from the basis of the knowledge they have and apply it to a scenario presented to them.

Question 5: What other related nursing diagnoses could apply to this scenario?

Working from the facts in the scenario, students were expected to evaluate, consider and then make a decision by separating relevant from irrelevant data. The students were expected to make a nursing diagnosis of the child.

In order to answer this question, students would have had to apply the following critical thinking skills:

- Divergent thinking
- Identification of a nursing problem and clinical decision making
- Evaluation of facts in order to make a decision

A mean of 1.7 out of a possible 5 was obtained for all the above-mentioned critical thinking abilities. In brief, students were unable to answer this question with success.

Question 6: Describe and explain your approach in detail to Sarah's father about

- a) **his cigarette smoking and**
- a) **the danger smoking poses to his children**

This question was asked to determine whether students are able to display intellectual courage, understand the father's opinion and also to determine whether the students were curious about what the father knows and does not know.

The score for this question was very low. On the question of understanding the opinion of the father, a mean of 1.2 out of a possible 5 was scored; intellectual courage was not exercised (the mean was 1.1) and students mostly displayed no curiosity, as is evident from the mean score of 1.2. The mean scores were calculated out of a possible 5.

In answering this question, students tended to be very paternalistic to the father by telling him what he should and should not do, instead of asking him for his opinion, trying to establish what he knows and trying to understand his behaviour.

Question 7: In your opinion what could be a possible treatment for the child. Give the reasons for your choice of treatment.

This question was included to determine the application of the following critical thinking abilities:

- use of cognitive knowledge as basic support
- evaluation
- clarification
- goal-directedness

It was clear that the students were aware of the protocol used in the treatment of acute ear infection and they were also able to stay focused on the goal they wanted to reach in the treatment of the child. In most cases the answers corresponded to the protocol of treatment as used in the IMCI [Integrated Management of Childhood Illnesses] regime. Clearly they did use their knowledge to support their answers, as is evident in the mean

score of 2.6 out of a possible 5. Since they focused on the prescribed protocol, it helped them to be goal directed since they were able, in many cases, to clarify why they use a particular drug. For clarification a mean of 2.1 out of a possible 5 was obtained, and a mean score of 2.2 out of a possible 5 was calculated for being goal directed.

Students found it difficult to apply the ability to evaluate the regime and explain the rationale behind a specific choice of treatment, however. They were supposed to state that if the first line of choice of antibiotic fails, the second line would be used. They were also supposed to indicate what the second line of antibiotics consisted of. A mean of 1.8 out of a possible 5 was obtained for this concept.

Question 8: Describe your approach with regard to parents who place their children at risk for health problems

This question focused on the application of affective critical thinking skills, namely:

- being open minded
- being creative
- applying intellectual humility

The students were expected to explore the situation with an open mind and be creative in what they said and how they approached the parents. They should have had the intellectual humility to admit that they do not know how the parents think or what they believe and should first have informed themselves about the parents' thinking before prescribing to them what to do.

The scores for these questions were not very high but indicated that students did not apply these skills as expected.

A mean of 1.3 out of a possible 5 was obtained for intellectual humility, a mean score of 1.5 out of a possible 5 for creativity and a mean value of 1.6 out of a possible 5 was obtained for the quality of open mindedness.

It was also evident from the students' answers that they liked to tell the parents what to do without having any background information on the rationale behind their actions.

Question 9: What other information about Sarah and her family, other than in the case study, would you need to address Sarah's problem?

To answer this question the students had to display the following critical thinking skills:

- analysis
- an inquiring mind
- independent thinking.

The students had to read through the scenario and then analyze the content given. From that analysis, the student should have had some questions/queries in his/her mind and have been thinking autonomously on what he or she still needed to know to render holistic care to this child with acute ear infection.

For analysis and independent thinking a mean value of 1.5 out of a possible 5 was obtained, but the students only got a mean score of 1.4 for an "inquiring mind".

It was clear that students were not able to search for information which was not given to them in the scenario. They did not identify issues that they needed to know in order to give proper care to this child. A holistic approach to the problem tended to be lacking and the role of some relevant elements like the environment was totally ignored.

Question 10: Would you consider that there was any difference between ear infection in children and the same condition in adults? Explain your answer.

Students were again expected to draw conclusions from the scenario and to substantiate their answer with a clear explanation. With a mean value of 2.1 out of a possible 5, for their inferential ability, it was clear that the theoretical knowledge they have of the anatomical structure of the ear in children and adults assisted them to answer the question. They could, however, not manage to clarify their answer with a clear explanation, as was evident in the mean score of 1.8 out of a possible 5.

Question 11: If you were the parent, what would you need to know before taking your child home?

This question was included in the questionnaire to determine whether the students could think themselves into the parent's situation and indicate what the parent would need to know before leaving the health centre. The two critical thinking skills reflected in this question were:

- intellectual empathy
- creativity

Respondents were, to a certain extent, able to think themselves into the parents' situation and some valuable ideas regarding what they would have liked to know emerged from the answers to this question. A mean score of 2.3 out of a possible 5 was obtained.

For mental creativity a mean value of 1.9 out of a possible 5 was obtained here. This is slightly higher than the creative ability that was assessed from the answers to question 8 (mean 1.5), as described above. The reason for this might be that the expected answers differ according to the question. However, both scores are considered low, bearing in mind that these students will be entering the field as professional nurses in less than four months from the time of data collection.

Question 12: Describe your goal in Sarah's management

In order to answer this question the students had to be goal directed and focused on the management of Sarah, a child with an ear infection. In general, students showed a slight ability to stay focused and displayed the ability to keep certain goals – such as pain relief in their management of the client in mind.

For both concepts a mean value of 2.2 out of a possible 5 was obtained.

Question 13: Write Sarah's report as you would have written it in her health passport.

This question was included to determine whether the students were able to write critically after their management of the case. Many students attempted to write clearly

but the majority of respondents failed to write clearly about the management of the case, let alone write critically.

This concept got a mean value of 1.7 out of a possible 5. By analyzing this question it became clear that if the approach to a case was superficial and not well thought through, the report on the case would also be inadequate and not critically expressed.

In answering this question, students wrote the parameters and the treatment but nothing more. Those represented the information they had in front of them. Some did not even comment on the fact that the client was back for the second time. No referrals to other members of the health team, for example to a social worker were mentioned. In most cases the report about Sarah and her management was improper and meaningless.

Question 14: Explain how you feel about the way you approached Sarah’s case.

This question gave students the opportunity to reflect on their experience, to ponder over their choices and to become aware of their “self” and how they felt about the way they handled the case scenario.

The following critical thinking skills were assessed in this question:

- intellectual integrity
- reflection
- open-mindedness
- self-awareness.

It seemed to be a difficult task for respondents to reflect on their own feelings and to be open minded about why and how they handled the case. Four respondents left these

questions unanswered, which did not frequently happen in the replies to the questions of the scenario. The mean value for the application of intellectual integrity for this question was 1.8 out of a possible 5. For reflection the mean value of 1.9 was obtained. This is almost similar to the mean value of 1.8 for this concept in question 4. Open-mindedness obtained the low mean value of 1.7 out of a possible 5.

It was also found that students did not succeed in writing about themselves and how they presented and managed the case. It is important to note that care of a patient can only improve if a respondent can reflect on how she or he handled the case and detect areas for improvement.

Question 15: Describe the difficulties you encountered in answering the questions about the scenario.

The last question of this scenario called for self-assessment by the respondents. A mean value of 2.2 out of a possible 5 was scored. Three respondents did not answer this question. Students found it hard to assess themselves in order to identify areas of improvement.

Assessment by researcher

Five additional summative questions, namely questions 16–20 on the case scenario, were added to the evaluation tool for the scenario and had to be scored by the researcher only. These questions were not included as part of the questions the respondents had to

answer. The rationale behind these questions was to allow the researcher to gain an overall impression on the handling of the scenario by the individual students.

The questions were scored out of a possible 5 with 1 as “not at all”, 3 as “satisfactory” and 5 as “to a great extent”.

The scores for these questions are described below.

Question 16. Did the student display intellectual perseverance?

For this question it should have been evident that the students displayed the ability to handle difficult situations by providing multiple answers/solutions. A mean value of 2.5 out of a possible 5 was obtained. It was evident that very few students left out any questions. It was also significant that students tried to answer the questions in some way, although not always as expected.

Question 17. Did the student display a questioning mind in answering the questions?

This question was included to assess the overall ability of the students to ask questions and not accept everything as is but to try and find alternatives to certain answers. For this question a mean value of 1.6 out of a possible 5 was obtained. It emerged very clearly that students tend just to accept what they are told rather than to ask questions about the case. For critical thinking to be applied, an inquiring mind is essential.

Question 18. Did the student display diligence in obtaining information?

Diligence in obtaining information is supportive to the inquiring mind that was evaluated in question 17. A mean value of 1.5 was obtained out of a possible 5, which actually supported and clarified the above assumption that students do not question enough. Not having or not applying this ability can have a detrimental effect on the utilization of the nursing process and will affect the care of the patient negatively.

Question 19. Was the overall approach to the case study analytical – was it clear that student stay focused?

It was found that students, in a way, did stay focused and that they tried to analyze the case scenario. A mean of 2.5 out of a possible 5 was obtained, which indicated that these two concepts were almost satisfactorily applied as part of an overall approach to the case scenario.

Question 20. Was the thinking purposeful? – is it clear that student know where heading with this scenario?

The impression was that students were in contact with the case all the time and that they were trying to think purposefully to answer the questions. A mean value of 2.4 out of a possible 5 was obtained for this summative question.

4.4 Summary

Although the researcher is of the opinion that the analyzed concepts are the ideal for a

nurse to possess, it was important to reduce the concepts to a few which are considered most important to include in an educational training programme for nurses in Namibia in order to equip them with the skills needed to handle any situation they can possibly be confronted with. The researcher has, with literature support, arrived at “umbrella” concepts, namely the most important concepts that nurses in Namibia need and without which they cannot practice. These umbrella concepts are to be included in the educational programme.

The term “critical approach” is, for the purposes of this research, regarded as a comprehensive term to describe the execution of critical thinking. Facione (1998, p.7) states clearly that a critical approach does not refer to a person who is always negative or hypercritical but that it refers to a person who has a probing inquisitiveness, a keenness of mind, a zealous dedication to reason and a hunger or eagerness for reliable information.

Norris (1985, p.44) is very clear that no matter what level of critical thinking a person possesses, it is of no value unless the person has a critical spirit. For the purposes of this study the term “critical approach” will be used to encompass all related concepts to critical thinking on the assumption that if a nurse possesses the skill of critical thinking, she/he possesses a critical approach.

In chapter 5, the researcher conceptualized the terms as identified in this chapter.

CHAPTER 5

CONCEPTUALISATION OF THE CRITICAL THINKING FRAMEWORK WITHIN NURSING

5.3 Introduction

This chapter bridges phases 1 and 2. The purpose of this chapter is to conceptualize the empirical findings arrived at from the needs assessment (phase 1), which reflected the application of critical thinking skills by the respondents (see addendum 1.4). The ultimate aim was to develop an educational programme to facilitate critical thinking in nursing practice. Mouton (1998, p.109) describes conceptualization as the definition of key concepts in a study with a view to integrating one's research into conceptual frameworks. The term also refers to a category of perceptions or experiences (De Vos, 2002(b), p.29).

The findings revealed six main concepts and their related sub-concepts. These concepts included interpretation, analysis, evaluation, inference, explanation and self-regulation. These concepts were inferred from the deduction by the researcher. These concepts were the results of the concept analysis of critical thinking by 46 experts directed by Facione (1990, p. 6), together with the related dispositions.

These six main concepts constituted the framework within which the educational programme was developed.

5.2 Development of a conceptual framework

The conceptual framework for the development of the educational programme is presented by defining the central concepts and thereafter provides an outline of the relationship between these concepts.

5.2.1 Concept synthesis

Concept synthesis is defined by Walker and Avant (2005, p. 32) as a strategy to extract or pull together concept(s) from a body of data or set of observations. Furthermore, data for concept synthesis can be obtained from direct observation, quantitative evidence, literature, or a combination of the three (Walker & Avant, 2005, p.39).

The development of a conceptual framework for the educational programme to facilitate critical thinking in student nurses was based on a synthesis strategy whereby central concepts were formed from empirical evidence obtained from phase 1. The questions on the case scenario were formulated to address certain critical thinking skills that were found in the literature to be important in managing problem cases of this nature. The researcher decided on the strategy of a case scenario because much has been written on the utilization of this strategy in the facilitation of critical thinking. Case scenarios enhance active participation by students and encourage creativity, which in itself is crucial in the facilitation of critical thinking (Carlisle & Ibbotson, 2005, p.527).

From the answers obtained the researcher used synthesis to sift through a large amount of data from phase 1 (needs assessment), in order to identify important factors or relationships within these data. Since the researcher was confronted with a bulk of evidence after analyzing the data from phase 1 (needs assessment), concept synthesis was the logical next step. (See figure 5.1.)

Concept synthesis was conducted to cluster the essential concepts, which according to the literature; any nurse should have in order to cope with managing a problem situation in nursing practice.

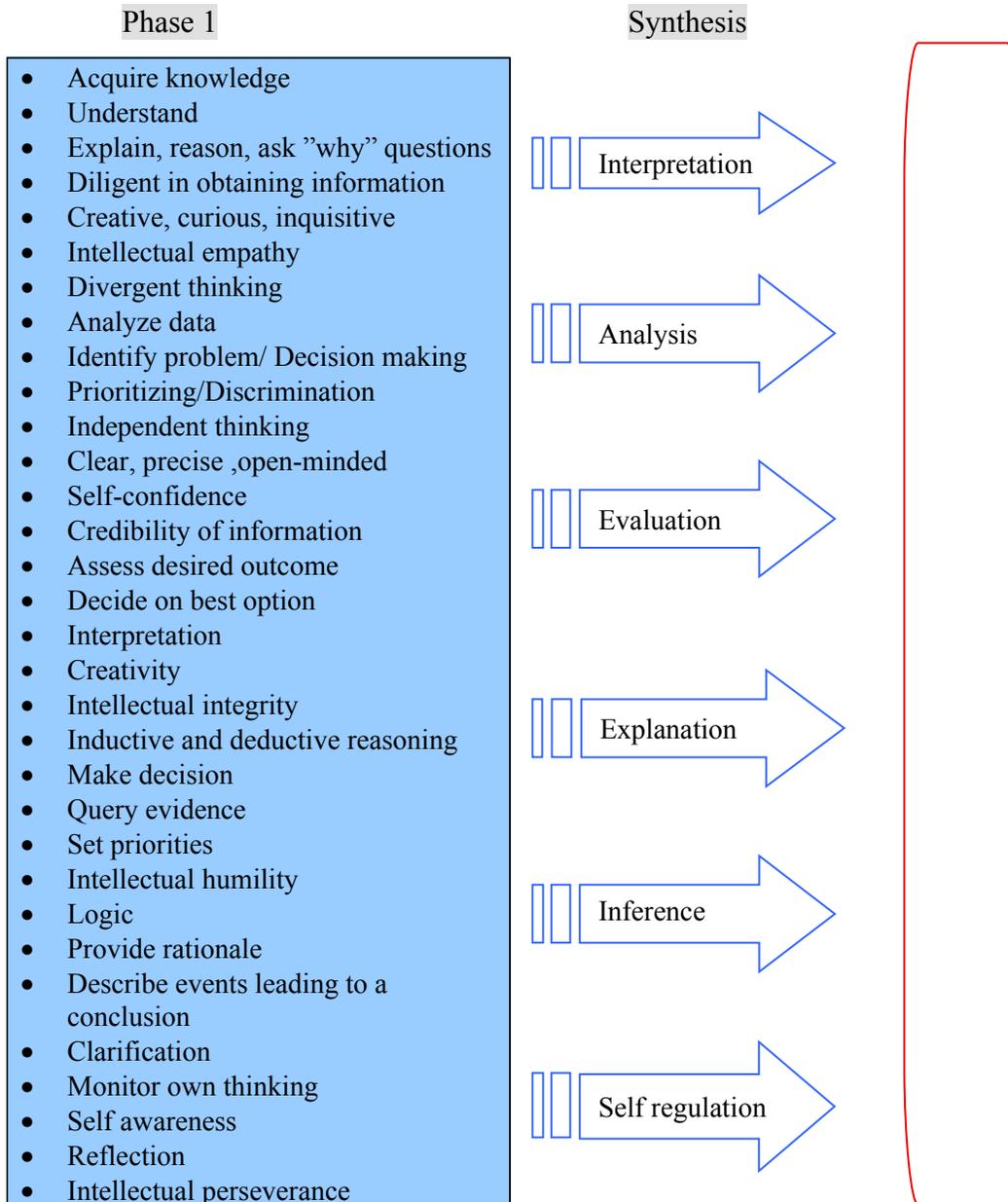
An extensive number of 36 concepts were deductively arrived at on the basis of students' answers to questions on an imaginary case scenario. These concepts served as quantitative evidence of the skills that are required from nurses to address and manage a problem case in nursing and were supported by literature on critical thinking. However, because of the number of concepts, it was essential to reduce the number of concepts by concept synthesis. To reduce, by synthesis, is seen as the process of forming an opinion about something on the basis of information or evidence that is available (Hornby, 2005, p.381).

In this study the researcher used synthesis to cluster the concepts arrived at, from the analysis of the scenarios, into six meaningful concepts, namely interpretation, analysis, evaluation, inference, explanation and self-regulation applicable to the nurse in Namibia,

as illustrated in fig 5.1. The literature supports these concepts as important ones for any critical thinker to possess. These six concepts fit into the framework of Facione (1990, p.6) where the 46 respondents participated in a Delphi study, where-after the six core critical thinking concepts were renowned. These six concepts were also used to formulate the pedagogical tools for the educational programme as.

Although critical thinking entails much more than the six main identified concepts, the researcher is of the opinion that the nurses in Namibia should master these concepts in order to manage a patient/client case in health care with a critical approach, and thereby find the best solution to the problem. The researcher is also of the opinion that if they could master all or some of these six main concepts, it could result in a remarkable improvement in nursing care in Namibia.

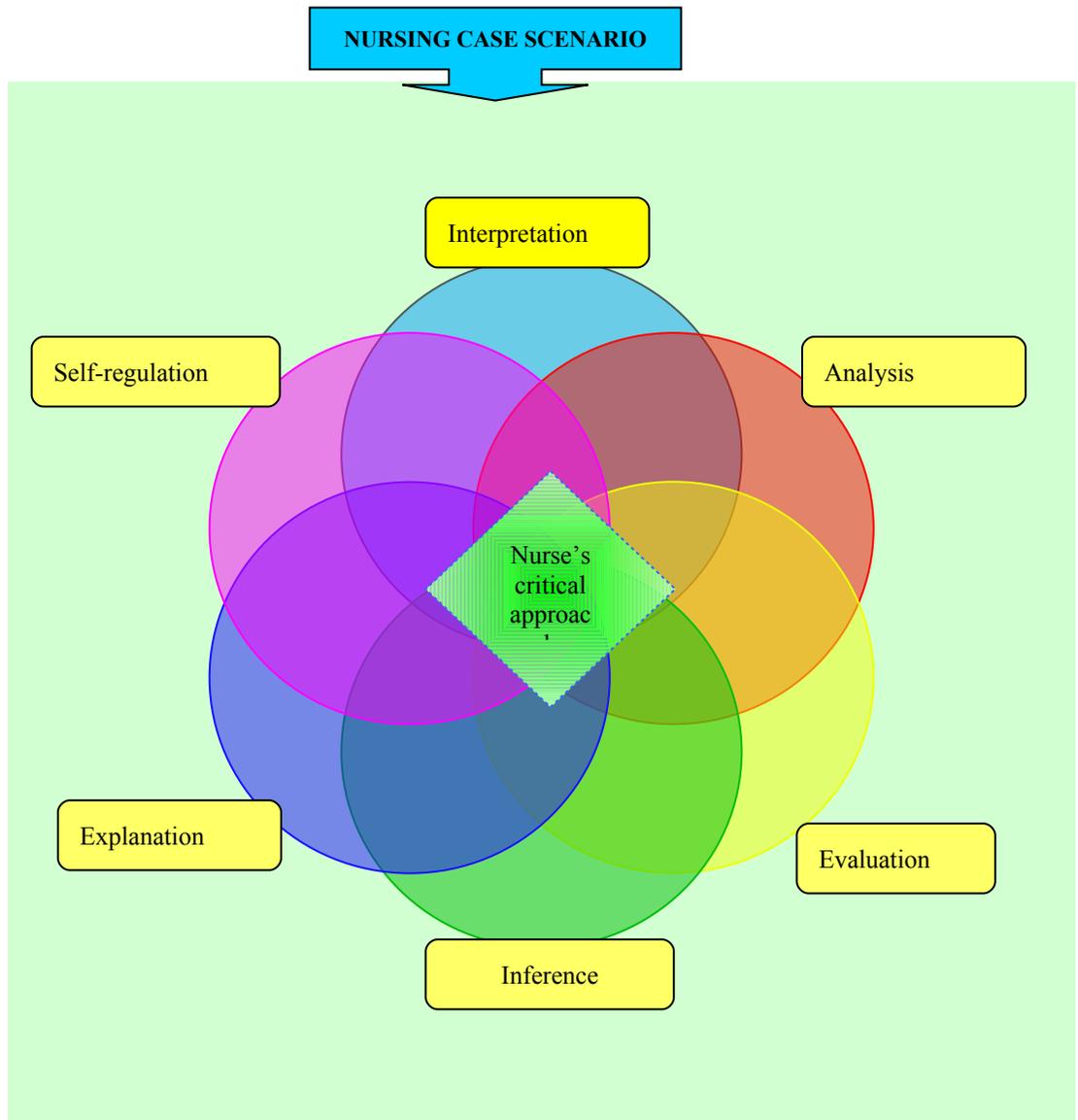
Although many definitions and concepts of critical thinking are described and explained in the literature, many nurse researchers internationally have attempted to use existing frameworks as that of Facione (1990) to develop assessment tools and programmes to facilitate critical thinking. Therefore, synthesis of these concepts into main concepts in this particular study is the result of a logical reasoning process by the researcher. These concepts were considered appropriate for this study because the main six concepts are also indicated in the literature as important skills to have in order to apply critical thinking in nursing practice.

Fig 5.1: CLUSTERING OF CONCEPTS THROUGH CONCEPT SYNTHESIS

⁵ Clear demarcation of concepts arrived at in phase 1 is not practical since there may be an overlapping of sub concepts. A sub concept may suit more than one specific core concept Also see figure 5.3

As the study concerns nursing practice, the researcher deemed it necessary to indicate the association of these concepts with nursing as illustrated in fig 5.2.

Figure 5.2: SCHEMATIC PRESENTATION OF CRITICAL THINKING CONCEPTS IN THE NURSING CONTEXT



5.2.2 Clarification of concepts

The main concepts, as reduced by the researcher after the data analysis, described in chapter 4 (phase 1- needs assessment of the study) and illustrated in figs 5.1 and 5.2, are: interpretation, analysis, evaluation, inference, explanation and self- regulation. The literature also supports these concepts as the most important cognitive skills in critical thinking and the competencies that it is considered each nurse should have in nursing practice (Fonteyn, 1998, p.15).

These concepts will now be defined and clarified in terms of the demarcated area identified for this study, namely nursing practice; they also represent the conceptual framework for the development of the programme. However, supplementary to literature on these concepts and exclusive to this study are the independent traits and skills that the literature considers to be essential to these main critical thinking skills (Facione, 1990, p.6) that are required to support the execution of the main concepts, also known as critical thinking dispositions (Facione , 1990, p.13). Critical thinking dispositions are attributes or habits of mind integrated into individual beliefs or actions that are conducive to critical thinking (Profetto-McGrath, Hesketh, Lang & Estabrooks, 2003, p.322). The researcher arrived at these finer subskills by analyzing the data from phase 1.

Although the researcher realized that critical thinking skills might take a long time to acquire, the objective of this study was to introduce and sensitize the students to at least

these most important critical thinking concepts. It was hoped that this would contribute towards a mind shift in nurses on how to approach a complex nursing problem in a scientific way. Although the concepts will be described separately, it is essential to mention that the concepts are intertwined and not applied independently, as indicated in fig 5.2.

5.2.2.1 Interpretation

Interpretation is defined as the particular way something is understood or explained. The explanation may take various forms (Hornby, 2005, p.783) as dictated by the particular situation. Interpretation is, however, not a concept that is applied in isolation; it includes the *ability to understand* and explain the meaning of information or an event. In the context of this study this would refer to situations in nursing practice that need to be explained and *understood* to make a nursing diagnosis (Potter & Perry, 1999, p.66; Feldmand, 2002, p. 47). The term also refers to comprehending and expressing the meaning and significance (Fonteyn, 1998, p.15) of data and actions in nursing practice, which includes observations made by utilizing one's senses. Examples of observation refer to the following: seeing wound drainage and smelling whether the drainage is offensive or not, hearing the tone of a patient's voice in a conversation and feeling the dryness of a dehydrated patient's skin. All these observations will assist the nurse to plan nursing care by interpretation since nothing in clinical practice happens by chance (Meyer, Naude & van Niekerk, 2004, p.113).

Interpretation in nursing practice is furthermore essential when nurses have to make vital decisions regarding patient care in the course of their daily duties by *interpreting* information they have collected about a patient (Kozier et. al., 2004, p. 245). The ability to understand and comprehend the meaning of the data is equally essential (Longacre, n.d., p.15). Critical thinkers do not jump to conclusions. Instead they ensure that they are well informed and have all the information they need to proceed to an interpretation (Botes, 2000, p.26). Nurses of the new millennium need to do more than merely perform tasks; they have to think clearly about what they are doing and what the results of their actions will be (Meyer, Naude & van Niekerk, 2004, p.112).

To be able to interpret any data, the nurse has to show *perseverance* in seeking for as much information as possible on the patient before an interpretation can be made (Kozier et. al., 2004, p.248). In their search for data to interpret it is necessary that the nurse should also display an *inquiring mind* by asking ‘*why?*’ questions to obtain as much information as possible about the situation. They should display *curiosity* in searching for more information in order to learn as much as possible about the situation in order to facilitate the planning of the nursing care of a particular client/ patient. A nurse should never be satisfied with the minimum of information, but should ask *challenging questions* to solve complex health care problems. Hence, interpretation also refers to accurately interpreting problems as well as subjective and objective data from common sources on the care of the patient (Simpson & Courtney, 2002, p. 96: ADEA, 2006, p. 931).

Curiosity, inquisitiveness and *showing an inquiring mind* are three essential concepts related to interpretation as a central concept to critical thinking. Inquisitiveness is considered a measure of intellectual curiosity and desire to learn. It is described as “one’s intellectual curiosity and one’s desire for learning even when the application of the knowledge is not readily apparent” (Conger & Mezza, 1996, p.11; Hawke, 2004, p.5). To be inquisitive means to have a strong desire to know about something, and it is “the activity to ask somebody questions, showing that you need information or that you have doubts” (Hornby, 2005, p. 359; p. 1190). It is the commitment to learning as much as you can about a topic. It is about asking “why?”, “why not?” and “how?” to obtain the necessary information about the patient to make a final interpretation (Facione, Facione & Giancarlo, 1994, p. 346; Hammond, 2004, p.13).

Asking “why?” questions is valuable in clarifying the meaning of a scenario. It means seeking new information to broaden one’s understanding and support curiosity and eagerness to acquire knowledge and learn the reasons for a patient’s condition (Alfaro Le-Fevre, 2002, p.24; Alfaro–Le Fevre, 2004, p.4; Alfaro–Le Fevre, 2004(b), p.8). Questions such as “Upon what do I base my interpretation?” might save valuable time in the long run (Robinson, 1998, p.7; Cowley, 2004, p.114) to speed up an interpretation. Interpretation with the necessary knowledge is essential for the nurse because without this ability the nurse in nursing practice would not be able to explain an event or phenomenon. Good interpretation is the foundation for the identification of a problem in nursing care (Sternberg & Spear-Swerling, 1996, p.103; Lipe & Beasley, 2004, p.10).

What kind of questions are nurses supposed to ask?

In nursing practice especially it is imperative for a nurse to be curious and ask questions about the client/patient, to enable them to plan the best care for the patient by interpreting each patient's scenario. A habit of inquisitiveness is an important precursor of critical thinking, which helps the nurse to search for information until it is possible to make the best interpretation about the patient's case in order to plan the best care for the patient. Asking vital questions is one aspect that is imperative for any critical thinker (Kozier et.al., 2004, p.249; Howard College, 2006, p.1).

For successful interpretation it is important for the nurse to tune in to the client's problems as they unfold. Also embedded in searching for information is recognizing the pieces of information or data that are missing and persistently looking for those pieces to enable the nurse to work out an individual nursing care plan. It is imperative that nurses cultivate the "why?" mentality so that they can find out as much as necessary. Facione and others agree that nurses should have the internal motivation to be inquisitive about real problems at hand in order to arrive at the best solution (Facione et. al., 1997(a), p.70; Fonteyn, 1998, p.38). Cronin & Rawlings-Anderson (2004, p.116) argue that adopting a questioning approach and looking for a range of solutions to nursing problems go hand in hand with the development of critical thinking skills in nursing and are important in proper interpretation.

Hence, for the nurse to reach a proper interpretation of the information at hand, they need to exercise *intellectual empathy* (Paul,1990, p.6) to imagine how the patient might feel in his situation. Intellectual empathy corresponds with the general meaning of empathy, which refers to understanding another person's feelings, experience etcetera, especially because you have been in a similar situation (Hornby, 2005, p.478). Intellectual empathy necessitates imagining yourself in the place of another in order to fully understand that "other" to interpret the scenario in question. It is a conscious effort to understand others by putting your own feelings aside and imagining yourself in their place (Alfaro-LeFevre, 1999, p.12 ; Green, 2000, p.5).

This is an extremely valuable skill to have as it will enable the nurse to understand and interpret what a patient is going through or why a patient decides to act or behave in a certain way. Intellectual empathy can be developed by answering appropriate questions, for example:

- Imagine yourself having a life-threatening condition such as AIDS with nurses avoiding your room and then ask yourself the question: How does it feel?
- You have pain and no one responds to your call: What are you thinking?
- You are waiting for the public health nurse who should visit on a Tuesday but it is already Wednesday. How do you feel about that?

Nurses with the skill of intellectual empathy are able to care for patients displaying certain behaviours, because they try to understand the behaviour.

As already discussed, nurses have to interpret a scenario as presented by each patient to enable them to plan the nursing care of the particular patient. It would be impossible for any nurse to interpret their observations without the basic support of background *knowledge* from which the nurse can recall known facts that sometimes serve as the foundations for further thinking. Total recall means remembering facts or remembering where to find them to assist in the solving of a nursing problem, founded on interpretation of data. Basic support does not only refer to background knowledge, however. It can also include information from others, observation and previously drawn conclusions (McKown, 1997, p.7 ; Rubenfeld & Scheffer, 1999, p.8).

In critical thinking a person should have background knowledge and experience in order to make a credible statement. It does not necessarily mean that the person is right but it puts the individual in a position to make accurate statements (Ennis, 1996, p.59).

If for example you do not know what the normal range for blood pressure is (support knowledge) , how would you start thinking about the reading of a patient whose reading is way above the “expected normal” (interpretation) (Green, 2000, p. 9; Alfaro-LeFevre, 2002 , p. 24). With basic support it is possible for the nurse to make judgments and try to clarify a patient’s condition. When a nurse uses background knowledge and known facts about all aspects of care, their basic support component of critical thinking is used.

What implication does this have for the nurse? Nurses should be updated with new developments and if it so happens that a nurse ends up in a situation where they need to update their knowledge, they need to do so to be in line with this concept of critical thinking. An easy way of finding out if one has sufficient knowledge is to ask the question: *Upon what facts do I base my interpretation and conclusions?* To answer that, one would make use of known facts and background knowledge; facts which are considered truths (Green, 2000, p.9).

With reference to background knowledge or basic support, Norris strongly (1985, p.440) supports this concept by saying that critical thinking cannot occur in a vacuum; it requires individuals to apply what they know about the subject matter (nursing) as well as their common sense and experience. Nurses cannot expect themselves to think critically if they do not have a broad theoretical and experimental knowledge base. Thinking critically in the clinical setting requires the nurse to have experience in the clinical setting. Until nurses have good technical skills such as the ability to put up intravenous infusions, most of their brainpower goes into that and little energy is left to practice critical thinking. Therefore novice nurses need a lot of experience before they are likely to think critically (Brannon & Carson, 2003, p.287; Alfaro-LeFevre, 2004, p.5).

Nurses are being encouraged to underpin their clinical decision making on an interpretation made, on the basis of the best evidence and knowledge. Outdated

knowledge has no place in modern health care and should be updated continuously (Cronin & Rawlings–Anderson, 2004, p.viii).

5.2.2.2 Analysis

Analysis is a way of thinking to which one has to be accustomed (Du Toit, 1995, p.83). It is furthermore a mental process by which one seeks to gain a better understanding of the nature of something by carefully separating the whole into smaller parts. It is also considered to be one of the most important techniques to master in critical thinking. A good example of analysis in nursing is covering all body systems during a physical examination, to get as much information as possible on the patient (Smith-Stoner, 1999, p.vi; Cowley, 2004, p. 114; Alfaro-LeFevre, 2004, p.280).

Analysis, according to Fonteyn (1998, p.15), implies identifying *inferential relationships* among concepts, *examining* ideas and *detecting* and analyzing arguments. It requires nurses to think for themselves and consider a wide range of ideas, learn from them and then be able, through analysis, to attempt to form or evaluate judgments on the basis of available/relevant considerations (Jones, 2001, p.4; Kozier et. al., 2004, p.247).

Nurses are practicing analysis when they *investigate* a course of action based on objective and subjective data. The analysis of assessment data guides the nurse in determining which problems they can treat independently and which need collaboration or referral (Lipe & Beasley, 2004, p. 10).

To analyze also means to “closely study or *evaluate* data” (Green, 2000, p. 7) and to use reason and evidence to resolve problems in order to put the information in a framework. The Center for Critical Thinking (CCT) defines analysis as the process of making a detailed examination to look into the nature, issue or situation of something (CCT, n.d., p.2). Therefore, analytical thinking is described as “using a logical method of thinking about something in order to understand it, especially by looking at all parts separately; it also means to use scientific analysis in order to find out about something” (Conger & Mezza, 1996, p.11; Pollard, 2002, p. 17; Alfaro-LeFevre, 2004(b), p. 9; Hornby, 2005, p. 47).

All the above-mentioned definitions fit the nursing scenario perfectly and clearly emphasize that nursing cannot do without a person with an analytical mind who can closely explore data in order to make a decision. A nurse who is able to analyze has an analytical approach in nursing her patients while remaining alert to problematic situations (Hawke, 2004, p. 5). The ability to sift or analyze evidence or arguments and respond flexibly to them is therefore by implication considered a prerequisite to competent and reflective practice. Students should think about the meaning of their analysis and evaluation as it relates to some present and future action in the care of the patient (Facione, Facione & Giancarlo, 1994, p. 346; Greenwood, 2000, p. 428; Varner & Peck, 2003, p. 56).

In the process of analysis the student nurse and other categories of nurses should be clear and precise in identifying the factors and should be able to explain why something is a risk factor. However, analysis involves more. It involves *focusing on results*, considering how much time it will take and drawing conclusions about what you have analyzed. Critical thinkers are people who know how to make crucial judgments in nursing. Professional nurses who can think critically are able to reflect beyond the obvious and analyze and compare ideas to render the best possible care to the patient. These professional nurses possess *intellectual autonomy*, in that they refuse to accept conclusions without evaluating the evidence (facts and reasons) for themselves. The analytical process also refers to demanding the *application of reason* and evidence, being alert to problematic situations and inclined to anticipate consequences (Facione, 1998, p.4; Alfaro-Le Fevre, 1999, p.14; Green, 2000, p.7; Lipe & Beasley, 2004, p.5; Alfaro-LeFevre, 2004, p.4).

In order to be alert to complicated situations, the nurse should have the analytical skills needed to organize data into meaningful patterns to help in making a diagnosis. To make a nursing diagnosis, the nurse needs to have the ability to analyze all the information gathered during the assessment and make judgments as to what data are relevant and not relevant to the health problem (Cronin and Rawlings–Anderson, 2004, p.120).

Why is analysis so important to the nurse? Analysis will facilitate the *making of choices* and decisions in the daily planning of nursing care. Decision making is a very complex

process in the everyday life of a nurse. Many decisions have to be made daily about problems and the interventions required to solve those problems – in everyday life as well as in nursing. Making choices or decisions is defined as selecting from a number of possible alternatives while caring for patients through the process of analysis, which is not easy because patients frequently have multiple problems and there are multiple signs and symptoms to interpret (Ellis, 1997, p. 325; Brannon & Carson, 2003, p. 290).

Choices need to be made about the following: nursing interventions, actions, treatments and test data. These choices depict a whole range of independent choices that do not require the supervision or direction of others but do rely on the analytical skills of the nurse. Clinical decision making is all about taking the best action in order to produce the desired goal (Makathini, 1992, p.25; Wilkinson, 1996, p.10; Fonteyn, 1998, p.74).

Bandman and Bandman (1988, p. 6) state that critical thinking in nursing consists in sharpening the distinctions between certainty, near certainty and degrees of uncertainty. A nurse learns to discriminate by analysis and by understanding and observing criteria before making any decisions.

Divergent thinking is one of the most prevalent cognitive components of critical thinking and refers to the ability of an individual to analyze a diversity of arguments and opinions (Green, 2000, p.7). This term should therefore be considered along with the clarification of the term “analyzing”, which has already been described and discussed as an important skill of critical thinking.

For a nurse divergent thinking is a valuable skill to have because nurses get to know so much about a patient that they will have irrelevant and relevant data to choose from when planning their nursing care for the patient. By screening out all irrelevant data, it is possible to draw accurate conclusions. The skill of divergent thinking can be developed through activities such as distinguishing relevant from irrelevant data, drawing accurate inferences, analyzing arguments and recognizing the strengths or limitations of opposing viewpoints. It is also essential that the nurse set priorities for herself in the plan of care for the patient. The orderly planning of care can only be done once the nurse first knows what they want to achieve (Applegate, 1998, p. 202; Green, 2000, p.7; Lipe & Beasley, 2004, p.65).

Separating irrelevant from relevant data is important in nursing care. Relevant data is usually referred to as the abnormal information about a client/patient which is essential to know, whereas irrelevant data is nice to know but it will not alter the patient's condition and it might not be applicable to the situation on hand.

A nurse can enhance divergent thinking, and thus analysis or *breaking down* information, by asking themselves the following questions:

- Of the data I have in front of me, which are most relevant to the care of my patient?
- How would I know if this drug is effective? Or ineffective?
- How will the care for the patient with this condition ?

- What can be inferred about this group of data? (Lipe & Beasley 2004, p.65).

5.2.2.3 Evaluation

Evaluation may be referred to as *judging* the value or forming an opinion about the worth, usefulness or importance of something and it is considered to be an important component of sound critical thinking. The process of evaluation is the assessment of the information obtained – to ascertain its probable trustworthiness as well as its relevance to the particular patient care situation. The nurse has to rate the source of the information for reliability and decide whether the information they obtained is credible, relevant to the current problem and without any bias. Evaluation requires discriminating between ideas and making decisions based on logic and evidence, and the nurse should therefore apply this concept to determine whether the desired outcome was achieved (CCT, n.d., p.8; Kajs, 2002, p.3; Lipe & Beasley, 2004, p. 10). Evaluation is therefore an *ongoing process* during the care of a client/ patient, its object being to determine whether what you are doing is in line with the desired outcome.

When the term evaluation is applied to nursing practice, it implies judging the value of assessment findings, treatments and test data. The ability to judge value is an important thinking strategy that will allow the nurse to develop, refine and improve on their actions in the execution of nursing care. Evaluation takes place in nursing practice in the course of all the activities in the nursing care of a patient. Findings that result from

interpretation can be judged for the purpose of planning the patient's care according to their needs. Treatment can be evaluated in terms of significance, usefulness, appropriateness and cost. Judging the value of any action can determine the existence and elimination of risk. Evaluation is an ongoing process for nurses throughout their care provision and nurses should be sure of what they evaluate and what they would like quality care for the client/patient (CCT, n.d., p.8; Fonteyn, 1998, p.82).

In order to secure quality in their care, nurses need to be constantly evaluating and correcting their thinking, asking questions like:

“What am I missing?”, “Do I Know what I need to know?”, “What else could be going on here?” and “How can I do this better?” In following this process of evaluating one soon realizes that critical thinking is not “rapid-fire thinking” (Alfaro-LeFevre, 2004(a), p.1)

Evaluation can hardly be done without interpretation, a term which has already been discussed. The latter is defined as “to comprehend and express the meaning or significance of a wide variety of experiences, situations, data, judgments, beliefs or criteria” (Facione, 1998, p.4). Interpretation therefore precedes the process of evaluation.

To evaluate her interpretation findings the nurse should employ *intellectual integrity* and *intellectual courage* (Paul, 1990, p.6).

Intellectual integrity implies holding one's own evidence to the same standard of proof to which one holds that of others and being consistent in the standards one applies. This will manifest in questions like:

- Are my assumptions about this patient correct?
- Are my conclusions accurate?
- Am I using the same approach and criteria as I would have used for something I believe in? (Green, 2000, p.5).

This term also includes the evaluation of own thinking to determine whether one has been doing right and willingness to admit when one's thinking may be flawed (Alfaro-LeFevre, 1999, p.10; Alfaro-LeFevre, 2004, p.4).

Intellectual courage (Paul, 1990, p.6) refers to willingness to listen and "fairly evaluate ideas, viewpoints and beliefs of others" (Zalon, 1998, p.4; Green, 2000, p. 4) even though one may not agree with these ideas or beliefs. It is the awareness of the need to face and fairly address ideas, beliefs or viewpoints to which one has not given serious hearing and the willingness to admit error or change beliefs, known as ***intellectual humility*** (Paul, 1990, p.6; Alfaro-LeFevre, 2004(b), p.10; Alfaro-LeFevre, 2004, p.4; Carroll, 2007, p.4).

Both these concepts are important in nursing care because it is important for any nurse to listen to what the patient and his family have to say even if the nurses have a strong

aversion or dislike towards what the patient is doing (e.g a patient with tuberculosis who keeps on smoking).

During the process of evaluation the nurse must be able to reflect on her interpretation and analysis. **Reflection** has been accepted as the vehicle for professional development within the sphere of nursing and it is considered an important concept to nurture and develop during the development of critical thinking skills, because reflecting allows the nurse to explore their experience and move into a new understanding of the patient's situation. Reflecting, for the nurse, implies having a dialogue with oneself, thinking and rethinking one's actions to determine whether the best action and/or decisions have been taken, and also integrating theory with experience (Caffarella & Barnett, 1994, p.38; Varner & Peck, 2003, p.53; Brown & Rutter, 2004, p.19; Cronin & Rawlings–Anderson, 2004, p.164).

Burnard (2005, p 85) is of the opinion that people's memories are generally poor and by reflecting one can compensate for poor memory by making the time to ponder over what has happened.

To ponder, contemplate or deliberate on something implies that the nurse takes the time to collect data, think a matter through in a disciplined manner, and weigh facts and evidence before making a decision regarding a patient's care. The ideal reflective thinker

is concerned about the *why*, the reasons and consequences of something that happened (Wilkinson, 1996, p.28; Green, 2000, p. 8; Van Aswegen, Brink & Steyn, 2000, p. 124).

5.2.2.4 Inference/conclusion.

Making an inference/decision is a skill that every nurse should develop and is especially important in the execution of nursing care. The word inference is used in the sense of conclusion, “meaning that the conclusion to an argument is the inference” (Lipe & Beasley, 2004, p.10). It also refers to the step that takes the nurse from the reason(s) to the conclusion (Ennis, 1996, p.6), using all possible reliable sources such as the patient’s family to reach those conclusions

As human beings we frequently make inferences. However, the inferences may be erroneous or others may disagree with them (Wright, 2002, p. 77). An inference is defined as something we suspect to be true, based on a logical conclusion after examination of the evidence or available information. It is further the ability to make correct decisions, based on ***logical reasoning*** and on the available information. An inference is furthermore defined as a strong or weak, justified or unjustified conclusion based on information (from the patient), assumptions and sound reasoning. The decisions made by inference will depend on using reliable sources. Clients present with a wide range of experiences, behaviours, signs and symptoms, from which the nurse observes the patient to make an inference about the patient’s condition (Rubenfeld &

Scheffer, 1999, p. 49; Potter & Perry, 1999, p.65; Lipe & Beasley, 2004, p.10; Alfaro-LeFevre, 2004, p.283).

The Centre for Critical Thinking (CCT) (n.d, p.12) considers an inference to be an intellectual act whereby one reaches an opinion. In addition inferences are viewed as judgments made about data; considered as mini conclusions, while the query to evidence is in fact a sub skill to inference (Facione, 1998, p. 5; Rubenfeld & Scheffer ,1999, p.132).

Fonteyn (1998, p. 650) describes inference as the IF – THEN proposition which is very valuable in nursing practice since much of the thinking nurses do focuses on the identifying of actual and potential problems. The IF – THEN proposition helps the nurse to anticipate which action to take if certain events occur and when there is a change in the client’s status. An example of an IF – THEN proposition stated to choose a plan of action might be:

“If the bleeding in the intestine and from the stomach are still present by this afternoon, I suggest a Saline infusion be commenced.”

An IF – THEN proposition can also be made during other phases of nursing care when some care has to be judged, for example: “If she weighs about 50 kg that would help me to know that the dose of Pethidine was sufficient”. The IF – THEN proposition also assists the nurse in drawing inferences, which as we have said is a related concept in critical thinking. Thinking about one’s thinking on a regular basis helps one to gradually become aware of the IF – THEN proposition. Green (2000, p.8) describes and supports

this IF –THEN proposition as integrating past experiences into present decisions (of which examples have already been given) (Schick & Vaughn, 1999, p. 138; Green 2000, p. 8).

A useful question to ask in order to practise this skill would be: What experiences from my past impact on the care I am delivering to this client/patient today?

Asking specific questions about a case will guide the nurse towards a full description of the situation. These questions would be: when, where and who were involved as well as questions that would mainly focus on the feelings and experience of the nurse while dealing with a situation. By asking and answering these reflective questions the nurse will be able to correct herself and look for some missing information where necessary and by doing this, the nurse will understand actions and events better (Forneris, 2004, p. 17).

Once actions and events are better understood, a decision will imply choosing from the different options by priority setting, which forms an essential part of decision making. In situations where considerations must be weighed and alternatives assessed, priority setting and judgment are imperative (Lipe & Beasley, 2004, p.4; Weinstein, 1995, p.9).

Hammond (2004, p.2) emphasizes that good decisions require good thinking and the two cannot be separated and that whatever the situation requires, it is necessary for any nurse to have gone through a process of thinking in order to make a judgment and reach a

conclusion. It is also necessary for the nurse to rely on what they already know by recalling cognitive knowledge which then serves as basic support in making decisions and judgments and reaching conclusions. A conclusion is defined as the viewpoint, opinion or position taken about an issue (Diestler, 1994, p.6).

An inference/conclusion which is not based on cognitive knowledge might cause the nurse to miss symptoms and this in turn could cost a patient his/her life. Exercising **clinical judgment** in nursing practice requires cognitive functioning.

Although the responsibility for making clinical decisions may seem frightening to a nursing student, it is part of what makes nursing such a rewarding and challenging profession.

In the clinical context, the nurse who adapts to critical thinking would be expected to draw judiciously on developed nursing knowledge in forming, evaluating or re-evaluating a clinical judgment. At the minimum, to be effective workers (professionals), nurses must be willing and able to reach informed, fair-minded judgments and conclusions in a variety of nursing situations (Facione & Facione, 1996, p.130; Facione, Facione & Giancarlo, 1997(a), p.67).

Conclusions and judgments are part of all phases of nursing practice. “Most conclusions are like rest stops on a journey; they provide guidance for travel along the nursing path... the conclusions represent the nurses’ thinking about the information at hand”

(Fonteyn, 1998, p.89). One reason why nurses use the thinking strategy of drawing conclusions in their practice is to arrive at an opinion about their clients' condition or status.

It is, however, necessary to mention that both experience and expertise can affect the way in which nurses make judgments and it is therefore important that nurses develop their critical thinking skills during their practice as nurses.

When reaching a conclusion or drawing an inference, reasoning forms an integral part of the process. **Reasoning** is very important to the critical thinker, who cannot simply accept things at face value. "To reason is to form judgment about a situation by considering the facts and using your power to think in a logical way" (Hornby, 2005, p.1213). Reasoning furthermore serves a purpose and is an attempt to answer a question or solve a problem (Wright, 2002, p.101).

Reasoning is considered by some authors to be a synonym for critical thinking, but since reasoning is a highly individualized complex activity, it needs more incisive discussion. Reasoning is only possible if one (the nurse) has **self-confidence** and **trusts** in her/his ability to reason, guide others and make decisions. Clearly a career involving any form of thoughtful decision making or problem solving, like nursing, is not indicated for people with little confidence in their ability to reason (Facione, Facione & Giancarlo, 1997, p. 73; Alfaro-LeFevre, 2004(b), p. 4).

Two types of reasoning essential to critical thinking are inductive and deductive reasoning, considered to be the building blocks of critical thinking in making an inference.

Reasoning however cannot be executed haphazardly and is associated with logic.

Logic, described as “a way of thinking or explaining something” (Hornby, 2005, p.869; Green, 2000, p.7) is also part of inductive and deductive reasoning in order to make an inference. It is furthermore considered as a science that consists in the description and evaluation of arguments (Jones, 2001, p. 10). Mouton (1998, p.71) describes drawing an inference as that “logical jump” one makes from a premise to a conclusion. It is necessary for a nurse student to be able to explain a possible risk factor logically as it is important that nursing actions and procedures should follow a logical order.

Using logic helps the nurse to discover whether things make sense and whether the conclusions are founded on evidence (Lipe & Beasley, 2004, p.6). Lindberg et. al. (1998, p.5) go as far as to say that critical thinking combines logical and creative thinking.

Another interrelated term to inference is **focus**. Focus is considered to be the product of inference (Ennis, 1996, p.7) and in terms of a definition refers to giving attention to one particular subject, situation or effort or it could imply the “something” or “the thing or person that people are most interested in; the act of paying special attention to something and making people interested in it” (Hornby, 2005, p.574).

When a nurse focuses she/he can be considered to be *goal-oriented* and *purposeful*, qualities which are imperative in the nursing care of a patient and in the execution of nursing tasks. “Purposeful” refers to having a useful purpose as well as acting with a clear aim and with determination to reach a goal (Wilkinson, 1996, p.11; Hornby, 2005, p.1180). In support of the above definition Facione (1998, p.3) considers critical thinking to be thinking that has a purpose, designed to prove a point, “interpreting what something means or solving a problem” by using an orderly, diligent and systematic process, especially in the inquiry phase. By keeping focused on one particular patient’s problem the nurse may be able to find the best solution (Conger & Mezza, 1996, p.11; Cowley, 2004, p.115).

In the process of inference, goal-orientation and focus the nurse need to exercise *intellectual humility* that involves knowing and accepting the limits of his or her own knowledge. When nurses make decisions/inferences they have to apply intellectual humility, where they admit what they do not know and express willingness to seek new information or to rethink the inference they have made on the basis of available information (Kozier et.al., 2004, p.247). It is important that the nurse is aware of her/his shortcomings in the making of inferences.

What sets critical thinkers apart from other thinkers is that when they recognize the limits they seek more information. This implies that a nurse who ends up in a ward or unit where s/he is confronted with unknown scenarios will seek information to inform

herself. Humility also involves being sensitive to one's own biases and prejudices, and admitting what one does not know (Alfaro-LeFevre, 1999, p.10; Green, 2000, p.4). This concept further implies that one bases every decision on the assumption one has examined and makes sure that one gets enough information from the patient /client to make a decision while remaining aware that personal bias should not influence the decision (Lipe & Beasley, 2004, p.8).

Intellectual humility is therefore an important concept to keep in mind when caring for patients with chronic illnesses such as AIDS and where patients do not always do what nurses expect them to do, for example stop smoking when the patient is suffering from emphysema. Bias on the part of the nurse will negatively affect the care he/she renders to the patient. Green (2000, p.4) is of the opinion that the nurse should ask herself/himself the following questions to develop or foster an attitude of critical thinking, based on inference:

- How do my biases or prejudices affect the outcome of my client's care?
- What is my first impression of the client's situation?
- How will I know when I need more information?

The skill of inference helps nurses to draw *conclusions* by weighing alternatives to find the best decision for the benefit of the patient .In order to make judgments the nurse also needs to discriminate between relevant and irrelevant data. Discrimination, according to definition, is to recognize that there is a difference between people and things and also

refers to terms like “differentiate” and “distinguish” as synonyms (Applegate, 1998, p.203; Hornby, 2005, p.417).

What makes the skill of inference so unique is that the nurse can practise creative thinking while making choices and decisions about a particular patient. Creative thinking is described by Hornby (2005, p.345) as “thinking about problems in a new way or thinking of new ideas”. This perfectly fits the nursing care scenario.

The literature also describes the use of creativity in terms of responding to one’s “gut” feeling or intuition to respond to a patient’s problems. Exploring alternative solutions to a patient’s problems, finding a new way (improvising) to do a task when not all the equipment is available, finding an alternative way to cut costs without compromising quality and to consider one’s “feeling” about a case are ways to implement creativity during nursing care (Green, 2000, p.8). Alfaro-Le Fevre (2002, p.24) refers to creative thinking as looking for better ways to do things by continually examining whether what one is doing is the best way to do something. It is a productive intellectual skill that creates original ideas by establishing relationships between thoughts and concepts. It involves the ability to break up and transfer a concept to new uses (Wilkinson, 1996, p.8).

Creativity in thinking therefore goes beyond textbook ideas. It means coming up with new, useful ideas. The creative thinker says “let’s try this new way”. Creative thinking

includes being open to new ideas or information which might come from different sources. Creativity is at the root of individualized care because it helps the individual to think “outside the box” (Cowley, 2004, p 150). With creative thinking it may not be possible to have a logical explanation for the actions and one may not necessarily have specific outcomes in mind (Wilkinson, 1996, p.10; Rubinfeld & Scheffer, 1999, p.15; Lipe & Beasley, 2004, p.7; Alfaro-LeFevre, 2004(b), p.8).

Whenever an action has been taken or an intervention performed, the nurse needs to be able to give a clear explanation, the term to be discussed next.

5.2.2.5 Explanation

An explanation is a function by which to *clarify* obscure meaning or to show how some puzzling occurrence fits in with or follows from preceding events (Jones, 2001, p.15). Providing explanations for interventions is one way that nurses can ensure that they will uphold high professional standards and that proper communication exists between nursing staff. Another way of describing the term explanation is “*giving a rationale*” or offering a reason for actions, beliefs or remarks; the key aspect on why things happened (Fonteyn, 1998: p.97; Irani, n.d, p.2). After a conclusion has been reached, the critical thinker should be able to explain clearly how she/he got to the conclusion. The nurse should be able to provide a sound rationale for answers/conclusions. Explanations add value to a conclusion and are about the events or influences that preceded a particular conclusion. Explanation is seen as a holistic term which is provided for different actions

in the care of the patient. Other aspects for which explanations are sought are therapy, tests and nursing interventions (Lipe & Beasley, 2004, p.10; Irani, n.d, p.2).

Explaining actions and interventions directly relates to *logic*. It is necessary for a nursing student to be able to explain a possible risk factor logically as it is important that nursing actions and procedures should be in logical order according to priorities based on the needs of the patient. Using logic helps us to discover whether things make sense, fit into the plan of the patient and whether the conclusion can be based on evidence (Lipe & Beasley, 2004, p. 6 ; Cowley, 2004, p.117).

A clear explanation can be supported by providing reasons for specific actions or conclusions taken in clinical practice. It is further believed that an explanation provides a *rationale* for a specific choice of treatment or action and it is considered to be one of the cognitive processes inherent in expert nurses' clinical reasoning. An explanation makes something clearer or easier to understand (Fonteyn, 1998, p.92; McKay, 2002, p.29; Hornby, 2005, p.257).

To be clear on actions, clarification by explanation is important. Through clarification important similarities and differences can be noted, assumptions can be identified and terms can be defined (Green, 2000, p.8). To make clarification more effective it is important for the nurse to recognize how assumptions can affect her actions. For example when a mother brings a child for immunization with dirty clothes one can

automatically assume that the child is not cared for and neglected or one can simply assume that the child had been at a day care centre and playing all morning before the mother brought him/her for the injection. It may also be necessary to ask questions to find out as much as possible in order to clarify the scenario (Green, 2000: p.8; Alfaro–Le Fevre, 2002, p.24).

It is important that a nurse should be able to explain how she/he arrived at a certain conclusion or judgment (Facione, 1998, p.5). By implication it is therefore expected of nurses that they, in the execution of their nursing tasks, explain, verbally and/or in writing, what they have done and what they intend to do in the nursing care of a particular patient. The nursing milieu does not have room for mistakes and lack of clarity when it comes to the care of a patient. Providing explanations is one way to ensure high professional standards in the care of the patient because, by doing that, through explanation one can tell how conclusions were reached (ATI, 2004, p.1).

Explanation like all other skills requires practice, but “given our human need to communicate, express ourselves and above all argue for our point of view, students are probably more disposed to this critical thinking skill than others” (Irani, n.d, p.4; Mc Kay, 2002, p.118).

5.2.2.6 Self–regulation.

Self-regulation is the process where one self-consciously monitors one’s own skills and act upon this (Facione, 1998, p.6). In fact, critical thinkers should be “big enough” to

admit that they were wrong or missed something in order to correct them self. How one thinks and feels about oneself and how one perceives one's potential ultimately affects success in working life (Cowin, 2001, p.313). Nurses are no exception here.

For critical thinkers, self-regulation implies continuously assessing their own knowledge and acting upon that assessment, which it is important to do within the nursing context. A prerequisite is that nurses should be honest and open minded about their assessment. Open mindedness refers to the active desire to learn to more sides than one and to give facts as they come and pay full attention to alternative possibilities. A nurse may end up in an unfamiliar situation. This calls for introspection and an admission that "I do not know it all". The nurse's own thinking must be monitored for clarity, precision, accuracy and significance as well as its relevance to the patient's case (Paul, 1990, p.4). Self-regulation helps the nurse to believe that one can "learn to learn" to do it better the next time since they are able to become aware of their own thinking processes (Botes, 2000, p.30; Feldman, 2002, p.16; Pollard, 2002, p. 17; Simpson & Courtney, 2002, p.96; Hammann, 2005, p.23).

In addition to open mindedness, *reflection* is also required for successful self-regulation. The nurse as an individual should reflect on the process that leads to a conclusion to determine whether they performed the process appropriately, and whether they had all the facts. Reflection at the evaluative level enabled practitioners to monitor their personal and professional performance to enable them to improve on their actions. The

process of reflection will change nothing in itself. The process of reflection can only be of extended value if the individual actually does something with the new knowledge gained through this activity. Reflection is necessary for self-evaluation and to make judgments about standards of practice. Nurse can then correct their own thinking process as needed by recognizing errors and correcting them. Self-regulation occurs in response to *self-evaluation* whereby nurses are considered to be shapers of their own world (Potter & Perry, 1999, p.66; Teekman, 2000, p.1133; Williams & Walker, 2003, p. 135; Lipe & Beasley, 2004, p.10).

As mentioned previously, reflection is considered an important concept to nurture and develop during the development of critical thinking skills and the notion of becoming a reflective practitioner has become an important one. Reflection entails the ability to recognize that critical thinking is a multidimensional, rather than a linear or step-by-step process whereby critical thinkers are free to integrate new ideas or insights at any time or change their opinions when they have new evidence (Burnard, 1995, p.45; Green, 2000, p. 8; Cronin and Rawlings–Anderson, 2004, p.164). Alfaro-LeFevre (2004, p.9) describes this reflection process as “hemming and hawing” about what was done and then correcting or changing actions by self-regulation. Reflecting brings new ideas and stimulates one to other perspectives. Reflection involves distinctive affective processes and necessarily views the past and envisions the future. It furthermore involves thinking about one’s learning (Mentkowski & Associates, 2000, p.186; Jones, 2001, p.135; Pollard, 2002, p. 213).

Self-regulation can be developed by exercising *intellectual perseverance* (Paul, 1990, p.6.). Intellectual perseverance in critical thinking is similar to other forms of perseverance which is defined as “continue trying to do or achieve something despite difficulties or a number of setbacks” (Hornby, 2005, p.1083). In nursing practice this term refers to the ability to work through difficulties and frustrations for something you believe in and continue to find effective solutions to client-related and other nursing problems. Nurses with this skill know that sometimes there is no easy answer and it might take time, confusion and frustration to find the best answer. Intellectual perseverance also nurtures *self-confidence*, which is indispensable in nursing practice. The nurse should have the confidence to admit that she is not always right and to share knowledge and initiatives with others in nursing practice (Wilkinson, 1996, p. 31: Green, 2000, p.5; Alfaro-LeFevre, 2002, p.24; Dunlap, 2006, p.19).

For the nurse to have and develop the skill of self-regulation, *self-awareness* must be evident. Self-awareness refers to knowledge and understanding of one’s own character in order to know oneself. It also includes identifying feelings within oneself when dealing with certain situations and scenarios. Critical thinkers should become aware of themselves so that they can improve on shortcomings and find their identity within a certain situation (Hornby 2005, p.1325).

In order to improve on shortcomings it is important that the critical thinker in nursing engage in *self-assessment*. Self-assessment gives rise to that sense of “how can I

improve?” (Mentkowski & Associates, 2000, p.186) and is defined as “the process of judging your own progress or achievements” (Hornby, 2005, p.1325). It requires the critical thinker to be introspective in order to evaluate and correct own thinking. Introspection means being sensitive to one’s own limitations in order to identify areas for improvement by exercising self-questioning. Self-questioning is done to determine whether there are gaps to fill as a result of a lack in information. After introspection or reflection, the critical thinker can reformulate opinions and explanations by means of self-regulation and self-correction. It is important that a critical thinker can assess his/her own ability in order to improve on the shortcomings (Teekman, 2000, p.1132; Alfaro–LeFevre, 2002, p.24).

To improve on shortcomings, critical thinkers should constantly re-evaluate themselves in order to apply *self-correction*. Awareness of one’s fallibility is part of being a critical thinker. Nurses must be engaged in analyzing their interpretation of the problem, explaining their analysis of relevant content or evaluating their inferences about the patient’s problem and the choices made (Facione & Facione, 1996, p.131; Youngblood & Beitz, 2001, p. 39; Jones, 2001, p.4).

What are the implications of all the above in taking care of a patient? It implies that if a nurse believes in caring for a patient to the best of her ability, no difficulty, set-back or bureaucratic regulations will stop her/him from doing this. If s/he is adamant about

becoming a critical thinker, everything will go into developing critical thinking skills.

This is the skill which a nurse displays who just never gives up!

6

5.2.2.7 Critical approach

For the purposes of this research, the term “critical approach” was used to embrace related concepts to critical thinking on the assumption that if nurses possess the skills embodied in the six main concepts of critical thinking, they possess a critical spirit, applicable to this study as a critical approach. A critical approach refers to the style or set of attitudes evident in critical thinking about one’s personal and professional conduct (Van Aswegen, Brink & Steyn, 2000, p.125; Feldman, 2002, p.24; Williams & Walker, 2003, p.131; Cowley, 2004, p.114). The six concepts were conceptualized throughout this chapter and described in the preceding text.

A critical approach is embodied in a questioning attitude (which was discussed earlier in this chapter) and includes openness to the examination of nursing knowledge, beliefs, attitudes, issues and intuition in the practice of nursing (Leppa, 1997, p.30).

Facione (1998, p.7) clearly states that a critical approach does not refer to a person who is always negative or hypercritical but that it refers to a person who has a probing inquisitiveness, a keenness of mind, a zealous dedication to reason and a hunger or eagerness for reliable information.

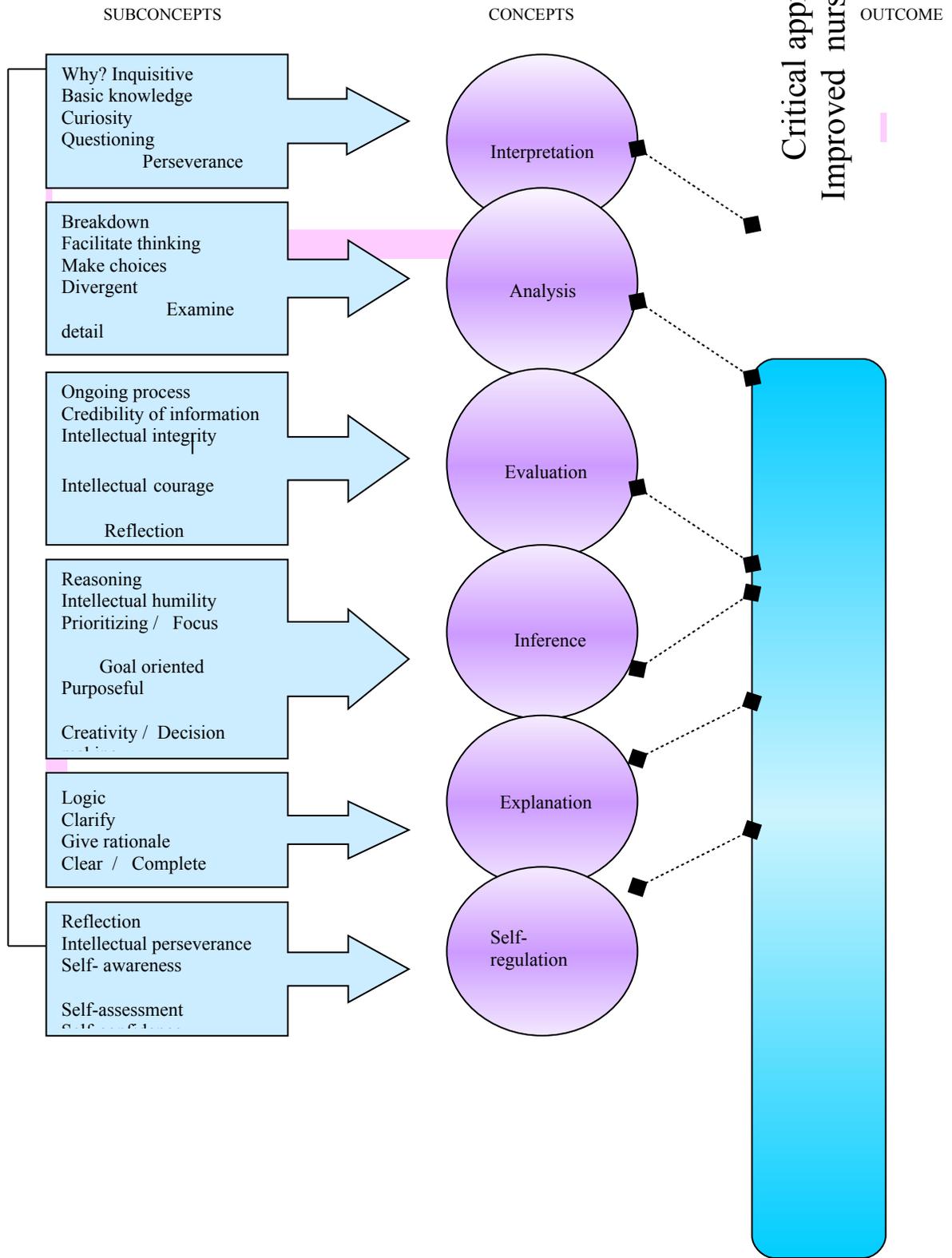
⁶ Affective dispositions have been integrated in the discussions on the cognitive skills of critical thinking

Norris (1985, p.44) is very clear that no matter what level of critical thinking a person possesses, it is of no value unless the person has a critical approach. According to the author, this approach has three requirements. The first is to employ critical thinking skills in reasoning about situations encountered in the world; the second is to think critically about one's own thinking since if this is not the case critical thinking is not open and honest and the third requirement is to act in accordance with critical thought (Norris, 1985, p.44).

The results of the conceptualization process were the denotations supported by the connotative meanings of critical thinking concepts which were used to develop an educational programme to facilitate critical thinking in student nurses.

Figure 5.3 illustrates the relation between critical thinking concepts and sub- concepts in the nursing context.

Figure 5.3 GRAPHIC REPRESENTATION OF THE RELATION BETWEEN THE MAIN CRITICAL THINKING CONCEPTS, SUBCONCEPTS AND A CRITICAL APPROACH



5.3 Summary

In the preceding text, the conceptual framework, in which content of the educational programme to facilitate critical thinking in student nurses was designed, was discussed. Six main critical thinking concepts with supportive sub-concepts were identified as essential for any nurse to have and ways to execute these concepts were explored. The facilitation of these concepts was done during the implementation a developed educational programme, as will be discussed in chapter 6.

Botes (2000, p.30) is of the opinion that the more you practise good thinking, the better you become because it is a matter of “practice it and enjoy it”. Critical thinking is not just challenging -- it should also be fun (Smith-Stoner, 1999, p.vi).

Critical thinking requires that one thinks for oneself. Being an independent thinker does not mean ignoring what others think and doing whatever one pleases. Following the ideas of others makes one dependent only if one accepts the ideas without question (Wilkinson, 1996, p.29). The development of independent learning means the student becomes able and more willing to take on personal responsibility for learning. Nurses who think critically make high-quality judgments and draw valid conclusions and are thus indispensable to the nursing profession (Profetto-McGrath et. al., 2003, p.323).

Without an inquiring and insightful workforce, health improvements will not be achieved (Price, 2004, p.46) and no changes will be brought about in nursing practice to improve the standards of nursing care.

The chapter focused on the six main concepts, namely analysis, interpretation, explanation, inference, evaluation and self-regulation, which form the critical thinkers conceptual framework on which the content of the educational programme will be based. In the next chapter the development of the educational programme will be discussed.

CHAPTER 6

DEVELOPMENT OF THE EDUCATIONAL PROGRAMME

6.1 Introduction

The main concepts that formed the framework for the development of the educational programme were conceptualized and illustrated within the nursing context, in the previous chapter. The purpose of this chapter is to describe the development of the educational programme which was conducted during phase 2 of the study.

The American Association of Colleges of Nursing and the National League for Nursing support the inclusion of critical thinking as an outcome criterion and central competency for nursing education programmes (Applegate, 1998, p.202; Redding, 2001, p.58; Stone, Davidson, Evans & Hansen, 2001, p.65; Oberleitner, n.d., p.50). However, this is a fairly new concept to nursing education. As late as 1991, nursing education played a “nominal role in the development of critical thinking” (Oberleitner, n.d, p.50). Redding (2001, p.58), is confident that higher education (including nursing education) is designed to foster the development of intellectual competencies and skills including critical thinking skills. At the same time, it was also indicated that critical thinking can be taught in several ways, with specific reference to a separate course/ programme (Wright, 2002, p. 59).

To emphasize the importance of the concept of critical thinking, it should be remembered that higher education is constantly in the limelight and comes in for criticism on whether the programmes they offer prepare their graduates adequately to perform in their field of interest. It is considered that taking difficult classes develops the brain more than taking easy classes. This implies that sessions, in programmes, that challenge critical thinking will produce more results than straightforward sessions (Mentkowski & Associates, 2000, p. 21; Jensen, 2006, p. 12). Therefore, in the light of the above the researcher considered it applicable and appropriate to develop an educational programme for final-year nursing students to facilitate the development of their critical thinking skills in nursing practice before they enter nursing as professionals.

The educational programme that was developed for the study was in line with the educational expectation that a programme should have a specific focus, based on a needs assessment. This is in fact considered to be crucial in the development of a programme (Fichardt & Viljoen, 2000, p.107; Thorpe & Loo, 2003, p. 567).

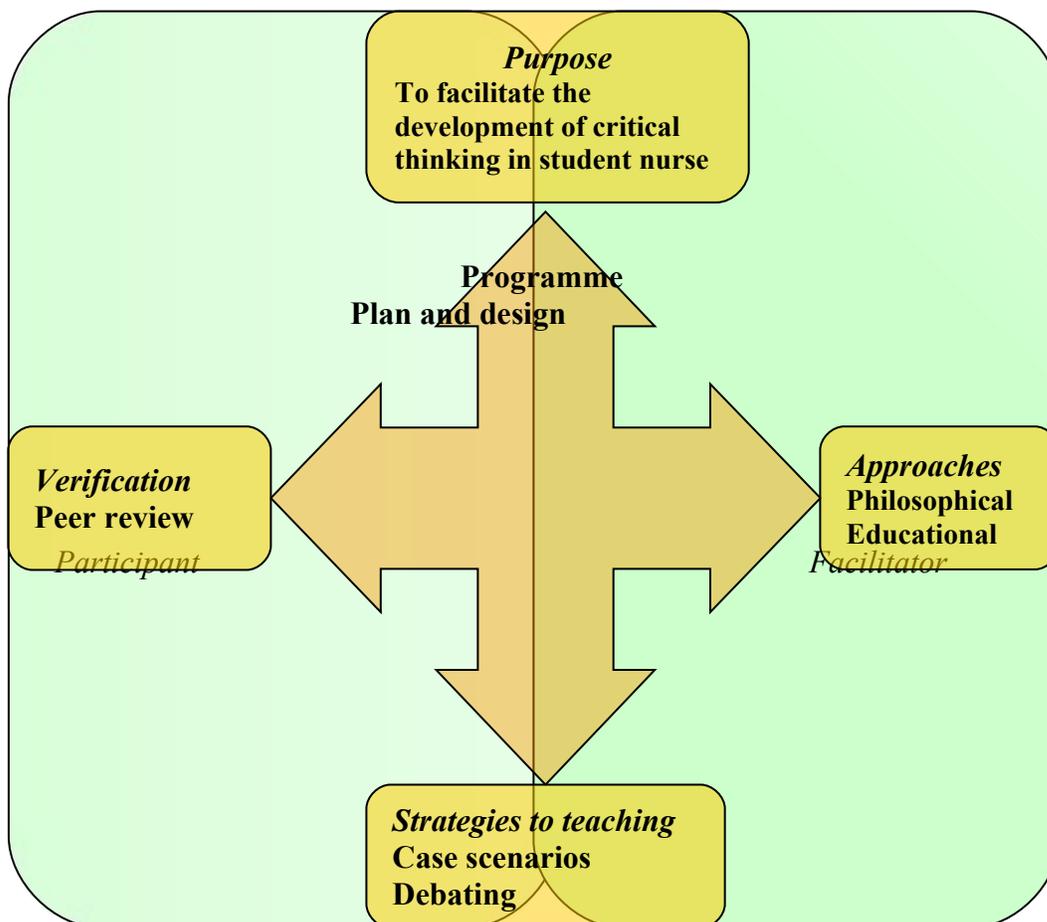
The focus of this educational programme was to facilitate the development of critical thinking in student nurses to increase their ability to solve problems and improve the quality of nursing care within the Namibian context. An integral part of this programme was to teach participants in the programme (the student nurses) how to use critical thinking to synthesize knowledge and abilities in providing holistic care for clients/patients across their life span. Given that we can never anticipate every possible

problem, educating people to think remains our best chance of solving the problems that come our way (Facione, Facione & Giancarlo, 1997(b), p.2; Boland, 1998, p.135; Finke & Boland, 1998, p.122; Fichardt & Viljoen, 2000, p.107; Thorpe & Loo, 2003, p. 567).

6.2 The programme to facilitate critical thinking

In the light of the above arguments and with literature support relating to the essence and applicability of educational programmes in the development of critical thinking in nursing education, the researcher developed an educational programme (phase 2) to facilitate critical thinking in the student nurse. Planning and design of the educational programme are indicated in figure 6.1. (see addenda 2.1 & 2.2).

Figure 6.1: PHASE 2: PLANNING OF PROGRAMME DEVELOPMENT



6.2.1 Purpose of phase 2

The purpose of phase two (2) of the study was to develop an educational programme within a conceptual framework as discussed in chapter 5. The nature, content and extent of the educational programme focused on the facilitation of the development and application of essential critical thinking skills which every nurse practitioner should master in nursing practice. This would enable the student nurse to render quality care to their clients /patients.

6.2.2 Situation analysis

The development of the educational programme was strengthened by the need that was identified in Namibia, namely that nursing students do not apply critical thinking skills in their management of patients and rendering of client/patient care. The fact that Namibian nurses fail to apply critical thinking skills in the execution of their daily nursing tasks has been identified as a challenge to nursing education in Namibia.

6.2.3 Philosophical approach

The researcher incorporated the philosophy of humanistic existentialism as well as the principles of constructivism that support existentialism into the programme.

Humanistic existentialism

Although the philosophical approach to the research has already been described in chapter 1, the researcher anticipated the integration of philosophical assumptions into the development of the educational programme.

The philosophical basis of an educational programme refers to the underlying values and beliefs that influence and direct the programme structure and its substance. It is important that the development of the programme be in line with the philosophy and mission statement of the institution. These describe the unique purpose and reason for the existence of an institution (Csokasy, 1998, p. 97).

The educational programme was developed within the philosophical approach of humanistic existentialism, which is in line with the mission statement of the Faculty of Medical and Health Sciences at the University of Namibia where nursing students are trained. Humanistic existentialism focuses on individualism and self-fulfillment, choices that need to be made, freedom of choice, meaning of choice and the responsibility one has for choice that indicates that a person is uniquely responsible for his/her own fate. It is believed that individuals are faced with freedom of choice to participate in the programme and that the development of critical thinking in the student and professional nurse remains a personal choice (Praeger, 1995, p. 302; Dillard & Laidig, 1998, p. 75) .

For the development of this educational programme the researcher focused on the student nurse as an individual on the verge of becoming a professional nurse who is responsible for the rendering of comprehensive health care. Rendering comprehensive health care involves the ability to identify and address the health needs of the nation of Namibia to render a service, especially in the domains of preventive, promotive, curative and rehabilitative health care.

In order to be able to render comprehensive health care, the student nurse has to develop as a critical thinker to empower him-/herself to exercise professional judgment which will ensure that the Namibian public will receive high quality safe, professionally and ethically based health care (Faculty of Medical and Health Sciences- objectives, UNAM). The above-mentioned is in line with the view of Shaw (2006, p. 3) on the existentialistic approach. Shaw says that in the class of the existentialist, subject matter takes second place to helping the students understand and appreciate themselves as unique individuals who accept complete responsibility for their thoughts, feelings and actions.

Humanistic existentialism as a philosophical approach to the study implied furthermore that student nurses should become aware of their ability to realize their potential, should have freedom of responsibility and in relation to others strive to find themselves in this process of developing critical thinking. Moreover, as human beings we should realize that we live in a world of complexities and possibilities and we all have the responsibility for making the most of this existence. Existentialism is particularly applicable to nursing because of its emphasis on self-determination, freedom of choice and self-responsibility (Praeger, 1995, p. 302; Dillard & Laidig, 1998, p. 75). A structure supportive of the philosophy of humanistic existentialism is one of the principles of constructivism which also supports the learner as a unique individual with unique backgrounds and needs.

Principles of constructivism

The constructivist paradigm, also referred to as the naturalistic paradigm, began as a counter movement to positivism and represents an alternative system for inquiry (Polit & Beck, 2006, p.15). It may also be considered a philosophical framework of learning. For the constructivist /naturalistic inquirer, reality is not fixed and many constructions are possible. In research, constructivism relates findings to the interaction between the inquirer and participants (Polit & Beck , 2006, p. 15; Wikipedia ,n.d (a), p.1).

For the educational principles and approach the constructivism focuses on the learner with multiple interpretations in mind, and where interaction among the learner and other stakeholders in the education process are important. The emphasis in the constructivist approach is on facilitator-supported learning, initiated and directed by the learner (Wikipedia ,n.d (a), p.1).

Constructivism emphasizes the involvement of the learner/student in his own learning to construct and create new ideas from previous experience. It is thus important that the learner is given the opportunity to voice his experience and to allow as many construction of a situation as possible. The principles of constructivism as applied to this educational programme were as follows:

- Real-world environments were incorporated into the programme, which assisted the participants to focus on everyday world problems in terms of case scenarios. However, conditions during the implementation of the programme allowed for

different interpretations of a given situation which facilitated active participation by the participants of the educational programme

- The facilitator of the educational programme (researcher) served as the coach to facilitate thoughts and strategies to solve these problems but participants were allowed freedom of thought and construction.
- The presentation of the educational programme focused on knowledge construction and not reproduction (see chapter 7).
- Reflective practice was fostered because constructivism allows and emphasizes understanding of a situation and not merely a reproduction as already mentioned.
- Multiple modes of presentation were encouraged which provided for the uniqueness of the learner/participant while allowing the learner to develop and individual potential.
- Self-awareness in the construction of knowledge was emphasized (Murphy, 1997, p. 4; Savard, 2004, p.1; Polit & Beck, 2006, p.16 ; Wikipedia ,n.d (a), p.1).

Except for the philosophical approaches, different educational approaches were also integrated into the development of the programme.

6.2. 4 Objectives of the educational programme

The objectives for this educational programme were compiled to enhance the development of critical thinking skills among student nurses by focusing on the less obvious and by helping the nurse to develop a “why” attitude towards the obvious. To

allow the students to learn to be self-aware and reflective, self-assessed and self-regarding, the educational programme needed to provide opportunities for reflective self-awareness, using a subtle approach and questioning attitude towards decisions made in the care of the patient (Robinson, 1998, p.4; Mentkowski & Associates, 2000, p. 235).

The following objectives were therefore developed for the educational programme:

The researcher

- formulated objectives for the educational programme to facilitate the development of critical thinking in students nurses. These included sensitization of the group towards the term “critical thinking” and an introduction to critical thinking concepts.
- outlined the content that had to be covered in the programme which was within the conceptual framework as discussed in chapter 5.
- explored, described and designed the strategies that will be followed during the implementation of the programme.
- integrated the critical thinking concepts into nursing practice by constructing case scenarios.
- drafted specific questions to strengthen the application of critical thinking concepts in the management of the case scenario.
- peer-reviewed the proposed programme.
- made the draft programme available to experts for validation

(See addenda 2.1 & 2.2.)

6.2.5 Content of the programme

The content of the programme entailed case scenarios which were designed around the six core cognitive critical thinking concepts as indicated in Table 6. 1.

Table 6.1 CORE COGNITIVE CRITICAL THINKING CONCEPTS INCORPORATED INTO THE EDUCATIONAL PROGRAMME ⁷

Six core critical thinking concepts	
• Interpretation	• Inference
• Analysis	• Explanation
• Evaluation	• Self-regulation

These concepts were addressed during the educational programme and the questions asked on the case scenario in the pretest and posttest specifically focused on the application of these six concepts.

The case scenario and the applicable questions appear in figure 6.2 and 6.3.

⁷ Read it in conjunction with Table 2.1 and Figure 5.3

Fig 6.2: PRESENTATION OF INTEGRATION OF CONCEPTS INTO QUESTIONS

Figure 6.3: MATCHING QUESTIONS TO CONCEPTS

Figure 6.3 : MATCHING QUESTIONS TO CONCEPTS [CONTINUED]

Verification of the educational programme

The draft educational programme was distributed to two experts on critical thinking (both qualified at the doctoral level) for peer review and verification. Peer review is considered an extremely useful activity since it allows stakeholders in student training the opportunity to air a creative meaning about an educational programme developed for professionals (Babbie & Mouton, 2001, p. 292).

The experts were identified in terms of their knowledge about and application of critical thinking in nursing practice. They were expected to peer-review the educational programme and comment on its contents. The researcher received valuable comments which were incorporated into the final educational programme.

6.2.6 Teaching strategies to facilitate critical thinking

The researcher employed specific teaching strategies during the educational programme to facilitate critical thinking. The strategies that were used are case scenarios and debating.

6.2.6.1 Case scenario

With any educational programme and/or curriculum it is important to identify teaching strategies suitable to address or offer the content of the particular curriculum. This educational programme was no exception. After the design and the validation of the educational programme content, strategies for teaching were decided upon.

Years back Sternberg (1985, p. 277) believed that critical thinking should be taught by using instructional material that reflects the realities of thinking in real life, which is strongly supported by the constructivists. Students have to be confronted with real-life problems, in the form of case scenarios, to understand how critical thinking can be used in everyday situations. The presentation of real-life problems in these case scenarios happens to be not only useful for thinking, but also successful in the development of critical thinking (Cooke & Moyle, 2002, p. 330).

A case scenario is defined as an in-depth analysis of a real-life situation as a way to illustrate class content and theory to real or simulated life or both. It requires the student to be actively involved in the educational setting, constructing ideas and debating decisions around a specific problem in the form of a case scenario. This strategy is extremely useful in nursing education as a means of exposing students to a case that they may come across in order to encourage debating in the class to facilitate critical thinking on the solution to the problem (Rowles & Brigham, 1998, p.258; Cooke & Moyle, 2002, p.331; Baumberger-Henry, 2005, p. 238).

Debating of a case in a case scenario is “a realistic way to present didactic information in a more meaningful text” (Pond, Bradshaw & Turner, 1991, p.18) and it may be a useful tool to teach students decision making and planning of care. It gives the individual the opportunity to use his/her knowledge base, deep-rooted ideas and assumptions to solve the problem (Thurmond, 2001, p.382; Souers, 2002, p. 9).In

constructivism the utilization of case scenarios is also seen as a means of challenging students. Constructivism examines how learning takes place, involving negotiation, with respect for and meaningful interpretation of ideas, making sense of an experience which is an excellent strategy to employ and fostering critical thinking because it calls for student interactions. Student interactions present students with the opportunity to practice and master their skills (Smith, 2002, p. 2 ; Siegel, 2005, p. 339; Baumberger-Henry, 2005, p. 238). Therefore the researcher (and facilitator of the programme) decided to focus on the utilization of case scenarios in the presentation of this educational programme, designed to facilitate critical thinking in student nurses.

However, for this teaching strategy to be successful, cases should be well designed and realistic. These criteria applied to the case scenarios that were developed for this educational programme. Furthermore the class environment should be non-threatening and peaceful. This is the responsibility of the facilitator, as described under the principles of adult education (Rowles & Brigham, 1998, p.258; Baumberger-Henry, 2005, p.238).

The advantage of case scenarios is that they stimulate critical thinking, retention and recall on condition that they reflect the realities of everyday problem solving. Unless these criteria are met, it is doubtful that students will be able to apply what they have learned from these programmes in their everyday lives (Sternberg, 1985, p. 280). For this educational programme different case scenarios were presented after the concepts

had been lectured, to enable students to apply critical thinking skills to a general and nursing situation. By brainstorming for ideas during group work, students were given the opportunity to examine their own viewpoints and rethink old ideas to fit the needs of the client/patient. By doing this the facilitator enhanced active participation and self-directed learning (Pond et.al., 1991, p.19; Rowles & Brigham, 1998, p. 258; Cooke & Moyle, 2002, p. 333).

6.2.6.2 Debating

In addition to case scenarios, debating can also be employed as a teaching strategy for the facilitation of critical thinking. The researcher attempted to enhance debating of relevant issues in groups so as to involve students in decision making. Debates are described as a valuable teaching method to enhance critical thinking in nursing. They also encourage students to exchange ideas on their decisions and outcomes. Debates can also be initiated by confronting students with real-life situations and thereby giving them the opportunity to apply their knowledge to solve problems and live the experience of their client/patient. It was also indicated that regular reflection on the debates would facilitate student learning. Debating can be a very successful exercise when it is done in small groups. Small group discussions promote communication in students who are quiet and nonverbal by nature. These students feel at ease when they can air their opinions in a small group (Abegglen, 1997, p.453; Jenkins & Turick–Gibson, 1999, p.11; Varner & Peck, 2003, p.53; Candela, Michael & Mitchell, 2003, p. 37).

Throughout the discussion the researcher has indicated, integrated and discussed several strategies that can enhance active participation and by doing that ultimately foster critical thinking. However, to summarize, the following strategies as indicated in table 6.1, were employed to facilitate interaction during the implementation of an educational programme for the facilitation of critical thinking. This will also help participants in their everyday contact and communication with patients/clients:

Table 6.2: STRATEGIES TO ENHANCE INTERACTION

STRATEGIES TO ENHANCE INTERACTION DURING PROGRAMME IMPLEMENTATION	
<i>Strategy</i>	<i>Application in study/implementation of programme</i>
Reflection	Participants were asked to constantly reflect on their approach towards the case study that they were confronted with
Respect and collaboration	During the discussions participants were requested to respect each others input and collaborate in groups to facilitate their thinking
Mutual trust	Group members were expected to trust each other and cooperate with each other
Effective listening	Group members had an opportunity to present and to listen to other presentations to comment and reflect. By doing that members learned from each other and interaction was promoted
Effective questioning	Questioning was encouraged amongst groups and group members To question also correspond with the inquisitive trait of a critical thinker Questioning further enhances the participants skills to employ in patient care

Feedback and paraphrasing	After each group session constructive feedback was given per group and others were expected to elaborate and question the other groups. This enhanced interaction among the participants as well as among the facilitator and participant. If any uncertainty existed about the feedback of a group the technique of paraphrasing were utilized
Self–disclosure	Self disclosure was eminent in development of the mutual trust and relationship amongst group members. A participant was given time before commenting on an issue to disclose feelings about a particular scenario

(Quinn, 2000, p. 470 – 475).

6.3 Educational and curriculum approaches integrated into the development of the educational programme

An eclectic approach to the development of this educational programme was applied. Different curriculum and educational approaches were utilized in the design of the educational programme.

The researcher strove to keep the programme simple but not simplistic, to serve as a guide to the nursing student in everyday nursing practice. The educational programme had an outcomes-based focus, namely to facilitate the development of critical thinking skills by the student nurse. Outcomes are described by Zundel, Needham, Richards, Kershaw, Daugharty and Robak (n.d., p. 2) as educational targets, something that the facilitator expected to achieve. The latter authors also emphasize that, during outcomes-

based learning, students are assisted in the achievement of certain targets, namely, in this educational programme, the application and development of critical thinking skills. This can be achieved through courses that are assignment–centered rather than textbook and lecture centered (Mihram, n.d., p. 15; Gellin & Beard, 2007, p. 2).

The educational programme was developed within the **principles of adult learning/andragogics** , as indicated in the model of Knowles (Schoenly, 1998, p.196; Quinn & Hughes, 2007, p.29), and in support thereof **constructivistic teaching principles** were emphasized (as discussed with philosophical approaches).

The cyclic **curriculum development model** as presented by Nicholls and Nicholls (1978, p.21), the curriculum development **model related to critical thinking by Videbeck** (Feingold & Perlich, 1999, p. 43) and **Duldt’s framework on debating critical** thinking were also utilized as part of the framework for the development of the educational programme as indicated in figure 6.2 .

6.3.1 Cyclic curriculum development model of Nicholls and Nicholls

With the principles of adult education and constructivism in mind, the researcher also utilized a specific method to develop the educational programme for this study. As mentioned previously, the curriculum model of Nicholls and Nicholls was used (figure 6.2 & figure 6.3).

The curriculum development model of Nicholls and Nicholls depicts curriculum development as a continuing process. This is very relevant to critical thinking. The model emphasizes the fact that actions within the curriculum are interrelated and interactive, and that no actions can take place in a vacuum. Since the model represents a circular process, it is indicative of an ongoing process with no particular starting or finishing point, based on a situational analysis. The following five actions are evident in this model:

- Conducting a situational analysis
- Selecting objectives
- Selecting and organizing content
- Selecting and organizing teaching methods
- Evaluation (Nicholls & Nicholls 1978, p. 21).

Other authors (Mentkowski & Associates, 2000, p.237) also support the process model of Nicholls and Nicholls. The researcher therefore decided to apply this model for the development of the educational programme.

The application of this model to the educational programme developed for this study, to facilitate the development of critical thinking in student nurses, resulted in the following actions:

- A situational analysis was done in phase 1 to determine to what extent senior nursing students are able to execute and apply critical thinking in the management of a specific nursing case. On the basis of this analysis specific objectives to address in

the educational programme were formulated. It is important to mention that the programme objectives related to the needs as identified in the situational analysis

- Content to assure the achievement of the objectives was constructed and suitable teaching methods designed to go with the content.
- During implementation of the programme emphasis in the choice of teaching methods was on active participation by the participants in the educational programme.
- Evaluation of the programme content was done by means of a pretest and posttest, before and after the programme, to determine whether there had been any change in the application of critical thinking skills by the student nurses after attending the programme.

6.3.2 Videbeck's model of curriculum development

In addition to the process model of Nicholls and Nicholls, the researcher found it appropriate to use Videbeck's curriculum model (Feingold & Perlich, 1999, p. 43) simultaneously with Nicholls and Nicholls's model (1978, p.21) as described, as an additional approach to the development of the educational programme (fig 6.2 & fig 6.3). This model includes four phases, which perfectly corresponded to the four actions of Nichols & Nicholls's cyclic curriculum model. These four phases were to describe the concept critical thinking, identify critical thinking outcomes, plan strategies to foster critical thinking skills and to evaluate student achievement during exercises of application of critical thinking (Feingold & Perlich, 1999, p. 43).

The application of this model to the educational programme for senior student nurses can be described as follows:

- The concept critical thinking was addressed and described in both the presentation of the educational programme and the handout that was provided to the participants.
- Clear outcomes for this educational programme with regard to critical thinking and its application thereof were formulated, namely that the student would “demonstrate the use of critical thinking in the execution of nursing care in addressing the patient’s need”.
- Specific strategies were designed for the educational programme to foster the development of critical thinking skills during nursing practice. The strategies focused on active participation by the participant during the educational programme
- The students’ ability to apply critical thinking was assessed by the facilitator of the programme (the researcher) by introducing a pretest before the programme and a posttest after completion of the programme. These tests were conducted to determine whether any change(s) had taken place in the application of critical thinking skills by students, and if so, whether these changes could be ascribed to the educational programme to facilitate the critical thinking skills of senior student nurses.

6.3.3 Knowles model on andragogy

Knowles developed an andragogical model that accommodates continuing education and training for adult learners, a group which includes nursing students. Andragogy is a term

that “belongs” to and refers to adult education as described by Knowles and is defined as “the art and science of helping adults learn” (Knowles, 1980, p. 43; Merriam & Brockett, 1997, p. 135; Quinn & Hughes, 2007, p.29).

Knowles realized that adults learn differently from the way children learn and he was also of the opinion that people learn best when treated as human beings during a lifelong process of education. Moreover, it is necessary to keep in mind that adult learners carry with them the baggage of their expectations of learning derived from formal schooling and that a mind shift might be necessary to get them to feel at ease with the “new” environment. For this mind shift to take place it is necessary to have an adult educator who plan and administers programmes and who counsels and facilitates learning by creating awareness in a certain subject (Heimlich & Norland, 1994, p. 146; Merriam & Brockett, 1997, p. xi ; Richardson, 1998, p.21).

For the adult educator to establish this mind shift of the learner, the following elements in this process model should be kept in mind. The adult educator needs to do the following:

- Establish a climate conducive to learning; referring to the physical, human and interpersonal environment.
- Create a mechanism for mutual planning, a cardinal principle of andragogy.
- Diagnose the needs for learning where the adult learner has to realize his own needs and perceptions.

- Design a pattern of learning experiences where self-directed learning features prominently.
- Formulate and operate a programme by setting clear objectives.
- Evaluate a programme with a five-step approach, namely ongoing evaluation, learning evaluation, behaviour evaluation, results evaluation and re-diagnosis of learning needs (Dekker, 1998, p.293; Quinn & Hughes, 2007, p.31).

The concept of adult learning is supported by Caffarella and Barnett (1994, p.32), who state that most adults prefer to be actively involved versus being primarily passive recipients of knowledge. Active learning involves the student through participation and an investment of energy in all phases of the learning process. However, adults fear failure, which implies that the educator or facilitator of the programme should ensure a relaxed, psychologically safe environment where empowerment of the learner can be facilitated (Courtney, 1992, p. 99; Norton, 1998(b), p.228; Norton, 1998, p.153; Levett-Jones, 2005, p. 365).

In support of the andragogical model as described, the development of the educational programme focused on cooperative learning as based on the beliefs of constructivism. Constructivism in teaching suggests that people learn through an interaction between thinking and experience and it encourages cooperative learning and therefore enhances active participation as suggested by Knowles. Integrating a constructivist approach to the adult learning principles seemed logical and applicable to this study, since the

approach can be adapted to any subject (Shaw, 2006, p. 3; Gagnon & Collay, n.d., p. 5; Murphy, 1997, p. 3; Pollard, 2002, p. 138).

The incorporation of Knowles's process model on andragogy and constructivism into the educational programme to facilitate the development of critical thinking, for this study, was done in the following way:

- All participants of the educational programme were adult learners involved in tertiary education.
- The participants were fourth-year nursing students with nursing experience to fall back on when confronted with new nursing problems.
- The strategy followed for the educational programme was that of active participation where the learners were involved in discussions and planning. However, they were not actively involved in the setting of the objectives of the educational programme because the programme was based on the needs that were identified by a needs assessment during phase 1 of the study;
- Clear objectives were formulated for the programme, which was offered over three days.
- The activities were self-directed to promote active participation and inquiry.
- Small group discussions were employed to enhance cooperative learning and build trust between members of the group, through face to face interaction.
- Groups were expected to give feedback on their progress in the cases presented during the implementation of the educational programme.

- An evaluation was done before and after the programme by a pre- and post-test to determine whether the application of critical thinking skills had improved.
(Levett-Jones, 2005, p.365; Gagnon & Collay, n.d, p. 1; Baumberger-Henry, 2005, p.239; Gagnon & Collay, n.d, p. 2; Quinn & Hughes, 2007, p.30).

In addition to the above, people need to be prepared to think critically to be able to distinguish between important and less important issues and this can be achieved through adult education. Two more aspects are important in adult education and support constructivism, namely the recognition of prior experience and knowledge in the class discussions and learning activities that are “situated” as near as possible to reality so that students can transfer learning more easily. These learning activities refer to the creation of very real scenarios whereby the teacher/facilitator encourages students to engage in active learning and gives them ever-broadening tools to enable them to keep learning. By integrating these, the emphasis of the constructivistic approach to learning is on individualized rather than mass learning (Carafella & Barnett, 1994, p. 36; ThirteenEd Online, 2004, p.1; Carlisle & Ibbotson, 2005, p 528; Banning, 2005, p. 504; Davis, Kumtepe & Aydeniz, 2007, p. 115).

By taking active participation into account, the researcher aimed to include as many exercises from nursing practice and everyday life as possible, in order to encourage students to exercise their skills pertaining the situations and to use their knowledge base to solve the case scenarios. Because adult learners have broad stores of knowledge and

varied experience, they can assist each other to learn (Fosnot, 1996, p. ix; Meyer, Naude & Van Niekerk, 2004, p. 89).

From the above, the roles of the adult learner and the educator/facilitator within the educational programme were summarized and are reflected in table 6.3.

Table 6.3: ROLES OF THE EDUCATOR AND THE LEARNER IN ADULT EDUCATION, INCORPORATING CONSTRUCTIVISM

[The activities of the educator and the learner do not necessarily correlate with each other in the table.]

Educator/facilitator	Learners
<ul style="list-style-type: none"> • Relate to the learners with respect • Create a psychologically safe environment to facilitate learning with mutual respect and acceptance of differences • Introduce learners to the clear objectives of the programme • Involve learners in assessing and determining their needs • Help learners to optimally make use of their experience • Assist learners to meet the learning objectives • Assist learners to help develop their learning activities • Promote active participation of the learner through self-directed activities 	<ul style="list-style-type: none"> • Accept responsibility for collaborating in planning activities • Adopt goals of the programme as their own goals • Actively participate in the learning experience • Participate in monitoring their own progress • Utilize prior experience in self- directed activities • Encourage fellow learners to participate • Pace their own learning while having the opportunity to construct knowledge on

<ul style="list-style-type: none"> • Encourage participation and cooperation with other learners • Introduce learners to situations where they can explore and find self-fulfillment • Assist learners in evaluating themselves and the programme • Acknowledge prior learning and experience 	<p>experience</p> <ul style="list-style-type: none"> • Build confidence and practical insight and understanding • Students raise own questions and determine their own learning experience
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(Fosnot, 1996 , p. ix; Feldman, 2002, p. 20; Pollard, 2002, p.159; Thirteen Ed Online, 2004, p.1; Meyer, Naude & Van Niekerk, 2004, p. 89).

6.3.4 Duldt's framework on debating critical thinking

The researcher also incorporated the framework on debating critical thinking as presented by Duldt (1997, p. 3) into the development of the educational programme (figure 6.2 and figure 6.3). Duldt believes that defining and debating concepts is the core of critical thinking. The author stipulates that there are three sets of data facilitators can use to determine the level of critical thinking of students (Duldt, 1997, p.3).

These are as follows:

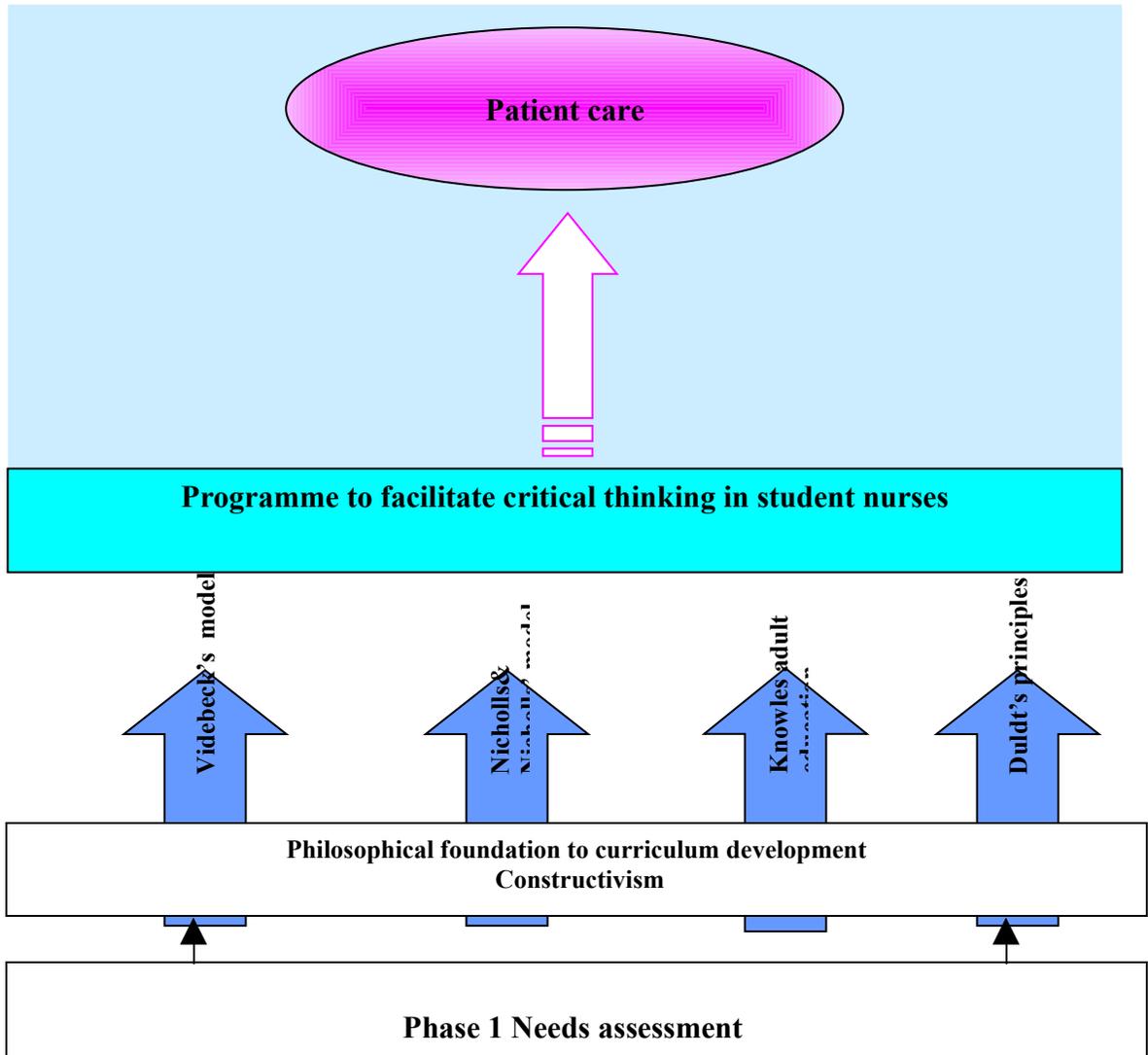
- The first is the most superficial level of “figuring things out” which occurs at the verbal level through discussions with the students. For this educational programme this level was determined by talking to students during the programme and listening to what they had to say about their everyday practice
- The second level is a bit harder and includes “reading” how others have figured something out. This was applied by presenting a case scenario to the students and then observing how they “figured it out”.

- The third and hardest way is the writing part of “figuring it out”. The facilitator can then look carefully at the structure and substance of what the students presented. As applied to the educational programme for this research, this level was assessed in the answers of students to the questions of the case scenario used in the pre-and post-test of the quasi-experimental design.

Duldt further holds the opinion (1997, p.4) that critical thinking should be learned over a period of time. For the purposes of this research, a condensed educational programme was offered to a selected group of students over a period of three days. Information vital to the discipline of nursing was handled and facilitated by the facilitator. The focus of the programme was on thinking rather than on learning. This supports the critical theory, which indicates that it is important to teach students how to think rather than what to think (Glen, 1995, p.175; Duldt, 1997, p. 4).

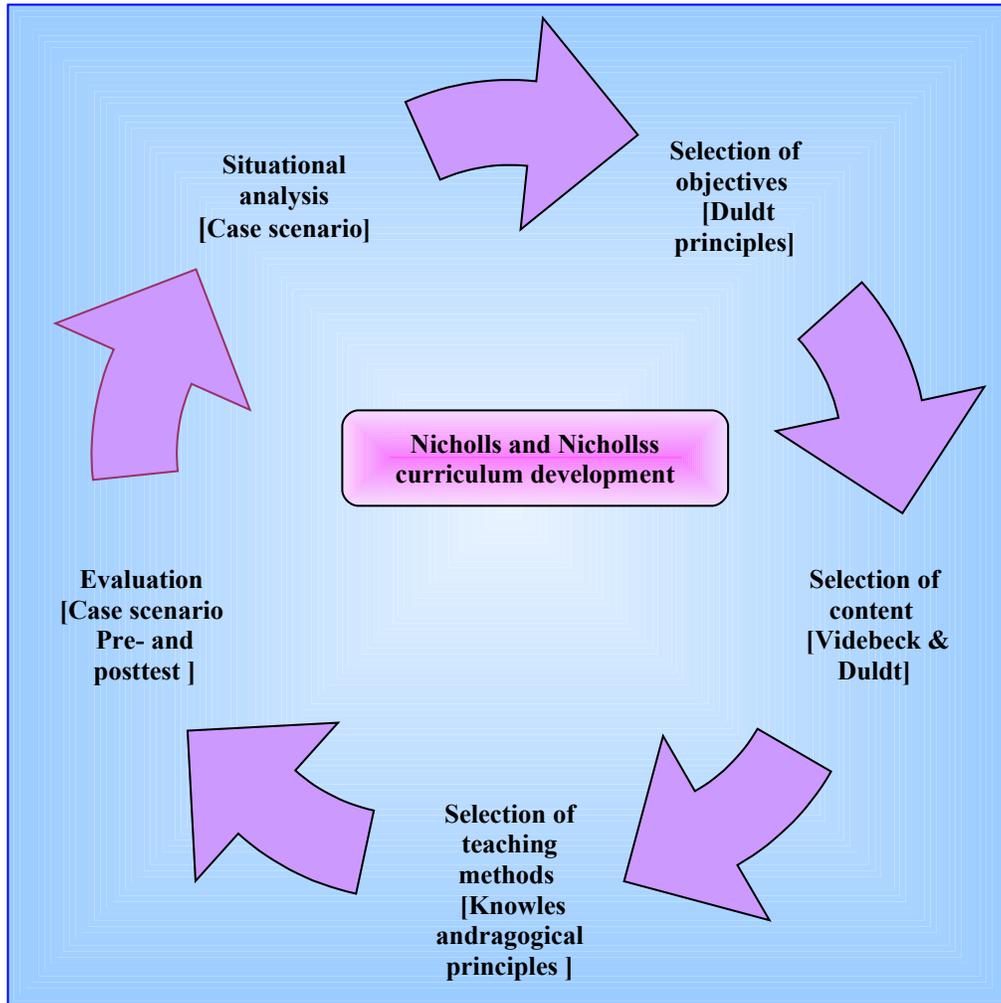
A schematic presentation on the development of the educational programme, follows in fig 6.4.

**Figure 6.4: SCHEMATIC PRESENTATION OF PROGRAMME
DEVELOPMENT**



The researcher incorporated different components of the development of the educational programme in the cyclic model to curriculum development. The incorporation of these components is presented in Figure 6.5.

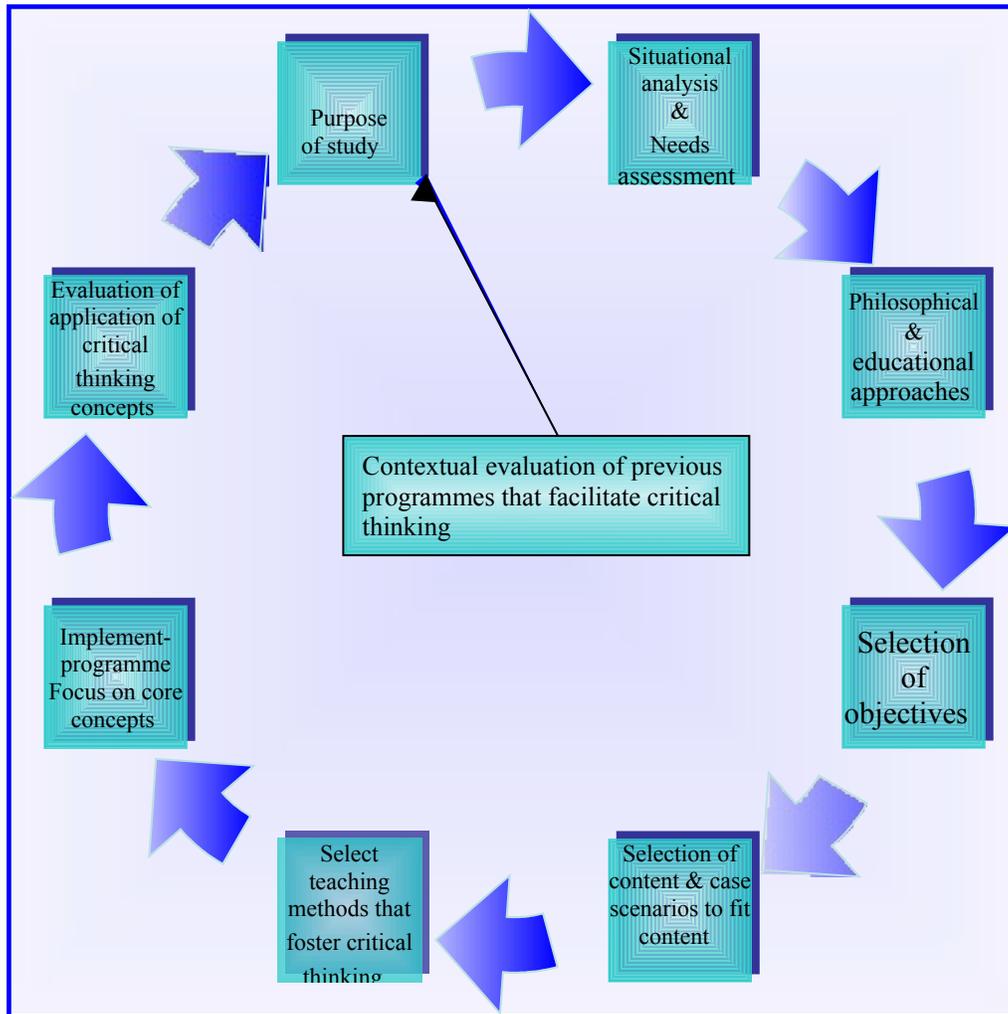
Figure 6.5: SCHEMATIC PRESENTATION OF INTEGRATED COMPONENTS WITHIN NICHOLLS AND NICHOLLS'S CYCLICAL MODEL TO CURRICULUM DEVELOPMENT



Designing the implementation of the educational programme is a logical step to execute after the process of programme development as indicated in fig 6.4.

The components of the researcher’s curriculum cycle as original contribution is summarized in figure 6.6.

Figure 6.6: SCHEMATIC PRESENTATION OF THE RESEARCHER’S INTEGRATED CURRICULUM CYCLE FOR A PROGRAMME TO FACILITATE CRITICAL THINKING



6. 4 Strategies to overcome obstacles during the implementation of the educational programme

Though many obstacles that may occur in the facilitation of critical thinking during the presentation of an educational programme were mentioned in chapter 2, the researcher, during the development of this educational programme, focused on strategies to employ

in order to overcome these obstacles in this programme. Those applied strategies are indicated in table 6.4.

**Table 6.4: STRATEGIES TO OVERCOME OBSTACLES IN FACILITATION
OF CRITICAL THINKING**

<i>Obstacle</i>	<i>Strategy employed during the programme to combat possible obstacle</i>
<p>a) Educators lack knowledge.</p> <p>b) Teaching and assessment methods are not facilitative of critical thinking</p> <p>c) Educators display a negative attitude and a resistance towards change</p>	<ul style="list-style-type: none"> • The programme was implemented by a well prepared facilitator. • Educational strategies to enhance active participation were employed e.g. use of case scenarios. • Facilitator moved away from passive lecturing to small group discussions to enhance participation. • <u>Students were encouraged to take ownership of their learning by integrating the principles of adult learning by Knowles and the principles of constructivism.</u>

<p>d) Lack of interest in facilitating critical thinking on the part of both the clinical tutor and the student (Pretorius, 2001, p.113).</p>	<ul style="list-style-type: none"> • Facilitator acted as a role model for critical thinking and enhanced positive attitudes among student nurses. • The teaching environment turned out to be very relaxed and stimulating. • Facilitator convinced students that it is necessary to enter into dialogue with each other and with the facilitator so that both parties got used to the utilization of active participation in teaching to facilitate critical thinking. • Facilitator provided opportunities for student to participate in active discussion.
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⁸(Pretorius, 2001, p.113; Cooke & Moyle, 2002, p. 335; Mangena & Chabeli, 2005, p.294).

The programme outline and the content of the educational programme as presented and provided to the participants appear at the end of this chapter.

6.5 Summary

The development of the educational programme for this study may benefit the Namibian community since the quality of nursing care will be enhanced if student nurses and professional nurses can think critically. The question is, however, whether students are

⁸ General obstacles as identified during previous studies appear in chapter 2

prepared for such a challenge in a complex, changing world and how nurse educators can encourage students to look beyond the obvious in clinical nursing to address complex nursing problems (Robinson, 1998, p.4; Dillard & Laidig, 1998, p.70).

Nursing all over the world is faced with the challenge of teaching students from varying backgrounds and diverse cultures (Richardson, 1998, p.17) and Namibia is no exception to this phenomenon. Preparing future professionals in the health sciences require making judgments in highly complex environments (Facione et. al., 1997, p. 4).

The preparation of these professionals includes the development of critical thinking. Critical thinking has become one of the benchmarks that are used to measure successful learning outcomes of students today. In the rapidly changing arena of health care, professional nurses must have critical thinking skills and use them to deliver optimal care. One way of achieving this is by offering an educational programme (Jenkins & Turick–Gibson, 1999, p.14; Gellin & Beard, 2007, p.1).

It is evident in literature that educators should move away from unilateral teaching such as lecturing which promotes dependency and passivity. Educators must be willing to examine and implement strategies that will provide participatory, meaningful and stimulating learning for the students, targeting their educational needs and priorities with self-esteem and authority. Educators are therefore challenged to identify measures and justify thoughtful, fair-minded engagement in problem solving, decision making and professional judgments which are all indicative of critical thinking. It is also emphasized

that through practice and with guidance from a good facilitator, we can develop our thinking skills as far as our natural abilities allow (Pond et. al., 1991, p.22; Facione et al., 1997, p.68; Fichardt & Viljoen, 2000, p.115; Facione, Facione & Giancarlo, 2000, p.61; Banning, 2005, p. 504).

This chapter addressed the development of a programme to facilitate critical thinking in student nurses, to meet the above challenge. Initially, an overview of and rationale for the educational programme were provided and the approaches utilized to guide the development of the educational programme were discussed. It is also important to mention that the main focus of the programme was to help the student to acquire skills in a “learn by doing” approach since the programme emphasized active participation by the student (ADEA, 2006, p.931). The researcher strove to contribute towards the development of the individual’s capacity for personal and social growth. “It was all about people” (Anastasi, 2004, p.10). The researcher’s vision in designing an educational programme to facilitate the development of critical thinking skills in the student nurse was to develop the skills of nurses in Namibia so that they would be able to face the challenges of the nursing profession in that country. It was envisaged that the students should finish the educational programme with a knowledge base and skills in critical thinking that they had not expected to acquire at the beginning of the programme.

It is essential, however, to realize that it is necessary to adapt whatever is taught to nursing students to address the needs of the individual student and to adapt the teaching strategies accordingly (Richardson, 1998, p.17; CTL, 2005, p.1). Furthermore it should be kept in mind that the student profile has changed tremendously over the past years, which requires the educator to be flexible in considering adult education principles.

Although some authors like Van Gelder (n.d, p.2) see the development of critical thinking as a lifelong journey that cannot be taught overnight, it is also essential to start somewhere in the development of critical thinking. Educators should begin infusing the concept, since “it is never too early or too late to start working on it” (Van Gelder, n.d, p. 3; Sternberg & Spear-Swerling, 1996, p. 111; Abegglen, 1997, p. 452).

The researcher is aware of the fact that students cannot be skilled in critical thinking after a short programme on critical thinking, but is confident that the educational programme will sensitize advanced thinkers in nursing to start developing their critical thinking skills so that the nurses of Namibia become “smart” in the execution of their nursing tasks. It is also the responsibility of an educator to provide as many opportunities as possible to the students to develop within a certain context .Learning is not the result of development, it is development. It requires self-organization from the prospective learner (Fosnot, 1996, p 29; Mentkowski & Associates, 2000, p. 58).

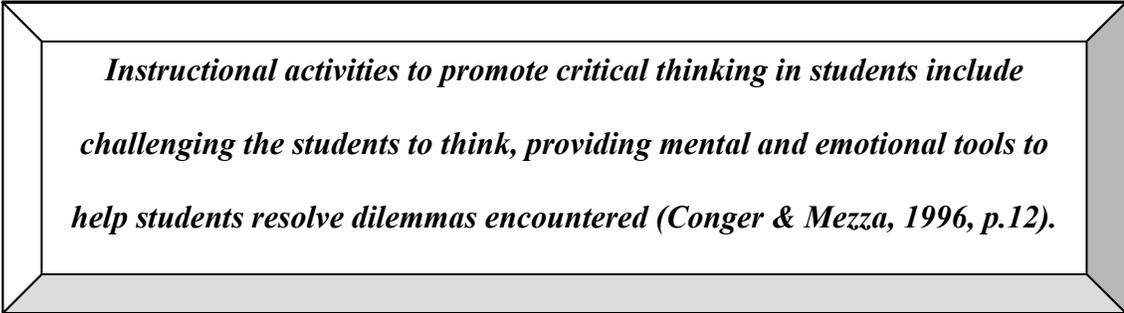
It is true that incorporating critical thinking into teaching pose challenges to the teacher, but those who do this in the right spirit and with dedication will be rewarded by observing clients receiving quality care!

The outline of the educational programme to guide the facilitator as well as the educational programme that was developed to facilitate critical thinking in student nurses appears as addenda 2.1 and 2.2 at the end of the study.

The next chapter, chapter 7, captures phase 3 of the research design.

CHAPTER 7

IMPLEMENTATION OF THE EDUCATIONAL PROGRAMME



Instructional activities to promote critical thinking in students include challenging the students to think, providing mental and emotional tools to help students resolve dilemmas encountered (Conger & Mezza, 1996, p.12).



7.1 Introduction

In chapter 6, the development of the educational programme (phase 2) to facilitate the development of critical thinking in the student nurse was described, with specific reference to the approaches and strategies employed. Phase 3 of the study comprised the implementation of the educational programme within a quasi-experimental design. Even though the steps of the research design are independently presented, they are inevitably intertwined.

The focus of this chapter is on the implementation (phase 3) of the above-mentioned educational programme. Implementation refers to the process of putting into practice an idea, educational programme or set of activities and structures for the people expected to change.

Teaching and learning, as the most important features of this educational programme, are considered to be a dynamic process (Norton, 1998(b), p.211). It is, however, important to note that the emphasis of this educational programme was on the learner and the learning that takes place, rather than on the teaching. Teaching merely took the

form of facilitation to develop critical thinking in the participants, because “without critical thinkers it is unlikely that much human progress would be made” – especially in the nursing profession (Wright, 2003, p.12). Although students normally like to be “spoon fed”, the facilitator aimed, during the implementation phase of the educational programme, to promote active participation so that the sessions would be meaningful and would comply with the different approaches used to design the educational programme. Spoon feeding may be convenient in the short term, but the long-term implications of passive learning are profoundly negative (Youngblood & Beitz, 2001, p.39; Johns, 2002, p.1).

At an international critical thinking conference, a model for teaching critical thinking was discussed. The model proposes that one of the most effective approaches to teaching critical thinking is to conduct a two-day workshop where active participation by participants is proposed. Students should be encouraged to read critically and do self-assessment during this workshop. During such a workshop, the basic concept of critical thinking should be emphasized as well as the application to the specific discipline concerned, in this study the nursing profession (Anonymous, 1993, p.39).

7.2 Methodology for Phase 3: The implementation of the educational programme

Implementation of the programme was conducted as phase 3 of the study within the following methodological framework:

Purpose

The overall purpose of phase 3 was to implement the educational programme that was developed to facilitate the development of critical thinking in the student nurse.

Design

The researcher utilized a quasi-experimental design within the quantitative approach for phase 3. The purpose of a quasi-experimental design is to identify and demonstrate casual relationships, examine relationships and clarify why certain events happened. The design also explains the causal relationship between the intervention, the behaviours and related conditions targeted for change (Burns & Grove, 2005, p. 27; De Vos, 2002, p. 112; Polit & Beck, 2006, p. 52).

Quasi-experiments, like true experiments, are characterized by manipulation of an independent variable called an intervention. In this study the intervention was the implementation of the educational programme. However, quasi-experimental designs lack the randomization to treatment groups which characterizes true experiments (Fouche & De Vos, 2002, p.146; Polit & Beck, 2004, p.181; Brink, 2006, p.97).

The strength of the quasi-experiment is that it may be practical when it is not feasible to conduct a true experiment. That was the case for this study where the researcher utilized the quasi-experimental design because randomization was not possible. A pretest–

posttest control group design was implemented (Polit & Beck, 2006, p. 187; Brink, 2006, p.98).

The quasi-experimental design appeared to be the most suitable design for this study because students from two different campuses were involved and logistically randomization as for the true experiment was not possible. It would have been extremely difficult to separate two groups of students in one class on a specific campus, expecting one group to follow the educational programme and one group to be excluded from the programme and then ensure that they did not influence each other when it came to the posttest. It turned out to be more practical and feasible to involve a whole class in the educational programme since it would be difficult to keep the participants from their colleagues for the duration of the educational programme.

The researcher therefore decided to use the fourth-year nursing students from the Windhoek campus as the experimental group and participants in the educational programme, and the fourth-year nursing students from the Oshakati campus as the control group. Both groups were pretested and posttested .

At this point it is worth commenting that both groups of students, although on two campuses, were following the same comprehensive nursing curriculum and have completed the same course content, as was indicated in the inclusion criteria of the design.

The quasi-experimental design is explained in table 7.1

Table 7.1: QUASI - EXPERIMENTAL DESIGN

Group	Pretest	Intervention	Posttest
Experimental (Windhoek: 47 students)	x	x	x
Control (Oshakati: 53 students)	x		x

(Polit & Beck, 2004, p.182; Fouche & De Vos, 2002, p.146)

Method

The educational programme was implemented over a period of three days, covering theoretical and practical content.

Objectives

The objectives for this phase were to

- select the two groups of final-year student nurses to fit the quasi experimental design as the experimental and control group
- conduct a pretest on both the experimental and the control group in Windhoek and Oshakati to determine their application of critical thinking skills to the management of a given case in an imaginary case scenario

- implement and facilitate the educational programme over a predetermined period of three days during the second semester of training for the experimental group in Windhoek
- ensure active participation by participants for the duration of the educational programme

Population

The population for this study consisted of nursing students in their final year (fourth year) of study at the training hospitals of Windhoek and Oshakati. Both campuses are incorporated in the Faculty of Medical and Health Sciences.

The full population of the fourth-year class at the Windhoek campus was selected to be part of the experimental group (47 students) and the students from Oshakati (53 students) formed the control group. The total number of students amounted to 100 students.⁹

Sample

No sample was drawn. The whole population of 100 students (from two campuses) had the possibility of being part of the research study. This number excluded the 10 students who had participated in the pilot testing of the data collection instrument.

⁹ The population for phase 3 is not the same as for phase 1 [indicated in table 3.1].

The inclusion criteria set for this phase corresponds with the criteria that were set for phase 1 (needs assessment). Both the groups met the following inclusion criteria:

- The students had completed the synthesis block of IMCI (Integrated Management of Childhood Illnesses).
- A period of five (5) weeks of rural community placement had been completed. During this time students had the opportunity to deal with different adult and paediatric patient cases while engaging in nursing practice.

Development of the instrument for the data collection

An instrument was compiled for the pretest at the start of the implementation phase of the educational programme. An imagined case scenario on a common paediatric case was developed for participants to analyze. The case scenario contained a relevant condition compared to the disease profile in Namibia and the condition had been included in their theoretical and clinical instruction. The format of the case scenario focused on a paediatric disorder which was covered in the theoretical as well as the clinical curriculum and education of the group of students concerned. The participants were expected to answer some relevant questions pertaining to the case scenario, to enable the researcher to determine the level of understanding and integration of critical thinking skills.

The case scenario was realistic and no unreasonable expectations or far-fetched questions were asked. The questions were open ended and participants had to write their own interpretation of the question. The researcher formulated open questions in such a

manner that the students were permitted creativity and initiative in their answers and the researcher was able to determine the application of the six critical thinking concepts, as conceptualized in chapter 5. Therefore, participants had the opportunity to utilize different skills to manage the presented case [see addendum 3.1].

Testing of the instrument:

The data collection as described was carried out through a case scenario on which participants had to answer specific questions. These questions were marked according to a memorandum and scoring rubric that was compiled by the researcher (See addenda 3.2 & 3.3). In order to establish validity and reliability for the phase, the instrument was tested (Polit & Beck, 2006, p.41).

Validity

Validity refers to the soundness of the findings of the study. For an instrument to be valid it should be compiled for a specific purpose in order to measure what it is suppose to measure (Polit & Beck, 2004, p. 416; Polit & Beck, 2006, p.41). The instrument (case scenario) that was used for the data collection in phase 3 was similar to the scenario that was developed for phase 1 with the difference that the scenario for phase 3 was more focused and specific and stemmed from the conceptual framework that was developed after the data analysis of phase 1. Face validity (also known as content-related validity) was ensured (Burns & Grove, 2005, p. 377), seeing that it concerned a pediatric case which was familiar to the senior nursing students. The case scenario contained no

strange questions and it was envisaged that a fourth- year nursing student at that stage of his/her studies should be able to answer the questions with ease. Construct validity was also ensured by asking applicable questions in line with the overall purpose of the educational programme.

Reliability

Reliability of the instrument in this phase refers to the accuracy, consistency and equivalence of information obtained and was established by inter-rater reliability. Equivalence or inter-rater reliability was ascertained by involving an independent rater who could assign values to the answers to the questions, independently from the researcher (Polit & Beck, 2004, p. 721; Burns & Grove, 2005, p. 374). The students' answers were analyzed by both the researcher and an independent evaluator to confirm consistency in interpretation and to detect any form of discrepancy. Moreover, student answers were rated twice to determine consistency in the rating of the researcher.

Inter-rater reliability was ensured by pilot testing.

Pilot testing

Inter-rater reliability could be determined and established by pilot testing the instrument before the researcher embarked on the pretest at the start of the educational programme. Pilot testing of the instrument is done as part of the preparations for a major study, to exclude any misconceptions or other flaws (Polit & Beck, 2004, p.727). Ten (10) fourth-

year students participated in the pilot test of the instrument, to detect any problems regarding the questions set. The questions were then analyzed according to a scoring rubric which was compiled by the researcher to ensure consistency in marking. During analysis of the answers to the pilot test there were a few points of detail to be added to the scoring rubric to exclude misinterpretations and to refine it to perfection. This was also done to determine whether the scoring rubric was reliable for use in the analysis of the pretest and posttest. The value of pilot testing lies in using the instrument exactly as it is going to be used in the study (Delpont, 2002, p.177; Strydom, 2002, p.215; Burns & Grove, 2005, p. 42).

The inter-rater reliability of the scoring of the case scenario was determined by means of a Cohen's Kappa analysis. Cohen's Kappa is used in the case of two independent raters. Raters' choices are reflected in a square table where counts in diagonal cells reflect inter-rater agreement (Johnson, Johnson & Stanne, 2000, p.1; Garson, 2007, p. 6). An inter-rater reliability kappa coefficient of 0.82 was scored, which is considered outstanding in terms of reliability. Once the researcher was satisfied with the establishment of validity and reliability for the compilation of the instrument and scoring rubric, data collection for phase 3 could commence.

Data collection

Data collection has already been defined as the process whereby the researcher gathers information to substantiate the research purpose and objectives (Burns & Grove, 2005,

p.421). Data collection for phase 3 was carried out by means of a pretest that included the simultaneous testing of both the students on the Windhoek campus and the students on the Oshakati campus. The rationale for the pretest was to build a database with which the posttest could be compared in phase 4 to indicate whether the educational programme made any difference in the application of the participants' critical thinking skills, and thereby determine the success of the programme. A total number of 100 students participated in the pretest [47 in Windhoek; 53 in Oshakati]. The 10 students who participated in the pilot testing of the instrument were excluded from the pretest. After the pretest had been conducted and all instruments collected, data analysis followed.

Data analysis

Data analysis for phase 3 entailed the marking of the questions answered by the participants according to a scoring rubric. The answers of each student were analyzed by calculating central values, more specifically the mean for each question, to determine their application of critical thinking skills in the management of a nursing problem. The analysis was done with the assistance of a statistician and the utilization of SPSS computer software. The analysis focused on the scoring in terms of the application of the six critical thinking concepts.

Internal validity of quasi-experimental design

By utilizing a quasi-experimental design the researcher was responsible for establishing and maintaining internal validity in the quasi-experimental design by ruling out factors that may have been a threat to the observed outcome, thereby determining whether the outcome of the post-test was the result of the intervention (Vockell & Asher, 1995, p. 218; Polit & Beck, 2006, p. 199). The threats to internal validity for this quasi-experimental design were identified and addressed as indicated in table 7.2.

Table 7.2 MANAGEMENT OF THREATS TO INTERNAL VALIDITY OF QUASI-EXPERIMENTAL DESIGN

Threat	Description	Control
History	Occurrence of events concurrent with the independent variable that could influence/affect the outcome/dependent variable	<p>a) No extraneous effects that could have changed the ability of the control group to answer the questions of the case scenario took place.</p> <p>b) Both groups were equally compiled.</p> <p>c) No other courses on the subject of critical thinking were offered to the participants before or during the time they were involved in the study. They came directly from rural placement (nursing practice in communities) five weeks prior to the implementation of the educational programme.</p> <p>d) The reminder that was given to the participants kept them in suspense about the content of the</p>

		educational programme. It only indicated the venue, time and dress code necessary for attending the educational programme.
Selection bias/threat	<p>The composition rather than the treatment of the group may account for the outcome.</p> <p>The threat encompasses biases resulting from pre-existing differences between groups. A selection threat is more likely to occur in studies where randomization is not possible.</p>	<p>a) The inclusion criteria for both the experimental and the control group were the same.</p> <p>b) Participation in the study was voluntary and with written consent.</p> <p>c) The researcher refrained from interfering in the active participation of the participants but merely facilitated the educational programme.</p> <p>d) The inclusion criteria encompassed what the participants had done in their general curriculum at the stage of the programme presentation. Both campuses have participants from different regions, and participants were all in the second semester of their fourth year at the same Department of Nursing, although at different campuses.</p> <p>e) Participants were all at the same level of their education and had done the same curriculum content at the stage of the programme.</p> <p>f) No interference took place at the completion of case scenario questions by the control group.</p>

		<p>g) By setting criteria for inclusion in the educational programme, similarity between groups had been secured as far as possible.</p> <p>h) Statistical analyses were done to compare groups in order to determine whether the groups were equal in compilation and academic standing before they embarked on the pretest.</p>
Maturation	<p>Improvements between testing sessions may be the result of routine changes that occur with time. This threat arises from processes occurring as a result of time rather than the independent variable.</p>	<p>a) Participants were at the same developmental stages in their academic achievements since the year of study and other requirements for the completion of their fourth year were similar</p> <p>b) The posttest was written directly after the educational programme had been completed to limit any external input or influences when the participant went back to practice or lectures.</p> <p>c) The posttest for the experimental and control group was written at the same time</p>
Instrumentation	<p>Differences may be found because the data collection process has somehow changed.</p> <p>Effects may be due to changes in measurements</p>	<p>a) No changes appeared in the data collection process.</p> <p>b) The pretest and posttest that were handed to participants in both the experimental and control groups were the same.</p> <p>c) Case scenarios were distributed and collected by</p>

	between the pretest and posttest rather than a result of the treatment.	the researcher and a research assistant, who had very clear instructions on what to do. d) No changes were made after the reliability of the instrument had been determined
Statistical regression	Groups selected on the basis of extreme scores tend to shift toward the mean of the original group when retested.	Participants were not drawn from extreme sectors of the population.
Experimental mortality	Differences subsequent testing sessions may occur because the composition of the group has changed.	a) Care was taken by the researcher /facilitator that no participant should leave the educational programme without a valid reason. b) If a participant had to leave the room/venue the researcher made sure that it was not because of the educational programme. c) The researcher tried to have the full complement of participants until the end of the educational programme.
Pretesting	The experience of taking the pretest may sensitize subjects towards the posttest.	a) Both groups received the same pretest at the same time, although at different campuses. b) No boredom as stated by Vockell and Asher (1995, p.243) was observed
Instability	Chance fluctuations in scores arising from	An independent rater was used to secure inter-rater reliability of the scoring rubric of the case scenario

	unreliability may cause changes in performance during various tests.	questions before the rubric was finalized and utilized for scoring answers to the case scenario. Cohen Kappa's coefficient was determined to indicate inter-rater reliability.
Social-psychological threats	Dynamics of the experimental situation may set up alternative treatments that may account for differences.	<p>a) Groups selected for the experimental and control groups were similar in compilation and characteristics.</p> <p>b) Normal lectures went on for the control group while the experimental group underwent the educational programme.</p> <p>c) Participants did not give any indication that a sense of unfairness existed among them because they were not chosen to be the experimental group.</p>
Expectancy effects	Outcomes may occur because experimenter or subjects expected those outcomes.	<p>a) The researcher did not have any expectation for the educational programme.</p> <p>b) The researcher did not verbalize any expectations towards participants.</p> <p>c) Case scenario given to students was in line with their academic standing since they were in their 4th year of study.</p> <p>d) The answers to the pretest and posttest were a true reflection of their internal processes.</p> <p>e) The outcome of the educational programme was</p>

		<p>therefore not distorted because of researcher expectations.</p> <p>f) The researcher tried to refrain from unwittingly influencing the participants towards the desired outcome.</p>
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(Vockell & Asher, 1995, p. 243; Burns & Grove, 2005, p 215; Polit & Beck, 2006, p.199)

The researcher is therefore confident that the internal validity of the quasi-experiment was not compromised and that the change that was evident in the scores was not by chance but because of the educational programme that was offered.

After the pretest had been distributed to the students the educational programme was offered, over a period of three days, to the students in Windhoek. The students from Oshakati continued with normal classes.

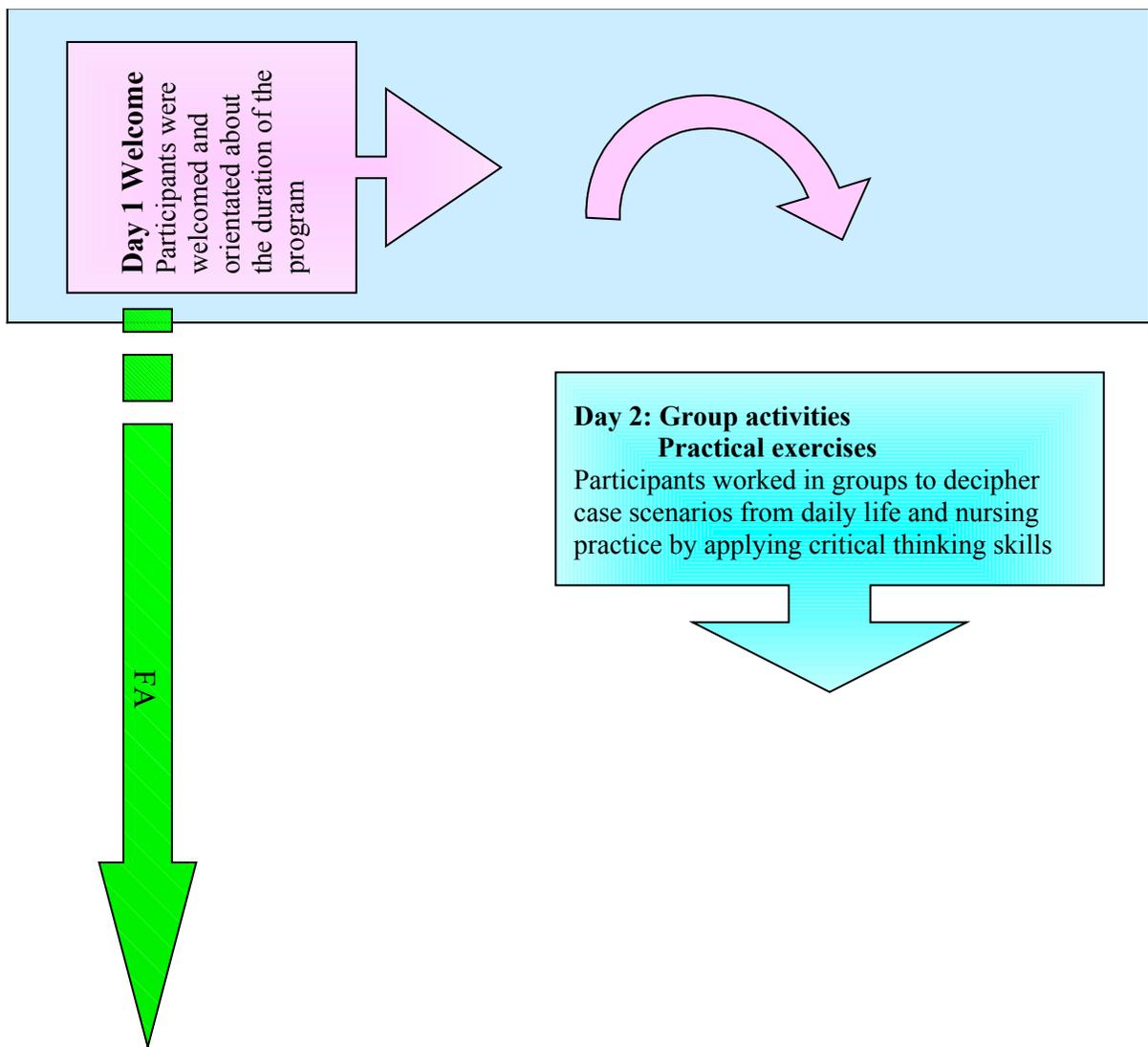
7.3 Process of implementation of the educational programme

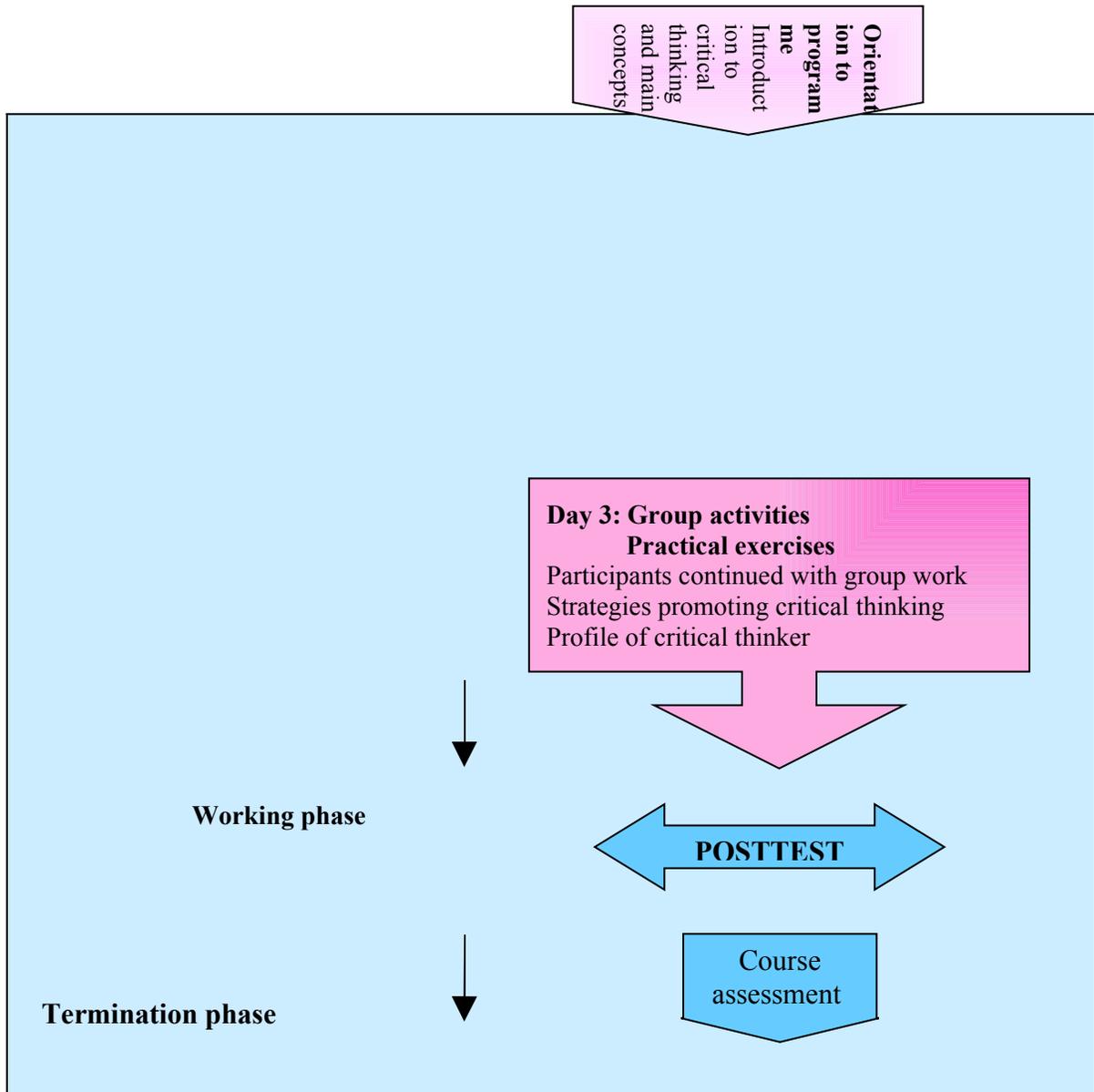
7.3.1 Schedule

Implementation of the educational programme was conducted according to a specific schedule which provided for different activities to take place over three days. Participation in the educational programme was voluntary and written consent was obtained by each participant before she/he embarked on the pretest. The participants received a programme schedule and a handout consisting of course material after the

pretest had been written. A schematic illustration of the implementation of the educational programme is given in fig 7.1

Figure 7.1: PROCESS OF IMPLEMENTATION OF AN EDUCATIONAL PROGRAMME TO FACILITATE THE DEVELOPMENT OF CRITICAL THINKING IN STUDENT NURSES





To put the participants at ease before commencing the educational programme, a “getting to know each other” session was conducted by the researcher in the capacity of facilitator. Thereafter participants continued with the set schedule as indicated in the programme material.

7.3.2 Dynamics of teaching during the implementation of the educational programme

The implementation of the educational programme entailed the utilization of specific teaching strategies and supportive activities that could enhance the facilitation of critical thinking by the participants. To achieve specific outcomes during the implementation of the educational programme, learning activities and conditions should be arranged to ensure that learning takes place. Learning has only taken place if it is evident in behavioural change after the intervention. To ensure that learning has taken place, learning activities should be purposefully planned to contribute to the achievement of major objectives of the educational programme (Norton, 1998, p. 152).

To achieve the objectives of this educational programme, active participation was required from the participants. Participation is described as the interchange of ideas, attempts at problem solving and active engagement of learners with each other and with the materials of instruction. Active involvement tends to increase content retention during the implementation of such a programme (Chubinski, 1996, p. 23; Stein, 1998, p. 4; Cowley, 2004, p. 14).

This educational programme was therefore aimed at the participants' (student nurses') behaviour in order to establish a positive change regarding utilization of critical thinking in nursing practice. Instructional activities during the educational programme included challenging the participants to think, providing mental and emotional tools to help them resolve dilemmas encountered, while the facilitator closely observed, assessed and counselled students where necessary (Frazer, 1992, p. 55 ; Conger & Mezza, 1996, p. 12)

The dynamics that were employed during the facilitation of the educational programme were the following:

7.3.2.1 Facilitation

As elaborated above, the focus of the implementation of the educational programme was on active participation and dual interaction. However, the role of the researcher as facilitator in this exercise was of the utmost importance and cannot be ignored. Facilitation was an important activity throughout the implementation of the educational programme.

Facilitation is considered an essential component of learning through practice and has drawn the emphasis away from didacticism (Banning, 2005, p. 502). It is that interactive, goal-oriented dynamic process, conducted by a facilitator, in which participants work together in an atmosphere of mutual respect, trust and comfort in order to learn by reflecting critically within an environment conducive to such thinking, while “helping each other”. It has become almost synonymous with training and has become almost as challenging to both the facilitator and the group members (Rylatt & Lohan, 1997, p. 23; Theory for Health promotion in Nursing, Rand Afrikaanse University, 1999; Birchenall, 2001, p 249; Johnston & Tinning, 2001, p 162; Williams & Walker, 2003, p.132)

The role of the facilitator during the implementation of the educational programme is to keep students on track and help them to focus on their tasks during different phases of content presentation. It is, however, of paramount importance that the balance be maintained and the exploration during this exercise for the students does not become superficial (Williams & Walker, 2003, p. 132). A facilitator is a “catalyst that takes a person from being a passive learner and transforms him or her into a person possessed of the power to take control of change” (Rylatt & Lohan, 1997: p. 23). This transformation through promotion and development should, however, be done with empathy, respect and motivation. Motivation concerns the direction of energy with the intention of mobilizing others to act, in this case to think critically within a problem situation (Ryan & Deci, 2000, p. 68; Meyer, Naude & Van Niekerk, 2004, p. 87).

During the presentation of the educational programme, the facilitator has to plan the strategies she/he will employ to achieve the main aim of the educational programme with great care. The role of the instructor (facilitator) is furthermore to provide a clear linkage between what is important (objectives), what will be learned (outcomes) and how it will be learned (teaching). The facilitator should also have the knowledge, insight and understanding of the concept concerned to facilitate a group of participants into, in this case, critical thinking. This description applied perfectly to the facilitator of this educational programme in view of the fact the participation by the participants had to be active in order to acquire the necessary critical thinking skills (Zundel et. al., n.d, p.9; Rylatt & Lohan, 1997, p. 28; Cilliers & Terblanche, 2000, p.91).

A facilitator assists learners not to focus on the “right” answer, but to think through situations where any answer is in doubt (Wright, 2002, p. 9). The facilitator further assesses their thinking for soundness and identifies areas for improvement during each activity. It is, however, necessary to emphasize that the facilitator will not become the learners’ equal, as is believed by some educators. The role of the facilitator is to stimulate, organize, integrate and bring to bear the potential of the group to deal with the task on hand (Heimlich, 1996, p.42). Seeing that the learners of today are the professionals of tomorrow, the facilitator has to respect the learner as a human being who will have an influence on the future of the profession (Meyer, Naude & Van Niekerk, 2004, p.87).

To illustrate the role of power during the process of facilitation, Rylatt and Lohan (1997, p. 26) presented a “power continuum” (fig 7.2) of facilitation. According to the continuum, the amount of power will be determined by outcomes envisaged for the educational programme.

Figure 7.2 POWER CONTINUUM DURING FACILITATION



As indicated in the figure above, if the facilitator takes on an expert role and is very structured in his/her design, a position to the left end of the continuum will be taken,

whereas on the other hand, if the facilitator takes a purely neutral position and just shares his/her observations and allows the group to discover things for themselves using their own processes, the facilitation is positioned at the other end of the continuum. Most facilitation belongs somewhere in the middle of the continuum (Rylatt & Lohan, 1997, p.27).

To demonstrate, for this educational programme on critical thinking the facilitator's power differed according to the content and stage of the educational programme. Initially the facilitator played a more dominant role because of the unfamiliar content offered, but afterwards a shift towards shared control took place. Although participants sometimes took the lead in the activities, they could never take over control completely as the facilitator always had to guide them through the activities. During facilitation in a self-directed scenario, learner control also varies on a continuum. It can be assumed that when the facilitator is in control, the learner will not be in such a controlling position (Canton, 1996, p.66).

During facilitation of the educational programme, the facilitator (the researcher) endeavoured to maintain certain principles to create a conducive environment for the implementation of the educational programme.

These principles were the following:

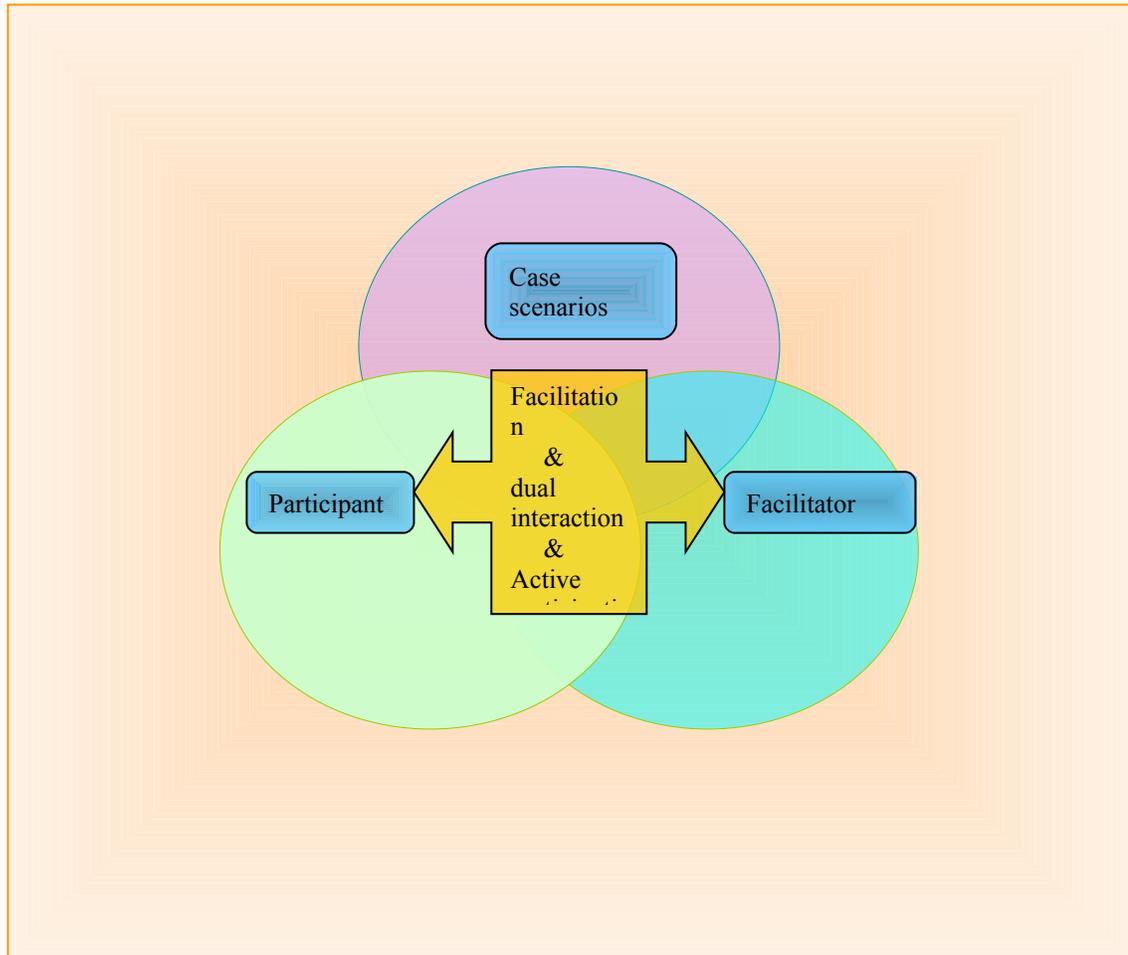
- A clear goal was set for each session.
- There was a clear structure in the presentation of the educational programme so that participants always knew what to expect.

- Appropriate recognition was given for all contributions so that participants would have a feeling of belonging.
- A clear idea of the “big picture”, in this case execution of critical thinking within the application of nursing practice, was always held up to the participants (Rooth, 1995, p.3; Rylatt & Lohan, 1997, p. 29; Myrick & Yonge, 2001, p. 461).

Effective facilitation depends on developing a number of strategies, namely the management of time, the provision of handouts and the securing of a non-threatening environment. In this educational programme each participant received a properly ring-bound handout which she/he could use and possess during the educational programme. Ground rules for the participation were set and clear instructions were given to the participants (Rooth, 1995, p. 3).

While learning never takes place in a vacuum, the researcher/ facilitator tried to build rapport with the whole group during activities. This was very important since some activities demanded the constant presence of the facilitator to achieve the desired outcomes. The interaction between the facilitator and participants is illustrated in figure 7.3.

Figure 7.3 INTERACTION, FACILITATION AND PARTICIPATION BY UTILIZING CASE SCENARIOS DURING THE IMPLEMENTATION OF THE EDUCATIONAL PROGRAMME



One strategy where the input and presence of the facilitator were imperative was the utilization of small group discussions.

7.3.2.2 Small group discussions

The utilization of small group discussions in teaching has been emphasized by a number of authors as it facilitates active participation and learning during the presentation of educational programmes or sessions. Therefore, the facilitator opted for the utilization of small group discussions in the presentation of this educational programme. Small group discussions give the participants an opportunity to share their reasoning processes and

thereby contribute to the development of critical thinking. Students may learn more from each other than from their facilitator. Small group discussions were therefore an essential focus in the implementation of the educational programme and were employed very successfully during the course of the programme (Frazer, 1992, p. 61; Sternberg & Spear-Swerling, 1996, p. 112; Norton, 1998, p. 163).

One of the obstacles that have been identified in the teaching of problem solving is the position where the teacher is the teacher and the participants the learners. This condition can be eliminated by means of small group discussions. However, the role of a facilitator in the utilization of this strategy cannot be ignored.

According to Cook (2004, p.6), small group discussions can be very frustrating if not well planned but on the other hand very rewarding if well planned. The following principles were kept in mind with the facilitation of the small group discussions for the duration of the educational programme:

- Participants were encouraged to know and respect each other in the group.
- As the facilitator, the researcher kept comments to a minimum and only intervened when necessary.
- Clear goals were set for each session.
- Open-ended questions were asked to limit factual answers but allow creativity.
- Continuous, positive feedback was given during these small group deliberations which served as positive reinforcement (Cook, 2004, p. 6; Cowley, 2004 , p. 15).

However, interaction was not restricted to small group discussions. Room for dual interaction between participants and the facilitator during the implementation of the educational programme was also allowed. The researcher/facilitator had the vision that, during the implementation of the educational programme, participants would not only learn how to think critically, but that they would motivate each other to grow in learning. Students shared their ideas about specific scenarios with each other and with the whole group. The facilitator made sure that each group of students got a chance at some stage to discuss their view on a specific case or scenario. Not one participant was apathetic, passive or disruptive to the group. All participants participated in the discussions, which became very lively and constructive.

7. 3.2.3 Course material

As already indicated,, the utilization of case scenarios, based on a real life situation, in the facilitation of critical thinking had been confirmed as a strategy that stimulates critical thinking, retention and recall. A real life situation stimulates the thinking of the participants and enhances creativity since there is no one “right answer” to such a situation. Prerequisites to the setting of these scenarios are that they should be interesting, realistic, and not excessively complex, clearly written and that participants should know what they were expected to do. The presentation of case scenarios which participants could relate to is usually more successful because it encourages classroom

or group debates, which in itself enhances critical thinking (Rowles & Brigham, 1998, p. 258; Hale, 2005, p. 5; Candela, Michael & Mitchell, 2003: p. 37).

Knowles (1990, p.26) argued that involvement in things like case histories generally offers greater learning opportunities for adults than “talking” to learners/students. It is, however, of the first importance that people in the roles of teacher, manager, health care provider or facilitator involve those around them to act with motivation (Ryan & Deci, 2000, p.69; CTL, 2005, p. 5).

For this study, the researcher compiled a number of case scenarios from everyday life as well as from nursing practice. The case scenarios facilitated the application of the six main critical thinking concepts that students had to master during the educational programme. These concepts were used as the indicators according to which students’ outcomes-based assessment was performed. The outcomes were measured by means of a deductive and descriptive approach to determine whether specific outcomes, set as learning objectives at the beginning of the educational programme, had been achieved (Zundel et. al., n.d, p. 4).

7.3.2.4 Teaching focus of presentation

The facilitator (researcher) had a specific focus in mind when presenting the programme. The facilitator moved away from didactic (fact-focused) teaching, where the focus and responsibility is on the teacher, and supported the approach of Cairns (1996, p.3), who used a critical thinking approach to teaching. This approach required a paradigm shift

which can refocus the student. In this form of teaching, content “lives” in the form of thinking. According to the author, only the student who “thinks through the content” (Cairns, 1996, p.3) will truly be able to take possession of the content and make it their own. Teaching about critical thinking involves thinking about thinking, as a result, students who think critically will begin to think at a higher level and improve the clarity, accuracy, relevance, depth, breadth and effectiveness of their thinking.

The focus during the presentation of the educational programme was on conducting an outcomes-based programme which emphasized that the students should accept responsibility for their own learning by exercising self-directed learning. Self-directed learning in an outcomes based educational programme means having clear objectives for students so that they know what they have to strive towards during the educational programme. Setting clear objectives clears up any mystery surrounding what is needed for the success of the educational programme (Mihram, n.d, p. 2; Cowley, 2004, p.66; Hale, 2005, p.5; Zundel et. al., n.d, p. 8)

7.3.2.5 Presentation of study material

The educational programme was presented in the form of a PowerPoint presentation and group activities. Both the PowerPoint and the group activities corresponded with objectives set in the handout that was given to the participants (addendum 2.3).

7.4 Summary

This chapter dealt with the dynamics concerning the implementation of the educational programme to facilitate the development of critical thinking in student nurses. The role of the facilitator during the educational programme was highlighted and the emphasis in the implementation of the educational programme was on active participation.

Active participation leads to individual growth, which gives the students confidence, a sense of freedom and identity and a feeling of belonging. Successful facilitation enables the student to benefit fully from the experiences by removing as many obstacles to learning as possible. Without facilitation the students lose direction as they endeavour to learn anything worth while from their experience (Gibbs, 1992, p.154; Birchenall, 2001, p. 249; Anastasi, 2004, p.10; CTL, 2005, p.3). As Mentkowski and Associates (2000, p.21) have rightfully indicated, “Learning is an ongoing advancing process. Learners build on what they know and can do.”

The evaluation of the educational programme (phase 4) will be discussed in chapter 8.

CHAPTER 8

EVALUATION OF THE EDUCATIONAL PROGRAMME

8.1 Introduction

This chapter deals with phase 4 of the study, namely the evaluation of the educational programme developed in phase 2 as described in chapter 6. The development of the educational programme was aimed at the facilitation of the development of critical thinking in the student nurse.

How critical thinking should be tested is a subject that has been debated for years. Since experts on critical thinking cannot agree on a definition for critical thinking there appears to be no single way to measure it accurately and to determine how it affects patient care. General measuring instruments are therefore not necessarily suitable for nursing and means should be found to measure critical thinking within the context of nursing practice. Evaluation can have different meanings for different people and can be interpreted in several ways. In all areas of nursing education and practice, evaluation is an important process that is used to measure learning and health-related outcomes (Oermann & Gaberson, 1998, p.1; Richardson, 1998, p. 27; NLN, n.d, p.1).

In previous nursing research that incorporated critical thinking tests, inconsistent relationships with decision making and clinical judgment were shown in addition to other inconsistencies related to critical thinking in nursing. Recommendations were then made that critical thinking tests should be adopted for nursing (Follman, 2003, p. 255).

Therefore, for this study, the evaluation of the critical thinking skills of participants was adapted to fit the situation and to measure the achievement of the objectives of the study. Firstly a description of the participants of the educational programme is presented; secondly the outcome of the pretest results is compared with that of the posttest results in order to accept or reject the stated hypothesis. This is followed by a description of the results of an assessment on the presentation of the educational programme which is presented in the form of descriptive statistics. The evaluation of the educational programme forms the fourth and last phase of the study, although it is conducted consecutively with phase 3.

The outline and format of discussion of this chapter will be as follows:

- A supportive discussion on the evaluation of an educational programme as an activity in education
- The methodology employed for phase 4
- Discussion of findings

8.2 Supportive discussion on the evaluation of an educational programme

As already discussed, evaluation is an important measure in nursing education and practice and it can be carried out for different reasons (Grotelueschen, n.d., p. 75). For

the purposes of this educational programme the following definition applies, namely that evaluation is the process whereby congruence of learner outcomes and educational programme objectives is determined. The sole basis for determining the success of an educational programme is to follow a holistic approach, to evaluate the provider's delivery of an educational programme and the participant's immediate experience (Jooste, 2003, p. 103). Canton (1996, p. 42) considers evaluation to be the process that is conducted to provide feedback to the individual (educational programme developer) as well as feedback for administrative purposes.

The most important function of feedback was to help participants learn to evaluate their own level of performance and focus their efforts to improve their skills. If an educational programme has made sense to a student and has elicited understanding at a personal level, it will become a lasting conceptual resource for that person (Mentkowski & Associates, 2000, p.89).

In order to establish whether an intervention has made a positive change, the researcher had to show two things: firstly that there has been a positive change over time and secondly that such a change is due to an intervention and not to extraneous factors (Babbie & Mouton, 2001, p. 348). The latter two conditions also applied to the evaluation of this educational programme.

As the researcher had different purposes in mind when carrying out the evaluation, the evaluation of the educational programme for this study was twofold:

- Firstly, to determine whether there has been a positive change in the participants' application of critical thinking skills, and whether that positive change was due to the educational programme.
- Secondly, to assess the presentation of the programme. The second evaluation entailed an assessment by participants of the presentation and facilitation of the educational programme itself. This was done to identify any changes to the presentation and structure of the educational programme that needed to be made [addendum 4.5].

Each of these evaluation sessions will be described and discussed.

8.3 Methodology for phase 4: The evaluation of the educational programme

The researcher aimed to determine whether the educational programme has succeeded or failed in the facilitation of the development of critical thinking skills and to ascertain how the participants valued the presentation of the educational programme.

Purpose

The purpose of phase four (4) was to evaluate whether the researcher had achieved the objective of the educational programme, namely to *facilitate the development of critical*

thinking skills of the final year student nurse. Specific objectives were therefore set for phase 4.

Objectives

The following objectives were set for this phase, namely to

- conduct a posttest after the third day of the educational programme in order to evaluate the application of critical thinking skills by the participant (the student nurse) in the management of a problem case in nursing practice
- compare the results of the pretest with the results of the posttest in order to determine whether there is a difference between the results of the pretest of the experimental group compared to the results of the posttest of the experimental group
- compare the mean scores of the experimental group with the mean scores of the control group
- test the stated hypothesis to determine if the participants have changed as a result of attending the educational programme
- allow participants to assess the presentation of the educational programme in order to detect whether some changes in the presentation of the educational programme need to be introduced by the researcher

As discussed, the evaluation of the educational programme was done to determine whether there was an improvement in the application of the critical thinking skills after they have attended and participated in the educational programme. This enabled the

researcher to accept or reject the stated hypothesis. A hypothesis is a tentative prediction about the relationship between two or more variables in the population under study, and it predicts an expected outcome. The use of a hypothesis in a study induces critical thinking and facilitates the interpretation of data (Polit & Beck, 2006, p. 120).

Formulating a hypothesis

Hypotheses were formulated and tested during this phase of the study. The aim of formulating a hypothesis was to determine whether any development had taken place in the experimental group who participated in the educational programme.

The following hypotheses are indicated in table 8.1 and are described under 8.4.

Development of the instrument for data collection

The instrument developed for this phase to conduct the posttest [addendum 4.1], correlated with the pretest [addendum 3.1] instrument developed in phase 3. The researcher also developed an assessment instrument which had to be used to assess the presentation of the educational programme and the opinion of the participants about the utilization of case scenarios as a strategy to facilitate critical thinking.

The questions asked on the case scenario were straightforward and focused on the main critical thinking skills that any participant (student nurse) at fourth- year level ought to have. It was expected that participants at that stage of their training would manage this case extremely well. The posttest served as parameter to determine whether their critical

thinking skills have improved after attending the educational programme which aimed to facilitate the critical thinking of participants [addenda 4.1, 4.2, 4.3 & 4.4].

The total possible score for the case scenario was 59, of which the distribution of maximum marks per question was as follows on each concept: Evaluation: 12; Analysis: 8; Interpretation: 12; Inference: 8; Explanation: 4 and Self- regulation: 15.

Reliability and validity

Reliability and validity of the posttest were already established, in view of the fact that exactly the same case scenario was handed to the participants as in the pretest. The answer sheets were compared by referring to each participant's student number.

Validity for the instrument on the program assessment was ensured through expert opinion and construct validity, as the questions related directly to the content of the educational programme. (See figure 6.2)

A description of the participants

As already discussed in chapter 7 (the implementation of the educational programme), all fourth-year nursing students (47) who complied with the inclusion criteria participated in the educational programme. Each participant consented in writing to be part of the programme - including the pretest and posttest. A total of 53 students participated as the control group in the pretest and posttest.

All the participants in the experimental and control groups of the study were registered for the Comprehensive Diploma in Nursing at the University of Namibia. Reasons were advanced in chapter 3 for the fact that the participants in the study were final-year students at the Windhoek and Oshakati campuses of the Faculty of Medical and Health Sciences.

[Figures 6.2 and 6.3 represent the outlay of the questions as they appeared in the pre and posttest. These questions were designed to address the six main critical thinking concepts as discussed in chapter 5 (conceptual framework of the study)].

Method of data collection

Data collection during phase 4 entailed the following:

- A posttest was conducted immediately after the educational programme had been concluded to ensure that no external variables influenced the students in answering the questions. It was important to exclude the interference of any other intervention such as other classes or training programmes until after the posttest in order to show that the difference, if any, in the performance of the students was due to the programme and not to something else (Babbie & Mouton, 2001, p. 348). The researcher collected data from the experimental group but was assisted with the collection of data from the control group by a research assistant.

- A programme assessment was conducted after the posttest, which focused on the presentation of the programme and the utilization of case scenarios as a teaching strategy in the facilitation of critical thinking

Data analysis

Posttest

The answers to the posttest were analyzed by means of a tested rubric [addendum 3.3] and results were described by means of descriptive statistics. Although several validated standardized measuring instruments for critical thinking have been designed over the years, they are not contextual to nursing and there is consensus in nursing literature that the instruments do not adequately measure critical thinking in the nursing discipline (Hicks, 2001, p.15; Khosravani, Manoochehri & Memarian, 2005, p. 4) and cannot simply be used in general to evaluate an exclusively designed educational programme to fit the Namibian nursing context. The evaluation instrument on which the answers of the case scenario were evaluated and rated was designed by the researcher to fit the content of the educational programme (addenda 3.2 & 3.3).

The aim of the posttest was to compare the results of each participant's posttest with the results of the pretest of the participant to indicate whether the student's performance had improved as a result of the educational programme on critical thinking. The results were analysed with the assistance of a statistician and by means of a t-test that formed part of the SPSS (Statistical Package for Social Sciences) computer software programme. A t-

test is defined as the parametric statistical test for analyzing the difference between the mean scores of two groups (Polit & Beck 2006, p.511) as indicated in tables 8.2. and 8.3 and figure 8.3. The discussion of the findings will follow. The findings as displayed in the tables and figure have enabled the researcher to test the hypotheses as formulated in table 8.1. The evaluation of the programme specifically focused on the six main critical thinking concepts.

Programme assessment

The participants were requested to complete the assessment of the programme presentation after completing the posttest. The aim of the programme presentation was to determine how the participants perceived the presentation of the programme and what their perceptions were regarding the utilization of case scenarios as a strategy to enhance critical thinking. The findings of this assessment will be discussed under 8.4.1.2

8.4 Discussion of findings

To highlight or emphasize the meanings of the findings it was decided to present them as follows:

- the differences between the two groups by means of statistical testing, specifically t-test analysis (See table 8.2)
- the exploration of these differences in a descriptive format by utilizing a table (See table 8.2)

- the presentation of graphs to demonstrate the differences in mean scores per critical thinking concept

The first discussion will be on the differences between the two groups, incorporating the testing of the stated hypotheses.

8.4.1 Formulated hypotheses

The following hypotheses, as shown in table 8.1, were formulated and will be discussed below.¹⁰

Table 8.1: Hypotheses formulated for the evaluation of the educational programme

Title	Null and alternative hypothesis
Hypothesis 1:	H₀₁: There is no significant difference between the

¹⁰ For the sake of completeness the table is presented on the next page

<p>This hypothesis was formulated to test the difference between the mean scores in the pretest of the experimental and control groups.</p>	<p>mean pretest scores of the control group and the experimental group with respect to the six critical thinking concepts</p> <p>Ha₁: There is a significant difference between the mean pretest scores of the control group and the experimental group with respect to the six critical thinking concepts</p>
<p>Hypothesis 2: This tested the difference in the mean scores between the pretest and posttest of the experimental group and the mean scores of the pretest and posttest of the control group.</p>	<p>Ho₂ There is no significant difference between the posttest and pretest mean scores of the experimental and control groups with respect to the six critical thinking concepts.</p> <p>Ha₂ The difference between the posttest and pretest mean scores of the experimental group is significantly higher than the difference between the posttest and the pretest of the control group with respect to the six critical thinking concepts.</p>
<p>Hypothesis 3 was formulated to test the difference in the mean posttest scores of the control group and the experimental group.</p>	<p>Ho₃: There is no significant difference between the mean posttest scores of the control group and the experimental group with respect to the six critical thinking concepts.</p> <p>Ha₃: The posttest mean scores of the experimental group are significantly higher than the mean posttest scores of the control group with respect to the six critical thinking concepts.</p>

8.4.2 The comparison of the pretests of the two groups

Both groups were compared to investigate the difference in the application of critical thinking skills during the management of a case scenario in the health setting.

The scores for the pretest and posttest of both the experimental and the control groups were analyzed by means of a t-test as indicated in table 8.2. No significant difference was expected between the means of the pretest scores of the two groups. In addition, the mean scores were compared to assess them for substantial differences. A substantial difference for this study is defined as a difference in mean scores of more than 5.

The pretest mean scores of the two groups did not differ statistically significantly in four concepts because the p-values were greater than 0,05. In two of the concepts the p-value for the pretest were $<0,05$, which implies that there was a difference in the pretest mean scores of the two groups. However, the difference in the mean scores of the posttest of the experimental group was significantly and substantially higher than the mean scores of the control group which “absorbed” the difference. The testing of hypothesis 1 therefore resulted in the following:

Hypothesis 1 [table 8.1]

- H_{01} is rejected in favour of H_{a1} on the 5% level of significance. In four of the concepts no significant difference in the mean scores of the pretest of the experimental and control groups were found. A significant difference in the mean scores of the pretest of the experimental group and the pretest of the control group was determined in two of the six critical thinking aspects. However, the difference in the mean scores of the posttest of the experimental

group and the mean scores of the posttest of the control group was also significantly and substantially higher.

(See hypothesis 3.)

8.4.3 Comparison of the pretest and posttest mean scores of the experimental group and the control group

The statistical analysis of the mean scores of the two groups enabled the researcher to assess whether the educational programme had a positive effect on the experimental group. This was done to ascertain whether the participants showed any improvement between the pretest and the posttest. The implication that the two groups were initially on a similar level suggested that a significant statistical difference between the pretest and posttest scores of the participants of the experimental group would indicate development as a result of the application of the educational programme.

To rule out the threat to internal validity posed by the consideration that the experimental group might have been better from the start, it was established statistically that in the concepts analysis and inference the groups were not equal in the pretest. The experimental group scored higher than the control group in their pretest before they attended the educational programme. It was determined, however, that they also scored significantly and substantially higher in the posttest compared to the mean score of the control group. It can therefore be concluded that the difference between the pretest and

the posttest of the experimental group on the concepts of analysis and inference is significant.

As indicated in table 8.2 and figure 8.3, a significant and substantial difference of more than 5 in the mean scores of the pretest of the experimental group was found in all six critical thinking concepts.

Figure 8.3 illustrates a graphical representation of the pretest and posttest scores of the two groups. This was of assistance in testing hypothesis 2.

Table 8.2: T-TEST ANALYSIS OF THE PRETEST AND POSTTEST SCORES OF THE EXPERIMENTAL AND CONTROL GROUPS

This statistical table will be added later

Hypothesis 2 [table 8.1]

- H_{02} is rejected in favour of H_{a2} on the 2.5% level of significance ($P < 0.001$) in all the six main critical thinking concepts. This indicates that the difference in the mean scores in the pretest and posttest of the experimental group is significantly but also substantially higher than the difference in the mean scores of the control group in all the six critical thinking concepts.

In addition to table 8.2, the p-values for the experimental and control groups are indicated in table 8.3. They serve as indicators for the significant impact of the educational programme on the performance of the participants in the experimental group.

Table 8.3: P-VALUES FOR BOTH THE EXPERIMENTAL AND THE CONTROL GROUPS

E = experimental group C = control group

Critical thinking aspects	P value - Pretest For difference between the two groups	P value - Posttest For differences between the two groups	Δ P values For overall differences between the two groups
Evaluation	0.201	< 0.001	< 0.001
Analysis	< 0.001	< 0.001	0.002
Interpretation	0.051	< 0.001	< 0.001
Inference	0.042	< 0.001	< 0.001
Explanation	0.54	< 0.001	< 0.001
Self-regulation	0.895	< 0.001	0.001
		P (E > C)	“ P (Δ E >> Δ C)”

The analysis of the p-values of the two groups as indicated in table 8.3 indicated that in all six critical thinking skills a significant difference occurred in the mean scores of the

experimental group. Owing to the fact that the posttest was written directly after completion of the educational programme, before exposure to any external influences, the researcher reached the conclusion that the difference was the result of the success of the educational programme.

8.4.4 Comparison of the posttest mean scores of the experimental group and the control group.

The mean scores of the posttest of the experimental group were compared with the mean scores of the posttest of the control group. A difference was observed between the mean scores of the posttest of the experimental group and the mean scores of the posttest of the control group. The mean scores of the posttest of the experimental group were significantly higher than the mean scores of the posttest of the control group.

From these findings it follows that the experimental group has probably developed through the facilitation of the educational programme. Hypothesis 3 tested as follows:

Hypothesis 3:

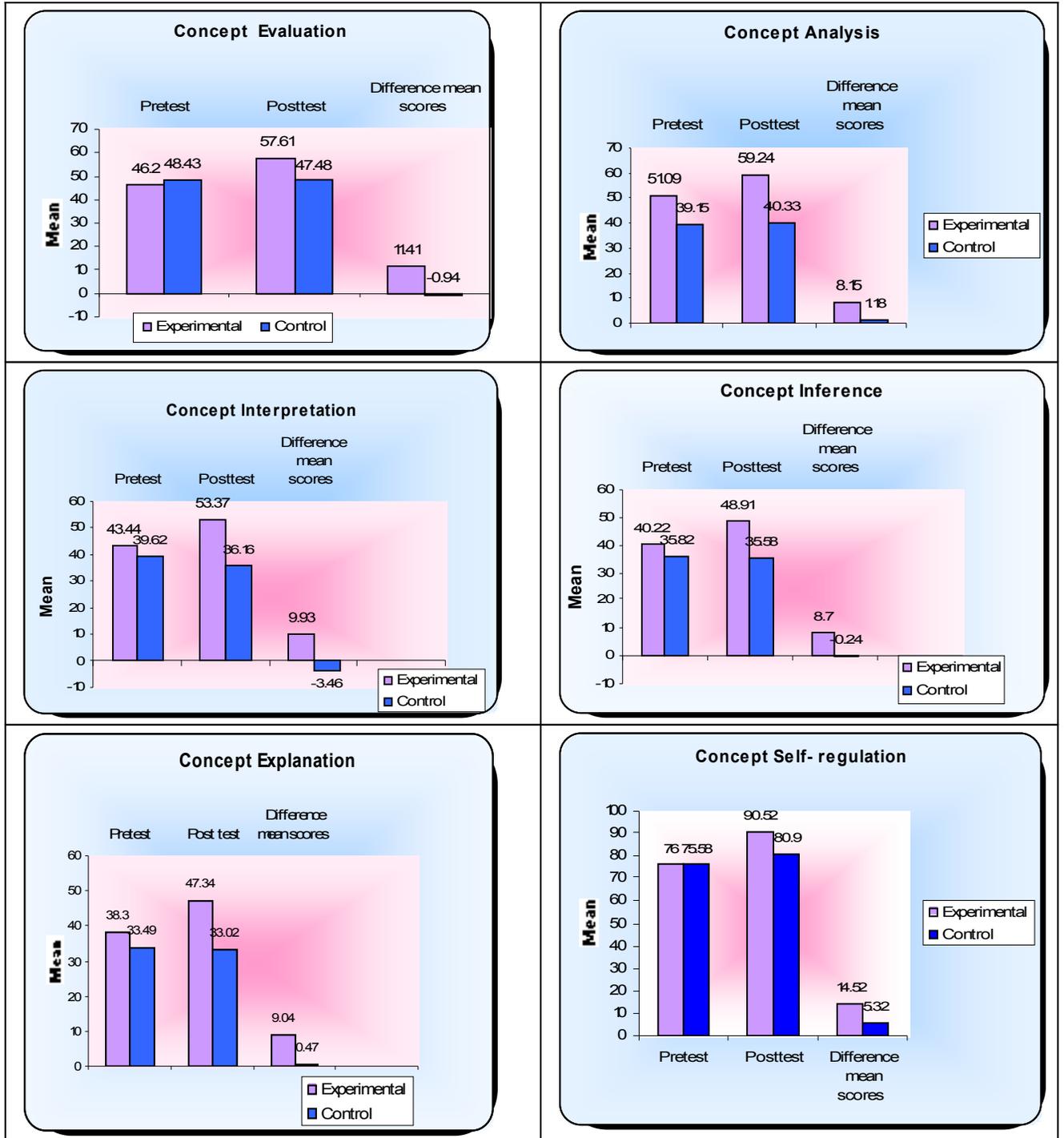
- H_{03} is rejected in favour of H_{a3} on the 2.5% level of significance ($P = <0,001$) in all the six main critical thinking concepts. This indicates that the mean scores of the posttest of the experimental group are significantly higher than the mean scores of the posttest of the control group in all the six critical thinking concepts.

These are not only significant but also substantial. This finding is derived from the fact that the differences in the mean scores for the experimental group are significantly higher than the difference in the mean scores of the posttest of the control group (see below).

It can be concluded that the difference was the result of the educational programme. The educational programme addressed the facilitating of the development of the following six main critical thinking concepts, namely interpretation, analysis, evaluation, inference, explanation and self-regulation. The t-test analysis on the pretest and posttest of the experimental and control groups is summarized in table 8.2

In conclusion, the outcome of the differences in mean scores between the pretest and the posttest of the two groups pertaining to the six main critical thinking concepts are indicated in figure 8.1

Figure 8.1: A graphical representation of the outcome of the pretest and posttest of the experimental and control groups indicating the mean scores of each group in the six main critical thinking concepts and the difference between the mean scores of the two groups



8.4.5 Discussion of the findings of the assessment of the presentation of the educational programme

The researcher was not only interested in the change in critical thinking ability of the participants, but also in the opinion of the participants regarding the content and presentation of the educational programme. Opinions were elicited through a formal assessment. Assessment is a critical component of educational practice and therefore affects educational reform efforts (Davis, Kumtepe & Aydeniz, 2007, p 113).

The educational programme assessment instrument consisted of close-ended and open-ended questions. Close-ended questions were asked about the organization and structure of the educational programme as well as the content relevance. Questions about the facilitation of the educational programme and resources supplied were included. Participants also had the opportunity to elaborate on positive and negative aspects of the educational programme and they had the opportunity to make recommendations that would be valuable to the researcher in the planning of future educational programmes.

This assessment was additional to and independent of the formal pretesting and posttesting of the educational programme. Participants completed the educational programme assessment anonymously and voluntarily. A total of 46 assessments were completed.

It was important to the researcher to obtain feedback from the participants in order to know how the participants experienced the educational programme presentation so that certain reforms could be made if necessary (Carlisle & Ibbotson, 2005, p. 531) .

The assessment instrument covered and focused on the following aspects, which will be discussed in detail.

- Organization of the educational programme
- Structure of the educational programme
- Content relevance
- Facilitator
- Resources
- Time span of the educational programme
- Impact of the educational programme
- Feedback on the utilization of the case scenario in the presentation of the educational programme

Participants were also expected to highlight their perceptions of the educational programme by elaborating on positive and negative aspects of the educational programme. They were given the opportunity to add recommendations. The results of the educational programme assessment will now be discussed.

8.4.5.1 Analysis of course assessment: discussion of findings

The instrument (refer to addendum 4.5) was distributed to the participants to assess the presentation of the educational programme after having completed the posttest directly

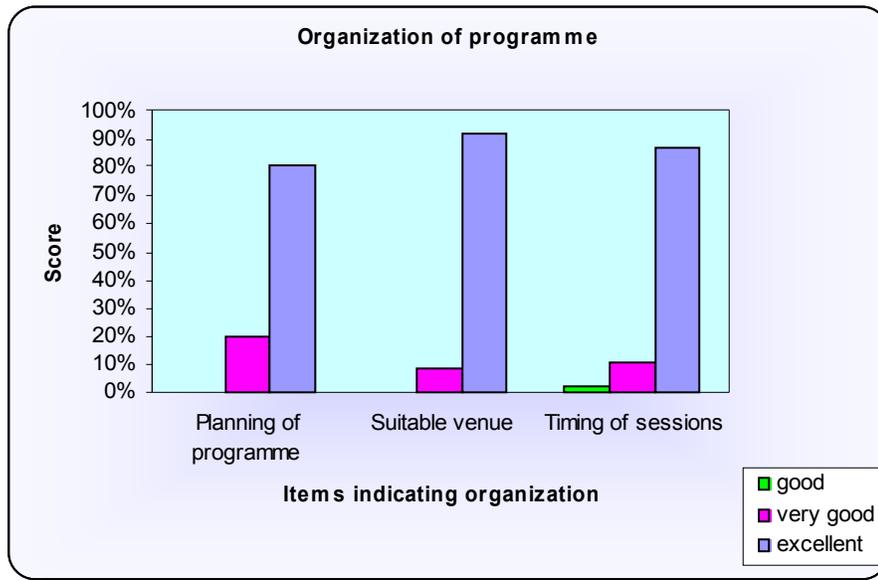
related to the research design of the study. A discussion of the findings of the programme assessment will be presented below in the same sequence as the questions on the questionnaire.

Section A (Part 1)

This section consisted of 7 subitems where respondents had the opportunity to assess the presentation and content of the educational programme. All 46 respondents replied to items 1- 7, which dealt with the organization and structure of the educational programme, the relevance of the content and the input by the facilitator as well as the resources used and time allocated to the programme.

The results for each of these items will now be discussed.

Figure 8.2: ORGANIZATION OF THE EDUCATIONAL PROGRAMME



The participants expressed the following views on the organization of the educational programme:

- Planning of the educational programme

On this aspect 9 (19,6%) out of a possible 46 respondents rated a 5 (very good) 37 (80,4%) respondents rated a 6 (excellent).

- Suitability of the venue

4 participants (8, 7%) found the venue good.

42 participants (91,3%) rated the venue as excellent.

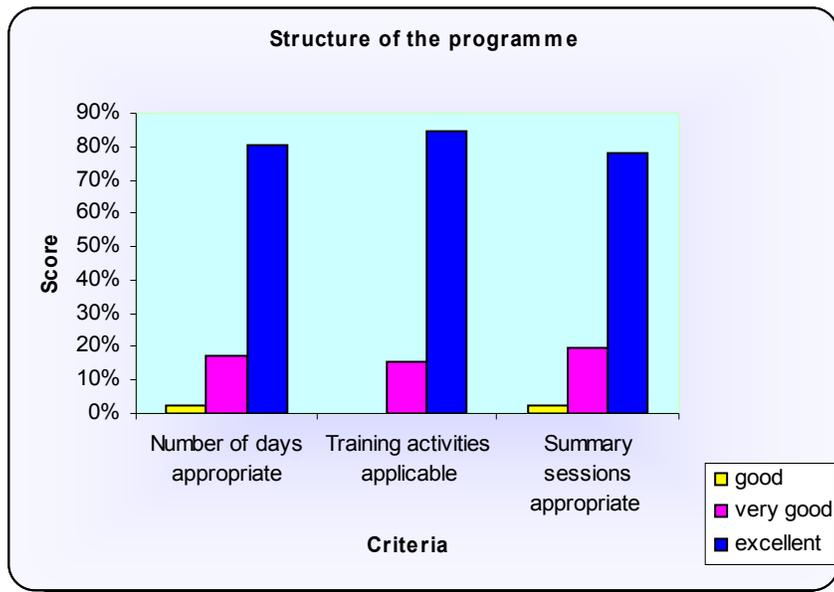
- Timing of each session

On the issue of timing of each session 1 respondent (2,2%) indicated that the timing was good, 5 respondents (10,9%) found it very good and 40 respondents (87,0%) rated the timing during the sessions as excellent.

Item 2: Structure of the educational programme

By responding to this item, participants had the opportunity to indicate what they thought of the structure of the educational programme, which included the number of days, range of training activities and summary sessions conducted (shown in figure 8.3).

Figure 8.3: STRUCTURE OF THE EDUCATIONAL PROGRAMME.



Participants made the following comments on the structure of the educational programme:

- Number of days

On the question whether the number of days was appropriate for the content covered, 1 respondent (2,2%) indicated a good, 8 respondents (17,3%) a very good and 37 respondents (80,4%) were of the opinion that the number of days was exactly enough and suitable for the educational programme.

- Range of training activities_

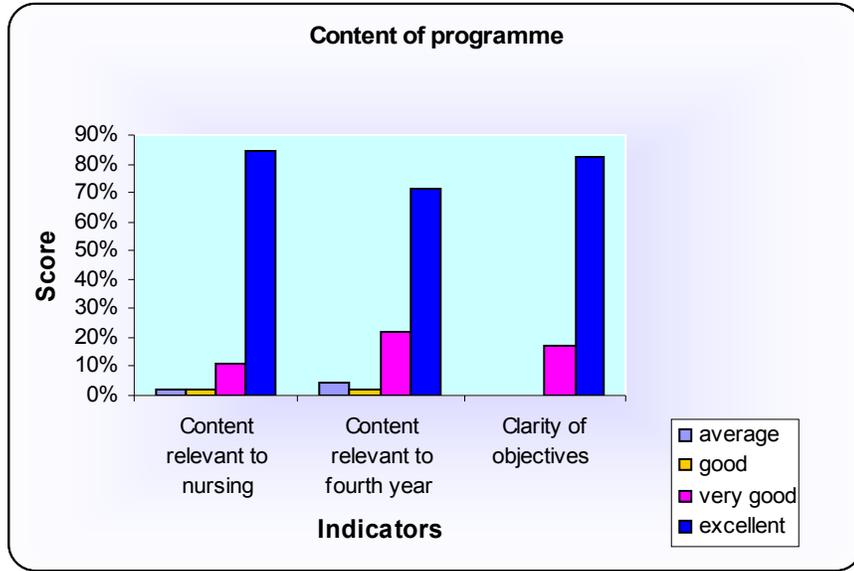
Respondents had to indicate whether the training activities offered were suitable and applicable. Seven respondents (15, 2%) viewed the activities as good and 39 (84,8%) as excellent.

- Summary sessions conducted._

On the question whether the summary sessions were conducted appropriately, 1 respondent (2, 2%) indicated that they were well conducted, 9 respondents (19, 6%) that they were very good and 36 respondents (78,3%) gave them an excellent.

Item 3: Content relevance

The researcher/ programme facilitator was interested in knowing how participants viewed the relevance of the content of the educational programme. The two items they had to respond to were relevance of the content of the educational programme to nursing and whether the content was relevant to fourth-year nursing students. Furthermore, they were expected to respond to the clarity of objectives set for the educational programme. The responses to this item are indicated in figure 8.4

Figure 8.4: CONTENT OF THE EDUCATIONAL PROGRAMME

The expression of comments by the participants can be described as follows:

- Relevance of the content of the educational programme to nursing

1 respondent (2,2%) indicated that the relevance was average, 1 respondent (2,2%) indicated that it was good, 5 respondents (11,0%) viewed it as very good and 39 respondents (84,8%) felt that the content of the educational programme was very relevant and expressed this by indicating an excellent.

- Relevance to fourth-year nursing students

Regarding whether the content was relevant to the fourth-year nursing students, 2 respondent (4,4%) indicated the relevance as average, 1 respondent (2,2%) indicated it was good, 10 respondents (21,8%) viewed it as very good and 33 respondents (71,7%) felt that the content of the educational programme was very relevant to nursing and expressed this by indicating an "excellent".

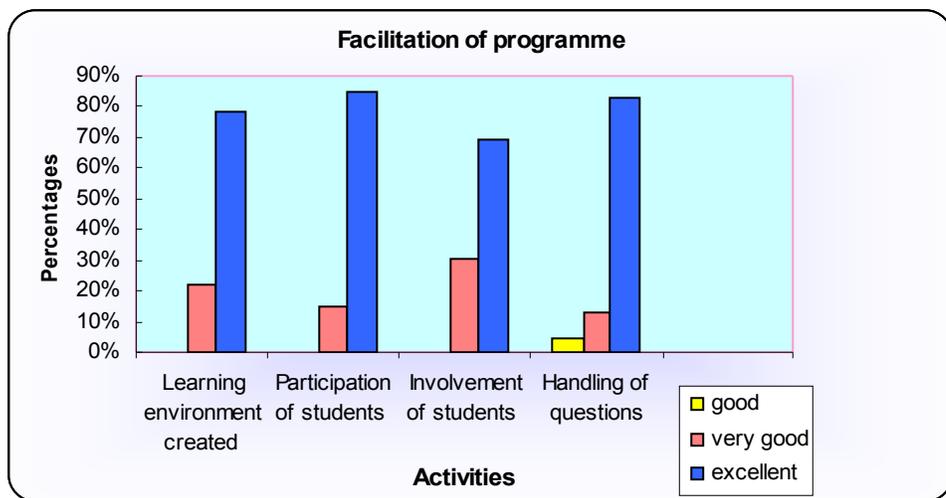
- Clarity of objectives

Eight respondents (17,4%) indicated that objectives set for the educational programme were very good and 38 (82, 6%) viewed the objectives as excellent.

Item 4: Facilitation of the educational programme

The facilitation of the educational programme was a major activity and it was important for the researcher to know whether respondents had any specific perceptions about the facilitation of the educational programme. On a scale of 1–6 the respondents had to respond to the following subitem, namely whether the facilitator had created a learning environment, whether participation by respondents was encouraged, how actively involved the respondents were during the educational programme and how the respondents’ questions were answered. These responses are indicated in figure 8.5.

Figure 8.5: FACILITATION OF THE EDUCATIONAL PROGRAMME



The discussion on the findings revealed the following:

- Creation of learning environment

Ten respondents (21,7%) were of the opinion that the learning environment was created in a very good way, and 36 respondents (78,3%) rated the creation of the environment as excellent.

- Participation by students

Seven respondents (15,2%) stated that students were encouraged to participate in a “very good way” and for 38 respondents (84,8%) the encouragement to participate was excellent.

- Involvement of students

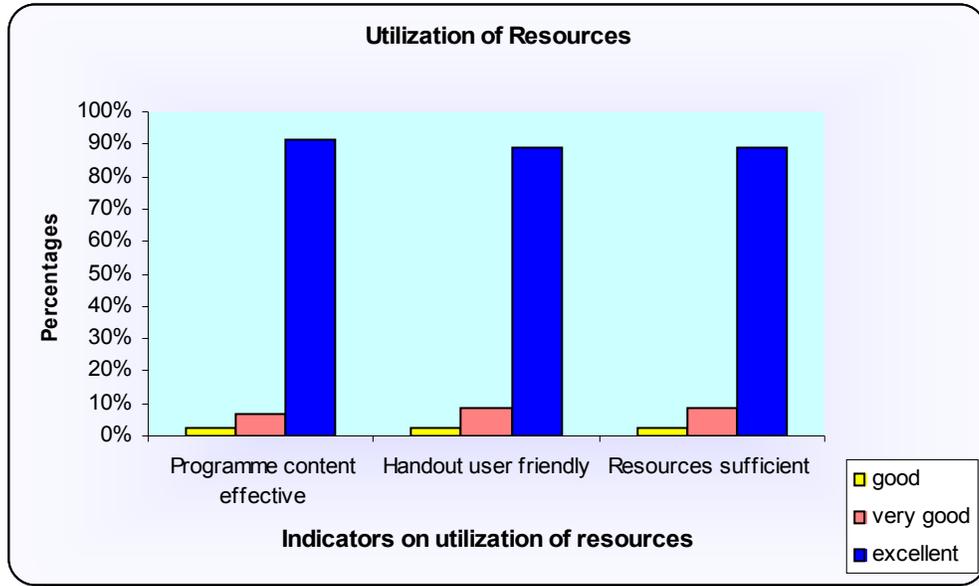
To the question of the extent to which the students were involved in the educational programme 14, (30,4%) respondents indicated “very well” and 32 respondents (69,6%) “excellent”.

- Handling of questions

Two respondents (4,4%) indicated that questions were handled “well”, 6 respondents (13,0%) indicated “very well” and 38 respondents (82,6%) said that questions were handled in an excellent way.

Item 5: Resources used during the educational programme

An item was included where participants had an opportunity to assess the educational programme in terms of resources used during the presentation and facilitation of the educational programme. The assessment was done in terms of the course handout, whether the content was user friendly and whether the resources were sufficient. The responses to this item are reflected in figure 8.6

Figure 8.6: UTILIZATION OF RESOURCES

The description of the comments on the utilization of resources during the programme can be interpreted as follows:

- Effectiveness of the course handout

On the question whether the course content was effective, 1 (2,2%) participant indicated that it was good, 3 (6,5%) indicated that it was very good and 42 participants (91, 3%) said it was excellent.

- Content: user friendly?

Participants were furthermore expected to indicate whether they found the handout user friendly. One (2,2%) participant indicated that it was good, 4 (8, 7%) said it was very good and 41 participants (89,1%) indicated it was excellent.

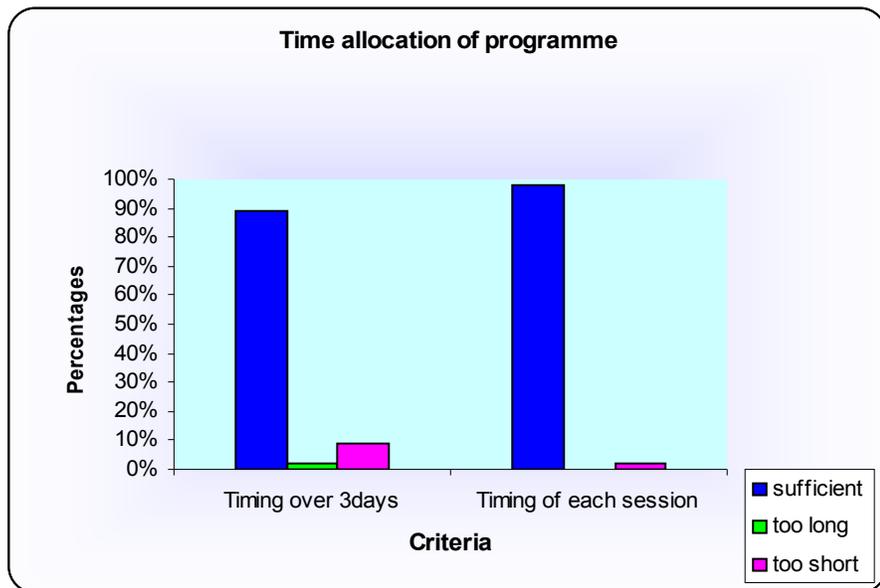
- Sufficiency of resources.

Regarding the sufficiency of the handout, 1 (2, 2%) participant indicated that it was good, 4 (8,7%) indicated it was very good and 41 participants (89,1%) indicated it was excellent.

Item 6: Time allocated for educational programme

The literature is not clear on how long an educational programme to facilitate critical thinking ought to be. It is indicated that the length of the programme will be determined by the information that needs to be conveyed during such a programme. Participants therefore had to indicate whether the three days allowed for the implementation of the educational programme was sufficient, too long or too short and comment on the timing of each session. The opinions are indicated in figure 8.7.

Figure 8.7: TIME ALLOCATION FOR EDUCATIONAL PROGRAMME.



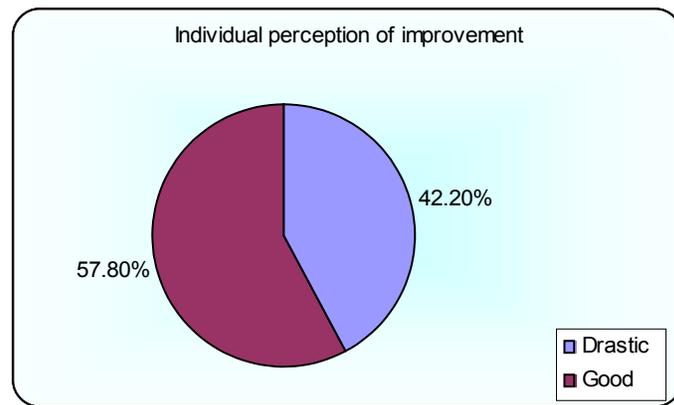
Out of a possible 46 responses, 41 (89,1%) indicated that the three days were sufficient and out of a possible 45 responses 44 (97,7%) indicated that the timing of each session was sufficient.

Item 7: Improvement of knowledge.

Forty-five participants responded to this question.

The researcher was interested in what the participants had to say regarding the improvement of their own knowledge. They had the opportunity to reflect about what their perception was regarding their level of improvement as indicated in figure 8.8.

Figure 8.8: INDIVIDUAL PERCEPTION OF LEVEL OF IMPROVEMENT AS A RESULT OF THE EDUCATIONAL PROGRAMME ON CRITICAL THINKING.



The analysis of the data revealed the following:

Participants could indicate on a scale of 1–5 how they rated their own improvement as a result of the educational programme; 1 being “no improvement” and 5 a “drastic improvement”.

Twenty-six participants (57,8%) out of a possible 45 indicated that there was a good improvement in their knowledge and 19 (42,2%) considered that there had been a drastic improvement following the educational programme.

Another part of this assessment allowed for participants to elaborate on positive and negative aspects of the programme and, where applicable, to make recommendations regarding any part of the programme.

Section A (Part 2):

This section provided for the participants to elaborate on their perceptions of the educational programme. Respondents were requested to comment on perceived possible positive and negative aspects of the educational programme. An additional request was to submit applicable recommendations about the presentation and content of the educational programme.

The participants highlighted the following positive aspects of the programme.

Positive aspects:

The following positive comments were made about the educational programme. They have been placed verbatim.

- “This program changed the attitudes of nurses.”
- “I learned a lot and changed my negativity into positivity.”
- “Program was well facilitated and prepared.”
- “Very informative program.”
- “Great improvement of our skills.”
- “I was so impressed with the program.”
- “The program taught me how to think more deeply and analyze situations before actions.”
- “Now I can use the six critical concepts.”
- “I learned more on how to think deep and solve a problem.”
- “It is a very good teaching program and a lot of people benefit from it.”
- “I personally learned a lot and I am planning to put it into practice.”
- “It stimulate one to think critically before acting.”
- “It is very good. It encourage thinking beyond normal thinking.”
- “It made me be alert on thinking when handling my patient. Method of teaching was effective.”
- “Everything in the program was perfect.”
- “It was a good program, especially for final year students.”
- “This program is really good. It taught me a lot, it woke me up. Critical thinking is needed because it helps people while they come across different difficulties. It was worthwhile.”

- “It was a fruitful program. It is useful for nurses to improve on critical thinking.”
- “It was really good that it helped me as student nurse to be able to apply my critical thinking skills.”
- “Excellent organization.”
- “The program was well set out and concepts clearly described.”
- “The program was effective and helpful in our daily life’s and work related. It improved my thinking.”
- “At least we will know how to handle a situation.”
- “I learned about using intellectual courage, deductive and inductive reason.”

The participants also had the opportunity to elaborate on any negative aspects regarding the programme. The following comments were received in this regard:

Negative aspects

The following negative comments were received:

- “Time for the program was too short.”
- “Although it was done a little late, it still helped me.”

The last part of the assessment allowed participants to make recommendations about any aspects regarding the programme. The recommendations mostly dealt with the presentation of the programme.

Recommendations

The following recommendations were made:

- “It was good for us and should be done to other students in future.”
- “Continue to offer this to fourth year students.”
- “The program should be integrated to the 2nd and 3rd year/ I wish it could be part of the 2nd and 3rd year curriculum.”[13 respondents]
- “Do the program with the 3rd years so that they can start thinking critically at an earlier level.”
- “The program should be conducted to all nurses in public hospitals.”[2 respondents]
- “Program to be done precisely this time after rural placement.”
- “Continue to teach our fellow students behind us, using the six concepts.”
- “This should be one of the nursing modules.”
- “Nurses in the hospital should be given in-service training so as to improve their skills and this will help Namibian nurses to improve nursing image.”
- “The program is of great importance and should be given to all 4th years.”

- “The program should not stop but continue then nursing care will improve.”

The programme assessment had some questions on the teaching strategy that was used during the presentation of the programme. The researcher used case scenarios to enhance active participation.

Section B

Case scenarios were utilized to promote group discussions and active participation. However, the researcher was interested in what the participants thought about the use of this teaching strategy.

Several questions dealt with the case scenario teaching strategy and students had to reply with a “Yes/No” to the questions on the use of case scenarios in the facilitation of critical thinking.

A total number of 46 participants answered in the affirmative to the use of case scenarios as a teaching strategy in the clinical setting. They also agreed that the use of case scenarios assisted them with the analysis of problem cases and it engaged them in drawing inferences. It furthermore helped them to reflect on decisions in order to find the best answer or solution.

They were given the opportunity to add some comments on the questions and the following emerged:

- “I know now how to apply critical thinking.”
- “Learned how to gather and cluster information.”

- “Know what I must do first.”
- “now I can make a conclusion.”
- “book I received in this program will be my weapon to fight with in equipping myself about critical thinking.”
- “Thanks for the program. It was an eye opener and empowerment.”

In view of the above findings, the researcher can conclude by stating that not only did the educational programme facilitate the development of critical thinking, but it was also perceived very positively by the participants. The participants were satisfied with both the content and the presentation of the programme.

8.5 Summary

This chapter dealt with the evaluation of the educational programme which was compiled and offered over a period of three days. Evaluation is the systematic process of collecting and interpreting information as a basis for decisions about learners (Oermann & Gaberson, 1998, p.3).

The rapid dynamic changes occurring in the health care setting have dictated a stronger, more comprehensive, holistic way of arriving at decisions than the traditional nursing process. This more comprehensive, holistic approach is called critical thinking (Thurmond, 2001, p.375). The researcher has designed an educational programme to

assist nursing students in achieving some aspects of the above-mentioned approach to thinking.

According to Wright (2002, p. 99), it is essential to determine the purpose for evaluation and the criterion one will use to judge performances because different purposes demand different types of testing procedures. If no existing instrument applies to a study, a rubric can be compiled to fit a specific purpose (Wright, 2002, p.99). For the purposes of this study, a specific rubric was compiled to fit the case scenario presentation designed for the study.

Evaluation of the educational programme was twofold, namely to determine whether the participants have improved on applying certain critical thinking skills and to assess their perception of the presentation of the educational programme in general. The results of these evaluations were very positive and conclusive remarks on the outcome of the objectives and recommendations appear in chapter 9.

CHAPTER 9

CONCLUSIONS, LIMITATIONS, UNIQUE CONTRIBUTION AND RECOMMENDATIONS

9.1 Introduction

The purpose of this chapter is to review the entire study and the outcome of the research objectives, and to discuss the significant findings and conclusions of the study. Recommendations are made with reference to critical thinking in nursing practice, further research, course developments and educational support. The limitations of the study are also highlighted.

The aim of this research project, as reflected in the title, was to develop an educational programme to facilitate the development of critical thinking by the student nurse in Namibia. The necessity for the project was firstly identified in a previous research project by the researcher (Pretorius, 2001, p.121) and secondly supported by personal observation during clinical follow-up of students in nursing practice.

The researcher is aware of the challenge that critical thinking presents in everyday life and in nursing and of the fact that it is not a skill that is acquired overnight. The researcher therefore attempted to introduce six main concepts of critical thinking to

professional nurses on the brink of a professional career, and thereby make a valuable contribution towards nursing in Namibia. The researcher's perception is that if nurses can master at least these six major concepts it will make a vast difference in nursing care in Namibia.

Conclusions are discussed with reference to each objective and its outcome. Simultaneously, the researcher will also indicate the recommendations applicable to each objective and to nursing practice in Namibia.

9.2 Conclusions

Conclusions are drawn according to the stated objectives that appear in chapter 1.

9.2.1 Objective 1

Conduct a needs assessment on the needs of the student nurse in Namibia regarding critical thinking in nursing practice [phase 1]

9.2.1.1. Conclusion

In formulating objective 1 the researcher aimed to determine the needs of student nurses in terms of critical thinking. To achieve this objective a needs assessment was conducted by utilizing a case scenario which had to be analyzed by fourth-year nursing students. To determine the mean of each concept in the case scenario, their answers were deductively analyzed. An answer could be indicated out of a possible 5. The highest score in a mean was 2.1 out of a possible 5 and the lowest score was 1.1 out of a possible 5.

It was therefore concluded that:

- The fourth-year nursing students were not able to analyze the case scenario in depth and with insight
- Answers to the questions were superficial.
- The students did not display an inquiring or an analytical mind

9.2.1.2. Recommendations

With reference to objective 1 the researcher recommended the following:

Education and training

Recommendations regarding the challenges of critical thinking in nursing practice are made in terms of theoretical programmes conducted by the Faculty of Medical and Health Sciences as well as programmes pertaining to the clinical education of students.

Teaching educational programmes in the Faculty of Medical and Health Sciences

- Contact between the lecturers and students should be organized to facilitate critical thinking. This can be done in small groups which need to be initiated by the lecturer.
- In order to ensure that student nurses think critically, action should be taken by the Faculty of Medical and Health Sciences, to address the challenges to facilitate critical thinking in student nurses, as early as their first year of training. This can be done by exposing them to the six basic concepts in terms of defining the concepts

and explaining where these fit into nursing practice. If critical thinking in students is facilitated from their first study year onwards and its development is continuously evaluated, students will achieve competent levels of critical thinking skills (Uys & Meyer, 2005, p.18).

- However, the integration of the concepts should continue to feature in the teaching of the second and the third year of training. For the educator to teach these concepts she/he needs to model critical thinking in class and in clinical practice. Mini courses should be offered to other nurse educators to introduce the concepts of critical thinking and the integration of these concepts into their teaching sessions. By conducting these courses, consistency in teaching methods can be ensured.
- It is essential that nurse educators familiarize themselves with the constructivistic approach to teaching as well as the principles of adult learning as described by Knowles in his theory of andragogy, since nursing learners are regarded as adults.

In relation to educational programmes in the clinical setting, the following are recommended:

- **It is recommended that the educational programme on the facilitating of critical thinking be included in the four-year basic degree nursing programme as an additional credit to clinical hours. The integration should be facilitated by all lecturers in their capacity as clinical nurse instructors**

- **The integration of critical thinking into clinical practice should focus on the six main critical concepts as developed and presented in the educational programme to facilitate critical thinking. These concepts can be integrated into the teaching of the scientific nursing process.**
- Further research to establish whether nurse educators are critical thinkers themselves needs to be done since it is impossible to teach critical thinking if one does not think critically oneself.
- Nurse educators should strive to establish and maintain an environment conducive to learning in both the classroom and the clinical setting.
- The nurse educator should play the role of a mediator who promotes self- directed learning in the clinical setting

Curriculum

Recommendations which concern the curriculum for the education and training of nursing students include the following:

- The Faculty of Medical and Health Sciences should, in their curriculum review, focus on objectives that can stimulate thinking and reasoning in students to promote active participation by students.
- **Nurse educators need to review their teaching and assessment methods to institute those that facilitate critical**

thinking skills. This applies to both theoretical and practical assessment.

- **Student forums should be initiated to create the opportunity for feedback or reflective sessions about their experiences regarding theory and practice in order to detect specific needs and plan to address those.**
- **The learning styles of students must be determined when teaching programmes are developed.**

Teaching strategies

The following recommendations are applicable to teaching strategies that could facilitate critical thinking:

- **Effective and outgoing communication between the lecturers and the students is vital for the development of critical thinking skills.**
- **Clinical nursing instructors are challenged to revisit their teaching strategies in theoretical and clinical nursing education as well as their method of assessment so as to**

facilitate critical thinking. Facilitated learning should become the focus of nurse education.

- **Facilitators and educators should be role models of creativity and critical thinking in nursing practice to emphasize the utilization of critical thinking to student nurses.**
- **Nurse educators are challenged to employ teaching strategies that will promote active participation, for example the utilization of case scenarios in clinical education and assessment.**
- Research should be done by Faculty to investigate the methods of clinical accompaniment used by nurse educators (clinical facilitators) in the clinical accompaniment of students. Inexperienced clinical facilitators can negatively affect the implementation of accompaniment methods (Uys & Meyer, 2005, p.13).
- A study should also be conducted to explore the students' perception of their facilitation by clinical facilitators during clinical accompaniment.
- Well-structured workbooks with clear outcomes should be compiled to facilitate critical thinking during clinical accompaniment and allocation.

9.2.2 Objective 2

Develop an educational programme to facilitate critical thinking in student nurses in nursing practice [phase 2]

9.2.2.1. Conclusion

It was concluded that the challenges identified in phase 1 could be addressed by means of an educational programme. The deductive descriptive analysis (phase 1) determined the development of the framework for the educational programme to facilitate critical thinking. A vast number of critical thinking concepts were arrived at in phase 1 and could not be addressed as such in the educational programme. This led to a concept synthesis whereby six major concepts were chosen, namely interpretation, analysis, evaluation, inference, explanation and self-regulation.

The educational programme was developed around the six concepts with the support of sub-concepts that the researcher considered necessary to support the main concept.

The philosophy of humanistic existentialism, several educational approaches, theories of adult learning and principles of constructivism were utilized as the foundation to the educational programme.

9.2.2.2. Recommendations

The following recommendations were formulated for objective 2.

Education and training

Regarding education and training, the researcher recommended the following:

- It is recommended that the educational programme be integrated into the final year of the four-year degree programme for nurses to equip nursing students with basic

critical thinking skills before they enter the profession as professional nurses. This is considered a remedy for the gap in clinical accompaniment of student nurses (Uys & Meyer, 2005, p.18).

- Facilitators to be trained by the Faculty of Medical and Health Sciences to conduct the educational programme in rural clinical settings to empower nursing staff to manage patient cases effectively. Facilitation in the clinical setting is of the utmost importance. In facilitation the emphasis should be on communication skills, guiding and leadership (Lekalakala – Mokgele & du Rand, 2005, p.25).
- To emphasize the essence of critical thinking in nursing practice, the researcher further recommends that the educational programme to facilitate critical thinking be offered to nursing staff of both the state and private hospitals, as part of in-service education to nursing personnel in the professional and sub-professional category. To accommodate the sub professional category, certain adaptations to fit their level of training need to be done.
- **Clinical learning activities such as the presentation of client/patient studies form an important aspect of the development of critical thinking in nursing practice and should be emphasized by nurse educators and clinical facilitators. During these presentations valuable disease processes and clinical manifestations are discovered.**

- **The researcher is confident that the educational programme that was developed through this study to facilitate critical thinking in student nurses can serve as a foundation for a short course which can be offered to professional nurses in the clinical field who completed their education a long time ago. Such a course could be recognized as part of continuous professional development.**

9.2.3 Objective 3

Implement and evaluate an educational programme to facilitate critical thinking in student nurses in nursing practice [phases 3 & 4]

9.2.3.1 Conclusion

It was concluded that this objective was achieved with the implementation and evaluation of a three-day educational programme on the facilitation of the development of critical thinking within a quasi-experimental design. Students from both the main campus (Windhoek) and the Northern Campus

(Oshakati) of the Department of Nursing at the Faculty of Medical and Health Sciences of the University of Namibia were included in the quasi-experiment. Internal validity of the design was ensured by eliminating the threats to an experimental design, as referred to in their guidelines by Vockell and Asher (1995, p. 243).

The evaluation of the educational programme was twofold:

- Firstly, to evaluate the efficiency of the educational programme, hypotheses

formulated in chapter 3 were tested statistically as described in chapter 8. Through

analysis of the data obtained during the pretest and posttest of the quasi-experimental

design, it was concluded that the educational programme made a significant

difference in the scores of those participants who attended the educational

programme. This indicated that they improved in the application of six selected critical thinking skills in nursing practice. Therefore the null hypotheses (H₀) on all six critical thinking concepts were rejected.

- Secondly, an educational programme presentation assessment was done after the completion of the posttest of the participants who attended the educational programme. The aim of this exercise was to determine the experiences and opinions of the participants on the presentation of the educational programme and the content that was offered, as well as their opinion regarding the utilization of case scenarios as a teaching strategy for the facilitation of critical thinking. As discussed in chapter 8, the general assessment was that all areas of the presentation were very successful, which can be seen as support for the outcome of the hypotheses.

The general perceptions of the students were very positive and some of their general recommendations regarding the educational programme are included the following verbatim comments:

- **“should be done to other students in future”**
- “the educational programme is of great importance and should be given to all 4th years”
- “the educational programme should be integrated to the 2nd and 3rd year”
- “the educational programme should be conducted to al nurses in public hospitals”
- “continue to teach our fellow students behind us, using the six concepts”
- “the educational programme should be one of the nursing modules”
- “nurses in the hospital should be given in-service training so as to improve their skills and this will help Namibian nurses to improve nursing image”
- “the educational programme should not stop but continue then nursing care will improve”

It is concluded that not only did the educational programme make a significant difference in the scores of the students regarding the application of their critical thinking skills, but it was also positively accepted by them.

9.2.3.2 Recommendations

Recommendations regarding objective 3 were formulated in terms of education and training, curriculum implications and teaching strategies.

Education and training

The following recommendations were made with regard to education and training:

- Professional nurses in clinical practice in the training hospitals in Namibia should be thoroughly prepared for their facilitation role in enhancing critical thinking by student nurses. This calls for commitment on the part of the professional nurses. Commitment can be fostered through regular meetings between Faculty and clinical staff in order to determine the challenges and deal with the frustrations of facilitation. It is necessary to inform all stakeholders that critical thinking will develop as students broaden their clinical field of experience (Uys & Meyer, 2005, p. 13).

Recommendations were also set for the curriculum.

Curriculum

Regarding the curriculum, the following were recommended:

- It is imperative that clinical staff in the training hospital be involved in the clinical assessment of students in order to make them feel valued and part of the students' training. The onus is on the individual lecturer of the Faculty of Medical and Health Sciences to involve the clinical staff regularly in his/her contact with

students.

- The researcher recognizes that there is a lack of guidelines to assist the nurse educators and clinical facilitators in the clinical accompaniment of students and therefore recommends that these guidelines be compiled, in addition to the educational programme, to assist the nurse educators and clinical facilitators in the facilitation of critical thinking by student nurses.

Some recommendations concerning teaching strategies were also made.

Teaching strategies

Well-designed teaching strategies are important to facilitate critical thinking in nursing practice. In this regard, the researcher formulated the following recommendations:

- **Educators and clinical staff should be motivated to adapt their teaching strategy in practice to enhance active involvement by the students. An excellent strategy that can be implemented is the utilization of real-life case scenarios. However, for learning to take place, people with facilitative personalities should be employed. They require qualities such as openness, warmth and flexibility (Lekalakala–Mokgele & du Rand, 2005, p.25).**

- **Faculty should continuously revise their methods of teaching in theoretical and clinical education and emphasize self-directed learning, away from the traditional methods of teaching. Faculty should render support to the lecturing staff in this regard.**
- Constructive feedback should be given after group discussions and time should be allowed for reflection by students in class and in clinical practice.

9.3 Limitations

The following limitation was identified in the study:

A methodological limitation to the study was that the researcher had to follow a quasi-experimental design where a true experiment would have been the ideal. The true experiment would have given the students at the Northern Campus an equal opportunity to participate in the educational programme, as a result of random selection, in order to enhance the possibility of generalizing the findings of the study.

However, owing to logistical factors that have already been explained, the researcher applied a quasi-experimental design

and tried to exclude all threats to the internal validity of the design.

9.4 Unique contribution of study to body of knowledge in nursing in Namibia

The study contributed uniquely to the body of scientific knowledge for nursing education and nursing practice in Namibia.

The two major contributions of the study were in terms of the application of the existing conceptual framework and to develop the educational programme that was developed to facilitate critical thinking in student nurses.

Conceptual framework

A *conceptual framework* was applied with the aim of addressing the need for the facilitation of critical thinking in nursing students in Namibia. The conceptual framework was based on the original concepts as identified during a Delphi study by Facione (1990:6) and supported by a thorough literature review and a deductive analysis of data gathered during phase 1.

Educational programme

An educational programme was *designed* to facilitate the development of critical thinking in student nurses in Namibia. The educational programme was then *implemented* and *evaluated*.

In the design of the educational programme to facilitate the development of critical thinking skills in student nurses in Namibia, the researcher *developed* and *designed* case scenarios as tools for the facilitation of critical thinking in student nurses by emphasizing active participation

The educational programme was furthermore converted to a self-instructional guide, with the necessary user instructions, for student nurses to work through on their own, especially when they found themselves in rural areas without official facilitation.

9.5 Concluding remarks

Of all activities in which human beings engage, the one most closely associated with the essence of being human is thinking (Boostrom, 2005, p. 10) and by compiling the educational programme the researcher strove to facilitate a stronger foundation for thinking, namely critical thinking in the context of nursing. Learning to become a critical thinker is considered to be a desirable attribute for a nurse (Williams & Walker, 2003, p. 131).

Although thinking is something each of us does on our own (Boostrom, 2005, p. 133), the educational programme provided a template to follow when students are thinking in nursing practice. Critical thinking is used to approach a problem and thereby choose a path of investigation which can lead to the best possible answer in health care (Feldman, 2002, p.4).

The professional nurse will encounter different clients with uniquely different types of health care problems. What is common to all clinical situations, however, is the nurse's responsibility to think critically "so that the client ultimately receives the very best in nursing care" (Perry & Potter, 1999, p.65). The latter also contend that although critical thinking cannot be learned overnight, it can be acquired through hard work and dedication and a desire to learn.

In addition, critical thinking is an essential part of nurses' daily activities of problem solving and decision making to save the lives of clients, sick and well (Mangena & Chabeli, 2005, p.297). Through critical thinking the nurse in Namibia will be able to become an independent thinker and practitioner who can approach the Namibian nation with fair-mindedness, integrity and perseverance. It is believed that the most important endeavour in nursing education is the teaching of critical thinking (Thurmond, 2001, p.387).

As nurses we should constantly seek evidence when it is important to know if the information we have about the patients is correct. As human beings we prefer to be well informed regarding scientific reality instead of entertaining mistaken ideas (Salmon, 2002, p.3).

In a world of “ever–accelerating change” (Feldman, 2002, p 3) the researcher is of the opinion that during this educational programme critical thinking was facilitated and that the educational programme offered made a positive and significant difference in the approach of nursing students to nursing problems. Participants were supported within a climate conducive to learning where they felt safe to question, challenge and be challenged and where they could exercise their creativity.

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