CHAPTER 5

Findings, implications, recommendations and conclusions

5.1 INTRODUCTION

This chapter summarises the study, presents the findings and their implications and makes recommendations. Strauss and Corbin's (1990) paradigm model was used to link categories to the emergent construct.

5.2 SUMMARY OF THE STUDY

The *research question* aimed at exploring what *critical thinking* entails. Since the research problem was a conceptual one and the research non-experiential and non-empirical, qualitative concept analysis was conducted. The researcher used Walker and Avant's (1995) process of concept analysis. This non-empirical study was pursued through a selective literature review. Literature was sampled from the fields of education, nursing, philosophy, psychology and social sciences. The literature was perused for both methodological and ontological information. With regard to the research topic, the literature review was concerned with definitions and descriptions of *critical thinking* to establish its attributes.

Open coding and comparative data analysis were used to abstract categories from data. Once the initial categories were fully evolved, theoretical sampling was pursued to enrich these categories. In addition, discussions were held with colleagues for their views on what critical thinking entails.

Data were reassembled after the initial categorisation through axial coding (Strauss & Corbin 1990:235) as described later in this chapter.

5.3 RESEARCH FINDINGS

Results of the analysis were presented in chapter 4. Table 5.1 below depicts the major themes and categories.

The *research question* aimed at exploring what critical thinking entails. Since the research problem was a conceptual one, and the research non-experiential and non-empirical, concept analysis incorporated within the qualitative paradigm was conducted. The process of concept analysis used is as proposed by Walker and Avant (1995). This non-empirical study was pursued through selective review of literature. Literature was sampled from the fields of education, nursing, philosophy, psychology and social sciences. Literature was perused for both methodological and ontological information. With regard to the research topic, literature review was concerned with definitions and descriptions of "critical thinking" to establish its attributes.

Open coding and comparative data analysis were utilised to abstract categories from data. Once initial categories were fully evolved, theoretical sampling was pursued to enrich these categories. In addition, discussions were held with colleagues for their views on what critical thinking entails. Data were reassembled after the initial categorisation through axial coding (Strauss & Corbin 1990:235) as described later in this chapter.

Bracketing was facilitated through analysis of thesaurus and dictionary meanings of the parent words, *"critical*" and "*think*" (see chapter 3, section 3.2). Data trustworthiness was enhanced through following Lincoln and Guba's (1981:301) model of trustworthiness: credibility, dependability, applicability and transferability (see chapter 2, section 2.4.3.2).

5.4 PRESENTATION OF RESULTS

Results of the analysis were presented in chapter 4. Major themes and categories are summarised in table 5.1 below.

TABLE 5.1
SUMMARY OF DATA THEMES AND CATEGORIES

	THEMES AND CATEGORIES
1	**ANTECEDENTS OF CRITICAL THINKING**
1.1	**Disposition of the critical thinker**
1.1.1	Inquisitiveness
1.1.2	Knowing
1.1.3	Open-mindedness
1.1.4	Objectivity
1.1.5	Scepticism
1.1.6	Autonomy
1.1.7	Logic
1.1.8	Intuition
1.1.9	Habitual
1.1.10	Caring
1.2	**Conditions relating to the quality of information**
1.2.1	General indicators
1.2.2	Objectivity
1.2.3	Rationality
1.2.4	Contextuality
1.3	**Situatedness in critical thinking**
2	**ATTRIBUTES OF CRITICAL THINKING**
2.1	**Domains**
2.2	**Reflective thinking as part of critical thinking**
2.2.1	Reflection
2.2.2	Strategies in reflection
2.2.3	Processes in reflective thinking
2.3	**Self-regulating thinking**
2.4	**Critical thinking versus problem solving**
2.5	**Overview of critical thinking processes**
2.5.1	Object of intention in critical thinking
2.5.2	Aims of critical thinking
2.5.3	Becoming aware
2.5.4	Data collection
2.5.5	Focussing
2.5.6	Making judgments
2.5.7	Decision making
2.5.8	Implementation
2.5.9	Cyclic nature of the process
2.5.10	Outcomes
2.5.11	Strategies in critical thinking
2.6	**The critical attribute of critical thinking: Rationality**

5.5 *CRITICAL THINKING* CONCEPT RECONSTRUCTION

The themes and categories resulting from the open coding phase of data analysis were reassembled by means of axial coding (see chapter 4). Strauss and Corbin's (1990:99) model was used to link these themes and categories to further illuminate the emerging construct. This paradigmatic model is depicted in figure 5.1 below.

(A)	CAUSAL CONDITIONS⇨
(B)	PHENOMENON⇨
(C)	CONTEXT ⇨
(D)	INTERVENING CONDITIONS ⇨
(E)	ACTION/INTER ACTION STRATEGIES ⇨
(F)	CONSEQUENCES

Figure 5.1

Strauss and Corbin's paradigmatic model

Critical thinking is thus described in terms of antecedents, action-interaction strategies, intervening conditions, context, critical thinking process and consequences. As the process unfolded, the structure of the model case, that is, *thinking critically*, emerged. Thinking critically occurs within the individual who actualises critical thinking. "Thinking critically" as a process unfolded as axial coding progressed.

Causal conditions in Strauss and Corbin's model equated with antecedents in Walker and Avant's process of concept clarification. However, causal conditions and antecedents are not necessarily the same thing. Nonetheless, these events or incidents lead to the development or occurrence of the process of *thinking critically*. These include factors such as pivotal life experiences, dilemmas or problems and crisis situations. The properties of these causal conditions include arguments, disagreements, problems, moral issues, confrontations and perplexities (see section 4.3.1.6).

Context represents a specific set of properties or problems to which a person responds through actions or interactions. Context also refers to a particular set of conditions in which action-interaction strategies are taken to manage, handle, carry out and respond to a specific phenomenon (Strauss & Corbin 1998:132). Critical thinking requires triggering factors that should evoke the process. These factors are part of the causal conditions mentioned earlier. Thus, problems, crises or dilemmas are critical factors in igniting the process of critical thinking. The thinker's dispositions and the quality of information should be such that they facilitate critical thinking. Antecedents generally provide for the context in which critical thinking becomes possible. Context also refers to the s*ituatedne*ss of the

critical thinker (see section 4.3.1.3). Situatedness of the thinker provides for the presentation of pivotal life experiences (causal conditions) for the manifestation of critical thinking.

Intervening conditions are the broad and general conditions bearing upon the action-interaction strategies (Strauss & Corbin 1990:103). The thinker's dispositions and the quality of information (see sections 4.1.1 and 4.1.2) have a bearing on the actual process of thinking critically. It is by virtue of the thinker's disposition to thinking critically and the quality of information that critical thinking may occur when a triggering factor is presented. Inquisitiveness, knowing, open-mindedness, objectivity, autonomy, habit, intuition, logic and caring all influence the thinker's thinking process to think critically as he/she encounters problem situations that he/she must manage. The management of these problems depends on adequate and specific knowledge in the problem area, rational thinking, and understanding the context of the problem to facilitate the process. For critical thinking to actualise, the above factors should continually be integrated.

Action-interaction strategies are devised to manage, handle, carry out or respond to a phenomenon under a specific set of conditions (Strauss & Corbin 1998:133). These are the strategic actions directed to the problem. The action-interaction strategies are articulated on the thinker's dispositions, the quality of information and the context. Strategies of critical thinking include questioning, analysis, judging, self-regulation, reflection, reflective scepticism, logical reasoning, contrasting, observance of relevancy and other factors (see section 4.3.2.5.1, category 2.5.11). These are indicative of and give credence to the thinker's thought process when thinking critically.

Consequences are the outcomes or results of action-interaction processes (Strauss & Corbin 1990:106). Consequences are not always predictable. Critical thinking (or thinking critically) is cyclical in nature. Outcomes or consequences are not end outcomes (or final consequences). Whatever the outcome in response to any pivotal life experience or any other trigger situation or "gap-producing event, will affect the disposition of the thinker so that this too will change. The thinker's disposition is existential and experiential in nature. It is a reflection of *homo viator* – "man always becoming" (Keller 1971:73). This also contributes to self-regulatory thinking. Outcomes in critical thinking facilitate human becoming. The process of thinking critically is diagrammatically depicted in figure 5.2.

5.6 PLAUSIBLE HYPOTHESES

The study of critical thinking led to the development of several plausible hypotheses. These plausible hypotheses are *apparently* reasonable and truthful as indicated by data from which they were abstracted. They represent relational propositions or statements of relationships between two or more concepts. Where hypotheses proper are able to define, explain and predict the relationship between concepts (McKena 1997:78, Strauss & Corbin 1998:135), these plausible hypotheses are intended to direct the discussion, contemplation and further hypothesis formulation and consequent research involvement. They also emphasise certain central ideas relating to the emergent construct.

Hypotheses on the manifestation of critical thinking include the following:

Hypothesis 1
Critical thinking is contingent with existence.

Hypothesis 2
Thinking critically is existential in nature and context dependent, allowing personal, professional and social growth and transfer of learning to future situations, including to health care practice.

Hypothesis 3
The thinker's dispositions and the quality of information are necessary relative conditions for the manifestation of critical thinking.

Hypothesis 4
Critical thinking occurs when there is a "gap-producing" or other pivotal life experience that ignites the process to think critically in the critically inclined thinker.

Hypothesis 5
Critical thinking is a continually evolving cyclical process.

Hypothesis 6

If outcomes of critical thinking became absolute, critical thinking would be redundant.

Hypothesis 7

Critical thinking is a means to a continual state of becoming, thus has an existential orientation.

Hypothesis 8

If critical thinking is habitually employed, academic, personal and social growth is facilitated.

Hypothesis 9

Critical thinking is a dynamic process that requires the employment of various constructive thinking strategies.

Hypothesis 10

Decontextualisation of critical thinking results in reductionism.

Hypothesis 11

Critical thinking does not necessarily result in problem solving.

Hypothesis 12

Critical thinking is crucial in ethical decision-making.

Hypothesis 13

Critical thinking, by its very nature, implies reflection and reflective thinking.

Hypothesis 14

Within *the human condition*, a single phenomenon, labelled by a certain name could be an antecedent to critical thinking, a disposition of the critical thinker, an attribute of critical thinking or an outcome of critical thinking.

5.7 IMPLICATIONS FOR NURSING AND HEALTH SCIENCES EDUCATION

The results of the analysis have several implications for health sciences education and practice. These include educational implications, recommendations for curriculum development, teaching, evaluation, assessment of critical thinking and recommendations for further research. The implications are discussed below.

5.7.1 Educational implications

In view of the nature and structure of critical thinking, the educational setting is faced with the tremendous task of cultivating critical thinking skills in learners. Critical thinking skills need to be contextualised to allow transfer and application of learning to practice. However, the initial educational task confronting the educators is the recognition of the antecedents, including the learners' dispositions, the quality of information, and the trigger factors that set the stage for critical thinking to take place. These factors also set the stage for cultivating critical thinking in individual learners (Pitchers & Soden 2000:237).

Since emphasis on content coverage is an outmoded educational goal, nurse educators should strive for conditions that facilitate critical thinking**.** Critical thinking should be infused into the nursing curriculum through faculty development. An emancipating curriculum, which represents the evolving and dynamic co-creation of learning between a student and a teacher, is relevant in this instance. Thus, educators should adopt, construct and develop approaches that support the development of critical thinking in health sciences education. These actions accommodate problem-based and case-based learning. The methods in these approaches involve preceptorship, clinical conferences, case studies/presentations, clinical rounds and seminars (Haas, Deardoff, Klotz, Baker, Coleman & De Witt 2002:520). These and other similar methods can provide for the fostering and entrenchment of a critical thinking disposition during professional socialisation. They provide learners with real-time experience in applying principles to achieve critical thinking outcomes (Loving & Wilson 2000:74; McCarthy-Tucker 2000:69). Further, educators should also design opportunities to engage students in a dialogue (inquisitiveness, scepticism and critical reflection) to make learning meaningful (Schreiber &

Banister 2002:41). These strategies align themselves with the cultivation of critical thinking disposition in the thinker (learner) since they serve as trigger factors that ignite the process (thinking critically). The outcome is thus the contextual understanding of experiences and creation of new meanings out of the situation – an important aspect of critical thinking (existential nature).

Another implication of critical thinking for nursing and health sciences education is that it should be taught and evaluated using a variety of teaching methods that must be evaluated through the use of a variety of instruments. In teaching critical thinking, cognitive affective and psychomotor domains should be included (see chapter 4, section 4.2.1.1.1). For example, it is important that the teacher sometimes guide the learner by raising questions that can produce anxiety in the learner with the objective of nurturing the affective aspect of the human disposition. Anxiety in a true learning setting usually culminates in feelings of release, gladness and excitement as a person leaves former assumptions and takes a new way of viewing the world (Zimmerman & Phillips 2000:422). A state of anxiety in the habitually sceptic, inquisitive and reflective mind leads the individual to seek factual, relevant information to arrive at a plausible solution. Situational cases should be identified and learners given opportunities to handle them. This may be followed by a post-clinical conference to allow reflection on the premises, facts and courses of actions taken to handle the problem. In general, learners should be exposed to pivotal life experiences during clinical practice (White, Amos & Kouzekanani 1999:34). This can be done through chart reviews (critiquing), case reviews or research/project assignments.

Another serious challenge facing Nursing Education is to move away from the behaviouristic model to a more comprehensive outcomes-based model where the product should demonstrate a critical thinking disposition and acting responsibly in various settings that challenge daily practice. The continued emphasis on behaviourism has a crippling effect on the development of health sciences education. Instead, as indicated above, new approaches to teaching, such as problem-based learning, community-based education and case-based education, can facilitate critical thinking development (Cascio, Campbell, Sandor, Rains & Clark 1995: 38; Cravener 1997:21; White, Amos & Kouzekanani 1999:33). These approaches are learner-centred, allow the learner to respond to gap-producing situations through the employment of higher order thinking strategies, such as rational thinking,

reflective thinking, analytic thinking, self regulation and the like (White et al 1999:34). Cravener (1997:22) states that, in general, these approaches have the following advantages:

- Students learn to direct the inquiry, make decisions on what information to collect and which management options to follow.
- Foster self-directed learning.
- Structure knowledge in the clinical context to facilitate application, thus, allow subject integration.
- Allow active participation/learning, a component and an outcome of critical thinking.
- Allow for knowledge utilisation in real-life events that serve as trigger factors for critical thinking process.
- Demand that learners make decisions, thus, force them to make choices and evaluate results of such actions (reflective scepticism).

Gestalt theory is also critical in the development of new approaches to teaching (see chapter 4, section 4.3.2.5.11). It emphasises that the whole is more than the sum of its parts. It is a cognitive process that represents a paradigm shift away from behaviourism (Quinn 1995:8). Since this requires that components of the whole be explained in terms of their contribution to the total system, the application of higher order thinking, to bring *reasons, evidence, logic* and *reflective thinking strategies* into play to arrive at the best possible results - at least tentatively, becomes essential. Quinn (1995:8) and Tanner (1993:3), see behaviourism as a reductionist approach that negates the introspective properties of the mind, which are critical for critical thinking manifestation. This has a crippling effect on education. Educational tasks should not be learnt in isolation. Different educational tasks should be viewed as they contribute to a sententious whole, that is, the attainment of aims and outcomes in the context of critical thinking. The educative setting should provide for dialogical reasoning to allow access to a complex level of reflection and comprehension (Daniel 2001:52).

Critical thinking also has reconstructive and transformative elements. Reconstructivist philosophies propose a paradigm shift from the traditional approaches to an emancipatory, empowering and liberating curriculum that values critical thinking (Schreiber & Banister 2002:41). The curriculum should therefore provide pragmatic value for users. Thus, outcomes should never be absolutised. Critical

thinking is critical for the reconstruction of knowledge to prevent stasis in health sciences education. This can facilitate continual becoming (existentialism) – the *gist* of critical thinking. Discussions with colleagues also indicate that critical thinking is necessary for the reconstruction and transformation of nursing and health sciences education as it provides for innovativeness of teaching and evaluation strategies.

Alternatively, transformation philosophy's stance is that of discarding the ideologies of post-positivism, which require that learners absorb specified content to meet evaluation criteria. As a result, written tests and examinations are used to evaluate learner achievement. This leaves the most critical outcome, *critical thinking*, unattended as it is difficult to assess it this way (Schreiber & Banister 1999:41). Passing tests and examinations is no indication that learning occurred. As discussed in section 4.3.2.5, critical thinking is a process consisting of several processes that must be nartured during the educational encounter. Thus, processes involved in responding to pivotal experiences should be taught and evaluated. Evaluation should also be geared at assessing the process in the thinker rather than the outcome.

Emphasis on critical thinking also creates a need to move away from the present evaluation strategies, examples being only tests and written examinations, which promote behaviourism and content reproduction. Strategies that can sharpen the reasoning ability, logical and analytic thinking as well as judgemental ability of the learner should be incorporated into teaching to foster critical thinking (Oermann 1997:25; Sellapah, Hussey, Blackmore & McMurray 1998:148).

Furthermore, it is vital to evaluate learning, using a variety of strategies. Evaluation techniques should assess critical thinking abilities in the cognitive, affective and psychomotor domains. The reason for this is that critical thinking involves the whole being – the thinker is the process (Jerkins & Turick-Gibson 1999:12; Oermann 1997:25).

The need to move away from content coverage to approaches that favour critical thinking makes serious demands on the contemporary teacher and student. This requires a change in teacher (tutor) attitude and teaching approaches (Schreiber & Banister 1999:42; Freeman, Voignier & Scott 2002:39):

- Collaborative role between teacher and learner.
- Balance of power differentials between teacher and students and among students. The environment should allow freedom of expression and attend to students' concerns to facilitate the teaching-learning process.
- Encourage constructive dialogue when working in groups – *openness, objectivity, scepticism* and *rationality* are facilitated.
- Creation of supportive environment, respect and open-mindedness. These enhance the development of a habitual critical thinking mind.
- Provide feedback to students in a manner that facilitates *reflective thinking* and *rationality,* indicating limitations and strengths.
- Posing questions in a manner that fosters *rationality* and *reflective scepticism.*
- Regard failure as an opportunity for personal and professional growth. The learner has a chance to revisit and challenge constructed realities so as to "*re-create*" (existence).
- Promote active learning methods. For example, reflective writing on experiences, case studies, critiquing of research projects, simulations, and interviews. These provide trigger factors to which the learner must respond.

Teachers should facilitate critical thinking by allowing learners independence and inventiveness (autonomy, reflexivity, analytical thinking and rationality) as they explore realities to achieve a better understanding (tentative truth) (McCarthy-Tucker 2000:71).

Since critical thinking is contingent with existence and experiential in nature, it should be taught in context to allow transfer of knowledge to practice. As indicated, a teacher's role includes development of opportunities for learning through the creation of trigger factors that will encourage the learner to seek relevant quality information that can be used to arrive at a plausible solution. Different thinking

modes should be reinforced in teaching critical thinking, namely deductive and inductive thinking (Daniel 2001:52; McCarthy-Tucker 2000:72).

Student-centred education should be encouraged. Teachers should share the responsibility with the learners and guide them towards cognitive understanding and generalisation beyond the actual task, that is, transfer of thinking skills across situations. Teachers should themselves be competent critical thinkers capable of explaining the thinking process they use to make decisions to students. Students should be allowed to construct their own meanings from knowledge and encouraged to provide rational explanations for such meanings. This aids the development of personal understanding, an important factor in critical thinking in view of its experiential nature. Flexibility and spontaneity are required to facilitate students' exploration of the situation without rigidly following preset artificial rules. Such freedom implies a humanistic existentialist approach to education and teaching critical thinking (McCarthy-Tucker 2000:70; Pitchers & Soden 2000:243). The outcome of education should be a self-actualised person capable of making choices that will allow personal, social and academic growth.

Teacher dispositions involve openness to reason, open-mindedness, regard for evidence (quality information), intellectual curiosity, reflective habit of mind and judicious scepticism. These, however, do not necessarily lead to student attainment of critical thinking. It is important is that they contribute to the creation of a context (antecedent) that facilitates critical thinking (McCarthy-Tucker 2000:76).

In summary, changing the way Nursing Education views teaching and learning, that is, the approaches and the context and faculty's willingness to be open to different world-views, is the foundation for a turning point in building a new phase of nursing and health sciences education. It is vital that faculty look at new ways of teaching (McCarthy-Tucker 2000:75); more correctly, new ways in which to facilitate student-centred learning – the essence of facilitating critical thinking. The manner in which teaching programmes are developed should embrace the critical thinking spirit of learners, promote the conditions for such thinking, develop such strategies and encourage such thinking in the thinker's mental operations (Pitchers & Soden 2000:247). In critical thinking, various world-views are acknowledged and integrated in an appropriate manner to facilitate the transformation of nursing and health education to become critical thinking oriented.

5.7.2 Recommendations

Based on implications of the findings for Nursing Education, the following recommendations are made. These recommendations serve as guidelines for the education and training of critical thinking nurse practitioner. As such, these recommendations touch on different aspects of education, including curriculum planning, outcomes, teaching strategies, and evaluation and assessment strategies.

5.7.2.1 Curriculum planning and development

With regard to curriculum planning, it is recommended that:

- Outcomes should be stated in such a manner that they clearly indicate, incorporate and promote the development of critical thinking attributes. These are reflective thinking, self-regulatory thinking, critical thinking process, strategies and the critical attribute of rationality, which by their presence are the determinants of critical thinking. As a result of the need to contextualise critical thinking, these attributes should be included in teaching non-clinical subjects. This enhances the contextualisation of critical thinking. Inquiry-based learning as in problem-based and community-based learning approaches is relevant for fostering critical thinking (see section 5.6).
- Teaching aims should promote academic, social and personal development. Contextualising critical thinking is important because it helps in the transfer of knowledge to real-life situations, an important factor in service delivery. Alternatively, the principle of existentialism places personal responsibility for growth that must be cultivated through the educational process.
- Teaching models should be implemented in a way that promotes independence, inventiveness, autonomy, philosophical dialogue, scepticism and inquisitiveness. As indicated above, approaches such as problem-based learning and community-based learning are crucial. These approaches set the stage for the presentation of trigger factors to activate the thinker to critical thinking. Thus, knowledge in the clinical setting should be structured to allow integration of subjects, for example, patients' conditions are explained and managed in relation to the normal structure and functions through pathophysiology and collaborative care.

- The curriculum should be structured to accommodate existential and experiential nature of critical thinking. The existential implies the individual's dispositions as well. This implies that open-mindedness, inquisitiveness, scepticism, intuitiveness, objectivity, caring, logic and knowledge should be emphasised. The experiential relates to the situatedness of the individual, which involves exposure to pivotal life experiences. As mentioned earlier, community-based and problem-based approaches are of relevance because they force the learners to pursue relevant knowledge and to act and reflect on such actions.
- In addition, problem-based education, in which the curriculum is organised around problems relevant to the desired learning outcomes, is critical for facilitating critical thinking. Problems serve as triggers for initiating the process of thinking critically, thus create a context in which the critical thinking process is facilitated. Real-life problems enhance the experiential and existential nature of critical thinking in view of its contingency with existence. Situational teaching is therefore necessary, especially in teaching the application of principles to real problems, as in ethical issues that arise during the care of patients/clients (Taylor 2001:175). The learner should integrate knowledge in handling such problems, make decisions, act and evaluate actions and also decide on further actions.
- A case-based curriculum is also instrumental in facilitating the development of critical thinking skills. Case studies and practice -based scenarios help actualise critical thinking as they also present the context and the trigger factors, further affirming the existential and experiential nature of critical thinking.
- Outcomes-based education also facilitates critical thinking in terms of its existential nature. Outcomes-based programmes are organised around the essential aspects that a learner should achieve to ensure meaningful learning. Thus, activities should be geared to critical thinking outcomes (involvement/participation, objectivity, reflectivity, rationality and existentialism).
- Participative learning should be promoted through curricula that accommodate it. This allows students to have hands-on experience with the application of principles to real-life problems. This also helps students to experience and exist in the context that presents triggers that ignite development of critical thinking skills. If students are involved (participate) in their learning, they learn to apply information relevantly and make assessments in terms of processes pursued to reach outcomes. These build their confidence, make them *autonomous* and thus, make learning

meaningful. Thus, outcomes should be clearly stated to make critical thinking possible in the learners' experience and existence.

5.7.2.2 Teaching strategies

Innovation in education is also geared to transform teaching strategies to facilitate the cultivation of critical thinking. This involves a change in teacher attitude and rejection of traditional teaching methods. In this regard, it is recommended that:

- Teachers should invest more energy in the reconstruction and transformation of curricula to be in line with the emancipatory approaches discussed in section 5.7.2.1.
- The teacher and learner should be partners who share a collaborative role (Smith & Carteig 2003:228). They are both regarded as co-learners because information is developing rapidly and demands continual updating on the teacher's part. It is important that the teacher ensure active participation of students. Strategies that force the students to be active in the learning process include case studies, case reviews, and journaling.
- Teaching critical thinking should be context-dependent and readily apply to the specific discipline. This requires the use of teaching methods that foster utilisation of knowledge gained from theory to deliver effectively, such as case studies, chart reviews, problem solving and role-playing.
- Teaching should allow the transfer of learning across domains, that is, cognitive, psychomotor and affective to prevent isolation of tasks, thus pave the way for autonomy in practice. Teaching should also be geared to the development of *creativity, innovativeness, self-regulation, rationality* and *reflective thinking*, which are critical in meeting the demands of service delivery. The strategies indicated above are relevant in this instance.

5.7.2.3 The teacher and the learning milieu

In view of the need for developing an emancipating curriculum that can facilitate critical thinking, the teacher is also faced with the challenge to be disposed to critical thinking. Thus, it is recommended that:

- Teachers should be skilled in critical thinking to help students become critical thinkers themselves. Teachers should be *analytical, rational, reflective, have intellectual curiosity, logical in approach, sceptic, and be able to use different reasoning modes*.
- Teachers should be mentors with a facilitative role. They should create a context for enhancing the development of trigger factors by asking appropriate relevant questions to guide the learners' thinking process towards critical thinking. For example, when handling crisis situations in the practice arena, clinical conferences for managing problem conditions are held. Alternatively, project assignments are allocated to learners to provide for knowledge acquisition through appropriate data- collection methods and techniques. Opportunities for reflection should be provided through post-clinical conferences following completion of tasks.
- Rational decision-making should be encouraged. Skilled questioning strategies should be employed to guide the process of critical thinking. Reflective thinking should also be encouraged by allowing students to reflect on experiences and make decisions on how to improve past actions.
- Open discussions are allowed to facilitate self-regulation, objectivity, scepticism, rational thinking, logical application of knowledge, responsible decision-making and reflective thinking.
- Students should be informed on their learning roles, outcomes, aims and objectives, teaching methods, and evaluation methods to promote their active participation and make learning meaningful to them. This can facilitate their personal, social and professional growth to align with critical thinking.

5.7.2.4 Evaluation and assessment strategies

In this regard, it is recommended that:

- A variety of evaluation methods should be used. Emphasis should be placed on evaluation methods that enhance efficient utilisation of knowledge, for example, case presentation, case evaluation, report writing or journaling, from which the evaluator checks for rationality, objectivity, reflection, quality of information, evidenced conclusions, logical thinking, and internal consistency in argument.

- Evaluation should be projected beyond the actual completion of isolated tasks. It should strive for the attainment of critical thinking outcomes. The individual should be able to grasp the importance of a single task in completion of the whole. The aim of education is to produce effective practitioners who can deliver efficient and effective health care service. Assessment should not focus only on the outcomes of critical thinking, such as possible problem solving or generation of alternative solutions and ideas. It should also focus on the assessment of the sub-processes of thinking involved in critical thinking, for example, reflection, decision–making and rationality. Project assignments that require reporting or journaling, which requires students to submit articles for publishing, are relevant.
- Evaluation methods should be liberated from written tests and examinations only, to evaluation of the processes and outcomes that support critical thinking. For example, report writing, project assignment, essays, journal writing and portfolios. These support the evaluation of reflective scepticism, rationality, evidence in conclusions, quality of information, objectivity and knowledge in context. The passing of tests and examinations is no indication that true learning or critical thinking, which is the epitome of professional learning, occurred. Tests and examinations should evaluate processes, such as reflection, critical reasoning, logical thinking and rational thinking.
- Students should be exposed to critiquing of evaluation methods, such as tests and examination questions, to evaluate critical reasoning, especially following marking.
- Open book tests and examinations can be used to evaluate the extent to which knowledge utilisation contextualises critical thinking: *analysis, synthesis, evaluation, rationality* and *reflection*.
- Real-life problems should be used to assess learning. These are more challenging because of their unpredictability compared to constructed cases, which are adapted to suit the demands of the situation in an effort to enhance learning. These should be followed by critiquing to evaluate the extent to which critical thinking is actualised.
- Clinical assessment should include case interviews and case evaluations, thus, further contextualising critical thinking. Interviews provide mechanisms for building the learner's capacity to obtain relevant quality information to resolve problems at hand through rational application of information.

5.8 RECOMMENDATIONS FOR FURTHER RESEARCH

As indicated in the background to the present study, the concept *critical thinking* is problematic, mainly in the "umbrella-likeness" of the concept. Nonetheless, the present study did identify certain areas in critical thinking that need to be investigated and clarified. Therefore it is recommended that:

- A study be done to measure the experiences of teachers and students using qualitative interviews to determine the extent to which critical thinking is contextualised in health sciences education.
- A study to design a model to teach critical thinking specific to health sciences education. This would assist in fostering critical thinking during professional socialisation.
- A study to develop a critical thinking teaching model, especially for non-clinical nursing courses. This can prevent fragmentation and allow for appropriate integration of non-clinical courses in the broader context of heath sciences education and practice and facilitate an understanding of their relevance for health practice.
- A study to develop an assessment and evaluation instrument on critical thinking specific to nursing.
- An evaluative study on the critical thinking skills of nurse educators.
- A philosophical analysis of critical thinking in constituting a life- world. In this instance, critical thinking is considered world-viewless as individuals continually open up to a variety of possibilities to construct new realities.
- Critical thinking should be studied transculturally as world-views may influence the way people think. This may help uncover how culture shapes people's dispositions and influences their thinking. Further, this can facilitate the cultivation of critical thinking dispositions across cultures because this is a critical outcome.
- A study to explore mechanisms for the maintenance of critical thinking dispositions in the teaching-learning environment and in health practice.
- A study into the possible differences in thinking relating to problem solving and ethical dilemma resolution.

5.9 LIMITATIONS

Limitations in the study relate to methodological principles including the design, sampling and data-collection techniques. The researcher considers the following as the strengths and weaknesses of this study:

- This was a non-empirical study using a concept analysis methodology. Discussions were held with colleagues on five major themes to enrich categories. It is not known whether richer meanings could be obtained from contextualised human sources through unstructured interviews.
- The utilisation of a literature review as the main data-collection method gathered large amounts of information and this complicated data analysis, making it rigorous and time-consuming (Walker & Avant 1995:47).
- The population from which interviewees were selected was narrow and comprised only tutors. This raises the question of what effect the inclusion of a wider population from health sciences education and the main stream education might make.

5.10 THE RESEARCHER'S EXPERIENCE

The researcher experienced the present study as a self-reflective journey. The research was a mechanism towards self-discovery and helped increase her personal knowing. This enabled the researcher to appraise herself in terms of her understanding of the concept of interest, that is, *critical thinking*. The study enriched and broadened the researcher's knowledge and understanding of what critical thinking entails. The study essentially facilitated the researcher's personal, psychological and professional growth.

Alternatively, the researcher experienced problems with concept analysis, especially the rigorous process of dealing with and making meaning of large amounts of deconstructed information. This caused a lot of anxiety for the researcher. Amidst all the problems, the researcher was faced with the tremendous task of setting examinations, tests and assignments and marking them. However, the academic support provided motivated the researcher to strive for the completion of the task. In

general, the researcher has grown tremendously and, as a result, has developed a need to strive for continued learning to broaden her horizons even further.

5.11 CONCLUSION

This study explored what critical thinking entails mainly from literature. The outcome of the analysis led to the provision of guidelines for reconstructing and restructuring Nursing Education with the goal of contextualising critical thinking in nursing. The ultimate purpose was to analyse (and clarify) the concept *critical thinking* with a view to improving the practice of nursing through the cultivation and entrenchment of a critical thinking spirit in nurses and student nurses.

The transformation and reconstruction of national education endeavours to place it on par with international standards worldwide. In education in general and in nursing and other allied disciplines, outcomes are applied across disciplines in all learning domains. The ability to think critically is vital in such a multi-faceted environment. Of pertinent concern to nursing education in all of this are the cross curricular outcomes in the attainment and maintenance of a critical thinking practitioner. In the researcher's view, the reconstruction of the concept *critical thinking* achieved in this study and the recommendations and guidelines put forward, based on this reconstruction, should guide nurse educators in enhancing their own critical thinking skills and those of their students.