

THE TEACHING OF CRITICAL THINKING:
REVIEWING THE PERCEPTIONS OF EDUCATORS IN
TERTIARY INSTITUTIONS IN NEW ZEALAND

Bhavana Mehta

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Declaration

Name of candidate: Bhavana Mehta

This Thesis/Dissertation/Research Project **entitled: The teaching of critical thinking: Reviewing the perceptions of educators in tertiary institutions of New Zealand** is submitted in partial fulfillment for the requirements for the Unitec degree of **Master of Education**

CANDIDATE'S DECLARATION

I confirm that:

- This Thesis/Dissertation/Research Project represents my own work;
- The contribution of supervisors and others to this work was consistent with the Unitec Regulations and Policies.
- Research for this work has been conducted in accordance with the Unitec Research Ethics Committee Policy and Procedures, and has fulfilled any requirements set for this project by the Unitec Research Ethics Committee.

Research Ethics Committee Approval Number: **(2015-1049)**

Candidate Signature:



Date: **15/12/2015**

Student number: **1432880**

Abstract

Teachers can inspire and motivate students to develop critical thinking. Successful critical thinkers can be successful and contributing citizens. According to the Oxford dictionary (2015) critical thinking is, “the objective analysis and evaluation of an issue in order to form a judgement”. In New Zealand education, the development of critical thinking is given utmost importance, spanning from Early Childcare education to tertiary education. Critical thinking is termed as a lifelong skill by the Tertiary Education Commission in the Statement of Intent 2015 – 2019. Critical thinking is one of the fundamental requisites expected of graduates by industry, business and employers. University brochures and websites in New Zealand assure the development of critical thinking skills in graduates. Critical thinking is deemed necessary for education, employment and successful life of an individual. In spite of all this, anecdotal evidence, reinforced by extant literature, indicates that understanding of critical thinking and associated development and assessment practices are inconsistent and deserving of further research. What remains unclear at present is the quality assurance for graduates who qualify the same level qualification from different institutions in New Zealand. This current study reviews the perceptions of educators about the nature of critical thinking and identifies the teaching strategies employed by those educators to develop critical thinking skills in students in tertiary institutions in New Zealand.

The research results indicate development of critical thinking lays equal emphasis on the role of students, teachers and systems. The thesis suggests the Tertiary Education Commission may consider providing a definition of critical thinking across the entire tertiary education sector to maintain the common understanding of critical thinking among students and teachers. This research indicates development of critical thinking may be measured by mandatory introduction of a pre-critical thinking test and post-critical thinking test for all students in the tertiary educational institutions. Further, tertiary teachers face difficulty with international students. The research findings suggest introduction of critical thinking course for international students in the first year of undergraduate course to introduce them to the expectations of the educational demands in New Zealand and to begin developing critical thinking skills and dispositions early in their study.

Gratitude

या देवी सवभवूतेषु मातरूपेणु संस्थिता ।
नमथतथयै नमथतथयै नमथतथयै नमो नमः ॥

yaa devI sarvabhUteShu maatRurUpeNa saMsthitaa
namastasyai namastasyai namastasyai namo namaH

To that Goddess, who is residing in all beings, in the form of
the mother, I bow, salute, pray and prostrate to her!

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List of Abbreviations and Acronyms

| | |
|------|---|
| NZQA | New Zealand Quality Authority |
| MoE | Ministry of Education |
| MBIE | Ministry of Business, Innovation and Employment |
| TEC | Tertiary Education Commission |
| NZTC | New Zealand Teachers Council |
| CT | Critical Thinking |
| SOI | Statement of Intent |
| ITP | Institute of Technology and Polytechnics |
| PTE | Private Training Establishment |
| CTAR | Critical Thinking Analytic Rubric |

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1 Chapter One—Introduction

1.1 Background to the Study

Many course outlines in tertiary education programmes in New Zealand mention critical thinking. Of the 20 course outlines from various institutions examined for this study, 18 included critical thinking as a learning objective. In New Zealand, six out of the eight universities offer specific courses on critical thinking; surprisingly, few of the remaining tertiary educational institutes explicitly offer specific courses on critical thinking. Educational scholars emphasize that a key objective of higher educational institutions is to cultivate graduates who can think critically (Macpherson & Owen, 2010; Jones, 2015; Vardi, 2015). The Tertiary Education Strategy sets out the government's long-term strategic direction for tertiary education as well as the current and medium-term priorities. The government's expectations from the tertiary sector put forth "delivering skills for industry", as identified in the Tertiary Education Strategy (Ministry of Education, 2015). A recent survey in the United States illustrates that employers demand critical thinking as an essential attribute in graduates (Hart Research Associates, 2013). Similarly, emphasis on the mismatch of skills between employees' capabilities and employer requirement is presented in an occasional paper by the Ministry of Economic Development, New Zealand (Stevens, 2012). It is not only in the West that critical thinking is seen as essential. A Chinese study emphasized the importance of developing critical thinking skills in graduates (He, Craig, & Wen, 2013).

The general consensus is that tertiary institutions have not performed well in developing critical thinking skills (Barnett, 1997). Boyle (2015) outlines the need for teachers to be critical thinkers and to develop curiosity in students through 'ungoogleable deeper questions' (p. 9). Brookfield (2012) states it is imperative for teachers to understand the term critical thinking in order to facilitate the transfer of critical thinking. This background leads to the research question: How do we teach and assess critical thinking skills in tertiary institutes?

1.2 Overview of Critical Thinking

A critical education provides the tools and skills necessary for independent thinking and learning (Paul, 1993, p. 227). Knowing how to think is fundamental to living productively and meaningfully in a democratic society (Whitehead, 2004). Critical thinking is considered positive as it benefits the nation, society, community, family and an individual's life (Paul, 1993), whereas at times, 'being critical' is received as negative (Cottrell, 2005). Literature provides ample, diverse definitions of critical thinking. The concepts of self-actualisation and reasoning to make judgements are common in most of the definitions of critical thinking. Moon (2008) describes critical thinking as a development process with a longitudinal dimension, which acknowledges a person's past and encourages its contribution to construction of new knowledge. In the face of abundant varying definitions of critical thinking and following Brookfield (2008), who stated that teachers need to be clear about what they want students to learn; this study sets out to review the perceptions of tertiary educators about critical thinking. Clearly a priority and current topic, this researcher wished to delve deeper in the vast knowledge pool of critical thinking, and potentially add some clarity and definition to the subject, particularly with respect to the teaching and learning of critical thinking in tertiary education sector. The tertiary education sector in New Zealand covers universities, institutes of technology and polytechnic (ITPs), private training establishments (PTEs), wananga and workplace training (Tertiary Education Commission, 2015a).

Thus, this research set out to enquire what educators in tertiary institutions in New Zealand mean by critical thinking and attempts to answer the research question: What is critical thinking? Such research is called for as numerous scholars have declared (Barnett, 2015; Facione, 2011; Paul, 1993) and worthwhile if it is true that critical thinking in education leads to better cultivated critical thinkers in society (Brookfield, 2008; Nosich, 2012; Paul & Elder, 2002).

1.3 Research Rationale

As noted above, critical thinking is an indispensable word found in university brochures and course catalogues. Davies and Barnett (2015) successfully outline the primacy of critical thinking in higher education. It has become a focus of research and imminently used in policies of education. The inclusion of critical thinking in higher education is emphasised by many authors (Moore, 2013; Flores, Matkin, Burbach, Quinn, & Harding, 2012; Jones, 2015; Howell & Kingsbury, 2015; Mulnix, 2012).

Moreover, critical thinking is defined as a set of cognitive skills such as analysis, interpretation, inference, and self-regulation by 46 experts of the Delphi panel (Facione, 1990). In the view of this researcher, critical thinking is a systematic thinking that enhances the chances of better decisions, solutions and judgement through precise and purposeful evaluation of thoughts. Voluminous literature professes preparing tertiary students for lifelong learning, active citizenship, and employment (Davies & Barnett, 2015). Halx and Reybold (2006), after extensive research put forth that learning requires effort, but critical thinking requires maximum exertion of intellectual capability and that students and teachers alike find critical thinking discomforting because it requires personal reflection.

Issues such as how to define critical thinking, how to teach critical thinking, and how to assess critical thinking plague educators who think about enhancing the critical thinking skills of their students (Choy & Cheah, 2009). According to a nation-wide survey in America, critical thinking was one of the top three intellectual and practical skills that employers wanted increased emphasis in higher education curricula (Association of American Colleges and Universities & National Leadership Council (U.S.), 2007). Paul (1993) claim that critical thinking is essential for the creation of a fair-minded critical society. Tertiary education institutes acknowledge the need to develop skills that help students to deal with ambiguous situations in different dimensions (Tertiary Education Commission, 2015b). Researchers often express the concern about educators' knowledge of critical thinking and how they convey the meaning of this concept to students (Moore, 2013; Flores et al., 2012).

This research study aims to address the ambiguity persisting in tertiary education institutes for developing students' critical thinking skills.

1.4 Data Collection

The Tertiary Education Commission (The TEC) is a Crown Entity established by the [Education Act 1989](#) (Tertiary Education Commission, 2015c). The TEC is one of a large number of organisations working to support and enhance what the tertiary education system delivers for New Zealanders. The TEC is jointly monitored by the Ministry of Education (MoE) and the Ministry of Business, Innovation and Employment (MBIE). The main function of the Tertiary Education Commission is to invest in tertiary education so that New Zealand graduates are equipped with the knowledge and skills needed for lifelong success (Tertiary Education Commission, 2015a). This reflects the role of the TEC in contributing to both education and the economy. Each year the TEC invests approximately \$2.8 billion in tertiary education organisations (Tertiary Education Commission, 2015a). The TEC is primarily responsible for government funding through investment plans and contracts with tertiary education organisations. Additionally the TEC monitors and manages the performance of tertiary education organisations. Moreover, it provides information and advice to the government about tertiary education organisations and the tertiary education sector. Universities, institutes of technology and polytechnic and wananga are monitored by the TEC on behalf of the Crown.

Four data collection sites, two large metropolitan universities and two large metropolitan institutes of technologies were selected for the purpose of this study. The criteria employed for the selection of institutions was based on their institutional webpages which mentioned the development of critical thinking skills in graduates. These institutions were selected as they provided a fairly large sample of tertiary education in New Zealand, in terms of students, variety of programmes they offer, student roll, and international recognition in quality compliance. These tertiary institutions are in the same geographical area within a New Zealand city. Each of the eight tertiary educators who are interviewed from these institutions, teach in different faculties.

1.5 Research Aims

This research study is led by the following broad aims with a view to provide a further platform for discussion in the context of critical thinking in tertiary educational institutes in New Zealand.

Research Aim 1. To categorize the ways critical thinking is defined in tertiary institutes.

Research Aim 2. To identify the existing teaching strategies employed to deliver critical thinking skills in tertiary institutes.

1.6 Research Questions

The two broad aims have resulted in the following research questions. These research questions were further shaped by the literature review and the methodology of this research study.

Question 1. What is critical thinking?

Question 2. How do we teachers teach and assess critical thinking skills in tertiary institutes?

1.7 Organisation of the Thesis

The thesis is organised into five chapters. Chapter one presents an overview of this research project and rationale for undertaking this research along with the research aims and questions.

Chapter two outlines and critically evaluates the relevant literature reviewed for this project.

Chapter three describes the research methodology employed for this research study. Selection of interpretive qualitative research methodology and two data collection research methods, documentary analysis and semi-structured interviews, are

justified. Detailed analysis of the various aspects of validity and reliability are outlined, followed by ethical considerations for this research study.

Chapter four displays the research findings in two sections. The first section presents findings from the document analysis of government documents and institutional documents retrieved from the webpages of each source respectively; and the second section presents findings from the semi-structured interviews with the tertiary educators from each of four different institutions.

Chapter five provides discussion and interpretations of the findings from document analysis and eight semi-structured interviews.

Chapter six summarises the conclusion, recommendations and limitations for the study and suggests final recommendation with respect to practice and further research.

2 Chapter Two—Literature Review

2.1 Introduction

This chapter discusses two main themes that emerged from the review of the literature: *Nature of critical thinking* and *Teaching of critical thinking*. In regards to the first theme *Nature of critical thinking*, the sub-themes explored are: meaning of critical thinking; a well cultivated thinker; and scope of critical thinking. Within the second theme: *Teaching of critical thinking*, the sub-themes discussed are strategies for teaching critical thinking and assessments.

2.2 Nature of Critical Thinking

2.2.1 Meaning of Critical Thinking

A wide range of definitions in literature provide variety of views on critical thinking. According to Oxford dictionary (2015) critical thinking is, “The objective analysis and evaluation of an issue in order to form a judgement”, whereas according to Davies and Barnett (2015), “critical thinking is about having skills of a certain sort” (p. 7). It is interesting to note that the former definition suggests critical thinking as substantive, whereas the latter view describes critical thinking as a set of skills. Many of the definitions point out critical thinking as a process: “cognitive activity that is associated with use of mind” (Cottrell, 2005, p. 1); “analytical and argument thinking” (Whitehead, 2004, p. 54); “hunting assumptions” (Brookfield, 2012, p. 7); “a form of self-development” (Barnett, 1997, p. 3), “a disciplined act” (Jones, 2015, p. 169). One of the definitions of critical thinking in the literature review described critical thinking as an art of thinking about thinking while thinking in order to make thinking better (Paul & Elder, 2006).

Lipman (1988) defines critical thinking as, “skilful, responsible thinking that is conducive to good judgement because it relies upon criteria, it is self-corrective and it is sensitive to context” (as cited in Nosich, 2012, p. 3). Ennis (1998) has defined critical thinking as, “reasonable, reflective thinking that is focused on deciding what to believe or do” (p. 16).

A two year research project was commissioned by the American Philosophical Association in 1990 to determine the core critical thinking skills and the role of critical thinking in educational assessment and instruction. Forty-six internationally renowned thinkers within United States and Canada, representing disciplines such as Philosophy, Social Sciences, Science, and Education participated in this research project, led by Dr. Peter Facione thesis. This project, henceforth referred as Delphi study in this thesis, published a report called “Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction” (Facione, 1990). This report provides a theoretical understanding of the term critical thinking, the dispositions for an ideal critical thinker, and the cognitive skills set comprising critical thinking. This Delphi study is a seminal work on the subject of critical thinking in education. Experts in the Delphi study put forth that not every useful cognitive process should be thought of as critical thinking. They further said that not every thinking skill is critical thinking.

In accordance, Mulnix (2012) states it is important that critical thinking should not be confused with other forms of thought. She enquires whether critical thinking and reasoning hold a privileged position in respect to knowledge over other thought processes such as problem solving, creative thinking and decision making.

Critical thinking is one among the family of closely related forms of higher order thinking, for example, problem solving, decision making and creative thinking. Paul and Elder (2006) defines problem-solving “the process of reaching solutions” (p. 58), and creative thinking as, “resulting from originality of thought” (p. 14). There is contradiction observed in the literature review about creative thinking and critical thinking, Whitehead (2004) considers creative thinking and critical thinking as two separate modes of thought while Paul and Elder (2004) conclude them to be inseparable.

For Cottrell (2005), learning to think in critically analytical and evaluative ways means using mental processes such as attention, categorisation, selection, and judgement. Analysis, implication, synthesis, evaluation, application and use of skills to plan the outcome in a situation are seen as fundamental for critical thinking. Supplementing

this view, the Delphi study (Facione, 1990) has presented cognitive skills such as interpretation, analysis, evaluation, inference, explanation and self-regulation as the core skills for critical thinking. Brookfield (2008) ascertains that students can be taught to recognize and use skills appropriately and make their thinking more effective.

Some critical thinking authors agree on one point, that the purpose of critical thinking is positive for example, self-improvement (Paul & Elder, 2006); self- corrective (Lipman, 1988); self-development (Barnett, 1997), whereas, Pithers and Soden (2000) identify critical thinking as beneficial to both the self and others. Contradictory to this, some author cautions that being critical can be considered as 'negative' (Cottrell, 2005).

In sum, there exist a number of definitions of critical thinking in the literature. It is also noteworthy that none of the theorists disagrees with other definitions of critical thinking, perhaps due to the complexity of critical thinking and its relationship with an unlimited number of behaviours in an unlimited number of situations as explained by (Paul, 1993). He further advocates two reasons to retain a host of definitions about critical thinking, rather than work solely with one definition: "1) to maintain insight into the various dimensions of critical thinking that alternative definitions highlight, and 2) to help oneself escape the limitations of each" (p. 46). Taken together, the literature reviewed suggests that critical thinking is a list of cognitive skills, which guide individuals to make informed decisions and judgements for all situations in life.

2.2.2 An Ideal Critical Thinker

Critical thinking is a cognitive skill that requires a framework to be mastered and monitored from time to time (Barnett, 1997). Moreover, just as any other skills, critical thinking may be possessed by an individual to a higher or lower degree (Paul, 1993). Huge responsibility is placed on the learner for knowing critical thinking (Nosich, 2012; Paul & Elder, 2002; Shuell, 1986). Hammer and Green, (2011) noted that the disposition of the student/thinker is as important as that of the teacher in developing attention to critical thinking skills.

Similarly, Paul and Elder (2002) explain critical thinking as self-directed, self-disciplined, self-monitored and self-corrective thinking. Critical thinking is the ability to engage in an activity, process or procedure. Moreover, critical thinking is considered to be a transferable skill across the curriculum and real life context (Tertiary Education Commission, 2015b), it is imperative for the learner to have the inclination for these skills (Vardi, 2015). Halpern (1998) added the idea that student dispositions can influence how they use critical thinking skills. She surmised that it is not enough to teach skills, or for students to develop abilities, if they are simply not inclined to use them. According to Bowell and Kemp (2015), a successful critical thinker is the one who can act and believe in accordance with good reasons, and who can articulate and make those reasons explicit.

There exist certain dispositions and abilities that ideal critical thinkers possess (Facione, 1990). Some of the dispositions and abilities of an ideal critical thinker, most often cited in the literature, are listed in the table below.

Table 1: Dispositions of Ideal Critical Thinkers

| Dispositions of ideal critical thinker | Abilities of ideal critical thinker |
|--|---|
| Be well informed (Ennis, 1998, p. 17) (Facione, 1990, p. 13) | Identify the focus: the issue, question or conclusion (Ennis, 1998, p. 17) |
| Inclined to seek alternatives (Ennis, 1998, p. 17) (Facione, 1990, p. 13) (Brookfield, 2008, p. 8) | Analysis (Facione, 1990, p. 6) (Ennis, 1998, p. 17) (Brookfield, 2008, p. 23) |
| Comes to well-reasoned conclusions and solutions (Ennis, 1998, p. 17) (Nosich, 2012, p. 174) (Paul & Elder, 2002, p. 15) | Challenge or Clarify the answer (Ennis, 1998, p. 17) (Brookfield, 2008, p.8) |

| | |
|--|---|
| <p>Considers other points of views</p> <p>(Ennis, 1998, p. 17)</p> <p>(Nosich, 2012, p. 174)</p> <p>(Facione, 1990, p. 13)</p> | <p>Judge the credibility of source</p> <p>(Ennis, 1998, p. 17)</p> |
| <p>Dedicated to communicate effectively, precisely and clearly</p> <p>(Ennis, 1998, p. 17)</p> <p>(Facione, 1990, p. 13)</p> <p>(Paul & Elder, 2002, p. 15)</p> | <p>Identify assumptions</p> <p>(Ennis, 1998, p. 17)</p> <p>(Paul & Elder, 2002, p. 15)</p> <p>(Brookfield, 2008, p. 7)</p> |
| <p>Determined to gather and assesses relevant information</p> <p>(Ennis, 1998, p. 17)</p> <p>(Paul & Elder, 2002, p. 15)</p> | <p>Judge deductions or inductions</p> <p>(Ennis, 1998, p. 17)</p> |
| <p>Be reflectively aware of their own beliefs</p> <p>(Ennis, 1998, p. 17)</p> | <p>Problem solving</p> <p>(Ennis, 1998, p. 17)</p> <p>(Paul & Elder, 2002, p. 15)</p> |
| <p>A good listener</p> <p>(Ennis, 1998, p. 17)</p> <p>(Nosich, 2012, p. 174)</p> | <p>Monitor own thinking</p> <p>(Ennis, 1998, p. 17)</p> <p>(Paul & Elder, 2002, p. 15)</p> |
| <p>Devoted to trust in the process of reasoned enquiry</p> <p>(Ennis, 1998, p. 17)</p> <p>(Facione, 1990, p. 13)</p> | <p>Confident in reasoning</p> <p>(Nosich, 2012, p. 175)</p> <p>(Facione, 1990, p. 6)</p> |
| <p>Fairmindedness in appraising enquiry</p> <p>(Ennis, 1998, p. 17)</p> <p>(Facione, 1990, p. 13)</p> | <p>Intellectually courageous</p> <p>(Nosich, 2012, p. 175)</p> <p>(Paul & Elder, 2002, p. 15)</p> |
| <p>Be concerned about others' welfare</p> <p>(Ennis, 1998, p. 17)</p> | <p>Intellectually empathetic</p> <p>(Nosich, 2012, p. 175)</p> |
| <p>Shows intellectual humility</p> <p>(Nosich, 2012, p. 174),</p> <p>(Ennis, 1998, p. 17)</p> | <p>Intellectually engaged</p> <p>(Nosich, 2012, p. 175)</p> |

| | |
|---|--|
| <p>Inclined to raise vital questions and problems (Facione, 1990, p. 13) (Paul & Elder, 2002, p. 15)</p> | <p>Intellectual perseverance (Nosich, 2012, p. 175) (Facione, 1990, p. 13) (Whitehead, 2004, p. 1)</p> |
| <p>Ability to formulate questions and problems clearly and precisely (Nosich, 2012, p. 174) (Paul & Elder, 2002, p. 15)</p> | <p>Intellectually autonomous (Nosich, 2012, p. 175)</p> |
| <p>A truth seeker (Nosich, 2012, p. 174)</p> | <p>Interpretation (Paul & Elder, 2002, p. 15)</p> |
| <p>Determined to test the conclusions and solutions against relevant criteria and standards (Paul & Elder, 2002, p. 15)</p> | <p>Evaluation (Facione, 1990, p. 6)</p> |
| <p>Open-mindedness (Nosich, 2012, p. 174) (Facione, 1990, p. 13) (Paul & Elder, 2002, p. 15) (Whitehead, 2004, p. 1)</p> | <p>Inference (Facione, 1990, p. 6)</p> |
| <p>Disciplined to abandon non-productive strategies in an attempt to self-correct (Facione, 1990, p. 13)</p> | <p>Self- directed (Paul & Elder, 2002, p. 15)</p> |
| <p>Shows alertness to opportunities to use critical thinking (Nosich, 2012, p. 174) (Facione, 1990, p. 13)</p> | <p>Self- corrective (Paul & Elder, 2002, p. 15)</p> |
| <p>Devoted honesty in facing one's own biases and prejudices (Nosich, 2012, p. 174)</p> | |

The cultivation of these dispositions is important to foster the use of critical thinking skills outside the narrow instructional setting. Facione (2011) asserts that critical thinking skills are developed alongside one's critical thinking spirit, or character.

Being skilled at critical thinking involves knowing, perhaps implicitly or without the ability to articulate this knowledge, both a set of procedures and when to apply those procedures (Vardi, 2015). People who have developed these affective dispositions are much more likely to apply their critical thinking skills appropriately in both their personal life and their civic life than are those who have mastered the skills but are not disposed to use them.

Hamby (2015) considers personal 'motivation' as the paramount facilitator for critical thinking, whereas Nosich (2012) asserts that 'enjoyment' in thinking critically is the chief factor that drives an individual to critical thinking. Sometimes the need to solve a complex problem or to make a crucial judgement in life or a 'dilemma' (Mezirow, 2012) leads to critical thinking.

Reflecting on and improving one's critical thinking skills involves judging when one is or is not performing well, or as well as possible, and considering ways of improving one's performance. To assess thinking Paul & Elder (2006) advise to check thinking through the following intellectual standards: clarity, accuracy, relevance, significance, logic, depth, breadth, precision and fairness. Nosich (2012) refers to the intellectual standards as a 'set of filters' to assess reasoning. He further affirms their presence whenever one reasons through anything.

2.2.3 Scope of Critical Thinking

Higher education aims to prepare graduates with critical thinking skills to deal with unseen complex realities. Gardner (2009) asserts that education must elevate human understanding about who we are and what we can do. This is identical to Barnett's (1997) theory of 'critical being' and 'critical doing'. Explaining it in depth, he says the essence of understanding is that it is performative. Critical thinking is an inherent part of education (Leicester, 2009). Barnett (2015) describes critical thinking as fundamentally collaborative in character, and rooted in interventions in the world of action, when understood as a practice.

When students in academia learn to look through things (Nosich, 2012) through their critical thinking skill, they develop critical stance (Barnett, 1997) a critical capacity—

oriented to the world of knowledge. (Barnett, 1997) writes about critical thinking as “reconstitution of knowledge, reconstitution of self and reconstitution of world” (p. 21). Critical knowledge always aspires not only to be critical, but to be reflective and self-reflective (Klikauer, 2015).

The literature highlights immense scope of critical thinking, spanning every field. It is also evident that critical thinking of any kind is never universal in any individual; everyone is subject to episodes of undisciplined or irrational thought (Paul & Elder, 2006). Critical thinking is therefore typically a matter of degree and dependent on, among other things, the quality and depth of experience in a given domain of thinking or with respect to a particular class of questions. No one is a critical thinker through-and-through, but only to a certain degree, with particular insights (Paul, 1993).

Finally, critical thinking is affected by scaffolding, peer groups. Critical thinking is socially situated; it is a social learning process (Brookfield, 2012). The emergent nature of collective group cognition in sense making offers a potential new direction for research into critical thinking (Stanton, Wong, Gore, Sevdalis, & Strub, 2011). Brookfield (2012) affirms that small group participation offers the most engaging moments in learning to think critically for students. The diversity of responses and lively exchange of ideas among peers in small groups benefits the students. Group work, working with peer or working in pairs foster critical thinking in students.

2.3 Teaching of Critical Thinking

If students are to learn desired outcomes in a reasonably effective manner, then the teacher's fundamental task is to get students to engage in learning activities that are likely to result in their achieving those outcomes.

(Shuell, 1986, p. 429)

As exemplified in the above statement by Shuell, capacity to engage in critical reflection is central to education (Lucas & Tan, 2013). Shuell (1986) clarifies that enduring change in ability or behaviour to do something because of an experience or practice is at the core of learning.

2.3.1 The Process of Critical Thinking

The key to teaching critical thinking is to understand how students experience the process (Brookfield, 2012). Nosich (2012) states critical thinking is different from just engaging in a mental exercise. Paul and Elder (2002) assert that critical thinking should not be mistaken as something that we do in addition to other thing but critical thinking is the way to do everything. Brookfield (2008) clarifies that when adults are asked to describe their most significant learning, they seldom use the term ‘critical thinking’, but talk about the aspects of “the process of critical thinking” (p. 49).

Some authors have tried to explain the process of critical thinking. Nosich (2012) ascertains that critical thinking involves three parts: “Asking questions; trying to answer those questions by reasoning them out and believing the results of our reasoning” (p. 5). Brookfield (2012) explains it as: “Identifying and checking assumptions; looking at ideas from different viewpoints and taking informed actions” (p. 1). Paul (1993) suggests micro as well as macro level activities for critical thinking: “In addition to the skills of identifying assumptions, evidences, conclusions, implications and consequences, students need to be able to read and write critically, to engage in Socratic discussion, to reason dialectically, to pursue root questions” (p. 305).

Brookfield (2008) claims critical thinking is a dynamic and ongoing process, making it difficult to discern between problem identification, diagnosis, exploration, action and reflection. Paul & Elder (2006) explain that to think critically, one must focus on the parts of thinking: its purpose, question, information, inference, assumptions, concepts, implications and point of view. Bowell and Kemp (2015) accord with Nosich (2012) as for them the process of successful critical thinking is to have good reasons to believe in what we believe or to prevent from believing with what we do not agree.

In summary, it is interesting to note that different authors have different views about the process of critical thinking, but they all in some way reconcile with the set of skills and sub-skills listed in the Delphi study by Facione (1990). The following table derived from the Delphi study (Facione, 1990, p. 6) lists the skills and sub-skills for critical thinking.

Table 2: Consensus List of Critical Thinking (CT) Cognitive Skills and Subskills

| Skill | Sub-skill |
|-----------------|---|
| Interpretation | Categorization Decoding Significance Clarifying Meaning |
| Analysis | Examining Ideas Identifying Arguments Analyzing Arguments |
| Evaluation | Assessing Claims Assessing Argument |
| Inference | Querying Evidence Conjecturing Alternatives Drawing Conclusions |
| Explanation | Stating Results Justifying Procedures Presenting Arguments |
| Self-Regulation | Self-examination Self-correction |

Source: Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction (Facione, 1990, p. 6)

2.3.2 Strategies for Developing Critical Thinking

The role of a teacher as a listener supplements the role of a ‘facilitator’ in class who supports alternative views, and challenges the views through open ended questions for constructive discourse (Murriss, 2014). Interactive feedback from teacher aids in the thinking capacity of students. A study by Wass, Harland and Mercer (2011) suggests that conversation with lecturers and peers scaffold students’ understanding for critical thinking. Another study focussing on teacher-student interaction by

Grantham, Robinson and Chapman (2015) concluded that teachers' approachability and frequent interaction with students helps to elevate confidence and academic skills of students. Motivation and self-esteem serve as fundamental for student learning (David & Brown, 2012) and are important parameters for a better performance. DeVriese (2008) claims teachers can create the foundation for justice, equality and empowerment through their pedagogy of inquiry.

Role modelling by teacher encourages critical thinking (Brookfield, 2012). Students learn better when teachers explain their actions to students (Nosich, 2012; Brookfield, 2012) It gives the students the confidence that they are in hands of a 'trusted guide' (Brookfield, 2012). Clarity of purpose by teacher serves as favourable ground for facilitating critical thinking in students (Lovatt, 2014). Students start to follow the thinking patterns of their educators.

Critical thinking is a questioning process (Cottrell, 2005; Nosich, 2012; Paul & Elder, 2006; Brookfield, 2012). Deckert & Wood (2013) explain Socratic questioning in class helps to draw the information on any topic from the students through arguments and class discussions. Asking questions is a way to know that students are thinking critically in that subject area (Chan, 2013). It is imperative for the teachers to know that critical thinking does not always end with a right answer but at times it ends up in a series of open questions that may puzzle the student (Halx & Reybold, 2006; Nosich, 2012).

Brookfield (2012) puts forth 'critical conversation protocol' in which students bring in a situation they are struggling with and discuss it in class, peers share their opinion, what they think the student should do in the scenario, and everyone learns from that process. He also advises teachers to use 'scenario analysis' to build up critical thinking in students. In this strategy, students have to discuss a choice made by a particular character in a fictional vignette and provide alternative suggestions checking the assumptions the character holds.

Critical thinking is a social learning process (Brookfield, 2012). Active learning takes place in a class environment of enquiry (Nosich, 2012; Rowan, Kommor, Herd, Salmon, & Benson, 2015) that engulfs students into negotiation, reflection, gathering

information, communication and decision making. The same opinion is reflected in Barnett's (1997) belief that interchange of ideas among peers facilitates critical thinking. There is great interplay of reasoning and thought in cooperative learning. In fact, cooperative learning leads to deeper learning and increased critical thinking (Millis, 2010). Students become receptive of multiple perspectives; open mindedness and freedom of thought are interlinked (Murriss, 2014). Davis (1993) agrees that students learn best when they engage actively in the learning process.

Interdisciplinary studies motivate critical thinking environment, where students from different disciplines come together to solve a problem (Rowan et al., 2015). Interdisciplinary studies mirror the interrelationship across variety of fields, and causes students to introspect multiple perspectives. Problem based learning and experiential learning equally foster critical thinking, as Kolb (1984) defines learning as a “process whereby knowledge is created through transformation of concrete experience” (p. 38).

Some writing tasks encourage critical thinking (Cottrell, 2005; Nosich, 2012; Paul & Elder, 2006; Brookfield, 2012; Whitehead, 2006). Cottrell (2005) mentions the involvement of motor memory in writing that makes it a good tool for teaching critical thinking, whereas Nosich (2012) includes SEE-I model in writing to make it effective. SEE-I model stands for statement, elaboration, exemplification and illustration. He indicates that a major goal of critical thinking is always to keep the whole in mind as you are working through the parts. Essay writing and utilizing questions that adhere to Bloom's Taxonomy of higher order thinking skills foster critical thinking in students (Smith & Szymanski, 2013).

Lectures are effective for teaching and synthesizing information, especially when information is complex, large classes make lecturing economical, and lecturing conforms to the way universities are currently configured relative to space and time (Lumpkin, Achen, & Dodd, 2015). Literature reveals that endless lectures do not keep minds engaged as many students mentally check out after only a few minutes (Lumpkin et al., 2015), a break of 10-15 minutes within lectures (Brookfield, 2012) by

a diversity of learning activities will keep students focused and engaged, fostering their learning.

It is difficult to explain the learning that takes place when an individual deals with a new situation or learns material that is totally new to them (Shuell, 1986). Brookfield (2012) illustrates students are compelled to think in different ways about an unnerving dilemma, this can be related to 'disorienting dilemma' (Mezirow, 2012). Brookfield (2012) describes how people think and change drastically after 'reappraisal of our meaning schemes and meaning perspectives' (p. 71). Mezirow (2012) states, "questions raised regarding one's values are apt to be viewed as a personal attack" (p. 84). For example, culture, customs, religious beliefs, social norms, learning styles, and self-concepts guide our life unless we face a critical reflection (Mezirow, 2012; Ennis, 1998).

Faulkne and Crowhurst (2014) contest about students who arrive holding preconceived values and beliefs in opposition to the objectives of the socially critical course. Mere engagement with course materials and activities will not help students prove beneficial to shift feelings and attitudes. As Murriss (2014) puts forth that for some students, it is for the first time at university that they have to genuinely mix and explore ideas with other races, religions and cultures, which may lead to great disturbance. Questioning for reasons, seeking alternatives, being open-minded are considered derogatory in certain cultures (Jones, 2005; Tiwari, Avery, & Lai, 2003; Bali, 2015; Ennis, 1998; Grosser & Lombard, 2008).

Cultural diversity may work as a barrier for students in the development of critical thinking when students enter tertiary education. Norris (1998) refers to the case of Inuit in Northern Canada, who find it offensive when asked to reason or reveal their mental status. He further mentions the difference in education systems of Amish of North America (as cited in Ennis, 1998) that acts as a barrier for the development of critical thinking. In this facet of global education, tertiary teachers should be mindful of the cultural traits of students while teaching critical thinking (ten Dam & Volman, 2004; Bali, 2015; Brookfield, 2008). Bruner (1985) states individual learners go about learning in different ways (as cited in Shuell, 1986).

A model of teaching critical thinking in higher education may benefit student learning (Nosich, 2012; Smith, 2011; Ellerton, 2015). Critical thinking is a practice (Paul, 1993; Nosich 2012; Brookfield, 2012) and students should be given tools of thinking (Whitehead, 2004; Nosich, 2012) to process information. Whitehead (2004) clarifies this need further by exemplifying, “just as a carpenter needs tools, the thinking tools allow to construct knowledge that is more significant” (p. 2). Barnett (1997) asserts the use of framework in higher education on which critical teaching can be mounted. He states, irrespective whether it is internal or external to an object, a framework will enable students to view their education in a genuinely critical way. Murriss (2014) believes in the essence of pedagogical opportunities to cultivate critical thinking in students.

2.3.3 Assessment

Assessment is central to the integrity and accountability of a university (Ferns & Zegwaard, 2014). Assessments should reflect how well the student has understood a particular concept and how the student can analyse and implicate the concept in different situations (Cotter & Tally, 2009). It is crucial for the student to understand the cause and effect of the concepts rather than just applying concepts to situations without comprehending them. A study conducted by Lee (2012) made a significant suggestion to the assessment of students’ thinking abilities by presenting an open-ended and exploratory approach rather than directive approach to investigate and understand student’s emergent thinking competence.

The purpose of assessment is to improve student’s ability to think, Saxton, Belanger and Becker (2012) list three criteria that may be recognised as best practice in critical thinking assessment: First, the target of critical thinking assessment should be the thought process, focussing on the rational evaluation and explanation in the student’s answer. Secondly, critical thinking assessment should invoke topic that are not directly instructed in the classroom. Thirdly, assessment of critical thinking should measure cognitive skills and critical thinking dispositions. Literature suggests use of rubrics in assessment, to draw students’ attention to the centrality of the skills and dispositions (Saxton et al., 2012; Lee, 2012).

For holistic evaluation of students' critical thinking skills, Paul (1993) suggests to take into consideration the dual scope of assessment: interdisciplinary and intradisciplinary. McPhun (2013) suggests integrated assessments to prepare learners for the realities they may face in their future careers. Hurley & Hurley (2013) encourage problem based assignments to highlight students' intellectual growth and critical thinking, whereas Saxton et al. (2012) suggest performance based online assessment using Critical Thinking Analytic Rubric (CTAR) to assess critical thinking. Ibrahim Holi Ali (2012) suggests collaboration between core subject teachers and language teachers to promote and develop critical thinking as this will facilitate assessing critical thinking skills. However, he further cautions about the endurance of the critical thinking skills in an individual; even if generic skills are proven to be effectively developed, the applicability of these skills outside the educational context is still in question.

2.4 Summary

This chapter illustrates the variety of definitions and strategies for the development of critical thinking in the extant literature. Abundance of literature around development of critical thinking is found. As seen in the literature review of this study, the development of critical thinking relies not just on teaching but also on the dispositions and abilities of an individual. Critical thinking is globally recognised as a key competency for graduates. In the following chapter the method and methodology for this research study are explained and presented.

3 Chapter Three—Methodology and Methods

3.1 Introduction

The central aim of this research is to explore the nature of critical thinking and the teaching strategies employed by educators to develop critical thinking in students in tertiary institutions in New Zealand. This qualitative research study employs the interpretive paradigm (Angen, 2000) for the collection of data.

This chapter introduces and outlines the methodology used to collect and analyse data in this research. It presents reasons for using a qualitative research paradigm to extract rich data, and examines the limitations of qualitative design. Subsequently, the data gathering methods adopted for this research, interviews and documentary analysis, are explained and justified. Consideration is given to ethical aspects in the data gathering methods used in this study.

3.2 Research Methodology

Researchers are guided by particular paradigms and the associated ontological and epistemological beliefs that influence their research questions, their choice of research methodology and the methods of data collection and analysis (Tolich & Davidson, 2011; Denzin & Lincoln, 2005). There are two main paradigms recognized in the research of educational problems: positivist and interpretive (Bryman, 2008). The interpretivist paradigm was developed as a critique of positivism in the social sciences. Tolich and Davidson (2011) explain that a researcher employing a positivist approach adheres to observing and measuring the problem remaining at some distance from the research subjects. In contrast, a researcher employing the interpretive approach, as per Bryman (2012), uses more direct interaction with the research subjects and produces a narrative to compare, contrast, analyse and interpret data to find patterns and meaning related to the research problem and its context.

The primary focus of this study was to review the perceptions of educators about the nature of critical thinking and the strategies employed in teaching and learning for

developing critical thinking in students. To understand the viewpoints of the educators, an interpretive research methodology was employed. According to Cohen, Manion, and Morrison (2011), an interpretive approach is suggested to understand the lived experiences of people while retaining the integrity of the study.

An interpretivist approach allows a focus on “the understanding of the social world through an examination of the interpretation of that world by its participants” (Bryman, 2008, p. 366). Within the interpretivist paradigm, this research adopted a constructivist lens, where meaning is created and co-created through the interactions of the researcher and the participants (Guba & Lincoln, 2005). A constructivist approach in this study allowed for the creation of knowledge (Denzin & Lincoln, 2005) through the mutual engagement (relativist ontology) with the interview participants. Semi-structured interviews were conducted with eight tertiary educators for this study to review the meaning of critical thinking in their words.

3.3 Qualitative Methodology

Qualitative research is identified as being constructivist and interpretivist (Bryman, 2012). Qualitative research is study leading to in-depth explorations about a topic, within its natural settings (Patton, 1990). Certain authors consider qualitative research as an effective tool, in which research may explore experiences; this includes the ability to explore in detail what is to be evaluated and lower operating costs (Denscombe, 2010) and increased validity when compared to quantitative methods of research (Cohen et al., 2011). Constructivists refuse to adopt any foundational standards by which truth can be universally known (Denzin & Lincoln, 2005), as opposed to quantitative enquiry which relies on numerical data and objectivism. Interpretive researchers rely on meaning that is shared in the natural settings (Bryman, 2012). On careful consideration, in order to gain data that is rich and personal (Cohen et al., 2011), a qualitative methodology for this study was suitable.

This study sought answers within the socially constructed nature of reality between the researcher and what is studied. Given this research seeks the perspectives of

human subjects, a qualitative methodology was considered most appropriate for this study.

Qualitative research is often criticized for its “impressionistic and subjective” nature of enquiry (Bryman, 2012). According to Bryman (2012), some quantitative researchers argue the methods used to gather and interpret qualitative data lack scientific integrity, lack of statistical correlations in results and rely on the researchers’ interpretation of what is significant or insignificant to the study.

These considerations aside, qualitative methods as compared to quantitative methods allow the detailed analysis of change, whereas the latter are only able to measure that the change has occurred over time, but not how (what processes were involved) and why (in terms of circumstances and stakeholders) it has occurred (Bryman, 2012). Bryman (2012) goes on to say that statistical analysis is unlikely to go beyond counts, frequencies, graphs or cross tabulations. The qualitative method is well designed to explore the multitudes of experiences and differences put forth by people (Denzin & Lincoln, 2005). This further strengthens the choice of qualitative methodology for this study, as this study sets out to review the perceptions of educators.

Several researchers (Patton, 1990; Denzin & Lincoln, 2005; Cohen et al., 2011; Bryman, 2012) argue, the best qualitative research methods rely on the ‘interplay’ of resources and the personal judgments of those involved, suggesting a multi method approach is useful when attempting to understand a given phenomenon. In this study, the researcher adopted an interpretive approach utilizing documentary analysis and semi-structured interviews as data collection methods. These are discussed in detail under data collection methods in the following paragraphs in this chapter.

3.4 Research Design

One of the foremost aspects of any research study is the research design. Research design, according to Bryman (2012), is considered as “a framework for collection and analysis of data” (p. 715). To review educators’ perceptions about critical thinking in

tertiary institutions, a qualitative research study was planned following an interpretive approach using the constructivist lens, where meaning is created and co-created through the interactions of the researcher and the participants (Guba & Lincoln, 2005). Documentary analysis (Wellington, 2015; Bell, 2010) of national documents was integrated to explore the relevance of critical thinking in tertiary education institutions. Additionally, semi-structured interviews Bryman (2012) with the educators of tertiary education institutions were planned. Use of two methods in a qualitative study strengthens the validity and reliability (Cohen et al., 2011).

3.5 Research Methods

Research methods are the strategies and instruments used to gather data in a research study. Data collection is the core of all research. The first method employed in this study for data collection was documentary analysis. “The greatest attraction of using documentary sources is their accessibility” (Denscombe, 2010, p. 220). The decision to use documentary analysis for this study was based mainly to explore the relevance of critical thinking in the tertiary education sector in New Zealand. Atkinson and Coffey (as cited in Bryman, 2012) doubt the relevancy of relying solely on documents, as they say, “we cannot treat records however “official” as firm evidence of what they report” (p. 555). Additionally, Bryman (2012) asserts that documents have to be interrogated and examined in the context of other sources of data collection. Thus, the second method employed for data collection was semi structured interviews. Denscombe (2010) states the depth of information obtained by interviews produces best value for money meaning, “when what they [interview participants] offer is an insight they have, as people in a special position to know” (p. 165). Wellington (2015) considers interviews as the primary source of data collection and documentary analysis as secondary source of data collection method, and this is the case here.

3.5.1 Documentary Analysis

Documentary analysis explicates information contained in the text of documents (Denscombe, 2010). Documentary analysis forms an important method in qualitative research for promoting ‘methodological pluralism’ (Cohen et al., 2011, p. 254) to

ascertain and validate the data findings (Cardno, 2003). Documentary analysis provided the groundwork in this research study to identify relevance of critical thinking in tertiary education in New Zealand. It was deemed important to consider how the tertiary strategies and policies outline critical thinking in the documents related to tertiary institutional organisation. Documentary analysis establishes the current practices about what is happening, in contrast to what should be happening (Cardno, 2003).

Three national documents: Tertiary Education Strategy 2014-2018; Statement of Intent 2014-2018; and Statement of Intent 2015/16-2018/19 were reviewed for this study. Documentary analysis, according to Cohen et al., (2011), can be a useful technique for allowing us to discover and describe the focus of individual, group, institutional and social attention. For assessing the quality of documents, the researcher maintained criteria listed by Scott (as cited in Wellington, 2015): authenticity, meaning genuineness; credibility, meaning legitimacy; representativeness, meaning the level of how well or accurately something reflects upon a sample; and, finally, precision and clarity of the document.

Additionally, the following framework (Bryman, 2012, p. 561) was considered for evaluating the documents.

- Who produced the document?
- Why was the document produced?
- Was the person or group that produced the document in a position to write authoritatively about the issue or subject?
- Is the material genuine?
- Did the person or group have an axe to grind and if so can you identify a particular slant?
- Is the document typical of its kind and, if not, is it possible to establish how untypical it is and in what way?
- Is the meaning of the document clear?
- Can you corroborate the events or accounts presented in the document?

- Are there different interpretations of the document from the one you offer and, if so, what are they and why have you discounted them?

This research focused on the three national documents: Tertiary Education Strategy 2014-2019; Statement of Intent 2014-2018; Statement of Intent 2015/16-2018/19. These documents were selected as they provided up-to-date information on tertiary sector expectations and services. The following table lists the authors, stakeholders and purpose of each of the national documents.

Table 3: Fundamentals of Documents

| Document Type | Author | Stakeholders | Purpose of Creation |
|--|-------------------------------|---------------------------------|--|
| Tertiary Education Strategy 2014-2019 | Ministry of Education | Tertiary Educational Institutes | To set out the Government's long-term strategic direction for tertiary education |
| Statement of Intent (Responsibility) 2014-2018 | Tertiary Education Commission | Tertiary Educational Institutes | Sets out TEC's strategic intentions for four years (2014-2018) |
| Statement of Intent 2015/16- 2018/19 | Tertiary Education Commission | Tertiary Educational Institutes | Sets out TEC's strategic intentions for four years (2015/16-2018/19) |

The Tertiary Education Commission (TEC) is charged with giving effect to the [Tertiary Education Strategy 2014-19](#) (Tertiary Education Commission, 2015a). The Tertiary Education Strategy 2014-19 is jointly developed by MoE and MBIE. It sets out the government's long-term strategic direction for tertiary education (Ministry of Education, 2015). The Strategy focuses on an outward facing and engaging tertiary education system which improves the outcomes for graduates. It lists the priorities that New Zealand government expects out of tertiary education organisations in New Zealand. The funding and monitoring role of TEC in tertiary education organisation guided further in the direction of Statement of Intent. The Statement of Intent

describes what the Tertiary Education Commission intends to achieve over the next four years in New Zealand's tertiary education and training system (Tertiary Education Commission, 2014).

The rationale for choosing these documents is due to their role in the tertiary education sector. These national documents have a fundamental impact on the curriculum and on teaching and learning strategies. These documents are developed by MoE and MBIE jointly in order to serve the education-wide outcome, "A world leading education system that equips all New Zealanders with the knowledge, skills and values to be successful citizens in the 21st century" (Tertiary Education Commission, 2014, p. 16). These documents serve as the guidelines for tertiary education organisations.

Documentary analysis was a time-consuming and protracted process (Bryman, 2012). It takes good amount of time and interpretation skills to get the meaning from documents as there is no single meaning (Wellington, 2015) to be sought in them. Furthermore, in this study documents helped frame the interview questions for the participants. It also provided a body of data that could be anticipated from the interview participants. For example, the documents mention the relevance and the demand to develop critical thinking in students; critical thinking is deemed as crucial to prepare 21st century citizens (Tertiary Education Commission, 2014), but there is no mention of assessing the quality compliance of these skills in the qualifying graduates. This led to the research question about how critical thinking in students in tertiary educational institutions is assessed. The documents used in this study were a stable source of information that could be analysed over and over and were crosschecked with interview data frequently.

3.5.2 Interviews

For this research study, interviews were suitable as interview is "a process of knowledge construction" (Kvale & Brinkmann, 2009, p. 48) and the information received from interviews was something that could not be otherwise obtained from any other source. Denscombe (2010) states the purpose of a research interview is to probe a respondent's views, perspectives or life-history. Moreover, interviews

supplemented by documentary analysis form an excellent means of triangulation, helping to increase the trustworthiness, reliability and validity of research (Wellington, 2015).

Cohen et al. (2011) categorize interviews into four types: informal conversational, guided approach, standardized open-ended, and closed quantitative interviews. An informal conversational interview is very casual, with no preplanning. Questions are asked on the spur of the moment as the interview unfolds. This would not have been a good choice for this study as collection of rich data is not promised in such interviews. As compared to standardized interviews, guided and closed approaches were found less suitable for this qualitative study to collect the data. Standardized open-ended interviews are pre-planned interviews with questions determined in advance. Similar account about semi-structured interviews is explained by Bryman (2012): “the researcher has a list of questions or fairly specific topics to be covered...all the questions will be asked and similar wordings will be used from interviewee to interviewee” (p. 471).

Considering the fact that in semi-structured interviews, interviewers are able to ask extra questions, to gain more detailed information, or to follow a view point made by the participant (Bryman, 2012), this type was determined to be most appropriate for this research study. The most important aspect of these interviews is that participants are able to express their ideas fully and freely, thus providing more data to draw the meaning (Fontana & Frey, 2005). To get an insight of the educators’ knowledge, opinions and beliefs, semi-structured interviews were considered to be best as they provided flexibility (Bryman, 2012; Denscombe, 2010), and data could be easily compared with generalizations and themes could be easily drawn.

However, Cohen et al. (2011) caution about the shortfalls of ‘standardized wording of questions’ as naturalness in answers and questions is limited. Bryman, (2012) advises the new researchers to refrain from leading the interviewees to avoid facing unexpected contingencies due to lack of interview skills and experiences. With these cautions in mind, interviews were scheduled with educators.

A list of questions for the research interviews, called 'interview schedule', was prepared and pilot interviews were carried out with colleagues and professors at the researcher's institution, Unitec Institute of Technology. Piloting, as suggested by Wellington (2015), helped in practising as well as guiding the interview schedule. Piloting proved to be beneficial. The interview schedule was refined by considering reshuffling two questions, which made it easier to uncover the data in an ongoing order. The interviewees understood the questions and proved to produce the data that was thought useful for this study.

Establishing rapport with the interviewees is vital (Wellington, 2015). The initial two minutes of each interview were allocated for a brief social involvement. This facilitated ease of the interaction throughout the interviews. Transcription of the interview recordings was another factor to be considered. Bryman (2012) describes transcription as "the written translation of recorded interview or focus group session" (p. 717). To maintain the precision and accuracy of the data, the researcher transcribed each recording. This exercise helped in authentic coding the data, eliminating the fear of loss of important verbatim. Only upon receiving approval of the transcribed interview data from the interviewees were the transcriptions used for coding.

This study set out to interview eight participants from tertiary education institutes who teach critical thinking explicitly or implicitly in their course (n=8). The tertiary education sector in New Zealand covers universities, institutes of technology and polytechnic (ITPs), private training establishments (PTEs), wananga and workplace training. Institutional webpages of tertiary education institutes were examined to locate the participants. Two criteria were maintained while selecting the institutions. The first criterion was institutes that mentioned the development of critical thinking on their respective webpages, either as an explicit course or in their course outline. Secondly, selection was based on the geographical accessibility of the institutes, which can be considered as purposive sampling (Cohen et al., 2011).

Scanning through the web brochures and course outlines of several programmes of the institutes, four tertiary institutes were selected. Two universities and two institutes

of technology and polytechnic were selected. Selection of participants from the institutions followed one criterion – ‘participants must be teaching critical thinking explicitly or implicitly in their course’. Two participants from each institution were selected based on the courses they teach in the institutions.

In order to protect the identity of the tertiary education institutes and the eight interview participants, pseudonyms were used throughout the research study. The following table represents the pseudonyms used for this research study in a tabular form.

Table 4: Information About Research Participants

| Participants | Institutions | Designation | Faculty |
|---------------------|---------------------|---------------------|---|
| Avril | Kaimata ITP | Senior Lecturer | Teaching (Early Childhood Education ECE) |
| Benoit | Kaimata ITP | Senior Lecturer | Social Work |
| Chris | Nelson University | Senior Lecturer | Philosophy |
| Daniel | Nelson University | Associate Professor | Philosophy |
| Earnest | Kaitaia ITP | Senior Lecturer | Computing and information Technology |
| Fred | Kaitaia ITP | Lecturer | Transport Technology |
| Grace | Napier University | Professor | School of Engineering & Advanced Technology |
| Hugh | Napier University | Lecturer | School of Nursing |

Initial contact with the participants was made by the researcher over phone. Institutional approval was sought upon receiving preliminary voluntary consent from the participants, providing the information sheet and organisational consent letter to the tertiary institutions, as seen in Appendices A and B respectively. The participants were then emailed information sheets, consent forms and interview schedules after securing institutional approval as seen in Appendices E, C and D respectively. Interview time for each participant was fixed at a time that was convenient to the interviewee. Interviews were conducted in the office of each participant. Participants were asked five interview questions as listed in the interview schedule in Appendix E. The semi structured interviews yielded rich data from the participants. This validated the preference of semi-structured interviews for this study.

3.6 Data Analysis

In documentary analysis, thematic coding was used to classify the representativeness, context and the authority of the documents searching for the themes that related back to literature for this study. The emergence of this new knowledge in data analysis was then used to inform findings as presented later in the next chapter.

Data analysis commenced after the transcriptions were verified and approved by the interviewees. Varied data necessitated a systematic method to analysis. Bryman (2012) asserts that there are no set rules to follow when it comes to maintaining large chunks of data in qualitative research. He further elaborates that key tasks are organizing and explaining the data in terms of the participants' meaning, noting any patterns, themes, categories and regularities. Such an interpretation leads to useful knowledge.

The following table for initial coding (Bryman, 2012) of the interview data was used to identify the developing codes relating to the literature themes. Cohen et al., (2011) state that "a code is a word or an abbreviation sufficiently close to that which it is describing for the researcher to see at a glance what it means" (p. 560). Coding helped to condense the data in some systematic form so it was manageable

(Bryman, 2012). Attaching codes to data and generating categories enabled to review what was articulated in interview data from the transcriptions.

Table 5: Initial Coding of Data

| | |
|--|----------------------------|
| Institution: Kaimata Institute of Technology and Polytechnic Interviewee: Avril | Coding Information: |
| Q 1 What do you mean by critical thinking? | |
| A 1 | |

After the initial coding, these codes were grouped together into sub-themes to present the data in new light. A table is used to present the sub-themes for each question. Participant quotes were presented under each question to assist the subthemes. Key data themes that emerged out of the sub-themes using ‘focused coding’ (Cohen et al., 2011) were presented in a table. Memos were used throughout the process to keep the relevant ideas and “not to lose track of the thinking in various topics” (Bryman, 2012, p. 573).

3.7 Validity and Reliability

To maintain the worth of research in higher academics, validity and reliability are very important. In this qualitative research study, the research questions were sought to review the perception of educators about the nature of critical thinking and the teaching strategies employed in developing critical thinking in students. Cohen *et al.* (2011) recognize the subjectivity of respondents, their opinions, attitudes and perspectives that potentially contribute a degree of bias to research and challenge the claim to reliability and validity in qualitative method. Threat to reliability and validity is contested by Agar (as cited in Cohen et al., 2011) who asserts that, in qualitative data collection, the intensive personal involvement and in-depth responses of individuals secure a sufficient level of validity and reliability.

Bryman (2012), on the other hand states, generalization is impossible in qualitative study, if the data collection tools do not portray numbers or frequency in results that

can offer to claim reliability. Validity in this research was strengthened by extracting the data from the interviews, i.e. data are presented in terms of the respondents rather than researchers (Cohen et al., 2011), and getting the transcribed data checked by the respective interviewee. This checking is another method of validation, called internal validity (Bryman, 2012).

Transcription in qualitative research is again a threat when it comes to reliability. Cohen et al., (2011) consider reliability as a fit between what the researcher records as data and what actually occurs. They call this issue 'transcriber selectivity'. Reliability in quantitative studies is concerned with issues of consistency of measures (Bryman, 2012). In qualitative studies it is associated with terms such as credibility, neutrality, conformability, dependability, consistency, applicability and trustworthiness (Cohen et al., 2011). Reliability in quantitative research can be assessed if another researcher follows the same procedures in order to measure the concept of a research, which is called replication, whereas replication in social research is not common (Bryman, 2012).

Reliability in this research study is simply based on real life experiences, honesty in data presentation, and comprehensiveness as emphasised by Cohen et al., (2011). Hitchcock & Hughes (as cited in Cohen et al., 2011), draw our attention to the fact that as the interviews are interpersonal, it is quite a challenging task to prevent influencing the interview. This researcher had to be very cautious of not delivering words during interview, while asking them questions that would suggest desired or expected responses. Denscombe (2003) has termed this as 'chimera', meaning a thing which is hoped for but is illusory or impossible to achieve.

To consolidate the validity and reliability in this research, methodological triangulation was used. It is one of the most widely employed triangulation types on offer (Cohen et al., 2011). Concerning this study, two research tools were used, documentary analysis and interviews. Triangulation in research methods fosters the confidence of the researcher. The apex notion of triangulation is to address reliability and validity. Triangulation assures these methods are consistent with an interpretive qualitative research design, as they allow participants a voice and the researcher to see through

the eyes of participants (Bryman, 2012). However, triangulation in this research helped largely to have a clear understanding of what is expected on paper through documentary analysis and what is delivered in practice through the semi-structured interviews. Cohen et al., (2011) encourage the use of triangulation to seek a holistic view of education outcomes.

3.8 Ethical Consideration

Due consideration was observed in this research to maintain ethical guidelines. Aims of ethical guidelines are to protect the participants and the researcher alike. Unitec Research Ethics Committee guidelines guided this researcher through the process of ethical design and conduct of the study. Bryman, (2012) has suggested four significant ethical considerations for researchers to avoid; namely, lack of informed consent; harm to participants; invasion of privacy; and deception. This research study has followed the core ethical issues of informed consent, confidentiality and anonymity, and minimizing harm to participants.

3.8.1 Informed Consent

As the words suggest, informed consent is obtaining permission from the human participants, and from the organizations to which the participants belong. Informed consent is a voluntary approval of the participant to take part in the research. Cohen et al., (2011) clarify that it offers the participants their right to freedom as well as it bestows upon them some responsibility if something goes wrong in the research. Bryman, (2012) affirms the necessity of obtaining consent of the participants and the organizations involved in providing the research facilities.

Cohen et al., (2011) suggest that obtaining organizational approval consolidates the researcher's position as 'serious investigator' (p. 81). As this study aimed at interviewing eight tertiary institute educators from four tertiary institutions, written permission was sought from each institution. At initial stage, institutional Ethics Committee or the Academic Dean of the institution was informed about the aims, purposes and methods of proposed research to get approval for conducting research interviews in their premises with two of their educators. Information sheets providing

the nature of the research were sent electronically. Only upon receiving participants' consent, information sheet, consent form and interview schedule were sent to them. Information sheets for participants and tertiary institutions, consent forms and interview schedule can be seen in the Appendices section.

Participants were given the chance of asking questions concerning any doubts about the nature of study before starting the interviews. No inducements were made to the participants for participating in the interviews. Additionally, participants were provided with the interview transcripts to review, change or add further information. Bryman (2012) considers participant validation as a significant feature of the research. The participants had the option of withdrawing from the research study until 15 days from the day they return the checked transcripts. It was explained in writing that after this time limit the data will be recognized as a part of the project.

3.8.2 Anonymity and Confidentiality

To ensure the anonymity and confidentiality of the organizations and participants, all the relevant criteria were observed in my research project. Cohen et al., (2011) affirm that it is the responsibility of the researcher to maintain the faith that the participants put in them for upholding their confidentiality and no information relating to participant must be made public. The transcripts, audio files and hard copy materials (Bryman, 2012) are stored in a password protected USB drive and in a locked cabinet, which is accessible only to this researcher and the principal supervisor. The stored data will be deleted after five years.

Anonymity in this research study was assured by the use of pseudonyms to describe the four tertiary educational institutions and the eight interview participants. Anonymity means any information provided by the participant must not be revealed in any way (Cohen et al., 2011). Pseudonyms were used throughout the process of transcription, data analysis and interpretation. Confidentiality and anonymity were guaranteed in writing to the participants and institutions in their respective consent forms.

3.8.3 Minimisation of Harm

To ensure the minimization of harm, piloting of interview schedule was organized before the interview phase in this study. This was done particularly to test if the interview questions caused any psychological distress. During the process of interview, participants were given the option of refusing to answer any questions; they did not wish to answer.

3.9 Summary

This chapter outlined the research methodology for this research project, and clarified the position of this study as interpretative constructivist qualitative research. Choice of semi-structured interviews and documentary analysis was explained with reference to key resources including Cohen et al., (2011), Bryman (2012), Denzin and Lincoln, (2005), Denscombe (2010) and Kvale & Brinkmann, (2009). Moreover, data analysis and process used were elucidated, followed by the criteria used for validity and reliability, as outlined by Cohen et al. (2011) and Bryman (2012). Finally, the ethical considerations in this research study were explained. Data findings from documentary analysis and semi-structured interviews are presented and analysed in the following chapter.

4 Chapter Four—Research Findings and Analysis

4.1 Introduction

In this chapter, data findings from documentary analysis and semi-structured interviews are presented and analysed. An examination of National documents established the relevance of critical thinking in tertiary institutions in New Zealand. A brief description of interview participants is provided before the interview data analysis. The interview schedule used for gathering the data is listed in Appendix E.

The chapter is presented in two parts:

Part 1—National documents are analysed in the first section. Initially the documents are analysed based on the way each of them identifies critical thinking. The thematic coding of national documents follows the initial analysis.

Part 2—In the second section, the data collected in eight semi-structured interviews are presented. The interview schedule questions are stated at the beginning of the interview data analysis. The categories identified from each interview question are presented in tables. The process then derives key themes from these categories; subsequently these key themes become linked back to the research questions. A subsequent process derives data themes from the key themes.

4.2 Analysis of the Documents

As stated earlier in chapter three, the Tertiary Education Commission (TEC) is jointly monitored by Ministry of Education (MoE) and Ministry of Business, Innovation, and Employment (MBIE). “The TEC is uniquely placed in its role between the educational and economic domains as a steward of the tertiary education system” (Tertiary Education Commission, 2014, p. 7). TEC is charged with giving effect to the [Tertiary Education Strategy 2014-19](#) (Tertiary Education Commission, 2015a). The Tertiary Education Strategy sets out the government’s long-term strategic direction for tertiary education (Ministry of Education, 2015). “This strategy highlights the need to build

international relationships that contribute to improved competitiveness, support business and innovation through development of relevant skills and research and improve outcomes for all” (Ministry of Education, 2015, p.1). The strategy acknowledges the need to provide a skilled labour force to the industry in New Zealand. Employers are finding it difficult to find staff with relevant skills (Ministry of Education, 2015).

The Tertiary Education Strategy strives for an engaging tertiary education system with a holistic approach for students, with strong links to industry, community and the global economy (Tertiary Education Commission, 2015b). The focus is placed on science, technology, engineering, and mathematics. The strategy places substantial demands on tertiary education organisations for the development of transferable skills such as ability to communicate, interpretation of information, critical and logical thinking (Ministry of Education, 2015). In addition to the content and vocation-specific skills within the qualification, obtaining and developing transferable skills is the ‘most crucial outcome’ of tertiary study (Ministry of Education, 2015).

The Tertiary Education Commission produces the Statement of Intent. It sets out the objectives and performance commitments of the Tertiary Education Commission for the next four years. One of the three impacts outlined in the Statement of Intent that TEC plans to achieve is “a tertiary system that is more responsive to the needs of employers and learners” (The Tertiary Education Commission, 2014, p. 23; The Tertiary Education Commission, 2015a, p. 9). This impact is targeted at national as well as regional levels to respond to changes in learners and needs of community and employers. To achieve this impact, greater focus is placed on learner outcomes in the Statement of Intent 2015/16-2018/19, whereas the Statement of Intent 2014-2018 entails the expectation of development soft and transferable skills and capabilities such as teamwork, communication, problem solving and the ability to navigate ambiguous situations. The Statement of Intent highlights the needs of employers for ‘graduates with transferable skills’ and ‘future-proof’ graduates for roles that yet do not exist in the economy (Tertiary Education Commission, 2014, p. 13). Additionally, also recognising the needs of the learner, TEC expects learner

outcomes that reflect an improved social, cultural and economic success for the students.

The following table outlines the analysis of documents in the context of critical thinking.

Table 6: Analysis of National Documents in Critical Thinking Context

| Documents | Analysis criteria—how the documents refer to or describe critical thinking | | | | | |
|--|--|--|--|--|--|--|
| | Mentions critical thinking | Identifies critical thinking as a learning outcome | Emphasises teaching of critical thinking | Emphasises assessment of critical thinking | Demands evidence of students' learning critical thinking | Gives reasons why critical thinking is important |
| Tertiary Education Strategy 2014/2019 | ● | ● | ● | × | × | ● |
| Statement of Intent 2014/2018 | ● | ● | ● | × | × | ● |
| Statement of Intent 2015/16/2018/19 | ● | ● | ● | × | × | ● |
| Key ●—Document contains the reference or description. ×—Document does not contain the reference or description. | | | | | | |

Overall, these documents present a vivid picture emphasizing the development of soft and transferable skills, improving the learner outcomes in tertiary education. The documents provide ample justification for the demand in the soft skills with excerpts as follows: “respond to mismatches between requirements of the labour market and the skilled graduates” (Tertiary Education Commission, 2014, p. 8), and to equip graduates with “skills that meet employers need” (Tertiary Education Commission, 2015b, p. 5).

Further, these documents state needs for the following criteria:

- “a more highly skilled, adaptive, innovative and productive workforce” (Tertiary Education Commission, 2015b, p. 10),
- “improved economic, social and cultural outcomes for the graduates” (TEC, 2015a, p. 12),
- “equip all New Zealanders with the knowledge, skills and values to be successful citizens of the 21st Century” (Tertiary Education Commission, 2014, p. 16),
- “skills to future proof graduates for roles that yet do not exist in the economy” (Tertiary Education Commission, 2014, p. 13), and
- “more graduates with skills valued by the employers” (TEC, 2014, p. 19).

Likewise, it is also observed that the strategy places the responsibility on tertiary education organisations to achieve these results (Ministry of Education, 2015).

To provide a greater focus on learner outcomes and the needs of employers, the TEC provides incentives to tertiary education organisations. The TEC’s focus is on funding and monitoring tertiary education organisations. The success indicators according to the TEC for each of the tertiary education organisations are primarily based on the success and retention of the students in an academic year, stated as, “an increased proportion of the population with a tertiary qualification” (Tertiary Education Commission, 2014, p. 15).

No demands are made from TEC for any specialised assessments for students that may test the attainment of transferable skills in students during their tertiary study. There are no provisions found to encourage the development of transferable skills in the tertiary education strategy. By contrasts, to encourage research excellence in the tertiary education organisations, the TEC provides the Performance-Based Research Fund and the Centres of Research Excellence fund to tertiary education organisations (Tertiary Education Commission, 2014, p. 23). References to quality assurance for the development of transferable skills in graduates are found barely in the Statements of Intent and the Tertiary Education Strategy.

The Tertiary Education Strategy acknowledges international students provide an important source of income to New Zealand; nevertheless, the strategy sees international education as an opportunity to improve the value delivery by tertiary education (Tertiary Education Commission, 2014). International education is listed as a financial agenda for the tertiary education sector in New Zealand (Tertiary Education Commission, 2015b) and equal educational benefits are illustrated for the international students and the domestic students in the Statements of Intent 2015/16-2018/19. Provision of system-wide support to international students is mentioned by TEC under the Leadership Statement for International Education (Tertiary Education Commission, 2014). Moreover, TEC in the Statements of Intents outlines the integration of an international component not only in the courses and curriculum, but in the community as well. International students are considered as an important component of New Zealand education system.

Using thematic coding (Bryman, 2012) the documentary analysis produced 10 codes. The following table describes the three categories: *Accountability*, *Fundamental skill* and *Flawed accuracy* that were derived from the codes. The three national documents hold tertiary educational institutes accountable for the development of critical thinking. The documents consider critical thinking to be one of the fundamental skills listed necessary in graduates, but no clear guidelines are provided for the compliance for the development of generic skills in students. The analysis of documents indicates flawed accuracy in the measurement of generic skills including critical thinking skills for students in tertiary institutes.

Table 7: Documentary Analysis

| Categories | The Tertiary Education Strategy | The Statement of Intent 2014-2018 | The Statement of Intent 2015/16-2018/19 |
|--------------------------|---------------------------------|-----------------------------------|---|
| Accountability | Yes | Yes | Yes |
| Fundamental skill | Yes | Yes | Yes |
| Flawed accuracy | Yes | Yes | Yes |

4.3 Summary 1

Data from the three government documents in this study are coded using thematic analysis (Bryman, 2012). Data illustrates that the government acknowledges generic skills (including critical thinking) to be of prime importance for the social, economic and cultural progress of New Zealand (Tertiary Education Commission, 2014, p. 16) and that equally recognises the goal of education is to prepare graduates for successful citizenry. The New Zealand government bestows the essential task of developing soft and transferable skills in graduates on tertiary education organisations (Ministry of Education, 2015). To fulfil the demand from employers, the tertiary institutes are counted accountable for development of these skills in students. Delivery of generic skills is planned in policies and strategic plans. Critical thinking is deemed as a fundamental skill for graduates, and at large, for the business, industry, community, society and New Zealand (Tertiary Education Commission, 2015b, p. 10). Government demands from educational systems to develop New Zealand students with skills required to prosper socially, culturally and economically (Jones, 2015). The monitoring and funding function of TEC is observed to be driven by the quantity of students finishing the qualification (Tertiary Education Commission, 2014, p. 24), but measures to ensure the quality of soft and transferable skills in graduates are found insufficient. Though the outcome is expected from the institutes, there is lack of quality compliance for skills development in the documents.

The two terms that concurrently appear in the key themes are **Students** and **Systems**. National documents analysed for this study pinpoint that it is necessary to cultivate students with skills, additionally, they lay this responsibility on tertiary educational institutes. The need for development of skills including critical thinking is sought from variety of systems—businesses, employers, government agencies, educational bodies as well as local communities and society as a whole. Thus, systems initiate the need for the development of skills in students in tertiary educational institutions.

4.4 Interview Data Analysis

The Research Participants

The purpose of the interviews was to collect tertiary educators' perceptions of critical thinking. Purposive sampling (Bryman, 2012) was used for this study as all the participants were to be tertiary educators, teaching critical thinking in their curriculum, explicitly or implicitly. Institutional websites were searched to locate the participants. Initial calls were made to engage the participants and receiving their positive interest, institutional consent was sought providing the information sheet and organisational consent letter to the tertiary institutions, as seen in Appendices A and B respectively. Interview schedule was emailed to the participants along with the information sheet and the consent form seeking their voluntary participation. These forms can be seen in Appendices E, C and D respectively.

As explained in chapter three, pseudonyms were used throughout the research study to protect the identity of institutions and the eight interview participants. Eight interviews were conducted as a part of this study. Interviews were guided by the interview schedule (attached as Appendix E), which was approved by the Unitec Research Proposal Committee and Unitec Research Ethics Committee.

Questions one, two, and three sought to collect data for the first theme of this research study: nature of critical thinking; and questions four and five obtained answers for the next theme: teaching of critical thinking.

The interview participants were asked the following questions listed in the Interview Schedule.

Question 1. What do you mean by critical thinking? This question was designed to ascertain the nature of critical thinking in interviewees' words.

Question 2. What do you believe to be the components of critical thinking? This question was designed to enquire the core elements of critical thinking according to the interviewees.

Question 3. What teaching strategies do you use to develop critical thinking skills in students? This question was designed to understand the current teaching strategies employed by the interview participants for development of critical thinking in students.

Question 4. How do you come to know that students have acquired the critical thinking skills through your teaching in class? This question was designed to help codify the existing practices used to test the development of critical thinking in students.

Question 5. Is there any evidence that can demonstrate the development or define the conditions under which the critical thinking skills are developed to their best? This question was designed to find the factors that facilitate or hinder the development of critical thinking in students.

Question one asked: What do you mean by critical thinking?

Question asked the participants about the meaning of critical thinking. Critical thinking being a vast subject, a variety of perceptions was observed in the responses. It is interesting to note that all the participants gave the meaning of critical thinking based in the context of their respective subject areas.

I have provided each educator's meaning of critical thinking (see Table 8) in their own words below. The following comments may be referred to as raw data (Cohen et al., 2011; Bryman, 2012), but it is interesting to note the similarities and differences across the perspectives.

Avril defined critical thinking as:

Critical thinking for students is to get them to look at the bigger picture and not just to see their own perspective, but to kind of work out first of all who are all the participants, the stakeholders and the issue at hand and how does the decision that might be made affect each one of them differently.

Table 8: Educators' Perception about Meaning of Critical Thinking

| Categories | Number of Responses |
|-----------------------------|----------------------------|
| Integration | 8 |
| Multiple Perspective | 8 |
| Analysis | 8 |
| Inquisitiveness | 8 |
| Evaluation | 6 |
| Creative thinking | 6 |
| Informed thinking | 5 |
| Strategic thinking | 4 |
| Implication | 3 |
| Reconstruction of knowledge | 2 |
| Logical reasoning | 2 |

Educator Benoit had a different vision of critical thinking:

Critical thinking is challenging to some extent the dominant cultural, interpretivist thinking and positive thinking. I think critical thinking includes, validates, certainly considers and recognises indigenous thinking.

She justifies further the stand for the indigenous perspective as:

I think that with the recognition of indigenous knowledge as being a valid way of seeing the world, I think critical thinking then becomes quite local and the knowledge of critical thinking becomes localised; there is no more acceptance of universalised kind of generalised understanding of the world. And if critical thinking challenges

what is universal then that means what I do locally becomes valid and the knowledge and the construction, if you like, of that knowledge becomes valid; where perhaps it might not have been recognised.

Educator Carlos consolidates critical thinking as:

It's thinking that is informed to avoid mistakes and to seek proper kind of structure. So it's critical in the sense that it's not so much about the content of what you think about but how you approach thinking about a subject; how you are given information and how you infer information from a body of information. What are legitimate rational moves, and maybe more applied is to finding your way to have good reasons that support what you believe and be able to give these reasons in a logical manner that actually supports the beliefs.

He further adds that:

It is a sort of interaction between what we believe in and how we can justify what we believe in, and just trying to make sure that we have good justifications for our beliefs.

Educator Daniel describes critical thinking as:

A set of skills, which allows people to assess claims and information they come across, in order to work out the likelihood that it's true.

Educator Fred affirms the basic subject specific knowledge as critical for critical thinking. He explains:

It means that the learners have developed skill sets to identify an issue or problem and critically think about how to solve it. They also need to have the basic understanding and subject knowledge. A sound foundation will enable the learners to identify the problem, have some understanding, and through critical evaluation work out strategies of how they would address the issue/problem. Analyse it and through mental reconstruction, new solutions and ideas can be formed. Knowledge,

application, evaluation, reflection and reconstruction are key elements that foster the ability to think critically. In a nutshell, this is what I believe what critical thinking mean.

Educator Grace has a different opinion for critical thinking. She says:

My perception of critical thinking is about the ability to question hard rather than just accept what information is put in front of you. So it is about students' learning I guess. Problem one is not believe everything that is on the net as gospel; and to be able to take what they already know and integrate it, and to probe and to question and to analyse and to seek further information where they think it doesn't add up.

Educator Hugh sees critical thinking as:

Thinking outside the box and what is over that perhaps a student would think about that would come from a text book or a piece of literature and that, but what does it actually mean? Thinking between the lines is critical thinking.

A considerable significance to team spirit is presented by him for critical thinking by saying:

I can think about a problem and come up with some solutions but it is always another person who can add to that, in ways that you never thought of as well. I think you cannot be a critical thinker personally and professionally by yourself, but when there is a team it just adds to the whole idea of critical thinking and it becomes very dynamic.

Educator Earnest gives two notions of critical thinking, one as the strategic thinking that is time bound, and other is thinking deep about a context. In his words:

I think of critical thinking as when a student is able to look, in that particular field, at a viewpoint which he had not thought of earlier. Whether he revisits or thinks about it as a result of further enquiry on the subject, internet or skills, or whatever; but then he is able to see other standpoints. Sometimes it would be just a thing in terms of time dimension; like a strategic area that affects not just him but affects other members of

the organisation, for instance... normally critical in that sense that it is strategic, would also imply strategy.

He further pinpoints:

One is looking at a small thing, not necessarily strategic to the organization, but in-depth looking at a particular subject area and able to see something new.

Educator Grace agrees with Earnest on the latter notion of deep thinking about the context. As she describes:

To dig and delve a little bit deeper.

Grace and Fred gave attention to students' wisdom and intellect in their perception about critical thinking. Educator Carlos and Daniel are in accord for logic and reasoning as integral parts of critical thinking, whereas Educator Avril and Hugh believe in the idea of seeing a context from different perspectives.

Supplementing these perspectives Benoit promotes:

Indigenous thinking as the way of critical thinking.

Alternatively, Carlos raised a concern over teaching critical thinking, namely:

In terms of skills, something I am thinking about is one fear I have when I teach critical thinking is to create people that can defend any view they have and that's really annoying.

Question two asked: What do you believe to be the components of critical thinking?

The participants identified and explained various skills denoting the components of critical thinking (see Table 9). The following table presents all the skills mentioned in the interviews by each of the participating educators and the frequency of how many educators have agreed in accordance for the particular skill.

Table 9: Components of Critical Thinking

| Categories | Number of responses |
|----------------------|----------------------------|
| Analysis | 8 |
| Multiple perspective | 8 |
| Reasoning | 8 |
| Inquisitiveness | 8 |
| Integration | 8 |
| Synthesis | 8 |
| Able to discuss | 8 |
| Open to challenges | 8 |
| Reflexive thinking | 8 |
| Implication | 8 |
| Communication | 8 |
| Creative thinking | 6 |
| Flexible | 6 |
| Decision making | 5 |
| Fair-minded | 5 |

Apart from the above given list of components, some educators suggested a few other fundamental components of critical thinking. Earnest holds students' motivation and attitude extremely crucial components for critical thinking, as he commented:

You can take a horse to water but you can't make it drink.

A new component for critical thinking was identified in the data, 'creation stories'. It is not found in the literature reviewed for this study. Creation stories according Benoit are the stories of struggle faced by mankind in the past decades (world wars, natural calamity, and psychological stress). Benoit said critical thinking is based in our 'value system'. As presented in her words,

I think [a] component of critical thinking is creation of story; how a creation story informs our values and how our values then inform what we think, what we feel and what we do.

According to Hugh, having time to think in a situation is a component that helps to re-evaluate our thinking. He said:

It is a luxury when you have time to think about a situation.

Educator Daniel identified responsibility as a core component of critical thinking:

They [students] ought to take this [critical thinking] seriously.

Question three asked: What teaching strategies do you use to develop critical thinking skills in students?

The participants mentioned various strategies for developing critical thinking. The following table represents all the strategies mentioned in the interviews by each of the participating educators.

Table 10: Strategies for Teaching Critical Thinking Skills

| Strategies | Avril | Benoit | Carlos | Daniel | Earnest | Fred | Grace | Hugh | Total number of responses |
|-------------------------------|--|--|--|--|--|--|--|--|---------------------------|
| Socratic questioning | <input type="checkbox"/> <input type="checkbox"/> | 8 |
| Discussion | <input type="checkbox"/> <input type="checkbox"/> | 8 |
| Communication/ Interaction | <input type="checkbox"/> <input type="checkbox"/> | 8 |
| Assessment/ Feedback | <input type="checkbox"/> <input type="checkbox"/> | 8 |
| Lecturing | <input type="checkbox"/> <input type="checkbox"/> | 8 |
| Real life experiences | <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> | 7 |
| Working in Groups | | | <input type="checkbox"/> <input type="checkbox"/> | 6 |
| Inquiry based learning | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | 6 |
| Debates | <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> | | 5 |
| Problem-based learning | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | 5 |
| Scenario-based teaching | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | | | <input type="checkbox"/> <input type="checkbox"/> | 5 |
| Visual Thinking System | <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> | | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | 4 |
| Constructive Learning | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | | 4 |
| Writing | <input type="checkbox"/> <input type="checkbox"/> | | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> | 4 |
| Research | | | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | 4 |
| Case Studies | <input type="checkbox"/> <input type="checkbox"/> | | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | | 3 |

Table 10: Strategies for Teaching Critical Thinking Skills (continued)

| Strategies | Avril | Benoit | Carlos | Daniel | Earnest | Fred | Grace | Hugh | Total number of responses |
|------------------------------|--|--|--------|--------|--|--|--|--|---------------------------|
| Role Modelling | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | | | | | | 2 |
| Motivation | | | | | <input type="checkbox"/> <input type="checkbox"/> | | | <input type="checkbox"/> <input type="checkbox"/> | 2 |
| Group Presentation | | | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | | 2 |
| Peer Learning | | | | | | <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> | 2 |
| Peer Reviewing | | | | | | <input type="checkbox"/> <input type="checkbox"/> | | <input type="checkbox"/> <input type="checkbox"/> | 2 |
| Project-based learning | | | | | | <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> <input type="checkbox"/> | | 2 |
| Positioning/Creation Stories | | <input type="checkbox"/> <input type="checkbox"/> | | | | | | | 1 |
| Hui Tahi | | <input type="checkbox"/> <input type="checkbox"/> | | | | | | | 1 |
| Indigenous positioning | | <input type="checkbox"/> <input type="checkbox"/> | | | | | | | 1 |
| Karakia/Waiata | | <input type="checkbox"/> <input type="checkbox"/> | | | | | | | 1 |
| Spirituality | | <input type="checkbox"/> <input type="checkbox"/> | | | | | | | 1 |
| Understanding our history | | <input type="checkbox"/> <input type="checkbox"/> | | | | | | | 1 |
| Industry integration | | | | | | | <input type="checkbox"/> <input type="checkbox"/> | | 1 |
| Flip Classrooms | | | | | | | <input type="checkbox"/> <input type="checkbox"/> | | 1 |
| Inter-disciplinary learning | | | | | | | <input type="checkbox"/> <input type="checkbox"/> | | 1 |

From the data reviewed in this question, it is interesting to notice that there are a few strategies that are mentioned either by Benoit or Grace, but none of the other participants ever mentioned them throughout the interviews. For example, Benoit puts forward the concept of 'Hui Tahi' (meeting) for critical thinking as:

I think as people bring themselves present into the room then I think critical thinking is more likely to occur in terms of taking care of people emotionally and being able to say what they need to clear their minds for the day's learning. I think that has been a crucial part of enabling and developing critical thinking. Spirituality is a way of thinking and that helps us in critical thinking.

Grace encourages interdisciplinary learning to foster critical thinking, as expressed in her words,

It's about teaching the wealth of inter-disciplinary and I think that's what we need to learn to do more.

Grace relates questioning to reflection as she maintains:

So I guess it's reflection on what you know, seeking more information, being able to query that information for truth and do a gap analysis to look for what else you need to know.

Fred admits that discussions not only help teachers facilitate teaching, but in disguise they are tools for their learning too. He says:

Through certain discussions in class, we have group discussions about a certain topic. The feedback you get from some of the groups or some of the individuals is very in-depth. Sometimes as an educator you learn from them too and that's the way it should be.

Hugh notifies benefits of the discussion method as:

Discussion where you can push boundaries and ideas and thoughts, and challenge them again on things on a professional, personal, cultural level as well.

In contrast, Avril views discussion as a challenging method for diverse classrooms. She explains:

It is difficult because you get a lot of different ethnicities who don't like discussion for a start and to put forward something in a classroom is not culturally appropriate; to question something is not culturally appropriate.

Assessments were considered essential for teaching critical thinking; Avril illuminates this point as:

So the classroom is one platform in which you can teach but I'm coming now to learn that actually the feedback on the assignment is also a place where I can teach.

The broad list of strategies listed in the table above are categorised as didactic teaching and collaborative teaching for easy handling of the data. Primarily, collaborative teaching strategies like discussions, debates, sharing real-life experiences are employed by educators to develop critical thinking in students. Lecturing (though a didactic teaching strategy) is employed by all the interview participants. It is worthwhile, noticing the variation of strategies educators employ depending on their subjects. In summary, an amalgam of teacher-led and student/teacher collaborative strategies emerges from the data.

4.5 Summary 2

A summary of findings after first three interview questions is required here as a strong emerging data theme concurrently appears in all the three questions: the emphasis on the role and responsibility of the **students** themselves in the development of critical thinking skills.

Twenty-four categories in all from the first three interview questions lead to three key themes: cognitive skills; disposition and interaction. These three key themes are subsumed into the data theme: **Students**. Emphasis on the role of students was reiterating throughout the data. Skills and dispositions mentioned are about students

and teaching strategies discussed were mostly interactive with students. The student is placed at the centre of the interview data of the first three interview questions.

A key finding under the data theme **student** has emerged in the data: Educators face difficulty with international students. Further discussion on this key finding is provided in chapter 5.2.

Table.13 represents the twenty-four categories and the corresponding key themes located in the coding process.

Table 11: First Coding Table

| Interview question | Categories | Key themes | Data Theme |
|---------------------------|-----------------------------|-------------------|-------------------|
| 1 and 2 | Integration | Cognitive Skill | Students |
| | Analysis | | |
| | Logical reasoning | | |
| | Evaluation | | |
| | Creative thinking | | |
| | Communication | | |
| | Strategic thinking | | |
| | Implication | | |
| | Reconstruction of knowledge | | |
| | Synthesis | | |
| | Able to discuss | | |
| | Reflexive thinking | | |
| | Decision making | | |

Table 11: First Coding Table (continued)

| | | | |
|---|-------------------------------|-------------|--|
| | Inquisitiveness | Disposition | |
| | Multiple perspective | | |
| | Open-mindedness | | |
| | Open to challenges | | |
| | Flexible | | |
| | Fair-minded | | |
| | Inquisitiveness | | |
| | Open to different perspective | | |
| | Self-directed | | |
| 3 | Didactic teaching | Interaction | |
| | Collaborative teaching | | |

Question four asked: How do you come to know that students have acquired the critical thinking skills through your teaching in class?

The participants' responses for the strategies employed for checking the acquisition of critical thinking skills in students are listed in the following table.

Table 12: Checking for the Acquisition of Critical Thinking

| Categories | Number of responses |
|-----------------------|----------------------------|
| Classroom discussions | 8 |
| Assignments | 6 |
| Research | 3 |

Avril and Grace both accord classroom discussions as an effective method to know the development of critical thinking in students.

Grace clearly justifies the rationale as:

It's possibly more in terms of conversation with the student rather than in written work that you actually see it. It's when they want to debate something with you so it is in conversation rather than written because written is often, I guess, more formal and where they think it's assessed they're going to write the party line, where in a conversation they might be more prepared to engage in debate.

Avril in accord with Grace commented:

First of all in our conversations in class; whether they're able to question on the spur of the moment what the conversation is saying.

Carlos, Daniel and Grace find huge class size detrimental for discussions. Carlos expressed his concern as:

How can you try to have a good discussion on being vegetarian with 500 people?

Benoit sees the acquisition of critical thinking skills in students as they are able to find their positioning in the world, she says:

I think so because they're being able to reconcile the tensions that are causing the conflicts.

Carlos is not sure whether the system of assessment is a sure way to say that they have acquired the critical thinking skills. He expressed his doubt as:

I don't know whether or not it (assessment) works; it's a controversial question I think in general.

Daniel acknowledges the limitations of assessment as:

What we find out is not really whether they can do it (critical thinking), but whether they can pass our tests.

Variations in the credibility of assessments are found in the data. Writing and classroom discussions, though considered as effective tools to ascertain student's critical thinking, each of them have their own limitations.

Question five asked: Is there any evidence that can demonstrate the development or define the conditions under which the critical thinking skills are developed to their best?

The participants' responses for the conditions under which critical thinking skills are developed are listed in the following tables. Participants provided a variety of factors that facilitated or hindered the development of critical thinking.

All the educators mentioned certain factors that facilitated the development of critical thinking skills. The above table represents factors that foster the development of critical thinking in students, as mentioned in the interviews by each of the participating educators.

According to Earnest, students' interest in the subject is the primary facilitator for teaching of critical thinking. He says:

When they (students) are made to study by force they are not interested; they don't even care. They are very casual at school; but later a professional field of their choice seems to engage them better.

Daniel lists environment as an effective facilitator to learn critical thinking skills. He says:

Probably the most effective way to develop this, actually, is not through courses like ours; but just living in an environment where you sit around with your parents, where your family argues about things. I mean, that's where most people learn this.

Additionally he speculates:

I suspect people who can do this are getting it from their families actually, much more than from educators.

Table 13: Facilitators for Development of Critical Thinking

| Categories | Number of responses |
|----------------------------|----------------------------|
| Inquisitiveness | 8 |
| Multiple perspective | 8 |
| Open-mindedness | 8 |
| Logical reasoning | 8 |
| Self-directed | 8 |
| Comfort /security | 8 |
| Discussion | 8 |
| Motivation | 8 |
| Feedback | 8 |
| Trust | 6 |
| Engaging | 6 |
| Clarity of purpose | 6 |
| Transparency of guidelines | 5 |
| Relevance of subject | 5 |

Barriers for teaching of critical thinking

A concern was raised by all the educators about the following barriers for development of critical thinking.

Table 14: Barriers for Development of Critical Thinking

| Categories | Number of Responses |
|-------------------|---------------------|
| Students attitude | 7 |
| Culture | 6 |
| Family | 6 |
| School | 5 |
| Lack of resource | 5 |
| Time | 4 |

Students' attitude towards learning critical thinking was one of the important factors for the learning of the skills. Earnest commented, as:

You can take a horse to water but you can't make it drink.

Grace equally agrees to this point as she mentions:

Different students take it different ways and some are really embracing the concept of thinking differently and looking outside the square; for other people that's a stretch. There will be growth for different students at different levels.

Avril ruminates about students who are at disadvantage of family time that scaffolds the development of critical thinking. She says:

Most families don't sit around the dinner table and have those kinds of discussions so you have to teach the skills otherwise it doesn't work.

Fred exalted the role of school in developing critical thinking by saying:

And then you have the ones that sort of come ready; they come straight from school and they already know about enquiry based learning and all those things.

On the contrary, Avril expressed her concerns for the failure of schools in developing critical thinking capacities of students. Lack of developed critical thinking skills in her students is expressed by her as:

Well I don't know where my guys have been then.

She adds to her dolor:

I am shocked that some of my students don't know how to read and pull out the core points, how to make notes so that they can pull them into an assignment.

4.6 Summary 3

All twenty-three categories were identified from the data from the last two interview questions. Some of the categories for example cognitive skills, interaction, and disposition appear to be overlapping, as they are present in the previously presented data. It is noteworthy to find that interaction in this context describes the personal approach a teacher takes in a class, as compared to previous section, which describes communication with students. The twenty three categories lead to four emergent key themes: assessment, relationship, environment and interaction. Two data themes concurrently appear in the data: **Systems** and **Teacher**, as illustrated in the following table.

Two key findings under **Systems** are built up from the data:

- Lack of clarity about critical thinking prevails in tertiary education institutes.
- There is no quality assured for the development of critical thinking in students in tertiary education institutions in New Zealand.

One key finding under third data theme **Teacher** has emerged:

- A longer relationship between the student and teacher facilitates critical thinking.

Table 15: Second Coding Table

| Interview question | Categories | Key themes | Data Theme |
|---------------------------|-----------------------|-------------------|---------------------|
| 4 and 5 | Communication | Interaction | Teacher; Systems |
| | Feedback | | |
| | Relevance of subject | | |
| | Clarity of purpose | | |
| | Clear guidelines | | |
| | Classroom discussions | Assessment | |
| | Assignments | | |
| | Research | | |
| | Trust | Relationship | |
| | Comfort/security | | |
| | Motivation | | |
| | Time | | |
| | Engaging | Environment | |
| | Family | | |
| | School | | |
| | Culture | | |
| Lack of resource | | | |

4.7 Brief Summary

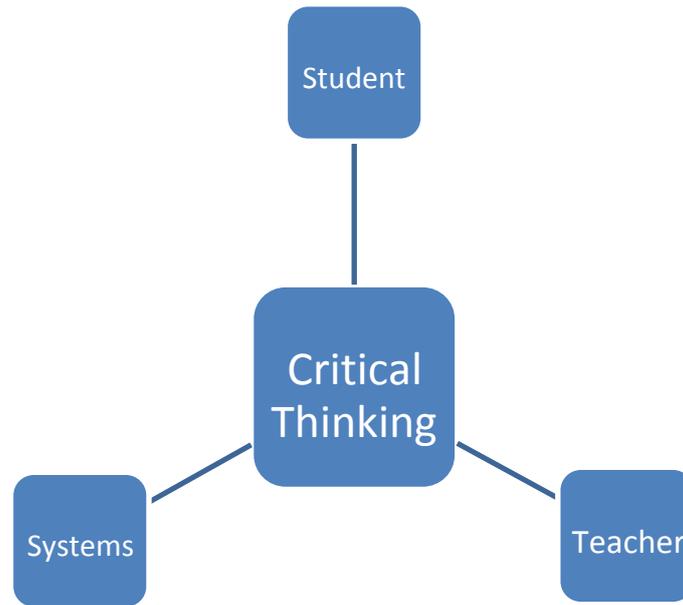


Figure 1: Critical Thinking Relationship and Entities

Data findings from the interviews and documentary analysis were presented in this chapter. In all, there were forty-seven categories. These categories were grouped into six key themes: cognitive skill, disposition, interaction, assessment, relationship, and environment. By contextualising the meaning in key themes, three data themes are generated: **Student**, **Teacher** and **Systems**. In the next chapter, discussion and interpretation of key finding is presented. Figure 1 represents the relationship between the three data themes in relation to critical thinking.

5 Chapter Five—Discussion

5.1 Introduction

In this chapter the themes emerging out of the data from documentary analysis and semi-structured interviews are further interpreted and discussed in relation to the literature review in chapter two.

5.2 Educators face difficulty with international students

This study found that there is a great emphasis placed on the role of the students. As discussed in the literature review, the Delphi report (Facione, 1990) recognises the role of the learner as important for development of critical thinking. This study reinforces and provides detailed findings as exemplified in educators' words, inquisitiveness, concern to be well informed open-mindedness, willingness to reconsider and revise views, flexibility in considering alternatives, understanding of opinions of other people, self-confidence in one's own ability to reason are all important dispositions to learn and use critical thinking. These criteria are covered by certain authors (Nosich, 2012; Paul & Elder, 2002; Facione, 1990) as traits of ideal critical thinker.

The findings of this study point toward common distress educators have around students from different cultures and ethnicities in the classes. As noted in the literature review, Ennis (1998) highlights how ethnicities and cultural perspectives prove an impediment for critical thinking in classrooms, through the example of Inuit of Canada and Amish of North America.

Avril is upset about students who refrain from questioning. She comments:

It is difficult. You get a lot of different ethnicities who don't like discussion for a start and to put forward something in a classroom is not culturally appropriate; to question something is not culturally appropriate. Hugh comments:

There are students that just do not get it and do not say anything in class, but they come up after class when everybody has gone.

As stated in literature review, Brookfield (2012) writes that students learn better through class interactions where all the students take part willingly and clear their doubts. This learning is missed when students do not speak up in class. This current research showcases the hidden impact of cultures in classrooms. The literature review in chapter two narrates the eminent role of culture for development of critical thinking in students. This study validates that the role of the culture is crucial in the development of the dispositions necessary for critical thinking.

Student's prior education systems were also considered as an impediment to learning critical thinking by four participant educators. Grace struggles hard to impart the concept of critical thinking to Asian students. She states:

It's a big stretch for Asian students; as some can do it (critical thinking); to be able to grasp the concept that I want them to think and not parrot. It's a paradigm shift for them and for postgraduate students it can take them a couple of years to get that.

On an evaluative scale Earnest mentions:

If you go to the Nobel prizes list, you will see majority of them are from Israel Jews. There are Europeans, from the West, and Indians, but very few from other parts of the world. It tells you about the kind of philosophical perceptions related to critical thinking.

All the educators wanted students to enquire; to ask questions; to seek further information rather than just believe what teachers are saying as 'sage on stage', or as Grace mentions,

That's a cultural thing; especially the Asian cultures, where they think that because that's what they have been trained to do. The professor is a master and you win points for parroting.

The question here arises that every year international students come to New Zealand universities for higher education, so how will this problem be solved by the education system and how can the quality assurance of learning outcome for these international

students be assured? This research highlights the woes international students face when they come to New Zealand for a higher education. Some international students indeed face a huge paradigm shift in patterns of education. The research finding indicates Tertiary Education Commission there is an urgent need to address this issue for the benefit of international students. New Zealand teachers, who always aspire to facilitate better learning outcomes, might consider this as a priority.

5.3 A longer, dedicated educational relationship facilitates critical thinking

A relationship among students and educators nurtured by time and motivation provides security and comfort to students to raise their doubts and concerns in class. This study identified that such a relationship among students and educators plays an important role for development of critical thinking, in keeping with Brookfield (2008), trust in their educators promotes confidence in students. For example, a student fixed an audio system in a car in the presence of educator Fred. This was a new experience for the student but he managed to do everything on his own. Educator Fred was pleasantly surprised at his new skill. The point the interview data makes is that even challenging tasks can be accomplished if the support system for such learning is motivating and trusting. It makes a difference in the learning when the students are familiar with the teacher.

Contradiction in this notion is seen when a same course is taught by different educators, depending on the availability of the educators. In case of a term-length course on critical thinking, hardly any rapport is developed among students and teachers and it becomes difficult for the students to relate to the essence of the subject. Additionally, the data suggests students choose a term-length critical thinking course to fill up the needed credits for their degree completion (Barnett, 1997). The true gist for the course design is highly neglected (Lumpkin et al., 2015). Educators Carlos and Daniel agree that once they have taught the core content of the course through lecture method to a class of 100 students they hardly know who their students were. On the contrary we see educators Avril and Grace who try hard to raise the awareness of critical thinking in students over a span of three years.

Participant educators acknowledged that critical thinking is a time-bound process. It may take years for students to know what critical thinking is, in terms of the educational process. The data suggest teachers will be able to foster the development of critical thinking when they are with the same students for longer duration of time.

The research data indicates that lectures are used as the main mode for transmitting information to students. Further discussion of these topics is followed in smaller groups of students, by different tutors in the tertiary institutions. Students and tutors in such groups lack the required rapport that fosters honest, open, and critical discussions, as students have to adjust to different teaching styles with varying tutors. As noted earlier, an ambience of trust between student and teacher promotes development of critical thinking in students.

5.4 Lack of clarity about critical thinking in tertiary education institutes

The only reason for providing a long trail of definitions of critical thinking in the words of the educators in chapter four was to indicate the diverse perceptions of the educators. As mentioned in chapter four, the meanings of critical thinking were contextualised by the educators in terms of their respective subject, as exemplified by examples such as: “thinking outside the box”, for nursing educator Hugh, where one has to teach to deal with new situations every day; “a set of skills to assess claims and information”, for philosophy educator Daniel, where one has to teach to make better judgements in a deceptive world; “seeing the bigger picture from different perspectives”, for ECE educator Avril, where one has to teach to look at government policies and plans; “recognising the indigenous thinking”, for the social work educator Benoit, where one has to teach to connect to the society; “in-depth looking at a subject area and able to see something new”, for computing educator Earnest, where one has to teach research work and lead them to discovery. As noted earlier in the literature review, Brookfield (2012) ascertains this very fact that teaching of critical thinking is conceived and practised differently from department to department and from program to program. The evidence of this in terms of the perceptions of the educators is compelling in this study.

The interview data revealed that most of the educators emphasized cognitive skills such as analysis, integration, assimilation, reasoning, and open to multiple perspectives. This is consistent with the literature as seen in the writings of Brookfield (2012) and Nosich (2012), both of whom emphasize identifying the assumptions, checking out the validity of assumptions, and taking informed actions after looking at the several different perspectives.

Carlos describes critical thinking with a set of tools that should accompany an individual all the time to avoid mistakes. At the same time, he expresses his agony over the fact that students at times make no difference between critical thinking and argumentation. He comments:

Critical thinking is not about winning and showing that your argument is the right one; it is about figuring out which argument is the winner. So you're not here to win an argument, you are here to figure out which argument wins.

As noted in the literature review, Cottrell (2005) cautions that though critical thinking focuses on arguments, it requires evaluation of these arguments on the quality of reasoning irrespective of personal approval or disapproval. Reasoning was considered as a vital component for critical thinking by seven of the participants, two of them mentioned 'logical reasoning' explicitly.

Having the basic subject specific knowledge (Willingham, 2008) was considered to be a favourable aspect for better critical thinking skill, by all the educators. Apart from the eight elements of reasoning (Paul, 1993) that aid in critical thinking, Nosich (2012) outlines 'context'-background to reasoning: contextual knowledge—as an important component for critical thinking.

All the participant educators emphasise students to learn 'seeing things from different perspective'. Avril promotes this for seeing policies and laws in Early Childcare Education context, whereas Earnest, Grace and Fred promote it for research purpose, and Hugh relates this understanding as being empathetic in nursing, whereas Benoit asks students to see things from different perspective to find their positionality, their place in society, and to reconcile social issues in society.

This suggests there is a need to review the term critical thinking for students as well as educators in tertiary educational institutions, and provide an insight and context for the meaning of the term 'critical thinking'. There exists confusion regarding whether critical thinking is looking at the larger horizontal framework of the context or looking at the focussed vertical details of the context. There is a need to clarify which of these two aspects should be considered by tertiary educators for students or both must be included in the teaching to develop critical thinking, as students loose on either one of the two aspects when tertiary educators lack the clarity.

5.5 Quality assurance for the development of critical thinking in students

This research found two basic forms of assessments that educators used to determine if students are learning and using critical thinking: written assessments and discussions in class. Students' writings in examinations were considered to be the most effective way of test the critical thinking skills. This research detects obscurity in assessment patterns in tertiary institutions. Computer generated multiple choice question papers are devised keeping in mind several factors. The data suggests that the educators are well aware of the limitations of using such assessments. The educators have no option but to give multiple-choice computerised test for assessment as institutions lack the resources for manual correction for thousands of students enrolled for the course.

And then we have about a week to mark it so we can't really get them to write an essay or anything like that; we don't have the resources to mark it. We're talking about hundreds of hours of marking so the obvious solution was to go for a multi-choice test.

This further suggests that students miss out on the most important aspect of feedback in such cases. A sharp contrast has been noted in teachers' attitude towards assessments from larger classrooms to smaller ones, where feedback fosters students' learning. This is clearly noted by the following comment by Avril:

I tell them (students) there is a lot of feedback but this is the only point at which I get to talk to you alone and these are the things you need to do to make it better.

The study clarifies the difference between the personal feedbacks a student receives from a teacher on the written assessments compared to computer generated results in case of multiple choice questions. Assessments are a way of personal communication between students and teachers. Students' learning outcomes can be facilitated if teachers provide valuable feedback to each student regarding their progress.

Discussions are considered as another tool for assessing the critical thinking skills. This is reflected in the literature by Brookfield (2012) who states that critical thinking is better understood as a social learning process in group discussions. Hugh expressed the same thought as:

Discussion in class is so important where you can discuss a situation and it is really fun and exciting when the whole class gets into the discussion around a situation and discusses all the different aspects of it.

The research data signifies that students express much better in class discussions as there is no fear of being marked, additionally there is facilitation of peer feedback. One noteworthy point found in the research data is 'time factor'. Educators can gauge the elevating critical thinking capacities of the students if the students are with them for more than a term.

While discussions form a major ground for cultivating critical thinking, there is no assurance that all the students have participated in the class discussions. It becomes difficult in such scenario to consider discussion as an assessment tool. Similarly, written assessments mentioned by participants in this study, hardly determine the development of critical thinking in students. New assessments are needed to mark the development of critical thinking in students in tertiary education.

Neither of the two commonly used means of assessing critical thinking in New Zealand appears to this researcher as sufficiently rigorous to truly determine if students are demonstrating key facets of critical thinking or progressively developing critical thinking skills. Distinguishing among students' critical thinking abilities and disposition at this point in time is difficult and indefensible.

5.6 Summary

This chapter has explored the connection between the literature reviewed for this study and the key themes arising from documentary analysis and the information obtained from the interview respondents leading to key findings. One key finding is the problems educators of tertiary institutions face with international students. What is clear about the findings is that international students need thorough guidance about the expectations of the New Zealand education system. Furthermore, though there are number of definitions found in the literature about critical thinking, the findings of this study found there are complexities in educators' understanding of critical thinking. This suggests that the Tertiary Education Commission should consider giving one clear definition of critical thinking that is common across all the tertiary educational institutes of New Zealand to facilitate better understanding of the term among students and educators. The third finding is that there is a dearth of assessment patterns to ensure the development of critical thinking in students in tertiary institutions. The next chapter will discuss the recommendations, conclusions, limitations, and suggestions for future research of this research.

6 Chapter Six—Conclusions and Recommendations

6.1 Introduction

In chapter five the research data findings were discussed and interconnections between research questions, literature review and data themes were presented. In this chapter an overview of the research study along with conclusion, recommendation and the limitations are presented.

An overview of the research study

This research study set out to review the perceptions of educators about the nature of critical thinking and to identify the teaching strategies they employ to develop critical thinking skills in students at tertiary institutions. Eight academics from four different tertiary education institutes in Auckland, New Zealand were interviewed. Background preparation for the interviews comprised extensive review of the extant literature on critical thinking and its development, and robust discussions with international authorities on the subject in New Zealand and the United States. Three key source documents published by the New Zealand government providing educational policy and priorities for tertiary institutions were thoroughly and critically reviewed to determine to what degree a mandate for teaching critical thinking exists, and to ascertain what, if any, guidance on structuring the teaching and learning of critical thinking is provided, with the assessment or assurance of critical thinking of particular interest. Rhetorically, the development of critical thinking is a high priority, as evidenced in the government publications, many scholarly sources referenced in the thesis, and, indeed, virtually every academic this researcher spoke with during the year-long study, not least of who include the eight interviewees. Four conclusions drawn from the discussion of data themes in chapter five are presented in this chapter.

The four conclusions arising from this study are presented in this chapter, relating to the two research questions that guided the research:

Research Question 1: What is critical thinking?

Research Question 2: How do we teach and assess critical thinking skills in tertiary institutions?

6.2 Conclusions

6.2.1 *Conclusions related to research question 1*

Conclusion 1: Introduction of a mandatory critical thinking course in the first year of their degree course.

Educators face difficulty with international students. This research suggests that the way to resolve this issue may be introduction of a mandatory critical thinking course in the first year of their degree. Introductory course will work as the basic building blocks (Brookfield, 2012) for international students, clarifying the expectations of the education system in New Zealand, where critical thinking behaviour is the key to education.

When the relevancy of this course is explained, students may have a better understanding of the tasks they will be facing. Students may come out of their cocoons and may experience freedom of expression in questioning, writing and reading earlier than it may be anticipated without the critical thinking course in the first year of their degree course.

Conclusion 2: The educational authorities may consider providing an explicit definition of critical thinking across the tertiary education institutions.

The research found there are differences in the way critical thinking is perceived by different faculties and different disciplines. Students may be confused regarding the actual meaning of the term critical thinking in education. Branches of education perceive critical thinking in different light: philosophical perspective; social

perspective; scientific perspective. A philosophical perspective is inclined toward logical thinking; a social perspective is inclined toward resolving conflicts; whereas a scientific perspective is inclined at exploring the intricacies of a particular topic. One way of solving this problem is that the educational authorities at the central level may consider providing an explicit definition of critical thinking across the tertiary education institutions. A clear and precise definition of critical thinking may avoid any chaos for the tertiary students when they shift from one subject to another, additionally it may help students to grasp the concept firmly.

6.2.2 Conclusions related to research question 2

Conclusion 3: Tertiary institutions may consider providing the same teacher to the particular cohort of students for enhanced learning outcome.

This research study found that students' critical thinking skills are elevated over time with the teacher. Development of trust, confidence and mutual understanding is significant in fostering of critical spirit in students. Change of faculty may hamper this development. One way of solving this problem is that tertiary institutions may consider providing the same teacher to the particular cohort of students for enhanced learning outcome. For fostering autonomy and efficiency in the students' performance it is vital for the institutions to provide them secure and comfortable environment.

Conclusion 4: Introduction of pre- and post-critical thinking tests for every graduate in the institution.

The research found that funding for the tertiary education institutes is based mainly on the quantity of graduates passing the programme. Paradoxically, while critical thinking skills are demanded by employers and government alike (Tertiary Education Commission, 2015b) there is no quality compliance for the delivery or development of these skills. No explicit assessments for measuring the development of critical thinking exist in the tertiary institutions. The research concluded that the way for resolving this problem may be introduction of pre- and post-critical thinking tests, as also suggested in a study by Hatcher (2011), at the beginning and end of the course respectively, for every graduate in the institution.

6.3 Limitations of the Study

The first limitation of this qualitative research study is the small sample size. Eight research participants are few in number to draw generalisation about the perceptions of the tertiary educators in New Zealand. Moreover, all the four educational institutes were from the same metropolitan city so the findings may not reveal the difficulties faced by tertiary educators in other cities or in small towns with fewer resources, or, indeed, the strategies and the tools in use elsewhere. It is also unclear the degree to which other individuals in these same institutions are involved in teaching of critical thinking and, if so, whether their perspectives and approaches to the teaching and learning of critical thinking differ.

The second limitation of the research study was exclusion of the students' assessment sheets. The researcher could have requested the assessment sheets from the interview participants to better understand the assessing strategy in the institutions. Arising from the findings of this study, it is clear that more thought is needed regarding the assessment for critical thinking.

A related limitation—though intentionally excluded from the scope—is lack of student perspective. The study did not attempt to nor opportunistically encounter student voice and perspective—the student experience. This study cannot represent the students' impressions of the teaching and learning of critical thinking, its perceived need, challenges, merits, and process.

Recognition of a limitation of this study arises from the way teachers described or discussed critical thinking where it may be of relevance to distinguish critical thinking from critical pedagogy (Barnett, 1997). This was not an intent of this study but raises important questions that could be followed up in further research.

6.4 Recommendations

The findings of this study have produced four recommendations, three of which may be of possible utility for New Zealand tertiary educational institutions and one for the Tertiary Education Commission.

Recommendation 1

Introduction of critical thinking course for international students in the first year of undergraduate course.

This research study recommends tertiary educational institutions to consider starting a mandatory course in the first-year degree course to train international students in developing critical thinking, through variety of educational tasks. It is crucial to introduce them to the expectations of the New Zealand educational system. Being aware of the educational expectations may result in enhanced learning outcomes for the international students in New Zealand education system.

Recommendation 2

The educational authorities may consider providing a precise definition of critical thinking to the tertiary educational institutions in New Zealand.

The research reveals there is absence of a clear and precise definition of critical thinking across educational institutions and across faculties within the educational institutions. The educational authorities at the central level may consider providing a precise definition of critical thinking to all the tertiary educational institutions. A common definition of critical thinking across the tertiary institutions will help students and teachers in learning and teaching the concept precisely.

Recommendation 3

The tertiary educational institutes may consider retaining same staff for students throughout their study to foster critical thinking.

The research emphasises that longer time periods of interaction between student and teacher encourages development of critical thinking. Tertiary educational institutions may consider retaining same staff for students throughout their study to foster critical thinking. The study shows students develop trust and confidence in the teacher over a length of time. One way to do this requiring little change in current structure and operation would be to employ one or more critical thinking advisors to work with teachers and students to improve instructional and assessment strategies.

This could provide continuity across time and the curriculum.

Recommendation 4

Introduction of pre- and post-critical thinking tests for all starting and completing students of tertiary educational institutions.

This research emphasises a need to assess critical thinking of every graduate in tertiary institutions. The tertiary educational institutions may consider having critical thinking tests at the beginning and at the end of the educational programme to assess students' quality of critical thinking and growth over time. This may serve as data base for the institutions to ascertain the development of the critical thinking skills in students during their tenure of study. A statement of results for the development of critical thinking for students will provide evidence of their enhanced capability of critical thinking for the future employers. Additionally, the results will enhance the employability of New Zealand graduates in competitive job market.

6.5 Recommendations for Future Study

This research has found that educators face difficulty in developing critical thinking in classrooms with international students. A research study with international students of tertiary educational institutions in New Zealand would aid in understanding their barriers and hence help shape future tertiary education plans and policies.

Further research on the assessments employed in tertiary institutions for assessing critical thinking can be considered on a broader scale, as this study interviewed participants only from four tertiary institutions in one metropolitan city of New

Zealand. It appears clear to this researcher that whilst validated critical thinking assessments exist, they are not widely known or used. It is unclear and probably not the case that critical thinking, at least as represented by the voices heard in this study, is consistently rigorously and methodically assessed across institutions.

Based on the results of this modest study, more ambitious studies of the teaching and learning of critical thinking could be carried out, perhaps including more institutions across New Zealand or elsewhere and perhaps using other methods to canvass a larger sample, such as survey. Additionally, identification and critique of existing courses on critical thinking and their effectiveness would be advantageous.

It would be interesting and likely worthwhile to obtain clear definitions and expectations of employers on what they believe the attributes of critical thinking in new graduates or young professionals are, and / or to monitor over time whether or not strategies in tertiary institutions are producing graduates who demonstrate the capabilities and dispositions of critical thinking.

6.6 Final Conclusion

The research study aimed to review the perceptions of educators about the nature of critical thinking and identify the teaching strategies employed by them to develop critical thinking skills in students in tertiary institutions. National documents were analysed to study the relevance of critical thinking. It is clear that critical thinking is espoused as important, and most would agree that a focus on developing critical thinking exists. It is less certain that critical thinking is consistently understood. It appears, though more research is needed to validate or inform this observation, that strategies for and effectiveness of the associated skill and disposition development are pretty much left up to the inclination, creativity, and capability of individual teachers. Everybody expects tertiary graduates to possess and demonstrate critical thinking, but there is little agreement on how this best occurs, and little evidence that learning of critical thinking can be methodically tested or assured. Much work remains to be done in the area. An important discovery from this current study is that development of critical thinking in students is a combined result of student, teacher

and systems working in concert. Thus, effective strategies are likely to address each component.

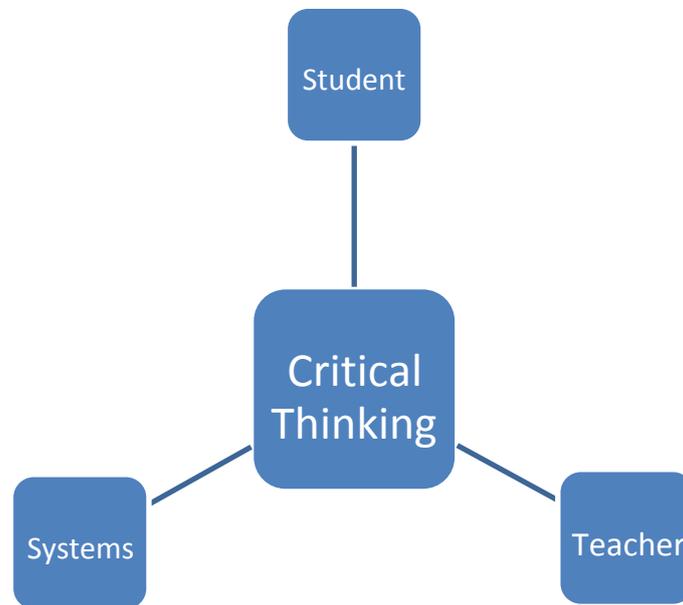


Figure 2: Critical Thinking Relationship and Entities

Critical thinking development in tertiary students is guided by teachers, supported by effective systems, and varies on the dispositions of the students. Effective teaching strategies will motivate, engage, and enable students to learn and develop disposition to use critical thinking skills.

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APPENDICES

Appendix A— Information Sheet for Tertiary Institution



INFORMATION SHEET FOR TERTIARY INSTITUTION

Title of Thesis:

The teaching of critical thinking: Reviewing perceptions of educators in tertiary institutions in New Zealand.

My name is Bhavana Mehta. I am currently enrolled in the Master of Education degree in the Department of Education at Unitec Institute of Technology and seek your help in meeting the requirements of research for a Thesis course which forms a substantial part of this degree.

The aim of my project is to review the perception of educators about the way critical thinking is defined and the teaching strategies employed by them in delivering and developing these skills in students in tertiary institutions in New Zealand. My research will be conducted in four tertiary institutions located in Auckland. I request your participation in the following way.

I will be collecting data using an interview schedule and would appreciate being able to interview two of your educators individually, at a time that is mutually suitable to each of the interviewee and your institute. The interview will be conducted in privacy, in their respective office room and the duration of each interview will be 60 minutes. Interviewees will be required to sign a consent form prior to the interview. They will be provided with a copy of the interview transcript to check for accuracy and will be

asked to verify this within a week of receipt of the transcript. They may withdraw themselves or any information that has been provided for this project up to 15 days after the return/confirmation of your verified transcript.

Neither your educators nor your institute will be identified in the thesis. All information related to my research at your institution will be kept secure and confidential. I will be digitally recording the interviews and I will be undertaking interview transcription. Please note the information of the research data may be used for publication and/or conference presentations. I will be locating the perspective participants from your institutional website only upon receiving your approval to conduct the research.

Contribution by your educators will be extremely valuable to my study. I would appreciate an email response at your earliest convenience to indicate your interest in participating in my study.

If you have any queries about the project, you may contact my supervisor at Unitec Institute of Technology.

My supervisor is Dr. Jay Hays and may be contacted by email or phone.

Phone: (09) 815 4321 ext. 8559

Email jhays@unitec.ac.nz

Yours sincerely,

Bhavana Mehta

M.ED. student; Unitec Institute of Technology.

UREC REGISTRATION NUMBER: (2015-1049)

This study has been approved by the Unitec Research Ethics Committee from (17.08.2015) to (17.08.2016). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph.: 09 815-4321 ext. 6162). Any issues you raise will be

treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix B— Organisational Consent Letter

LETTER PROVIDING ORGANISATION'S PERMISSION TO CONDUCT RESEARCH

[Organisation's letterhead] Date:

Address letter to: Bhavana Mehta

Postal address: 7 Weona Place

Westmere Auckland 1022

Email: bhavana_mehta@hotmail.com

RE: Master of Education

THESIS TITLE: The teaching of critical thinking: Reviewing perceptions of educators in tertiary institutes in New Zealand.

TO WHOM IT MAY CONCERN

I have been given and have understood an explanation of this research project and I give permission for research to be conducted in my organisation. I understand that the name of my organisation will not be used in any public reports.

Signature

Name of signatory

Appendix C— Information Sheet for Interview Participants



INFORMATION SHEET FOR INTERVIEW PARTICIPANTS

Title of Thesis:

The teaching of critical thinking: Reviewing perceptions of educators in tertiary institutions in New Zealand.

My name is Bhavana Mehta. I am currently enrolled in the Master of Education degree in the Department of Education at Unitec Institute of Technology and seek your help in meeting the requirements of research for a Thesis course which forms a substantial part of this degree.

The aim of my project is to review the perception of educators in tertiary institutions in New Zealand about the way critical thinking is defined and the teaching strategies employed by them in delivering and developing these skills in students.

I request your participation in the following way. I will be collecting data using an interview schedule and would appreciate being able to interview you at a time that is mutually suitable. I will also be asking you to sign a consent form regarding this event. The interview venue will be your office room and the duration of the interview will be 60 minutes. You will be provided with a copy of the interview transcript to check for accuracy and will be asked to verify this within a week of receipt of the transcript.

Neither you nor your organisation will be identified in the thesis. I will be digitally recording your contribution and I will be undertaking interview transcription. I will

provide a transcript (or summary of findings if appropriate) for you to check before data analysis is undertaken. Please note the information of the research data may be used for publication and/or conference presentations. If you have any queries about the project, you may contact my supervisor at Unitec Institute of Technology. You may withdraw yourself or any information that has been provided for this project up to 15 days after the return/confirmation of your verified transcript.

My supervisor is Dr. Jay Hays and may be contacted by email or phone.

Phone: (09) 815 4321 ext. 8559

Email jhays@unitec.ac.nz

Yours sincerely,

Bhavana Mehta

M.ED. student; Unitec Institute of Technology.

UREC REGISTRATION NUMBER: (2015-1049)

This study has been approved by the Unitec Research Ethics Committee from (15.08.2015) to (15.08.2016). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph.: 09 815-4321 ext. 6162). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix D— Consent Form for the Interview Participants



CONSENT FORM FOR INTERVIEW PARTICIPATION

RE: Master of Education

THESIS TITLE: The teaching of critical thinking: Reviewing perceptions of educators in tertiary institutions in New Zealand.

RESEARCHER: Bhavana Mehta

Participant's consent

I have been given and have understood an explanation of this research and I have had an opportunity to ask questions and have had them answered. I understand that neither my name nor the name of my organisation will be used in any public reports. I understand that the information I provide for the interviews will only be used for the purpose of this project and will not be shared with any other participants. I understand that my interview will be digitally recorded and the transcription of the data will be undertaken by the researcher. I also understand that I will be provided with a transcript of the interview for verification and that I may withdraw myself or any information that has been provided for this project up to 15 days after the return/confirmation of my verified transcript.

I agree to take part in this project.

Signed: _____

Name: _____

Date: _____

UREC REGISTRATION NUMBER: (2015-1049)

This study has been approved by the Unitec Research Ethics Committee from (17.08.2015) to (17.08.2016). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Committee through the UREC Secretary (ph.: 09 815-4321 ext. 6162). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.

Appendix E— Interview Schedule



INTERVIEW SCHEDULE

The teaching of critical thinking: Reviewing perceptions of educators in tertiary institutions in New Zealand.

INSTITUTION: _____

DATE: _____

INTERVIEWEE: _____

POSITION: _____

INTERVIEWER: _____

1. What do you mean by critical thinking?

2. What do you believe to be the components of critical thinking?

3. What teaching strategies do you use to develop critical thinking skills in students?

4. How do you come to know that students have acquired the critical thinking skills through your teaching in class?

5. Is there any evidence that can demonstrate the development or define the conditions under which the critical thinking skills are developed to their best?

