

## CHAPTER 3

### Uses of the concept and data gathering, including the literature review

#### 3.1 INTRODUCTION

The literature review was the main data collection method. Literature from various sources was assembled, deconstructed and analysed through constant comparisons to identify the uses of the concept and to develop categories and themes as they emerged from data. The literature review was therefore instrumental in data control as it allowed variables that describe critical thinking to emerge.

There are several similarities in the description of elements that comprise *critical thinking*, including logic, reflection, inquisitiveness, analysis and rationality. Critical thinking is said to be an open-ended and complicated process, which is difficult to analyse. It is also difficult to develop a list of aspects and dimensions that can be said to be exclusive to critical thinking. Various aspects, components, skills, and dispositions have been identified and described in an effort to clarify the concept of critical thinking and build categories and themes.

The following sections describe some aspects of critical thinking.

#### 3.2 DICTIONARY DEFINITIONS AND THESAURUS SYNONYMS FOR PARENT WORDS

According to Walker and Avant (1995:40), concept analysis requires the use of dictionary or thesauruses as data sources. As a way of bringing her beliefs into the open, that is bracketing, the researcher used the thesaurus and the dictionary to both clarify the parent words, namely "think" and "critical" and her own pre-understanding of these concepts in relation to critical thinking. The researcher read through the thesaurus list and noted the concepts that she could relate to the concept *critical thinking* as she understood them at that time. She then investigated the words that she noted

further to clarify her understanding. Some of the words that did not lead to repetition of synonyms when reinvestigated were also pursued to enhance the researcher's understanding of the word "critical thinking" within its broader usage. As is the case in qualitative research in general, the thesaurus search gathered an unmanageable amount of (unstructured) data. As a result it is impossible to discuss each synonym.

### 3.2.1 "Think" as a parent word/concept

Table 3.1 below indicates the list of synonyms for the word "think". However, not all the synonyms are discussed. *Thinking* may be defined as the power to reason, make judgements or careful consideration, thus using the mind to form ideas (*Dictionary of Contemporary English* 1991:1103). Other constructs typical of thinking include judging, assuming, contemplating, recalling, meditating, and fantasising. Thinking is a cognitive activity involved in making sense about issues (Smith-Blair & Neighbors 2000:251).

TABLE 3.1 SYNONYMS FOR "THINK"

Believe	Espouse	Propensity
Brood	Feel	Reason*
Cogitate	Hold	Recall
Conceive	Imagine	Recollect
Conceptualise*	Invent	Reflect*
Conclude*	Judge*	Regard
Consider*	Mediate	Remember
Contemplate	Maintain	Ruminate
Create	Mull	Speculate
Deem	Muse	Study
Deliberate*	Ponder	Suppose
Envision	Presume	View

(Rodale 1986)

The following concepts were abstracted from Rodale (1966) for discussion as synonyms for the word "think", namely ***conceptualise, conclude, consider, contemplate, deliberate, envision, judge, reason, reflect***. These are words which, when reviewed through the dictionary and thesaurus, were more characteristic of the word "think" as a mental operation. Some words, however, were not discussed even though they are applicable since the results are somehow repetitious and therefore make data redundant whereby a stage of saturation is reached too early. For example "to imagine" is

to “think”, “conceptualise”, “consider” or “ponder”. Alternatively, those words that are not seen as relevant to the use of the word “think” in the process of thinking are not included. For example “believe” means to “accept” whereas “create” is concerned with bringing something into existence not necessarily the use of the word thinking, although thinking can be creative.

### 3.2.1.1 *Synonym for think: conceptualise*

Think is the synonym for “conceptualise” that was traced in relation to thinking as in critical thinking or as a mental process. Thinking makes use of concepts to deal with objects of intention. Concepts are the building blocks for knowledge (Rossouw 2001:8). Synonyms for conceptualise which do not immediately reflect thinking in this instance include abstract, pure, theoretical and tangible.

### 3.2.1.2 *Synonym for think: conclude*

To “conclude” is to make a judgement reached by reasoning, that is, to decide. To “conclude” means to “infer” based on a given premise or evidence. To “infer” is to “conclude” from facts or reasoning (*The Oxford Thesaurus* 1991:607). To “deduct” means to “reason” and “infer” from a general law, thus deductive reasoning (*The Oxford Thesaurus* 1991:302). Thinking can therefore be regarded as a mental activity aimed at making a decision based on reasons (*The Oxford Thesaurus* 1991:236).

TABLE 3.2 SYNONYMS FOR “THINK”: CONCLUDE

Ascertain	Deduct*	Reason
Assume	Deem	Resolve
Decide*	Determine	Settle
Believe	Infer*	Surmise
Deduce	Judge	Verify

(Rodale 1986)

### 3.2.1.3 Synonym for think: consider

"Consider" as a general attribute and a process of critical thinking can be described as a mental contemplation in order to reach a conclusion (*The Oxford Thesaurus* 1991:244). "Consideration" is about the use of meta-cognition where facts are assessed in relation to their fittingness to the evolving construct. The salient properties are deliberated upon, conferred, examined and evaluated to strike a balance between reality and myth. To further explain the main synonym, consider the definitions of the following two synonyms, namely, ponder and weigh. To consider means to "ponder" which refers to give deep consideration or meditate (*The Oxford Thesaurus* 1991:925). To "weigh" means to "consider" facts carefully for a case. Weight is a measure of heaviness of an object, in this instance the weight of evidence (*The Oxford Thesaurus* 1991:1392).

TABLE 3.3 SYNONYMS FOR "THINK": CONSIDER

Address	Deal with	Manage
Appraise	Deem	Muse
Assess*	Deliberate	Note
Balance	Discuss	Observe
Believe	Estimate	Ponder*
Brood	Evaluate	Refer to
Check	Examine*	Regards
Compare	Figure	Review
Confer*	Handle	Treat
Consult	Heed	View
Contemplate*	Judge	Weight
Count		(Rodale 1986)

### 3.2.1.4 Synonym for think: contemplate

"Contemplate" is the term included as an attribute of thinking that refers to a "survey" that takes place in the mind (*The Oxford Thesaurus* 1991:247). Contemplation is an important attribute of thinking that should be continually integrated throughout the process of thinking. Contemplation is about "examination" of meanings, "meditation" on facts, "speculation", "consideration" of alternatives and "exploration" in anticipation of resolving problems. To further explain the main synonym, the following three synonyms are defined: "cogitation", "survey" and "explore". To "cogitate" means to "think deeply" about a problem or possibility (*The Oxford Dictionary* 1991:219). To "survey" means to "consider" in a comprehensive way, to "examine" carefully in order to appraise and value a condition (*The Oxford*

*Dictionary* 1991:1229). To “explore” means to “examine” systematically and purposively (*The Oxford Thesaurus* 1991:412). The variables that are of relevance should be explored and brought to the surface, thus, thinking critically.

**TABLE 3.4 SYNONYMS FOR “THINK”: CONTEMPLATE**

Anticipate	Examine*	Picture
Await	Expect	Ponder
Cogitate*	Explore*	Probe
Consider	Figure	Reflect*
Contemplate	Harbour	Regard Ruminare
Deliberate*	Imagine	Speculate
Dwell	Inspect	Survey*
Dwell on	Meditate	Think about
Entertain	Muse on	(Rodale 1986)
Envision*		

### 3.2.1.5 *Synonym for think: deliberate*

To “deliberate” means to “discuss” reasons for or against (*The Oxford Thesaurus* 1991:306). The following additional synonyms serve to further explain the main synonym: “confer” and “meditate”. To “confer” means to “consult” (*The Oxford Thesaurus* 1991:239). To “meditate” means to “think deeply” about something (*The Oxford Thesaurus* 1991:737). The object of intention in critical thinking is basically facts, statements or ideas. It is the application of the general thinking processes, namely, analysis, examination, meditation, reasoning, reflection and weighing in thinking so that facts may be established to help actualise the outcomes of the process, “critical thinking”. The above variables are discussed in relevant sections of synonyms explored. “Thinking” may be referred to as critical if a person becomes completely absorbed in the object of intention to try and use the mind creatively, thus cogitating. The above synonyms are applicable to thinking critically. However, they could not all be discussed but help saturate the uses of the concept “think”, for example, “analyse”, “concentrate” or “debate”.

**TABLE 3.5 SYNONYMS FOR "THINK": DELIBERATE**

Address	Convene	Parley
Analyse*	Converse	Ponder
Argue	Debate	Rationalise
Brood	Discuss	Reason
Cogitate*	Examine*	Reflect*
Concentrate	Figure	Review
Confer*	Meditate*	Study
Consider	Meet	Think
Consult	Muse	Weigh*
Contemplate		(Rodale 1986)

### 3.2.1.6 *Synonym for think: envision*

To "envision" is associated with seeing, foresight or visualising (*The Oxford Thesaurus* 1991:393). To "envision" is a word that has a futuristic orientation. To further assist the explanation of the main synonym, the following two synonyms are defined: "anticipate" or "predict". To anticipate means to "foresee" and act in advance (*The Oxford Thesaurus* 1991:46). To "predict" means to make a declaration about something in advance (*The Oxford Thesaurus* 1991:938).

In critical thinking, one directs the thinking processes towards forecasting, predicting and anticipating through contemplating on the objects of intention, clarifying ideas in the mind with the aim of developing a better understanding of the issue of concern.

**TABLE 3.6 SYNONYMS FOR "THINK": ENVISION**

Anticipate	Fancy	Predict*
Await	Forecast	Pretend
Conceive	Foresee	Prophecy
Contemplate*	Foretell	See
Create	Imagine*	Think
Divine	Invent	Understand
Dream	Picture	Visualise
Expect		(Rodale 1986)

### 3.2.1.7 *Synonym for think: judge*

"Judging" refers to questioning the merits of something (*The Oxford Thesaurus* 1991:640). The synonyms provided in table 3.7 below are equally applicable to the act of judging. However, the synonyms that are discussed were selected as they all seem to encompass the act of judging. To

"analyse", "appraise", "conclude" or "examine" were all discussed earlier. Thinking as related to critical thinking is concerned with higher order thinking, logic, reasoning, creativity and meta-cognition to evaluate evidence for or against facts so as to take a stance or position (Daniel 2001:50, 54). "Logic" refers to reasoned thought or argument as distinguished from irrationality (*The Concise Oxford Dictionary* 1991:697). "Reasoning" means the process of drawing conclusions from facts (*The Oxford Thesaurus* 1991:999). "Creativity" refers to originality of thought or being imaginative (*The Concise Oxford Dictionary* 1991:272). "Meta-cognition" refers to the strategic management of thinking processes to provide internal logic (Jenkins & Turick-Gibson 1999:11).

**TABLE 3.7 SYNONYMS FOR "THINK": JUDGE**

Adjudicate	Consider	Infer
Analyse*	Decide	Inspect
Appraise*	Deduct	Predict
Arbitrate	Deem	Rate
Assess	Determine	Regard
Assume	Diagnose	Rule
Believe	Estimate	Settle
Calculate	Evaluate	Surmise
Conclude*	Examine*	Value
Conjecture		(Rodale 1986)

### **3.2.1.8 Synonym for think: reason and reasoning**

"Reason" is an intellectual faculty by which conclusions are drawn from premises (*The Oxford Thesaurus* 1991:999). "Rationality" refers to something based on reasons or sensitivity (*The Oxford Thesaurus* 1991:995) and to be reasonable is to use an argument by way of "persuasion", that is, to have sound "judgement" within the limits of reason (*The Concise Oxford Dictionary* 1991:997). "Reasoning" as a mental activity is about "conferring", "rationalising" and "rationality" in dealing with statements or ideas. Reasoning requires that the subject of concern is assessed in all its dimensions in the mind of the thinker, an important aspect in actualising critical thinking aims and objectives. The uses of the word "reasoning" as implied by the synonyms above should be applied in context. (Greenwood 2000:429). The critical thinker should gather information and deliberate on it logically as in confrontation with his/her own thoughts. The following two definitions of synonyms serve to crystallise the explanation of "reason" and "reasoning" in the context of critical thinking, namely, "inducing" and "extrapolating". To "induce" refers to "persuasion" or use of "influence" or "establish a

general proposition" (*The Oxford Thesaurus* 1991:603). To "extrapolate" is to go beyond the known to the unknown, to make inferences beyond what is known (*The Oxford Thesaurus* 1991:415). Other synonyms earmarked in tables 3.8 and 3.9 below were discussed earlier. Synonyms are reciprocal and can be used interchangeably, taking into consideration the context in which they are applied. The synonyms therefore serve to increase the breadth of uses of the concept "think".

**TABLE 3.8 SYNONYMS FOR "THINK": REASON**

Analyse	Deduce	Persuade
Argue	Deliberate*	Ponder
Argument	Discuss	Presume
Assume	Extrapolate	Rationality*
Basis	Gather	Rationalise
Cogitate	Induce	Sanity
Conclude	Infer*	Sense
Confer*	Judge	Suppose
Convince	Judgement	Think
Debate	Logic*	(Rodale 1986)

**TABLE 3.9 SYNONYMS FOR "THINK": REASONING**

Analysing*	Debating	Inferring*
Arguing	Deducing*	Pondering*
Argument	Deliberating*	Rationalising
Argumentation	Discussing	Reasoning
Cogitation*	Extrapolating*	Thinking
Concluding	Inducing*	Weighing
		(Rodale 1986)

### 3.2.1.9 *Synonym for think: reflect*

"Reflection" is a thinking process that provides for the cyclic nature of critical thinking. Reflection is associated with "reconsideration" (*The Oxford Thesaurus* 1991:1008).

**TABLE 3.10 SYNONYMS FOR "THINK": REFLECT**

Cast back	Exhibit	Repeat
Cogitate	Glance	Reproduce
Concentrate	Indicate	Resonate*
Consider*	Imitate	Resound
Contemplate*	Meditate*	Reveal
Deliberate	Muse*	Show
Dream	Ponder*	Study
Dwell	Rebound	Think
		(Rodale 1986)



To reflect means to "muse" or "resonate". To "muse" is to "reflect about" or to "ponder on", usually in silence (*The Oxford Thesaurus* 1991:780). To "resonate" means to "reverberate" or "resound" (*The Oxford Thesaurus* 1991:1025). These definitions serve to clarify synonyms as applied to "thinking". It should be noted, however, that these synonyms are repetitive and iterative as they clarify the word "think". Most of these synonyms were discussed earlier. "Reflection" encourages critical thinking ability. Reflection is a thinking activity that helps evaluate the processes and outcomes of thinking, at least critically (Burton 2000:1013).

### 3.2.1.10 *Synonym for think: logic and logical*

"Logic" refers to a chain of reasoning and deductions consistent with reasons (*The Oxford Thesaurus* 1991:699). Being "logical", again is the ability to "reason correctly and consistently" (*The Oxford Thesaurus* 1991:698).

Analytical	Induction	Rational*
Argumentation	Inductive	Rationality
Caution*	Intelligible	Reason
Credible	Judgement	Reasonable*
Deduction	Legitimate	Sense*
Deductive	Lucid	Validity
Discerning*	Practical	Wisdom

(Rodale 1986)

Being "cautious", to "discern" and "sense" all help to further explain the synonyms "logic" and "logical" as they clarify the parent word "think". Some were discussed earlier. To be "cautious" is to be "prudent", to "care" or to have "forethought" (*The Oxford Thesaurus* 1991:461). "Discernment" refers to "discrimination", having a "clear perception" to permit differentiation or "good judgement" (*The Oxford Thesaurus* 1991:368). "Sense" is about having a "mental perception or awareness" or "sound practical judgement" (*The Oxford Thesaurus* 1991:1102). "Logic" is a crucial aspect of the process of thinking critically. This thinking should be based on *appropriate, sensual, cautious and rational* use of facts to solve problems. Logic appropriately applied, calls for wisdom or a discerning spirit to produce good results.

### 3.3.2 “Critical” as the parent word

The word “critical” has a unique meaning to nurses as it applies to something serious in respect of the person’s condition of illness. However, the word “critical” is used differently in relation to the thinking process. Table 3.12 below illustrates this. “Critical” is a term used to refer to “faultfinding” or “judging” in an effort to bring about good and bad qualities of something (*The Oxford Thesaurus* 1991:76).

**TABLE 3.12 SYNONYMS FOR “CRITICAL”**

Accurate*	Disparaging	Logical*
Acute	Essential*	Meticulous
Analytical*	Exact	Momentous*
Astute	Explanatory	Perceptive
Clarifying	Fastidious	Perspicacious
Conscientious	Finicky	Pivotal*
Crucial*	Grave	Refine
Dangerous	Grievous	Scrupulous
Decisive	Illuminating	Serious
Derogatory	Important	Significant
Determining	Judging*	Urgent
Discerning	Judicial	Vital*
Discriminate		(Rodale 1986)

The words selected are those characteristic to the word critical as it applies to the thinking processes. These include “**analytical**”, “**crucial**”, “**essential**”, “**judging**”, “**meticulous**”, “**pivotal**” and “**vital**”.

#### 3.3.2.1 Synonym for critical: pivotal

A “pivot” is a “hinge” or something to depend on, that is, something essential (*The Oxford Thesaurus* 1991:908). Critical thinking is pivotal as it is about focusing on the central, crucial, essential, fundamental or significant aspects of the phenomenon of concern (see table 3.13 below).

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**TABLE 3.13 SYNONYMS FOR "CRITICAL": PIVOTAL**


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Capital	Essential*	Principal
Central*	Focal	Serious
Consequential	Fundamental*	Significant
Critical	Important	Vital
Crucial*	Key	Weighty
Decisive	Momentous	(Rodale 1986)

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"Essential" refers to something "absolutely necessary", that is, "fundamental" (*The Oxford Thesaurus* 1991:400). Significant means "important" or "meaningful" (*The Oxford Thesaurus* 1991:1130). "Central" refers to a "main" or "principal" aspect (*The Oxford Thesaurus* 1991:181). These definitions serve to further explain the parent word as they define the concept "critical".

### 3.2.2.2 *Synonym for critical: analytical*

"Analysis" refers to a detailed examination of elements or structure of a substance, thus determining its constituents (*The Oxford Thesaurus* 1991:38). "Being analytic" relates to logical analysis of a structure or a substance (*The Oxford Thesaurus* 1991:39). To "analyse" is to examine in detail, ascertain the characteristics and to show the essence of a structure (*The Concise Oxford Thesaurus* 1991:38). Table 3.14 depicts the relevant synonyms.

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**TABLE 3.14 SYNONYMS FOR "CRITICAL": ANALYTICAL**


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Critical*	Discriminate	Judging
Deductive	Inductive	Logical*
		(Rodale 1986)

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***Analysis, analysing*** and ***being analytical*** in relation to critical thinking require the use of various thinking modes. These thinking modes fall within deductive and inductive reasoning and are used to discriminate facts for or against and the application of logical integration to bear on the judgement and decision taken. The terms "logic" and "logical" are also synonymous with thinking. Logic equates to thinking and logical to the critical nature of critical thinking.

### 3.3.2.3 *Synonym for critical: judge*

“Judging” refers to the appraisal or consideration that culminates in decision making (*The Oxford Thesaurus* 1991:640). Synonyms such as “analyse”, “assess” and “appraisal” are further defined to clarify the word “judge”. Table 3.15 indicates these synonyms.

**TABLE 3.15 SYNONYMS FOR “CRITICAL”: JUDGE**

Adjudge	Consider	Infer
Adjudicate	Decide	Rate
Analyse*	Deem	Rule
Appraise*	Determine	Setting
Arbitrate	Diagnose	Surmise
Assess*	Evaluate	Value
Conclude	Examine*	

(Rodale 1986)

To “analyse” refers to a detailed examination of the structure of a substance, as indicated earlier (*The Concise Oxford Thesaurus* 1991:38). To “assess” means to “evaluate”. To “appraise” has to do with assessment of the worth, value and quality of an object (*The Oxford Thesaurus* 1991:52). As discussed, critical thinking requires the engagement of the mind in the appraisal, examination and analysis of ideas bearing upon the action.

### 3.3.2.4 *Synonym for critical: logical*

“Logical” refers to a chain of reasoning. It is also considered to be a necessary consequence of a decision or an argument. It refers to correct reasoning and deductions based on consistency (*The Oxford Thesaurus* 1991:697).

**TABLE 3.16 SYNONYMS FOR “CRITICAL”: LOGIC AND LOGICAL**

Analytical	Induction	Rational*
Argumentation	Inductive	Rationality
Cautious	Intelligible	Reason
Credible*	Judgement	Reasonable
Deduction*	Legitimate*	Sense*
Deductive	Lucid	Validity
Discerning	Practical	Wisdom

(Rodale 1986)

Synonyms such as "credible", "deduction" and "legitimate" are defined to further explain "logical" as a synonym for critical. "Credible" refers to something "trustworthy" or "capable of being believed" (*The Oxford Thesaurus* 1991:697). "Deduction" refers to a process of reasoning by which a specific conclusion necessarily follows from a set of general premises (*The Oxford Thesaurus* 1991:697). "Legitimate" means "being based on acceptable principles of reasoning" (*The Oxford Thesaurus* 1991:697). "Logic" as it relates to critical is crucial in critical thinking.

### 3.3.2.5 *Synonym for critical: accurate*

Being "accurate" has to do with truthful representation of aspects or phenomena (*The Oxford Thesaurus* 1991:9). Table 3.17 below depicts synonyms for accurate and critical.

Correct	Precise	True
Exact	Perfect	Truthful
		(Rodale 1986)

"Precise", "credible" and "caring" serve to further explain the word "critical" as it relates to thinking. "Precise" refers to being strict in the observance of rules or standards, to be strictly correct in amount or value (*The Oxford Thesaurus* 1991:697). To be "caring" is to pay serious attention to an issue of concern, in this instance thinking (*The Oxford Thesaurus* 1991:697). As explained in section 3.3.2.4 above, credibility has to do with truthfulness, an important aspect of thinking critically.

### 3.3.2.6 *Synonym for critical: crucial*

"Crucial" refers to something "decisive", "critical" or "very important" (*The Oxford Thesaurus* 1991:278). Synonyms for crucial as these emerged from the dictionary review are reflected in table 3.18 below.

**TABLE 3.18 SYNONYMS FOR "CRITICAL": CRUCIAL**

Vital	Decisive*	Fundamental*
Central	Essential	Important
Critical		(Rodale 1986)

To be "decisive" is about being influential and able to make quick decisions to resolve problems (*The Oxford Thesaurus* 1991:697). Other synonyms only serve to further clarify the word "crucial" as it applies to critical thinking.

### 3.3.2.7 *Synonym for critical: essential*

"Essential" refers to something absolutely "necessary", "indispensable", "fundamental" or "basic" for existence or occurrence (*The Oxford Thesaurus* 1991:400). Thinking should of necessity be critical. This was discussed in section in section 3.3.2.1 as a synonym for critical (pivotal). Table 3.19 illuminates synonyms for critical.

**TABLE 3.19 SYNONYMS FOR "CRITICAL": ESSENTIAL**

Critical	Essential	Necessary
Crucial	Fundamental*	Vital*
Decisive*	Indispensable	(Rodale 1986)

### 3.3.2.8 *Synonym for critical: meticulous*

"Meticulous" refers to giving "great or excessive attention to detail, being very careful or precise" (*The Oxford Thesaurus* 1991:747). In critical thinking, these aspects should be adhered to. Table 3.20 illustrates the synonyms.

**TABLE 3.20 SYNONYMS FOR "CRITICAL": METICULOUS**

Careful	Scrupulous*	Particular
Detailed*	Thorough	Painstaking*
		(Rodale 1986)

### 3.3.2.9 *Synonym for critical: vital*

“Vital” as a synonym to critical is indicated in table 3.19 below. These synonyms have already been discussed and help saturate the meaning of the word “critical” as it relates to thinking.

Critical	Decisive	Imperative
Crucial	Essential*	Very important*
Central	Fundamental	(Rodale 1986)

“Vital” refers to an “essential” or “important” aspect of the existence of a thing (*The Oxford Thesaurus* 1991:1373). The essential or important aspect is being critical in thinking (see section 3.3.2.1).

At this point the review ends.

Having, to some extent, clarified the parent words “critical” and “thinking” as these relate to “critical thinking” at the linguistic level, the literature on research conducted into critical thinking in the clinical and educational fields in nursing will be discussed. The insights gained from the previous explication of the two parent words “critical” and “thinking” should guide the reader’s understanding of the concerns raised by research into critical thinking.

Critical thinking is a highly focused, continuing mental operation involving both inductive and deductive reasoning based on continuing analytical results. It encompasses inventiveness and creativity.

## 3.3 LITERATURE OVERVIEW

The following section is aimed at clarifying the concerns in relation to the concept *critical thinking* as applied to nursing in the educational and clinical setting. The issues discussed include teaching, the challenge to defining the concept, definition of the concept elements, skills and dispositions of “critical thinking”.

### 3.3.1 Teaching critical thinking

Critical thinking remains an important requirement for professional nursing education and training. In a study on the relationship of critical thinking ability to professional nursing competence, Maynard (1996:16) indicated that critical thinking did not change significantly during the educational experience from sophomore to senior years, but a significant increase occurred during years of professional practice. She therefore found no relationship between critical thinking and professional competence. In her view, however, experience was the key influencing factor in the development of competence.

May, Edell, Butell, Doughty and Langford (1999:102,105), who explored the relationship between critical thinking and clinical competence of baccalaureate nursing students, concur with Maynard. In a study of 144 nurses who demonstrated the ability to think critically and practice competently according to set standards, May et al found no statistically significant correlation between critical thinking and clinical competence, hence they concluded that critical thinking might not emerge as an associated factor with clinical competence until some time after professional practice had commenced. In a study investigating the relationship between selected discourse strategies and the level of students' critical thinking in nursing during post-clinical conferences, Rossignol (1997:474) found no significant correlation between the use of discourse strategies and the development of critical thinking ability. The discourse strategies, namely, teacher high level questioning, teacher participation, student-to-student participation, teacher elaboration of student ideas and teacher probing questions did not improve the critical thinking abilities of students. This contradicted previous research findings by Garris (1974), Jones (1984) and Smith (1983) (cited in Rossignol 1997:470), who found that the critical thinking abilities of students exposed to discourse strategies were significantly increased.

Pardue (1987:359) investigated the differences in critical thinking abilities among various educational levels and found that graduates from professional programmes had the highest scores, but there were no statistically significant differences in decision-making skills among the various groups. This suggests that although the professional students scored highly on the knowledge of critical thinking abilities, they could not transfer their knowledge to practice. This also implies that critical thinking skills learned in isolation do not transfer to other areas. There is a concern that teachers emphasise the



mastery of skills whereas students cannot transfer knowledge of critical thinking to clinical practice. Students need guidance in the application of skills during training. Mere content coverage is of no use and is invalid. Brock and Butts (1998:6), Thomson (1997:60) and Bowles (2000:374) criticise this separatist approach. It implies that knowledge alone does not elevate "*thinking*" to the "*critical*" level as implied by the preliminary illumination and clarification of these two words as these pertain to critical thinking. This immediately leaves the question of the possible importance of contextual dimension in critical thinking.

Critical thinking is essential as it is an indication that a person has the ability to reason. Without critical thinking, students would be regarded as intellectually, emotionally and morally incomplete. If the nursing faculty does not teach critical thinking, there may be serious consequences, especially in nursing where a unique understanding of patients' problems is required. Critical thinking is important in nursing practice because the routine management of conditions is invalid (Thomson 1997:60). In this instance, the "critical" aspect of critical thinking is defined by the terms "unique understanding" and by being the opposite of what is considered "routine."

Students can be taught to think critically, though there are differences in programmes offered globally. Teaching critical thinking today is a challenge that faces nursing education. Strategies for the cultivation of critical thinking skills should be integrated into the nursing context, and should be the responsibility of nurse educators over time during professional socialisation (Thomson 1997:68).

### **3.3 2 The challenge to define *critical thinking***

There is disagreement on the meaning of the concept *critical thinking* as well as on how it can be included in the curricular programmes (Colucciello 1997:23; Morin 1997:450). Although critical thinking has been defined from various angles and perspectives and there seems to be some consistency in these definitions, nurse educators are still faced with the challenge to operationally define critical thinking so that its evaluation in the educational setting may be enhanced.

The development of an operational definition of *critical thinking* is a serious challenge to nursing education today as evaluation may prove to be impossible if critical thinking is not operationalised. This can be realised through the analysis of the concept *critical thinking*.

Videbeck's study (1997:5) on the prevailing practice of measuring critical thinking as an outcome criterion for National League for Nursing (NLN) supports the fact that it is difficult to measure a concept with no clear definition. So far, there are no universal criteria to measure critical thinking and, as a result, various schools of nursing have developed their own measurement tools. These are not context specific (Colucciello 1997:237; Morin 1997:450; Videbeck 1997:5).

The lack of a clear definition of critical thinking might be the cause of problems in the development of effective teaching and evaluation strategies. However, there is a need to analyse the concept to grasp its essence (Bittner & Tobin 1998:267-268; Haffer & Raingruber 1998:61; Morin 1997:450; Rane-Szostak 1996:5).

### 3.3.3 Defining the concept *critical thinking*

Defining critical thinking is an intricate and complicated process (Rane-Szostak & Robertson 1996:5).

The literature provides various definitions of *critical thinking* but no standard definition as yet. It is difficult to reach consensus, even amidst similar definitions. There is no consensus on the definition of *critical thinking*. Terms such as *critical analysis*, *critical awareness*, *critical consciousness* and *critical reflection* are often used synonymously with critical thinking. Others, such as *higher cognitive skills*, *creative thinking*, *meta-cognition*, *problem solving* and *reasoning*, are also often used interchangeably with critical thinking. This can only lead to the conclusion that if critical thinking is to be assessed, there is a need to study the uses and distinguishing attributes/defining characteristics of the concept to come to a common understanding (Colucciello 1997:236; Bowles 2000:373; Gordon 2000:340). The lack of clarity in defining critical thinking is a problem because it will be a difficult task to develop evaluation programmes and tools without a clear meaning of the concept. Rodgers (in Edwards 1998:159)

suggests that in order to develop greater understanding of the concept, it is best to analyse its common use, application and attributes.

Other constructs typical of thinking include judging, assuming, contemplating, recalling, meditating, and fantasising. Thinking is a cognitive activity involved in making sense about issues (Smith-Blair & Neighbors 2000:251).

Edwards (1998:159) describes thinking as a mental process whereby the sorting and organisation of information takes place. It is the ability to consider all possible descriptions of a problem. It involves framing of the situation in as many ways as possible. Edwards (1998:160) associates critical as it relates to "critical thinking" with faultfinding, uncovering hidden assumptions or expressing criticism or negative judgement as well as unmasking existing beliefs to enhance the position of an argument. The word "critical" comes from the Greek *kritidos*, which means to "question" or "make sense of", and be able to "analyse" (Smith-Blair & Neighbors 2000:251).

Critical thinking is believed to have its origin from the notion of an inquiring mind where individuals acknowledge their ignorance and start to engage in a dialogue with their experiences, and start to reflect on these experiences. Critical thinking makes use of reflective thinking strategies to understand experiences and phenomena, and to engage in an activity (Baker 1996:21; Bittner & Tobin 1998:268; Paul & Heaslip 1995:41; Sedlak 1997:12).

Critical thinking has also been defined as a process. In her analysis of the concept, Alfaro-LeFevre (1995:9) defines critical thinking as goal-directed thinking aimed at making judgements based on evidence rather than conjecture. As people go through the process of thinking, all actions should be supported with evidence. Smith-Blair and Neighbors (2000:252) cite Kataoka-Yahiro and Saylor (1994) who define critical thinking as a process of reasonable thinking, a scientific process. It is a continual process that uses *creative, logical, intuitive and analytical mental processes* to make sense of information that results in problem resolution (Hasten & Washburn 1999:39).

Critical thinking is also seen as a rational examination of ideas, inferences, assumptions, principles, arguments, conclusions, issues, statements, beliefs and actions. It is reasonable, reflective thinking geared toward decision making on a high level of cognition (Bandman & Bandman 1992:5; Hamilton 1996:119; Norris & Ennis 1989:10). It is referred to as reasonable and reflective thinking that is focused on deciding what to believe or what to do (Ennis, Millman and Tonko cited in Adams 1999:112).

In critical thinking, the process starts as a person explores the mental faculties to reach a conclusion. The critical thinking process is multifaceted and surpasses the steps of linear thinking, for example, the problem solving process (Bittner & Tobin 1998:269). However, critical thinking is an umbrella under which other forms of thinking flow. Critical thinking is characterised by different forms of thinking (see chapter 4 under data analysis). Critical thinking takes cognisance of the context. It involves reframing, collaborating and collecting relevant information to obtain new perspectives, ideas and options as necessary, in order to reach a resolution, hence requiring multiple patterns of knowing (Bittner & Tobin 1998:269).

A critical thinker is defined as a person with a sense of inquiry, a strong knowledge base and the skill to apply that knowledge in an inquiry. It requires probing, asking and answering questions that come to mind when encountering an experience. Critical thinking is therefore an investigation to explore a phenomenon (Bittner & Tobin 1998:262; Kurfiss 1988:2).

Critical thinking has also been expressed as involving more than problem solving. The individual should be able to interpret, evaluate, and make informed judgements about the adequacy of data and conclusions drawn, hence critical thinking includes prevention of problems and maximisation of potential and efficiency to avoid problems (Jacobs et al 1997:20; Vaughan-Wrobel et al 1997:485).

Critical thinking further involves cognitive and affective aspects. It is believed to involve cognitive skills such as comprehension, application, analysis and evaluation. It is the ability to monitor what we are thinking by focusing on critical points, and checking to see if we are really on target and accurate in our assessment. Critical thinking concentrates on factual information and observes relevancy in using

the information. It is concerned with insightful thinking where a variety of possible alternatives are employed to reach a solution. It uses logical reasoning in the process of developing a solution to a problem by recognising the values underlying and affecting decisions taken (Hamilton 1997:120; Malek 1986:20; Pardue 1987:355; Paul & Heaslip 1995:43; Videbeck 1997:6,8). The concept *critical thinking* involves various constructs such as attitudes, skills, knowledge and dispositions of the individual (May et al 1999:101). It is a multidimensional and outcome-based process that requires multidimensional instruments to evaluate students.

A Delphi project in the USA, in which forty-six experts from various fields of study were interviewed, produced the first consensual definition of critical thinkers. An ideal critical thinker was defined as "one who is habitually inquisitive, well informed, trustful of reason, open-minded, flexible, fair minded in evaluation, honest in facing biases, prudent in making judgements, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in selecting criteria, focused in inquiry and persistent in seeking results which are as precise as the subject and the circumstances of the inquiry permit" (Colucciello 1997:239; May et al 1997:101). Generally, critical thinking refers to judging in a reflective way what to believe or do. People should be able to follow the thinking process that led to a decision (Facione 2000:61).

Scheffer and Rubinfeld (2000:357) also used a Delphi project to study the meaning of critical thinking, using experts from nine countries. Through the study a consensus statement on critical thinking in nursing was reached. The panel identified ten habits of mind attributed to critical thinking, namely confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance and reflection. They also identified seven cognitive skills, namely analysis, application of standards, discrimination, information seeking, logical reasoning, prediction and transformation of knowledge. These indicate that meta-cognitive analysis may be of value in clarifying the concept *critical thinking*. An analysis of each aspect or element, which is believed to be congruent to critical thinking, is necessary.

Critical thinking is also regarded as an exploratory process. It is an investigation whose purpose is to explore a situation, phenomenon, question, or problem to arrive at a hypothesis or conclusion about it

and integrates all available information that can be convincingly justified (Kurfiss cited in Adams 1999:111).

### **3.3.4 Critical thinking: elements, skills and dispositions**

Critical thinking emerged as a construct with certain elements related to mental operations and also skills and dispositions. A discussion of each follows below.

#### **3.3.4.1 Elements**

The elements of critical thinking are reflection, rationality, questioning, analysis, intuition, self-regulated thinking and knowledge. These emanate from an integration of the result of the literature review. A discussion of each follows.

##### *3.3.4.1.1 Reflection*

Critical thinking is about reflectively making sound judgements by employing intellectual values, namely, honesty, tolerance to opposing ideas, attentive to reasons/implications, systematization and trustful of reason (Facione 2000:74)

Reflection, however, is a necessary condition for critical thinking (Sedlak 1997:16).

##### *3.3.4.1.1.1 Definition*

Reflection as cited here should be read in conjunction with section 3.2.1.9 where synonyms and dictionary definitions were discussed. Reflection is a recursive higher order mental process of thinking that consists of turning the subject over in the mind to give it serious consecutive consideration (Gordon 2000:341). Critical thinking is referred to as judging in a reflective way what to do or what to believe. Thus it is a purposive activity (Facione 2000:61).

### 3.3.4.1.1.2 *Attributes*

Reflection and reflective thinking:

- involve making of inferences, analogies, discrimination and evaluation (Gordon 2000:341). Reflective thinking is about pondering, recalling to mind, forming a mental picture and reasoning about a problem (Hamilton 1996:119).
- are characterised by scepticism which refers to suspension of assent to the obvious and never taking anything for granted (McPeck 1990:52; Paul & Heaslip 1995:41). Critical thinking is the skill and propensity to engage in an activity with reflective scepticism. It is a process of deciding what to do after some reflective thinking (Smith-Blair & Neighbors 2000:251,281).
- are concerned with the exploration of an issue of concern triggered by experience. The aim is to make meaning or sense out of the experience and to incorporate the experience into a person's view of the self and the world (Baker 1996:19).
- are also concerned with comparing, contrasting, pattern recognition, perceptual categorisation, framing and discourse with self.
- refer to the modification and development of ideas by using a problem- solving approach and
- are seen as doing a post-mortem on the process and premises that led to a particular action, thus analysing hunches and tacit knowledge in use (Burton 2000:1012).

### 3.3.4.1.1.3 *Importance to the present study*

According to Ford and Profetto-McGrath (1994:343), reflective thinking is fundamental to critical thinking. It is a process that enables people to look at all angles of the phenomenon, going deep into the subject to reveal the hidden meaning. It allows them to see the situation in its context and envision new possibilities, thus reflective practice enhances critical thinking (Burton 2000:1013).

Paying attention to their thinking, that is, reflective thinking, is an important aspect of critical thinking. Reflective thinking helps individuals to approach the subject in an open way (Siegel 1991:18). It helps

eliminate bias while examining phenomena as they become aware of their subjective view of phenomena and open up to other ideas. Critical thinking cannot exclude the reflective aspect because:

- Critical thinking is balanced when reflection is included. Kozier (in Hamilton 1996:119) defines critical thinking as careful judgement and thinking that is based on reflection, pondering and calling to mind, remembering, forming a mental picture and reasoning.
- Reflection is a necessary condition for critical thinking (Sedlak 1997:16), that is, people begin to question their knowledge about a phenomenon. Reflection involves questioning, continually answering and evaluating how much people know about a phenomenon. Reflection calls for them to acknowledge their intellectual ignorance and commitment to clear, precise, accurate action based on genuine knowledge (Bittner & Tobin 1998:268, Paul & Heaslip 1995:41).
- Thinking critically requires the cultivation of reflective skepticism, which must be appropriately applied to the problem at hand. Reflective skepticism refers to the suspension of knowledge directed towards a given statement or norm, or mode of doing things. Truth is never taken for granted. Alternative hypotheses are taken into consideration. A person goes beneath the surface to reveal the underlying assumptions. Thus reflection is fundamental to critical thinking (Ford & Profetto-Mcgrath 1994: 343; Kramer 1993:406; Thomson 1997:64). Critical thinking is a process of reflective decision-making mediated through dialectic and dialogical interaction, grounded in critical enquiry, further affirming the reflective element of critical thinking (Duscher 1999:580).
- Reflective thinking is a critical enquiry concerned with analysis of reasons behind actions or choices made. It contributes to better contextual understanding, a step towards thinking (Burton 2000:1012; Teekman 2000:1126). Critical thinking is thus, a reflective and reasonable process (Smith-Blair & Neighbors 2000:251).
- Critical thinking is reflective in nature. It is retrospective in that the person is confronted with information and evaluates the information in an unbiased, open-minded way (Botes 2000:28).

#### 3.4.4.1.2 *Rationality as a "critical thinking" attribute*

Maynard (1996:13) describes critical thinking as a process that requires rationality and logic. The definitions of rationality and logic should be read jointly with this section (see section 3.2.1).



### 3.3.4.1.2.1 *Definition*

Rationality is about reasoning to justify and explain assumptions. It is about making a judgement, and giving careful consideration. It is about displaying logic in connecting thoughts to form ideas. Thus, reasoning is a process by which people move from what they already know to further knowledge (Greenwood, Sullivan, Spencer & McDonald 2000:429).

### 3.3.4.1.2.2 *Attributes*

The variables that emerged with rationality as a component of critical thinking include:

- **Logical thinking.** Logic is an inherent factor in critical thinking. Reasoning should demonstrate the logical connection among facts and their relevance to the problem (Hamilton 1996:112, 121). There should be logic in the use of inferences. Critical thinking therefore involves the weighing of logic in evidence (Abegglen 1997:453, Vaughan-Wrobel et al 1997:485) (see also section 3.2.1.10).
- **Reason assessment.** Siegel (1991:18) maintains that critical thinking is only complete if the aspect of reason assessment is included. Reason assessment is the ability to weigh reasons that support evidences, paying attention to reasons, caring and attaching value to reasons that led to the acceptance and/or rejection of the object of intention.
- **Critical reasoning.** Walters (1986:235) states that critical reasoning emphasises a rational basis for belief and provides a procedure for resolving disagreements by means of further inquiry.

### 3.3.4.2.3 *Importance to the present study*

Rationality is important to the present study because:

- Critical thinking is about commitment to reason and attaching value to reasons, caring about reasoning (McPeck 1990:52).
- Critical thinking cannot exclude reasoning. It is about rational examination of ideas. Reasonableness forms the basis of critical thinking (Bandman & Bandman 1992:5).

- Critical thinking requires that there is reason assessment, and coexists with rationality. Without the inclusion of reason, there is no critical thinking (Siegel 1991:18).
- Logic should be concurrently included in reasoning. The reasonableness or worth of ideas is based on the extent to which it demonstrates logic. Logic is a science of reasoning and also forms the backbone of reasoning. In critical thinking ideas should flow logically and be supported by reasons (Jacobs et al 1997:19; Sedlak 1997:17). Logical reasoning is a tool by which individuals can justify their decisions (Botes 2000:28).
- Critical thinking is autonomous thinking demonstrated by independent thinking. Autonomous thinking is a necessary condition for critical thinking. It allows a person to seek answers independently and brings reasons to support evidence. The person must pay attention to reasons and regard them as being important. In critical thinking the person is committed to reasoning and attaches value to good reasons, that is caring about reasoning (McPeck 1990:52).
- Critical thinking is about value judgements or critical analysis. To be able to analyse an object of intention, good reasons must be provided to support evidence (McPeck 1990:52).
- Critical thinking requires sound thinking. Individuals should direct their minds in a disciplined way and be able to give reasons to validate their thinking patterns (Paul & Heaslip 1995:40).
- Reasoning adds further knowledge to existing knowledge by expanding what is already known, and using the knowledge to achieve intended purposes (Greenwood et al 2000:429).

#### *3.3.4.1.3 Questioning/dialectic process as an attribute of critical thinking*

According to Mathews and Gaul (1979:19), a questioning aspect is an important attribute of critical thinking. Questioning is a necessary condition and an attribute in the development of critical thinking (Dobrzykowski 1994: 273; Haffer & Raingruber 1998:68).

##### *3.3.4.1.3.1 Definition*

*The Concise Oxford Dictionary* (1991:321) defines a dialogic process (which questioning is) as an art of investigating the truth of opinions, testing it by discussion and the application of logical disputation, searching the phenomenon from all dimensions to obtain the deeper meaning and rule out conflicting

meanings. Questioning is about enquiring and investigating an issue under question or something disputable.

#### *3.3.4.1.3.2 Attributes*

The variables that evolved from the exploration of questioning include:

- **Intellectual curiosity.** Intellectual curiosity as an attribute of questioning as it pertains to critical thinking involves wanting to know more and more about the object of intention. It begins when individuals start to ask questions and continually answer them in an effort to evaluate the depth and breadth of their knowledge about a phenomenon (Colucciello 1997:239).
- **Use of metacognition.** In critical thinking, individuals employ meta-cognitive strategies to evaluate their thinking. They use internal logic to employ knowledge of inferences and abstracts to deal with the intended subject (Alfaro-LeFevre 1995:74; Dorbzykowski 1994:273).

#### *3.3.4.1.3.3 Importance to the present study*

According to Sedlak (1997:14), questioning is an ability necessary for critical thinking. It is about asking appropriate clarifying questions. Questions should be relevant to enhance the generation of clear and relevant answers. In critical thinking, it is necessary to engage in a dialogue with conflicting arguments. The dialogical process leads to consensus about arguments, which must be supported by reasons, thus include the following descriptions:

- Mathews and Gaul (1979:19) define critical thinking theoretically as an attitude of inquiry, which involves the use of facts, theories, abstractions, deductions, interpretation and evaluation of arguments. It emanates from the eagerness to acquire knowledge. When faced with a problem situation, a critical thinker will explore the situation to establish facts for, or against, arguments in an open-minded approach. Meta-cognitive strategies are used to separate relevant from irrelevant information (Alfaro-LeFevre 1995:74-77; Dobrzykowski 1994:273). Critical thinkers are disposed to

inquisitiveness whereby they want to be informed with regard to a wide range of issues, develop intellectual curiosity, and want to know more.

- Critical thinking begins when people start asking questions and continually answer them again and again to evaluate the depth and breadth of their knowledge about a phenomenon (Colucciello 1997:239; Facione 1990:25). It is necessary to engage in a dialogue about experiences to evoke the process of critical thinking, which is aimed at the selection of relevant from irrelevant data, normal from abnormal, as well as missing data. Questioning creates an awareness of diverse values and meanings in a variety of settings, thus augmenting the process of critical thinking to deal with the problem. Questioning is a necessary condition and an attribute in the development of critical thinking (Dobrzykowski 1994:273; Haffer & Raingruber 1998:68,69).
- Baron and Sternberg (1987:17) state that a social ability attributed to critical thinking questioning is clarity. A critical thinker should have the ability to ask appropriate clarifying questions. A critical thinker must be capable of developing clear, relevant questions to obtain reliable and relevant answers. This may be linked to truth seeking, where best knowledge is sought in an honest, unbiased fashion and finally adopted even if it differs from preconceptions and feelings (Smith-Blair & Neighbors 2000:253).
- Intellectual curiosity motivates people to expand and add to their knowledge base. Curiosity should be consistently applied in dealing with factors that continually confront an individual in daily practice (Smith-Blair & Neighbors 2000:253).
- Inquisitiveness or curiosity motivates people to expand their knowledge bases. It helps people to question absolutes and refrain from accepting routines, and always find new ways of doing things (Smith-Blair & Neighbors 2000:253).
- Critical thinking calls for a critical spirit, which embodies the questioning attitude. Critical thinking questioning should be context neutral to allow for transfer to other contexts (Leppa 1997:30).
- Paul (in Siegel (1989:10) distinguishes between two forms of critical thinking: the weak sense and the strong sense. The weak sense is problematic in that people have mastered skills and dispositions, but have a tendency to defend preconceived ideas to protect themselves from challenge. The strong sense of critical thinking focuses on world-views. It requires a dialectical approach where arguments should be appraised in relation to counter-arguments. People deal with different world-views in an open and fair-minded way, and are sensitive to the egocentric and

sociocentric components of their own world-view and committed to the depersonalisation of their world-view. Critical thinking calls for people to engage in a dialogue with their preconceived ideas, evaluating their worth of ideas in the light of reasons/arguments for or against them. This needs them to develop alternatives through insightful thinking and, in so doing, to reposition themselves accurately. Open-mindedness calls for sensitivity to other world-views (Smith-Blair & Neighbors 2000:253). Open-mindedness is the ability to listen and truly hear the possibilities of an idea without immediate judgement (Hasten & Washburn 1999:39). This, in particular, also relates to the researcher's attempt to bracket her own understanding of critical thinking through thesaurus and dictionary review. Thus, she brought to the surface what she perceived critical thinking to be.

- Critical thinking is a complex process comprising elements such as meta-cognition, creative thinking, and dialogic and dialectical reasoning. Meta-cognition refers to thinking about our own thinking, differentiating between mediocrity and excellence in our disposition to think critically. Creative thinking is made up of rationality and imagination. Dialogic and dialectic reasoning involves the incorporation and integration of opposing views until consensus is reached to allow for the development of a more accurate interpretation and resolution of contradictions. Critical thinking therefore culminates in providing answers to the perplexities. This involves analytical reductionism, thus reducing the problem to its constituent parts to make a deductive inference (Duscher 1999:578; Hickman 1993:37; Siegel 1989:12, 1991:18; Walters 1986:235).
- Truth seeking is the motive behind inquisitiveness and is associated with seeking the best knowledge. Truth seeking goes together with open-mindedness, which allows individuals to have tolerance for divergent views and be sensitive to the possibility of individual bias. Hasten and Washburn (1999:40) define open-mindedness as the ability to listen and truly hear the possibility of an idea without any immediate judgement. It is open-mindedness that rids people of defensive attitude. It helps people reflect on their views to become aware of other possibilities in life, thus nothing is taken as absolute. Everything is taken as tentative and subject to change (Smith-Blair & Neighbors 2000:253). Tentativeness, open-mindedness and being aware of the possibility of possibilities all relate to the questioning attitude in critical thinking.

#### *3.3.4.1.4 Analysis as an attribute of critical thinking*

Colucciello (1997:243), Hamilton (1996:123) and Facione (1990:19) concur that analysis is an important skill of critical thinking. Synonyms for analysis are discussed in section 3.3.2.3, which should be read in conjunction with this section.

##### *3.3.4.1.4.1 Definition*

According to Facione (1990:8), analysis refers to the ability to examine ideas, identify arguments in the light of proper identification of inferential relationships among data or statements. For Scheffer and Rubenfeld (2000:358) and Walters (1986:236), analysis is the breaking down of a whole into its constituent elements, which are then verified or falsified.

##### *3.3.4.1.4.2 Attributes*

According to Facione and Facione (1996:130), emergent variables for analysis include:

- **Breakdown** of material into constituent parts. The sum of the elements that make up the whole is believed to be more than the whole. Each element has distinguishing characteristics that help define the whole. Inductive analysis therefore provides more understanding than the whole (Edwards 1998:160).
- **Evaluation** of inferential relationships among statements by checking patterning with the intention to discovering and explaining relationships.

##### *3.4.4.1.4.3 Importance to the present study*

Analysis is important in critical thinking as:

- Analysis helps to examine ideas, identify and analyse arguments in the light of proper identification of intended or actual inferential relationships among statements. Critical thinking calls for the provision of reasons to support evidence.
- Analysis helps provide explanations or reasons for inferences made in dealing with problems (Facione & Facione 1996:130). Critical thinking requires the use of ideas to examine phenomena. Critical analysis by way of paying attention to our thought patterns is a strategy that enhances critical thinking (Edwards 1998:161).
- Being analytic (analyticity) is an estimate of the characteristics of reasoning and use of evidence to resolve problems. It helps in anticipation of difficulties, thus is necessary for dealing with problems in a specific discipline (Smith-Blair & Neighbors 2000:253).

#### 3.3.4.1.5 *Intuition as an attribute of critical thinking*

"Intuition" is an important factor in solving problems that are similar to previous encounters. This did not form part of the researcher's initial conception of the concept *critical thinking*.

##### 3.3.4.1.5.1 *Definition*

Intuition refers to the immediate apprehension by the mind without reasoning, use of sense or insight. It is the immediate apprehension that something is so, without the benefit of conscious reasoning (Scheffer & Rubenfeld 2000:358).

##### 3.3.4.1.5.2 *Attributes*

The following attributes emerged from Paul and Heaslip (1995:42):

- knowledge in common experiences from practice
- apprehensive knowledge without the use of conscious reasoning

### 3.3.4.1.5.3 Importance to the present study

Intuition is an important attribute of critical thinking (Paul & Heaslip 1995:44). Intuition does not just happen but requires critical thinking, just as critical thinking requires intuition. Critical thinking can be learned. Once individuals have consciously learned how to direct their thinking in dealing with the problem at hand, they use the knowledge intuitively in subsequent problems that are similar in nature, learning to make split-second decisions about how to deal with the problems. Intuitive knowledge is not haphazardly applied, but is critically incorporated to create good results for the problem at hand. Continual self-assessment is necessary to help evaluate the intuitive actions taken, thus critical analysis sets in. Intuition is important in critical thinking as it is brought about to solve problems in situations where objective data is minimal (Hasten & Washburn 1999:40). Table 3.22 indicates synonyms for intuition.

Feeling	Impulse	Sixth sense
Gut feeling	Insight	Suspicion
Hunch	Instinct	Perception
Inkling	Sense	(Rodale 1986)

### 3.3.4.1.6 Self-regulated thinking as an attribute of critical thinking

Self-regulated thinking also emerged from the literature as an attribute of critical thinking grouped with higher order cognitive skills. This, too, is an attribute the researcher did not previously consider in relation to critical thinking.

#### 3.3.4.1.6.1 Definition

Self-regulated thinking is a thinking process that guides thinking "critically". The activities in self-regulation create a balance towards responsible thinking and should be continually applied as the situation demands. Self-regulation is a process of thinking in which the person is able to do introspection and self-correction in a fair and open-minded way (Daley, Shaw, Balistreiri, Glasenapp & Piacentine 1999:42; Facione & Facione 1996:130).



### 3.3.4.1.6.2 *Attributes*

The variables that emerged from the literature as data to explain self-regulation include:

- **Flexibility** of the mind and open-mindedness as the first steps towards critical thinking (Daley et al 1999:42; Jerkins 1999:11).
- **Self-confidence.** People who can regulate their thinking are people who feel confident about their thinking. People must believe in their thinking (Scheffer & Rubenfeld 2000:358).
- **Autonomous thinking.** McPeck (1990:22) describes autonomy as the general ability to think critically. Autonomy strengthens people's self-confidence since it requires them to define a problem, select pertinent information and recognise unstated assumptions from which to draw inferences.
- **Meta-cognition.** The strategic management of thinking patterns, and monitoring and assessment of people's thinking (Jerkins 1999:11).

### 3.3.4.1.6.3 *Importance to the present study*

Self-regulated thinking is a cognitive skill that helps people to regulate or balance their thinking. Critical thinking is about being open-minded and fair-minded, which are critical attributes of self-regulation. It is being able to question their assumptions. Self-regulated thinking enhances the purposeful engagement of deductive and inductive analysis of data. Critical thinking is purposive goal-directed thinking, thus self-regulated thinking is accepted as a notion that helps define critical thinking (Alfaro-LeFevre1995:9).

Table 3.23 below illustrates the uses of the concept "self-regulated thinking".

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**TABLE 3.23 YNONYMS FOR "SELF-REGULATED THINKING"**


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Adjust	Manage*	Restrain
Control*	Maintain	Rule
Coordinate	Moderate	Steer
Direct	Monitor*	Supervise
Discipline	Oversee	Systematise
Govern	Reflect	Temper
Guide	Regulate*	Tune*

(Rodale 1986)

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### 3.3.4.1.7 Knowledge as an attribute of critical thinking

#### 3.3.4.1.7.1 Definition

Knowledge is a state of being informed about an aspect, having an understanding of the aspect of concern, theoretical or practical understanding of the subject (*The Concise Oxford Thesaurus* 1991:656). It is also referred to as truths and beliefs based on adequate evidence (Bandman & Bandman 1990:28). Scientific knowledge is a body of propositions, that is factual statements, hypotheses, theories and laws that at a specific time is accepted as being valid and reasonably correct (De Vos et al 2002:4).

#### 3.4.4.1.7.2 Attributes

Kataoka-Yahiro and Saylor (1994:353) identify several aspects of knowledge, namely

- The **know-how** that allows for instantaneous recognition of patterns of intuitive responses that facilitate expert judgement.
- Knowledge includes **cognitive competencies** that involve *hypothesis generation, problem solving and decision-making*, which are collectively known as critical thinking competencies.
- Knowledge is a critical thinking competency concerned with *diagnostic reasoning* and clinical inference.

### 3.3.4.1.7.3 Importance to the present study

Domain-specific knowledge is required for successful critical thinking. Knowledge about the discipline helps regulate thinking in accordance with the context. Discipline-specific knowledge provides supportive evidence. Knowledge enables understanding of the context, recognition of cues and the interpretation as relevant or irrelevant. Knowledge is a prerequisite for critical thinking because people need it to support ways of thinking (Botes 2000:28). Experiential knowledge is relevant to critical thinking as it provides a potent strategy to decrease simplicity thinking. Experiential knowledge is a necessary condition for critical thinking. Knowledge is a component of critical thinking which co-exists with two other components, namely meta-cognition and critical thinking attitudes and dispositions which support and guide towards critical thinking (Jerkins 1999:11; Kataoka-Yahiro & Saylor 1994:353).

Table 3.24 lists synonyms for knowledge.

Acquaintance	Expertise	Realisation
Awareness	Facts	Skill
Comprehension	Familiarity	Understanding
Data	Information	Wisdom
(Rodale 1986)		

### 3.3.4.2 Critical thinking skills and dispositions

Facione and Facione (1996:130) assert that critical thinking includes both skills and disposition dimensions. Critical thinking skills are manifested in performance and serve as indicators for critical thinking ability. The disposition toward critical thinking is the consistent internal motivation to use the critical thinking skills of reflection, exploration, and analysis. A person chooses to think in these advanced, sophisticated ways and is committed to them (Facione2000:65). Kurfiss (1988:69,71) concurs and stresses that critical thinking always involves values. Critical thinking is not a discipline but applies in all areas of life and learning. It has both general and content-specific components. Critical thinking is comprised of two components: the reason assessment and the critical spirit components. The reason assessment component seeks to validate reasons provided to support

statements, paying attention to reasons, which are regarded as important. The critical spirit/attitude component is a habit of thinking critically, compulsion or obsession to want to think critically. Critical thinking involves habits of mind, dispositions, skills and character traits. It involves a disposition to utilise appropriate criteria in the evaluation of statements and actions (Siegel 1991:23).

Critical thinking comprises the dimension of care therefore it should not be used in a confrontational manner (Ballin 1995:192). Norris (1995:206) holds that caring is a necessary condition to critical thinking as it enhances openness to ensure that ideas are fairly considered in a critical spirit. Critical thinking is open-mindedness and fair-mindedness made possible by caring (Norris 1995:201).

Facione and Facione (1990:8) state further that critical thinking has a cognitive skill dimension. The main skills comprise interpretation, analysis, evaluation, inference, explanation and self-regulation.

According to Fowler (1998:184), critical thinking involves the cognitive skills of reflection, challenging assumptions, self-regulated thinking, induction, deduction, analysis and careful evaluation of data. These cognitive skills should be engaged purposefully. Paying attention to thoughts is an important aspect of critical thinking; that is, applying reflective thinking to gain more understanding of the problem at hand. Dispositions to critical thinking include truth seeking, open-mindedness, analyticity, systematisation, self-confidence, inquisitiveness and maturity (Facione & Facione 1996:131).

The foundation for critical thinking is knowledge about the context of reason, which will influence an individual's pattern of thinking, as well as experience. Critical thinking occurs when there is flexibility and open-mindedness. Critical thinking starts with an inquisitive mind and proceeds with persistent thinking, which results in multiple answers. The individual must look beyond what is known to the unknown.

Thornhill and Wafer (1997:54) cite the four components of critical thinking as identification and challenging of assumptions, challenging the importance of context, imagining and exploring alternatives, and reflective skepticism. These further affirm the above cognitive aspects.

### 3.3.5 Critical thinking and problem solving

Kurfiss (1988:28) and Ford and Proffeto-McGrath (1994:342) describe critical thinking as a form of problem solving. For Kurfiss (1988:28), critical thinking is a form of problem solving but there are distinguishing characteristics between the two. Problem solving is a mental activity leading from an unsatisfactory state to a more desired goal state. The problems are usually complex but a correct answer usually exists, and sometimes only a limited number of approaches will work. Problems are usually well structured. Problem solving is usually narrower in scope than critical thinking.

Critical thinking, on the other hand, involves reasoning about open-ended and/or ill-structured problems, requiring inductive reasoning, with no single solution. The goal in critical thinking is not to find and execute a solution, but to construct a plausible representation of the situation or issue that can be presented in a convincing manner, not necessarily a right answer, but a reason to justify the answer. Problem solving is just a general critical thinking competency. There is considerable overlapping between critical thinking and problem solving (Dobrzykowski 1994:273; Hickman 1993:37, 38; Kataoka-Yahiro & Saylor 1994:353). It would seem, then, critical thinking finds better application in clinical ethics and in clinical practice as such.

Gordon (2000:342) associates critical thinking with other forms of reasoning, namely decision-making, clinical judgement and creativity. According to Hasten and Washburn (1999:39), critical thinking is the ability to solve problems by making sense of information, using creative, intuitive and analytical mental processes, which is a continual process.

### 3.3.6 Correlates to critical thinking

Critical thinking is sometimes used interchangeably with concepts such as critical analysis, critical awareness, critical consciousness and critical reflection (Edwards 1998:160, Rane-Szostak & Robertson 1996:5). Critical thinking is often used synonymously with creative thinking, meta-cognition, problem solving or reasoning (Bowles 2000:373, Colucciello1997:236, Gordon 2000:340). However,

as already stated, critical thinking is an umbrella concept. The analysis of the uses of the concept can provide a descriptive definition of *critical thinking*.

### **3.4 RESULTS FROM INTERVIEWSTERVIEWS**

Walker and Avant (1995:40) state that the use and meaning of a concept can also be derived from conducting interviews with colleagues. The outcomes of the interviews conducted with colleagues include antecedents, attributes, object of intention, outcomes and educational implications, which are discussed in the following sections. Supportive evidence for the discussion that follows is included in the categories that emerged from data as reflected in chapter 4.

#### **3.4.1 Antecedents**

The antecedents include the requirements, conditions and prerequisites for critical thinking. The antecedents derived from the interviews include insight, knowledge, critical thinking motivation, curiosity, skepticism, open-mindedness, reasonableness and commitment to reason. These antecedents seem similar to the result of analysis as interpreted by the researcher and serve to crystallise the final categories. Discipline-specific knowledge is an important aspect in the development of critical thinking and the process of thinking critically.

#### **3.4.2 Attributes**

The outcome of the interviews led to the explication of the following attributes as defining characteristics of critical thinking: higher order thinking, creative thinking, meta-cognition, rationality, logical thinking and reflection. These aspects are discussed under the attributes of critical thinking in chapter 4.

### **3.4.3 Object of intention/directedness**

Informants indicated that critical thinking is directed at gaining insight through the use of concepts, ideas, statements and inferences to explain the processes involved in thinking of the attainment of outcomes.

### **3.4.4 Outcomes**

The outcomes from the analysis of the discussions include self-regulation, problem resolution, discovery, creativity, autonomous thinking, knowledge development and professional growth. These variables directly or indirectly impact on the whole educational process.

### **3.4.5 Educational implications**

On a few occasions the informants cited the fact that critical thinking brings about change. When the products of learning are critical thinkers, they will be change agents in the educational setting. The changes are positive in the direction of reconstruction and transformation of educational programmes and teaching models. Innovative teaching strategies and evaluation techniques should be developed to foster critical thinking.

## **3.5 CONCLUSION**

The literature review was invaluable in clarifying the researcher's thinking and understanding of current knowledge of critical thinking in nursing, approaches used to study critical thinking and identifying areas that require further investigation. Several specific characteristics of critical thinking were identified. Thesaurus and dictionary reviews were instrumental in helping the researcher to undertake a journey of discovery.

Chapter 4 discusses the data analysis and categories and themes that emerged from the data.