Exploring business students' ability to think in an economic way: A study in an introductory economics course at one New Zealand tertiary institution

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ABSTRACT

The teaching of economics at an introductory level in the tertiary sector is fraught with challenges. Students arrive from a wide variety of backgrounds. Some have little more than a lay person's understanding of the economic world, whilst others have studied the subject previously and are familiar with the language, techniques and models embedded within it. These techniques are usually described collectively as the 'economic way of thinking' by economists. Most students are also studying the subject as part of a wider business qualification and therefore it is not their main focus during their studies. This problem has been researched extensively by many teachers of economics over the past forty years, but students still appear to emerge from their fast paced courses with only the rudimentary understandings of the subject.

The aim of this study was designed to investigate whether students, studying a one semester introductory course in economics at an Institute of Technology and Polytechnic (ITP) in New Zealand, could demonstrate that they were beginning to 'think like economists'. The data used as evidence were the reflective journals or diaries of the students' learning. The study further aimed to discover whether the construct of threshold concepts could contribute to an understanding of the problems and challenges that many students demonstrated within their journals.

The sample group for study was taken from three introductory economics courses at one ITP in New Zealand. Students were studying this course either as a compulsory component of their Bachelor of Business Studies or part of a core of subjects for New Zealand Diploma in Business. Thirty seven students' journals provided valid data for the study. The design employed a constructivist epistemology and an interpretivist theoretical perspective, using a qualitative research approach. The journals were analysed for evidence of students' understanding by means of tables developed specifically for this purpose. An analysis was further carried out of students' quotations from the reflective journals to establish evidence of the 'economic way of thinking' through nineteen foundation aspects within their journals.

The findings of this study showed that from 703 observations of 37 students' journal entries 206 had demonstrated a sophisticated level of the 'economic way of thinking' (categorised as level 3), 338 showed they were transitioning in their thinking (level 2), and 159 demonstrated negligible understanding of the 'economic way of thinking' (level 1).

Four propositions and recommendations were developed. A substantial group of students did demonstrate evidence of a sophisticated understanding of certain foundation aspects of the 'economic way of thinking' and the reflective journals provided evidence of this. Some of the foundation aspects appeared to create greater challenges for all students, but they were not all necessarily threshold concepts by themselves. It was also proposed that the literature on threshold concepts could assist in targeting the gaps students had in their understanding, whilst a web developed of the foundation aspects of the 'economic way of thinking' might assist students to appreciate the integrative nature of these aspects. Other avenues of further research might be the importance of teaching about threshold concepts to target specific troublesome areas, and the significance of the type of activities carried out in the journal that most contributes to the students' understanding. The perceptions students have of the use of reflective journals for their learning and teacher feedback during the writing of the journal could be further possibilities in the future.

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CHAPTER ONE - Introduction

Background

This thesis has been driven by the desire to make a contribution to undergraduate education in the field of economics. As a teacher in this subject at secondary and tertiary levels for over 30 years I have always felt that students struggled with certain key ideas. Their struggles compounded as they moved through the course, and frequently created barriers to their learning preventing them from succeeding in the subject. The key ideas in economics have frequently been grouped together and described as 'the economic way of thinking' by the community of economists (Ashwin, 2008). For many teachers of economics, the question has therefore been how to remove or minimise these barriers emerging in their learning. This above concern is particularly significant in a fast paced, heavy content based one semester course.

One economist, Frank (2012), noted that researchers of students studying introductory economics "found that exposure to introductory economics instruction was strikingly counterproductive" (p. 403). Further to this there has been a large body of literature, beginning in the 1970s and continuing to the present day, aiming to assist students improve their understanding, interest and attitudes towards the subject. This was driven by a concern that economics was shrinking as a subject in its own right (Becker, 2004a; Becker, 2004b). Last century, the research largely focused on creating tests of students' economic understandings and researching students' attitudes towards economics. Tests frequently employed were originally developed by Soper and Walstad (1983) and Walstad (1987). The focus in this time period had been on developing effective teaching in the subject, assessing achievement at undergraduate level, student attitudes, fears of economics and the curriculum content, to name but a few (Becker, 2004a; Becker, 2004b; Becker, Highsmith, Kennedy & Walstad, 1991; Becker & Watts, 1998; Benedict & Hoag 2002; Bergstrom, 2009; Lawson, 1994; Long, 2007; Soper & Walstad, 1983; Walstad, 1987). Others trialled a somewhat different approach

applying reflective exercises to real world scenarios, or by the redesigning of questions to create more student engagement (Ashwin, 2008; Dalziel, 2009; Davies, 2006; Davies & Mangan, 2007, 2008, 2010; Frank, 2012).

Over the past decade, however, there has been a growing trend drawing upon research from a broader base of disciplines using the development and understanding of threshold concepts. This was first proposed by Meyer and Land in a research project in universities in the United Kingdom (2003, 2005). The main feature of this field of enquiry is that there are "conceptual gateways or 'portals' that must be passed through, however difficult that passage might be, to arrive at important new understandings" (Land, Meyer & Smith, 2008, pp x). This rich and growing body of literature has included economics as a subject. Thus teachers of economics have much to gain from the insights this branch of educational theory has to offer. From this new body of knowledge it was considered that I could investigate the learning of students in their introductory economics courses at one polytechnic in New Zealand.

The researcher's interest

I had been grappling at one Institute of Technology and Polytechnic (ITP) in New Zealand with the problems discussed in the background to this study. Alternative methods to enhance learning in this fast paced course had been driven by the underlying belief that students should leave the economics course enriched by the experience and with a broader base of understanding of the real world. In previous courses a reflective journal, in the form of a diary of the students' learning, had been used as an assessment. It was hoped to investigate this data in more depth to establish if there was evidence of students' understanding of the 'economic way of thinking'. It was possible that it would provide evidence of the areas in which they struggled. This diary of learning focuses upon open ended questions. It allows students to engage in a meaningful discussion about their journey of learning in their own economic world and business scenarios identified through the course

prescription. In this situation the researcher was also the teacher of one of the groups whose journals were being used as data for the research. I acknowledge that this could be a source of bias in relation to interpreting the data. However, a full ethics approval was obtained and no data was analysed until after course results had been finalised.

Aims of the research

The aim of this thesis was to make a contribution to the wider research base in the teaching of the 'economic way of thinking'. It was recognised from the literature in the past thirty years that this has been a major challenge. Many students appeared to have emerged from their introductory economics courses disillusioned and confused (Frank, 2012). As Mankiw (2000, cited in Gans, King, Stonecash & Mankiw, 2012) noted in the preface "economists have a unique way of viewing the world, much of which can be taught in one or two semesters" (p. xxxi). This research then was designed to investigate whether students at the end of a one semester introductory course in economics at one ITP could demonstrate that they were beginning to 'think like economists'. The vehicle used to obtain the evidence for this was a reflective journal or diary of their learning. The study also aimed to discover, if students were not thinking like economists as demonstrated in their reflective journals, which aspects were causing problems, and how the literature on threshold concepts could cast light on this problem.

Research Questions

This thesis has two main objectives. Firstly it proposes to investigate student understanding of the 'economic way of thinking' throughout a one semester course. Secondly it reviews whether threshold concepts could assist with this investigation. This thesis thus narrowed its focus to the following two research questions:

1. ***To what extent do business students studying introductory economics demonstrate foundation understandings of the 'economic way of thinking'?***
2. ***How can the construct of threshold concepts inform our understanding of effective teaching of the 'economic way of thinking'?***

Thesis outline

Chapter one introduces the scope of the thesis which is organised into six chapters. It briefly describes the background, teaching context, researcher's interest and aims of this thesis. It further establishes the key research questions and provides an outline of the thesis.

Chapter two reviews some of the prominent developments in the teaching of economics, particularly with reference to threshold concepts first examined by Meyer & Land (2003, 2005). It briefly reviews concerns by teachers of the subject over the past thirty years from a New Zealand and international perspective. It focuses on an investigation of the first two chapters of a sample of introductory economics texts to establish a list of foundation aspects of the 'economic way of thinking'. This list would provide a possible basis to examine understanding of these concepts in the journal entries. Finally literature is provided on the significance of reflection in learning as background to reflective journals.

Chapter three provides the methodology and methods behind the approach to this research and how it was formulated. Qualitative research is briefly discussed and the approach of the research design was applying the interpretivist paradigm focusing on identifying evidence of student understanding within the journals. The context of the research setting, student sampling, and ethical approval are

discussed. Finally the data collection processes and techniques for analysis of the data are described.

Chapter four focuses on the findings and analysis of the data from the students' journals. The following categories are considered:

- Findings from the investigation of the journals data (numbers of students at various levels of understanding per foundation aspect)
- Analysis of the journals via quotations obtained and in relation to threshold concept literature

Chapter five focuses on the discussion of four propositions as a result of the findings in Chapter 4 in response to the research questions. These are broken down into two parts according to the discussion surrounding each research question. There are two propositions related to answering the first research question and two propositions to answer the second research question.

Chapter six develops four recommendations linked to the above propositions and concludes with some further possible research in this area and the contribution made by this thesis to the educational literature on improving the understanding of the 'economic way of thinking' in fast paced courses of introductory economics in a New Zealand context.

CHAPTER TWO - Literature review

Introduction

This chapter draws upon key literature concerning economics as it is taught at undergraduate level, in particular with reference to New Zealand introductory courses at institutes of technology and polytechnics (ITPs). It considers a selection of popular economics text books as to the key ideas established in their first two chapters. These texts were used to define the 'economic way of thinking'. The complexity of teaching economics, and especially the 'economic way of thinking', is reviewed with reference to the literature on threshold concepts. It is considered an understanding of the literature in this field of education could be applied to assist effective teaching of economics at an introductory level. Finally it reviews the purpose of reflection as a way of looking back on students' own life experiences related to the world of economics. The usage of a reflective journal is briefly discussed as a means of evidence of their learning.

Economics at the undergraduate level

An introductory course in economics is frequently taught as a compulsory subject in most undergraduate business school courses at universities and ITPs in New Zealand, Australia and other parts of the world. This is because much of the business world operates in the context of economics. Economics is considered to be part of the branch of social sciences studying aspects of human behaviour (Gans, King, Stonecash & Mankiw, 2012). The scientific tools that economists use can therefore be of value in the applied context of business. It is, moreover, one of the seven core courses set by the New Zealand Qualifications Authority (NZQA) in the N.Z. Diploma in Business Programme ("NZ Diploma in Business", 2013). The New Zealand Institute of Chartered Accountants ("NZICA", 2013) includes economics principles as a compulsory course in their Bachelor of Business Studies degree (accounting endorsement). For many programmes this will be a fifteen week semester requiring students to study a broad, but shallow, range of learning outcomes in a very compressed timeframe.

Many students at universities and ITPs in New Zealand come from a wide range of backgrounds and economics is not their primary study (Dalziel, 2009). Consequently, teachers of economics in these introductory courses have worried tirelessly about how to teach such an "encyclopaedic set of principles" successfully (Frank, 2005, p.1). Frank further argues that "exposure to introductory economics instruction was strikingly counterproductive" (p. 2); whilst Hansen, Salemi and Siegfried (2002, cited in Frank, 2012) commented that tests of students in basic economic principles six months after taking the course yielded no better results than those with no introductory economics at all. Frank (2005) suggests "most students seem to emerge from introductory economics courses without having learned even the most important basic principles" (p.1).

It could be argued that these concerns are relevant to many introductory courses that are taught in a tight timeframe. It is, however, still pertinent to ask how teachers can assist their students to arrive at a more meaningful conclusion to their studies. The aim should be that students gain a better understanding of the concepts to inform their business practice, rather than just rote learning procedures without the ability to apply those concepts in action.

The economic way of thinking

Economics has often been referred to as "a study of mankind in the ordinary business of life" (Marshall, 1920, p. 1). "The word *economy* comes from the Greek word *oikonomos*, which means 'one who manages a household' " (Mankiw, 2012, p. 3). It is simply the study of choosing (Case & Fair, 2002).These are oft quoted beginnings to an introductory text showing that economics is not necessarily something that is special. What they do share is alertness to issues that are important and affect peoples' everyday lives. Dolan and Lindsey (1977), an earlier text used for comparison, discuss the key to economics "is being in the things they think about" (p.3). As the influential economist, John Maynard Keynes once said "the theory of economics…. is a method rather than a doctrine, an apparatus of the mind, a technique of thinking, which helps its possessor to draw

correct conclusions" (Gwartney, Stroup, Sobel and Macpherson, 2009, p. 8; Heyne, Boettke & Prychitko, 2005, p.6; Stewart, 2012, preface).

In order to discover how teachers of economics view what is considered to be the 'economic way of thinking', a survey of chapters one and two of thirteen introductory economics texts was carried out. These were selected from 2000 through to 2012 time as a sample from U.S.A., Australia and New Zealand because many of them have been published in a number of editions and have received wide usage in U.S.A., Australia and ITPs in New Zealand. One outlier was included (Dolan and Lindsey, 1977) to establish whether the focus of ideas had changed. It was considered that an understanding of the 'economic way of thinking' for teaching introductory economics would be best established through a study of text books, rather than published articles. All of the texts surveyed aimed to establish key ideas about economics at an introductory level in their first two chapters. The assumption has been made that the concepts appearing regularly are a fair representative of what is considered to be traditional teaching in an introductory economics course via these texts. Table 1 on page 9 depicts a summary of these key basic economic ideas appearing most frequently in this survey.

Some of the concepts are regarded by the text book authors as specific to the way of thinking in the subject, whilst other authors describe them as the key ideas, concepts, tools or principles of the subject. A more detailed explanation of each of the concepts/ideas and principles is included in Appendix A. It is noted that some concepts may not appear in Chapter one or two of some texts. However, they will be covered at a later stage in these texts.

Table 1. Authors and Economic way of thinking/basic concepts (Chapters 1 & 2)

Concepts	Dolan & Lindsey (1977)	Evans (2000)	Case & Fair (2002)	Heyne, Boettke & Prychitko (2005)	Samuelson & Nordhaus (2005)	Sloman & Norris (2008)	Gwatney, Stroup, Strobel & McPherson (2009)	Hubbard, Garnett, Lewis & O'Brien (2010)	Calendar (2011)	Layton, Robinson & Tucker (2012)	Stewart (2012)	Gans, King, Stonecash & Mankiw (2012)	McConnel, Brue, & Flynn (2012)	Total
Economic Way of thinking	•		•	•		•	•		•	•	•	•	•	10
Scarcity & choice	•	•	•	•	•	•	•	•	•	•	•	•	•	13
Rational thinking				•		•	•	•				•	•	6
Trade off/ opportunity cost	•	•	•	•	•	•	•	•	•	•	•	•	•	13
Assumptions e.g. ceteris paribus		•	•			•	•	•	•	•	•	•	•	10
Models/graphs	•	•	•		•		•	•	•	•	•	•	•	11
Scientific way of thinking	•	•	•		•		•	•	•	•		•	•	10
Marginal costs and benefits	•	•	•	•		•	•	•		•		•	•	10
Incentives	•			•		•	•	•				•	•	7
The three economic questions and types of economies	•		•		•	•	•	•	•	•	•	•	•	11
Cause/effect association		•	•		•		•	•	•	•		•	•	9
Immediate & Secondary effects (unintended consequences)				•	•	•	•		•					5
Factors of production	•	•	•	•	•	•	•	•		•	•		•	11
Trade creates wealth	•	•	•	•	•		•	•	•	•	•	•	•	12
Normative /positive	•		•		•		•	•		•		•	•	8
Macro/micro		•	•		•	•		•		•	•	•	•	9
PPC	•	•	•	•	•	•	•	•		•	•	•	•	12
Efficiency/ equity	•	•	•	•	•			•	•	•	•	•		10
Demand/supply	•	•	•		•	•	•	•	•		•	•	•	11

All the concepts were selected because they are included, either explicitly or implicitly, in the learning outcomes of the courses taught at ITPs. It is noted that in higher level texts there would be greater recognition of differing viewpoints on the basic concepts in economics such as rationality. All thirteen texts discuss scarcity, choice and trade-offs or opportunity cost, and some state definite guidelines or principles at the outset to assist the thinker new to this subject. Furthermore, the idea that 'trade as a result of specialisation increases wealth' was prominent in some form in twelve texts. Production possibility curves, which are a recognised introductory graphing tool, also appeared in twelve texts. One text, Gwatney et al., (2009), establishes guideposts to thinking in an economic way and this has been attached in Appendix B. This shows a concerted effort by the authors to narrow the principles for students into a brief and logical list. Some of these include the importance of trade-offs due to scarce resources, people choosing purposefully, that incentives matter and considering secondary effects in decision making. The concern might be that this is an oversimplification of the process of the 'economic way of thinking' and can then lead students to look for a simplistic understanding of complex concepts. In total, ten of the text books establish the importance of the 'economic way of thinking' in the early chapters.

The economist's usage of scientific problem solving techniques is covered by ten texts. Economists aim to identify an economic problem and develop a solution by using a model based on simplifying assumptions. Data is collected about the problem, the model tested and conclusions drawn. The technique is intended to use objective processes which places it in the position of being a science (Layton, Robinson & Tucker, 2012). Other key recurring principles included the use of models, in particular graphs; factors of production; and the three economic questions with reference to the various economic systems to solve these questions (eleven texts). Demand, supply or both also appears in eleven texts. This is crucial in market economics so an introduction is not surprising. Efficiency versus equity, the idea of marginal costs versus marginal benefits and setting assumptions, the most common being 'ceteris paribus' (Evans, 2000; Hubbard, Garnett, Lewis & Brien, 2010) were noted in ten texts. Most of the introductory texts (eight) also explain the idea of

positive (what is) and normative economics (what ought to be) and show the perils for beginning students of falling into the latter (Case & Fair, 2002; McConnell, Brue, & Flynn 2012; Samuelson & Nordhaus, 2005). This emphasises the positivist approach of basic introductory economics. The two main subject areas of micro-economics and macro-economics were mentioned by nine texts. One surprising result was that some key ideas appeared in only a small number of texts in these early chapters. These were: people being rational thinkers, unintended consequences (six texts) and the importance of incentives, cited in just seven texts. It was considered important to include these because they are represented implicitly within the key learning outcomes of courses at ITP's. Table 1, on page 9, has been drawn to demonstrate a list of the key principles that most teachers of introductory economics would consider important to teach students the 'economic way of thinking'. Some concepts are less explicitly represented but are implied as introductory techniques, for example "purposeful decision-making" maybe discussed to mean rational thinking (Gwartney et al., 2009, p. 7).

The complexity of teaching economics

Most introductory economics textbooks begin with a discussion of economics as a subject and the importance of the 'economic way of thinking' (Gwatney et al., 2009; Heyne et al., 2005; Layton et al., 2009). The essence of economics is studying the nature of choice. One might consider this to be fairly straightforward; therefore it is important to establish what is creating the challenge for beginning students of economics. There is abundant research throughout the 1980s and into this last century on this issue. United States researchers, in particular, have assessed the attitudes to, and the understanding of economic principles, both at high school and college levels (Becker, 1997; Becker, 2004a; Becker, 2004b; Becker, Highsmith, Kennedy & Walstad, 1991; Becker & Watts, 1998; Benedict & Hoag, 2002; Bergstrom, 2009; Hansen, 1998; Lawson, 1994; Long, 2007; Soper & Walstad, 1983). All of this research refers to the difficulties in teaching mainstream theoretical text

book economics in the real world and considers the negative attitudes that can be developed towards the subject. Callander (2011) tries to establish why this might be the case when he states that “much of economics is counter-intuitive … the answers to questions in economics are often opposite of or quite different to what you might intuitively think” (p.5).

Frank (2012) argues that the best way to teach an introductory course is by narrowing down the core ideas to a short list of key “propositions” or principles (p. 405). These must be constantly revisited throughout the course. His suggested list (Appendix C) includes the principles of scarcity, opportunity cost, marginal cost and benefits, comparative advantage, equilibriums and efficiency. This solution has further been given credence by Ferraro and Taylor (2005, cited in Duhs & Alauddin, 2005, p. 166-7; Frank, 2012, p. 403-405), when they tested a large number of professional economists on an applied multi-choice problem concerning ‘opportunity cost’. This is a key concept established in the ‘economic way of thinking’ by all text books surveyed. This concept enables students to appreciate the importance of the “next best alternative” (Evans, 2000, p.6). Only 21.6% of their respondents, however, gained the model answer provided. The same exercise was given to students who had completed an economics course and only 7.4% answered it correctly. This might mean that the fast paced multi concept courses were leaving students confused about basic concepts as they have to focus on too much information. A more thorough elaboration of key ideas for both teachers and students could be a method of solving this issue.

Ashwin (2008) in his study on 14-19 year old economics students observes in ‘thinking like an economist’ that there is a barrier between the practitioners of economics or “the subject community” (p. 174), and those with only an everyday understanding of economics. This could be one aspect that divides students from teachers. It appears there is a type of novice understanding, described by Rubin (2002) as “folk economics”, or “the intuitive economics of the untrained person” (p.1). Ashwin’s 2008 study applied the verbs used from Bloom’s Taxonomy, for example “remembering, understanding, applying, analysing, evaluating and creating” (Biggs & Tang, 2007, p. 81) shown in Appendix D. The NZ Diploma in Business prescription (2013) features the notion

of learning outcomes as a priority in their prescriptions and applies key words in their learning outcomes which have been adapted from Bloom's taxonomy. The hierarchical Structure of Observed Learning Outcomes or SOLO taxonomy developed by Biggs & Collis (1982) was further researched. This is based on students being able to connect pieces of information in a hierarchical way and covers the levels pre-structural, uni-structural, multi-structural, relational and extended abstract (Appendix E). Ashwin (2008) applied the SOLO taxonomy in examination assessment questions to analyse students' responses to current issues.

From researching these key ideas about economists' views of the 'economic way of thinking' and some of the challenges in teaching introductory economics it is important to look to some more original approaches in teaching and assessing the subject. Many economics courses at this level tend to assess a large body of knowledge through a myriad of multi-choice or short answer questions. One such example to establish students' prior economic understanding would be the Test of Economic Literacy originally developed by Walstad & Rebeck, 2001 and adapted for New Zealand by Dalziel (2009) and Cameron & Lim (2011). Many courses apply multi-choice tests as their major source of assessments because of the large number of students studying these introductory courses. A number of economists however, are striving for different ways to encourage economic understanding (Maier, 2012; McGoldrick & Ziegert, 2012; Simkins, 2012). Frank (2012), in the creation of his shorter list of topics, notes it is not necessary that all economists agree with the exact nature of the content of a list of key economic ideas. What is important is that the list allows students to set their own economic questions based on the key ideas to investigate and create narratives from readings and their own experiences. This could provide a possible gateway to the development in students' ability to construct their own learning in an introductory economics course via some form of reflective journal as suggested by Biggs & Tang (2007).

Threshold concepts and the economic way of thinking

Researchers have noted that economics has a particular way of thinking and this could be classified as having 'troublesome knowledge' which is one characteristic of a threshold concept (Meyer & Land, 2003, Meyer & Land, 2005). Threshold concepts might be seen as "conceptual gateways or 'portals' that must be passed through" (Land, Meyer & Smith, 2008, p. x) to the ways of thinking and practising within a discipline. This poses a challenge for students to break through and transform their way of thinking (Meyer & Land, 2003, Meyer & Land, 2005). The work of Meyer & Land on 'threshold concepts' significantly added to Perkins's idea of 'troublesome knowledge' (1999). It was based on a study of undergraduate courses in universities in North England, known as the Enhancing Teaching and Learning Environments Project (ETL) in various disciplines. They argued that these threshold concepts could be likened to "a portal opening up a new and previously inaccessible way of thinking about something" (Meyer & Land, 2003, p.1).

Threshold concepts have been described as having five characteristics (Meyer & Land, 2006; Ricketts, 2010). They have 'transformative' value creating the opportunity of a total shift in understanding and attitude. Once learned, the holder of this concept cannot think in the way they did previously. The students' understanding becomes 'irreversible' (unlikely to be forgotten). Meyer and Land suggest that this knowledge and new way of thinking has 'integrative' effects, whereby they are able to link to other concepts, sometimes previously unattainable, enabling a greater vision of the complexity of the world. Entwistle (2006) discussed how the "different facets of a topic come together simultaneously – 'click into place'- to create a satisfying complete picture" (p.216). Threshold concepts also generally have the characteristic of being 'bounded' in the sense of having "terminal frontiers, bordering with thresholds into new conceptual areas" (Meyer & Land, 2003, p. 6). These threshold concepts are further linked to 'troublesome knowledge', in that because they are so important, they need to be incorporated into one's own understanding, or they become a problem by their absence (Perkins, 1999). Meyer and Land (2005) explain the situation as being 'betwixt and between' or sometimes in "stuck places", an expression coined by Brousseau to

demonstrate the feeling of hitting “epistemological obstacles” (Brousseau, 1997 cited in Meyer & Land 2005, p. 377, 2006, p. 27).

Perkins (1999) proposed that ‘troublesome knowledge’ has its own various attributes. Often the knowledge is ritualistic in having its own language. This would be particularly true in the discipline of economics. The models, for example graphs and formulae, would be of this nature as they require mathematical understanding. As soon as this ritualistic abstract knowledge is introduced to provide students with a rigorous tool for learning, they often become disconcerted and struggle. One respondent in the ETL project at an English university recalled “within Economics I sense that sometimes students see abstract models as abstract models and don’t see the link with the real world. Perhaps that’s a threshold issue….” (Meyer & Land, 2003, p. 12). This appears to be the heart of the ‘troublesome knowledge’ for students in economics, as they can often understand the theory in class, but they cannot see how it fits into their own everyday world, for example the assumption of rationality or thinking at the margin. Sometimes they discover it slips away once they leave the classroom situation. There may also be the issue that the knowledge is coming from a perspective that is alien to their own, for example the word ‘investment’ in economics may conflict with a layperson’s understanding of the word, or even that of different cultures. Perkins (1999) further suggests that there might be inert knowledge that is learned but is sitting waiting and dormant, needing to be used actively in order to relate to the real world. If the knowledge never becomes linked up it will not become grounded in one’s understanding. He considers that much of this ‘troublesome knowledge’ could be the specific language, which acts as a privilege, creating a barrier of power between those who have it and those who do not.

One term ‘liminality’, originally developed by Victor Turner in 1969, has also been applied to describe these ‘stuck places’, where students tend to mimic an understanding of the threshold concepts, but then regress into their earlier misconceptions. There can however, be no “full return to the pre-liminal state” (Meyer & Land, 2005, p. 376). It is important that previous conceptions must be relinquished before one can move into the new conceptual space, but in the liminal state there is

"double trouble" as students will experience a sense of loss (Land, 2011, p. 176). Savin–Baden (2008) made an important contribution through her work on experiencing a disjunction in the student's learning. She suggested it led to a new space which she termed "liquid learning" (p. 76). This positive view of the liminal space was further developed by Land, Rattray and Vivian (2012), and they concluded that for transformation to occur one needs to "oblige the learner to countenance something new and try to integrate it" (p. 2). They saw the state of liminality as "a space of connectivity" (p.5) to other concepts already grasped.

Shanahan and Meyer (2006) suggested that one example of a threshold concept in economics is 'opportunity cost'. This is "the value placed on the best rejected alternative when an individual makes choices" (P. 100). It has also emerged in the above mentioned text book survey as a core concept of the 'economic way of thinking' because it allows students to see the flip side of a choice in a way they never would have before. It allows a number of topics in introductory economics courses to be integrated. A focus on the rejected alternative is essential to ensure that people making decisions do not select the lesser of the top two priorities. It is considered as possessing the five key characteristics of threshold concepts, these being transformational, irreversible, integrative, bounded and frequently troublesome (Shanahan & Meyer, 2006). This was confirmed by Shanahan & Meyer's study of 234 responses from introductory economics students in 2003 when responses taken during week four of a course elicited examples of the characteristics of 'troublesome knowledge' (2006).

The work of Ferraro and Taylor (2005, cited in Frank, 2005) further confirmed this concept as a threshold concept but it was not particularly linked at this time to this pedagogical theory. One concern in studying a particular threshold concept is the extent that it contains all the characteristics, and if this cannot be identified clearly, whether this is of assistance in the development of the teaching of that concept. Further to this, troublesome knowledge, as noted above, can appear in a number of forms and students struggling through the threshold frequently do so because of issues with ritual knowledge, or 'tacit' understanding. The difficulty might be that students come to a

threshold concept with a variation in how they view key language such as opportunity and cost in the above example. This has been termed “pre-liminal variation” (Meyer & Land, 2006, p. 27). Identifying the nature of these variations in students’ understandings could be problematic in itself.

Reimann & Jackson (2006) similarly documented a collaborative investigation of a diverse group of students developing understanding of two threshold concepts in economics in the U.K. They considered two micro-economic concepts – ‘opportunity cost’ and ‘elasticity’. Their goal was to try to see if the idea of threshold concepts provided a useful tool to enhance teaching and learning and they were particularly concerned with whether students could “engage with the kinds of examples that are commonly used in economics teaching and how close these are to the economic problems which students are confronted with in their everyday lives” (p. 118). This may mean that by rewording questions, to better reflect the students’ experiences, it would assist them to understand and more easily apply the threshold concepts in question. This would then have bearing on the pedagogy of teaching economics, so that the questions used in teaching could be reworded to more closely reflect student experiences. Their work could then provide alternatives to the questions traditionally used in economics education. If their approach was successful in improving students’ understanding it would demonstrate a useful development in assisting students to view economic problems as if “through the eyes of economists” (p. 118).

Reimann & Jackson (2006) posed questions to small groups of students that were considered to be every day in nature and used “authentic settings” (p.119), for example “explain why McDonald’s does NOT offer an all-day breakfast menu” (p. 120), and another which concerned getting a broken mobile phone fixed. The questions allowed for the application of the two threshold concepts. They employed a longitudinal study over a period of one year testing students in their second week of lectures (prior to meeting the concepts in question), and then interviewed the students during the module after being taught the concepts. On completing the module the students were provided with the same questions to compare their answers and they were interviewed about them to capture the developing nature of their understanding. The teacher was also interviewed about the

teaching/learning environment and the students' answers. However, the number of students in the case study was small (eleven, nine and six in the respective time slots).

The authors concluded that the students were using some aspects of the concepts but were not able to apply them in a fully economic way. Their understanding tended to be implicit, rather than explicit, in the stating of economic ideas. They often referred to other concepts but did not necessarily apply 'elasticity' or 'opportunity cost'. Another problem was whether the questions had been couched with reference to the role of the consumer (as in the mobile phone question), or that of supplier (as in the McDonalds question), this being a less familiar role for students of introductory economics. Lastly they also noted that the two threshold concepts were taught differently and their conceptualisation was different by the students adding to the belief that the two threshold concepts differed in their perceived level of significance to students. This study was valuable in providing confirmation that threshold concepts are "a useful lens through which to view a specific teaching- learning environment" (Reimann & Jackson, 2006, p. 132), but the researchers noted that it was exploratory in nature and there was further scope for study. Some of their recommendations were to use classroom observation, or that of researching how teacher understanding of threshold concepts impacts on their teaching or students' experiences of "crossing the threshold" (p. 132).

Core concepts and threshold concepts

Entwistle (2008) researched the difficulty of identifying and distinguishing between core economic concepts (key ideas studied in the subject), and threshold concepts which have the properties described by Meyer & Land, (2003, 2005), but in particular are transformative and integrative within the economics discipline. Shanahan, Foster & Meyer (2008) further reiterated this when they argued that first year concepts are not necessarily threshold concepts. It is unlikely that all of the properties for threshold concepts will exist in equal measure in the basic ideas to be studied in an

introductory course. Kiley & Wisker (2009) noted that “while discipline-based colleagues can usually identify clear key concepts specific to their discipline, these may not all be threshold concepts” (p. 432). Examples of core concepts would most likely be scarcity and choice but opportunity cost, according to much of the literature, was viewed as having the characteristics of a threshold concept (Shanahan & Meyer, 2006).

Ashwin (2008) applied the SOLO taxonomy adding to the debate about whether threshold concepts and core concepts are different, and whether threshold concepts are at the higher level of the taxonomy. He argued that the levels at which students perform on the SOLO taxonomy scale was a measure of their ability to “think like an economist” (p. 174). He implied that a focus on understanding of basic definitions in the subject, for example ‘elasticity’, described by Ashwin as a core concept, would not necessarily lead to understanding of the way of thinking in that subject. An application of a particular threshold concept such as value might be vital “to transform the landscape” (p. 175) for the student. An understanding of value would allow them to see why people will pay more for a product in a given situation. He was conscious, however, that his research at that time was only the beginning of a solution to the problem of finding how to measure the quality of students’ ability to think in an economic way.

To further stress the higher level of thinking, Meyer & Land (2006) discussed “the transformed view or landscape may represent how people think in a particular discipline, or how they perceive, apprehend, or experience particular phenomena within the discipline” (p.3). One difficulty Entwistle (2008) noted was that “the threshold concept itself is acting as a threshold concept in thinking about teaching and learning” (p.30), and Perkins (2007) further adds we need to have “a theory of difficulty that identifies the trouble spots in that particular content, strives to explain them, and points toward adjustments in the teaching-learning process to help with them” (p. 44). Without this development, threshold concepts will not really add anything to the changes in pedagogy. Meyer & and Land (2005, cited in Schwartzman, 2010) argue that approaches to teaching should be “entirely discipline-specific” (p. 22), which would mean for economics that efforts to enable students through

troublesome spots (troublesome knowledge) must find teaching approaches that focus on the subject.

Davies and Mangan (2007, 2008, 2010) made a vital contribution to the threshold concept debate when they developed a table (Appendix F) in which they created three levels of conceptual change. *The basic level* is where students learn the key language, for example the distinction between price and cost, money and income, or investment and savings. This has transformative properties as it enables the students to look at everyday economic events to clarify their thinking. However, at that level the students have not begun to integrate these ideas with other concepts. The second level they classified as *the discipline level*, whereby students begin to pull together a number of the concepts and to see the way they overlap into other areas. The third level is considered to be *procedural.* To truly grasp economic understanding, one has to reduce the complexity of the economic world and apply procedures, such as 'ceteris paribus' (other things being equal), or models, for example a graph. Their work further developed a linkage between basic concepts and the threshold concepts by means of these procedural or modelling concepts. They suggest that several linked concepts will assist students with the development of "a way of understanding 'the big picture' " (Davies & Mangan, 2007, p. 722). Figure 1 below demonstrates this in a web form. They suggest the web will enable students to integrate the threshold concept of 'opportunity cost' into a variety of learning outcomes.

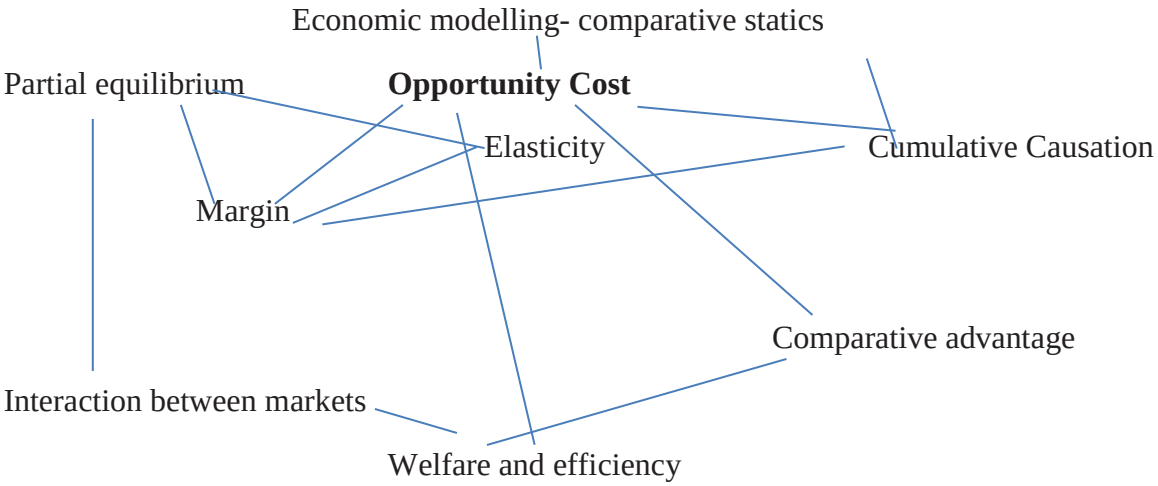

Fig 1: A web of concepts (Davies & Mangan, 2007, Fig 1, p. 722)

Davies and Mangan (2008) believed that the three tier table discussed above could be used to address the problems/issues they had identified in their research in four universities in the U.K. by further drawing on variation theory. Variation theory is a development of phenomenography. This is a methodology of using qualitative research empirically to investigate the variety of ways in which different people experience a phenomenon. The emphasis on variation theory has been given impetus by various theorists including Marton & Booth, 1997, Marton & Trigwell, 2000, Fazey & Marton, 2002, cited in Meyer et al., 2008. The concern here is to focus learners' attention on the variation in critical features of the phenomenon they are aiming to understand. They suggested a learner may not need to abandon a previous "way of experiencing something" in order to gain a new and presumably more advanced way of experiencing that phenomenon (Runesson, 1999 cited in Meyer et al., 2008, p. 59). This could be a valuable linkage to the integrative quality of threshold concepts.

Davies & Mangan (2008) argue that in variation theory "the teacher should draw the learner's attention to simultaneous variation in the features of the phenomenon that are critical to the desired conception" (p. 38). They consider, for example, the phenomenon of 'the demand for money' and the features embedded in it. These are the rate of interest, liquidity, means of payment, prices, income and credit cards. Some of these features may be familiar to the students such as credit cards, but others such as liquidity may not. An understanding of the phenomenon and application of the variation theory requires that students should understand all these key features at the same time to be able to grasp this whole complex idea. However, some models require more than just simultaneous variation at the basic level and will need a threshold concept, which is integrative, for example 'opportunity cost', to more fully draw their whole understanding together. The students may further need a model to allow them to open up this idea more clearly. Davies and Mangan (2008) then developed principles to work through the four problems or issues they had identified in this area and applying the different levels they saw in teaching economics. Their proposition was that an acquisition of the threshold concept provided a "keystone bringing form and robustness where

previously there was a collection of ideas" (Davies & Mangan, 2008, p. 42). The four principles they suggested teachers should work towards are identified below.

> "*Highlight variation to ensure there is a sufficient foundation of basic concepts to make it possible to work towards acquisition of the threshold concepts* (basic conceptual change - principle 1) … *Expose the way in which scholars in the discipline use procedural thresholds by highlighting variation in the use of key procedures* (procedural conceptual change- principle 2) … *Help students to integrate their understanding through using key procedures in re-working their understanding of previously acquired concepts in the light of threshold concepts* (discipline and procedural conceptual change- principle 3) … *Help students to regard their understanding as provisional and to tolerate uncertainty* – principle 4." (p. 42-43).

Davies and Mangan (2008) further aimed to apply the above principles to 'reflective exercises' (applied questions in economics) such as 'What are the economic arguments on whether a football club should sell an important player?'). This is a reflective exercise; it allowed students the option of conceiving an answer based on 'everyday knowledge', or they could answer the question in the way an economist would. The phrasing of the question would make the question generally accessible to all students (principles 1 and 3). Another type of activity applied were 'problem-focused exercises'. Here they considered case studies, for example the different prices in downloading music in two countries, and were encouraged to understand principles 1 and 2 and further integrate several threshold concepts (principle 3). Finally 'threshold network exercises' were used which also looks at principle 3, (Davies & Mangan, 2008, p. 43-47). Principle 4 was not fully addressed in their research. It further drew on evidence from four universities in 2005/2006 in the U.K. However, many of the concepts in the introductory economics courses considered in this particular project by Davies & Mangan (2008) are more detailed taking at least a year to cover compared to the

introductory one semester business courses in New Zealand. Many concepts they discuss would not be featured in the learning outcomes in the introductory courses at ITPs, or possibly only mentioned in passing. In Davies and Mangan's research the students and teachers differed in their views about the activities, but the researchers highlighted the importance of interviews with both students and teachers in developing their understanding (2008).

Possibly one valuable way of looking at the learning process and troublesome knowledge is the two contrasting metaphors (McCormick, 2008; Sfard, 1998). These are described as the acquisition metaphor (AM) and the participation metaphor (PM). The former refers to the individual's cognitive constructivism process where a learner perceives a situation as a conflict in what they think they know (their previous interpretation of a phenomenon) and the new theoretical evidence presented to them. From this conflict the learner has to actively decide whether they can absorb the new evidence, and therefore acquire the new knowledge, which will enable them to build up the framework linking to other relevant concepts (McCormick, 2008). If they do not acquire this content then there will be no transformation for the learner. So the student who breaks through and crosses the threshold has acquired the conceptual framework. In order to do this, they must have reflected and actively constructed their own learning. It is most likely that some additional tool to encourage them to work through this reflective process will be necessary to enable them to do this.

Looking at the PM angle involves the student viewing their knowledge construction from a social angle and seeing learning as desiring to participate in "a community of practice" (McCormick, 2008, p. 52). This would imply that in an introductory economics class the students would be wishing to acquire the rituals and procedures of economists so that they could belong to this group. This does not seem so applicable in an introductory economics course, but could be for a student majoring in an economics degree. It would also imply that the teacher should reflect on ways to create that community within the class so the students become active in creating their own answers to economic problems.

From the literature, it is apparent that there is on-going discussion on how to address the issue of embedding the 'economic way of thinking' into a brief introductory course to enable students to emerge from the course with some clarity of mind. The text book analysis in this study of key concepts did not make any distinction between core concepts (basic definitions key to the subject, but not necessarily threshold concepts), and those which were threshold concepts. The latter would need to hold all the five characteristics: transformative, bounded, irreversible, integrative and having troublesome knowledge (Meyer & Land, 2010). Kiley & Whisker (2009) argue that grasping a threshold concept will lead to a 'qualitatively different view of the subject matter……and of oneself as a learner' (p. 432). It is possible that the combination and integration of many concepts might be a threshold concept in itself, or that a particular phenomenon will not be fully understood without the addition of a threshold concept. It was considered that a deeper, and higher quality learning approach (Entwistle, 2008), could enable further understanding of this issue. Reflection might add to this discussion.

Reflection

Reflection, described by Tulloch et al. (1993) as meaning "going back in thought" (p. 939), has been identified as beneficial to students in their learning in a wider context. The early works of Dewey (1933, cited in Paton, 2006) argued that "experience alone does not necessarily lead to learning" (p. 97). It is what one does with that experience that becomes significant to learning. Schon (1987) noted "in the swampy lowland, messy confusing problems defy technical solution" (p.3). He implied that one needed to choose to move to the high ground through reflective practice to gain a clearer perspective of the experience. Kolb and Fry's work (1975) was used to show how the reflective process occurs in a practical sense at the teaching level, but can also be applied to all learners. The starting point for learners could be to partake in an experience which could be derived from their everyday lives. They could observe and reflect on it according to their own understanding, generalise it through the theory, and then further apply it to new situations. Kolb

emphasised that the learner can begin at any point in the cycle and teachers often begin at the reflective stage to introduce their lessons by reflecting on past learning to introduce a new topic (Wicks, 1996).

Kolb (1984) citing the Lewin and Dewey models, further conceived learning as a constructive process stating that “ideas are not fixed and immutable elements of thought but are formed and re-formed through experience” (p. 26). N. Z. Diploma in Business Programmes under N.Z.Q.A. set specific learning outcomes. This creates some friction in trying to follow a reflective process of learning, which emphasises construction and invention of ideas as a goal in itself. Kolb (1984) had been interested in researching the reflective cycle that would encourage deep learning, “making sense of facts, feelings and ideas, and integrating them with other facts previously learnt so that new ideas evolve and the new knowledge can be applied to problems” (Wicks, 1996, p. 188). Honey & Mumford (1992, cited in Wicks, 1996) further built on Kolb’s experiential learning cycle to describe four types of learners- theorists, pragmatists, activists and reflectors weaving these into the stages of the Kolb cycle. This work has been particularly applied into the world of business and management, and so is relevant as a reflective tool for economics students as also suggested by McGoldrick and Ziegert (2012).

The Kolb and Fry (1975) model may, however, be somewhat mechanistic and rigid, and the reflective process may be far more complex in action involving a more cultural, holistic emotional view of the world. Further, reflection may not necessarily mean that the learner changes how they think, nor may they arrive at the same conclusion by reflecting on the same experience at a different point in time (Zepke, 2003). This could be particularly true if the data observed was inconsistent in the observations for different students. One could also reflect and decide that no change needs to take place. For it to be an evolving process to change oneself and the world, one does need to critically reflect.

Brookfield (2005) recognises that when individuals reflect they will do so from a certain standpoint, but it is important to consider whether their own belief systems, such as the capitalist way of thinking, are creating a dominant ideology from which they are reluctant to escape. Critical reflection will enable the possessor of this tool to view the situation more widely than their own narrow world. From the humanist perspective they need to be ready to look at their experiences critically from every angle to try to achieve their full potential. Lastly looking at other social and group perspectives is essential to gain a greater awareness of the position of minority groups. In this understanding knowledge is created by the group, for example ethnic, social, gender or religious reasons for its own benefit (social constructivism). These processes of critical reflection are possibly more valuable tools, rather than the simple reflective processes described in the experiential models. Critical reflection is particularly useful in economics, since so much of economics teaching in Western society is based on the free market model which is derived from the classical capitalistic school of thought (Callander, 2011, Stewart, 2012). It is important that both teachers and students should be aware that these forces are dominating their own viewpoint.

The economic way of thinking and reflective journals

A reflective journal is a collection of pieces of writing, which allow the student to take responsibility for their own learning, by enabling them to consider what is happening over a given period of time (Harris, Krause, Gleeson, Peat, Taylor, & Garnett, 2007). The journal needs to be maintained on a regular basis so the student can see how their learning is progressing in a particular subject. The advantage of the journal, if set up correctly, is that it encourages students to think and discuss more deeply about issues, rather than applying a surface approach to their learning (Harris et al., (2007). Because beginning tertiary students may also be less confident in the initial stages, it might be necessary to structure the reflective journal by giving them some leading questions to narrow their focus. Harris et al., (2007) suggest that “reflective journals encourage students to reflect critically on the process of learning and their development over time” (p.1). It has been argued that a reflective journal, by definition, requires critical thinking about one’s work in progress

and particularly can be related to the cultural context in which the student operates whilst providing evidence of students' learning (Chirema, 2007).

According to Angelo and Cross (1993) some form of reflective journal could allow students to build on their experiences by weaving them into the more abstract theory from lectures. Journals are a valid way of "capturing insights…., playing with concepts,….(and) the reflection extends the time …. to devote to thinking about the issues… discussed in class" (Ramsey, 2002, p. 382). Since students in the 21st century come from a wide diversity of backgrounds and experiences, they frequently call upon a rich array of knowledge to inform their learning even prior to any economics instruction (Cameron & Lim, 2011). To think like an economist the process of reflection, and a reflective journal, could provide the opportunity to enable students to consider their own everyday personal and/or business decisions. Thus a reflective journal could be a useful assessment tool to measure students' understanding of the economic way of thinking' and the gaps in their knowledge. The difficulty, however, would be in measuring the contribution this component had to their understanding. Further to this, many students of ITPs lead extremely busy lives and this could be too large a task for a relatively compressed course at introductory level (Giles, 2009).

Reflective journals have largely been used in the sciences, and in particular the teaching and medical professions (Paton, 2006). Paton researched 122 journals in the Economics and Business unit of study 'communication and critical analysis' looking at both English speaking and non-English speaking backgrounds as to how a reflective journal enhanced their critical thinking. The analysis was carried out at three levels, the first being a diary of activities, the second the ability to assess decisions and plans, and the third level demonstrated the ability to critically reflect and develop a different perspective than the viewpoint in the reading tasks. The results showed that both groups improved understanding due to the journal, but the English speaking stream more so. It could mean that an emphasis on a reflective component, which necessarily involves writing, could disadvantage students for whom English is their second language. The journals focused on the social awareness of contentious issues such as the relationship between the environment to

economics or exploitation, and allowed students "to identify their own values, attitudes and beliefs underlying their reactions to various learning situations" (Paton, 2006, p. 98). The topics were possibly more socially far reaching than those able to be covered in the tight time frame of an introductory economics class. In this sense the reflective journal style in Paton's study has some limitations for use at an ITP.

Student engagement may also be an added bonus of a specially designed reflective tool of learning. As noted by Zepke (2013) "student engagement helps teachers and learners to actively involve themselves in learning experiences" (p. 4). Hockings, Cooke, Yamashita, McGinty and Bowl (2008, cited in Zepke, 2013) found that teachers who expected students to reflect on their learning, amongst other attributes, generally observed their students were more deeply engaged. Land, Cousin, Meyer & Davies (2006) further note the importance of teachers engaging learners when they proposed their nine key considerations in designing curriculum (p. 199). There appears to be a vital connection between the 'content knowledge' side of the model and the 'pedagogic knowledge' side (Entwistle, 2008). Teachers who give credence to the 'threshold concepts and troublesome knowledge' research, themselves are becoming more actively concerned to avoid mimicry and to ensure their students become engaged in the subject, therefore being proactive in looking for ways to assist their students to reflect on their learning. The students who are particularly engaged are also less likely to mimic understanding when they are meeting the 'troublesome knowledge' or 'stuck places' (Meyer & Land, 2005). A reflective journal may thus be a tool to prevent rote learning which can frequently occur at the introductory course level in an attempt to complete compulsory exercises.

One major difficulty could be the criteria for comparing and assessing portfolios and/or reflective journals and the lack of match between assessment criteria and the aim of the programme (Smith & Tilema, 2003, cited in Butler, 2006). A rubric of some form has been suggested to allow for a format for marking (Zeichner & Wray (2001, cited in Butler, 2006). Pearson and Heywood (2004, in Butler, 2006) argue that measuring reflection could be a subjective process which could be a

concern for reflective journals. It is also likely that students with fewer skills in writing may be disadvantaged by the reflective format and this could influence a teacher's view of the true reflective material.

It does appear however, from extensive research (Abrami & Barrett, 2005; Chang, 2001; Kimball, 2005; Loughran & Corrigan, 1995; Ma & Rada, 2005, cited in Butler, 2006) that in tertiary education alternative sources of assessment to tests, examinations and standard multi-choice questionnaires should be considered as being a more 'authentic' representation of the student's learning experience in economics. It is argued that learning (through reflective) journals allow students to focus their thinking (Wade & Yarbrough, 1996, in Butler, 2006), and in particular take more responsibility and be better engaged in their learning, by enabling them to examine the processes involved in their learning (Abrami, Wade, Pillay, Aslan, Bures & Bentley, 2008).

Summary

This literature review has examined a sample of introductory economic texts to establish key theoretical ideas (core concepts) to establish the 'economic way of thinking'. Two lists have also been documented as possible guides for the key ideas (Frank, 2012; Gwatney, et al., 2009). It has briefly considered the background into the complexity of teaching mainstream economics and the challenges for teachers and students, in particular drawing on threshold concepts and liminal spaces. Davies & Mangan's development of the three levels (2007), in combination with variation theory is vital. Their creation of four principles to address problems/issues and consider appropriate activities for students to acquire the threshold concepts is particularly useful to develop an assessment rubric for a journal (Davies & Mangan, 2007, 2008, 2010). Reference to the SOLO taxonomy of Biggs & Collis (1982), and Bloom's taxonomy (cited in Biggs & Tang, 2007), could also be employed as a measurement of levels of the 'economic way of thinking'. It has aimed to establish the distinction between core concepts and threshold concepts. The importance of reflection and a possible tool of assessment, a reflective journal have been documented.

CHAPTER THREE – Methodology and Methods

Introduction

The aim of this study was to establish whether students of introductory economics at one ITP in New Zealand had begun to 'think like economists'. The reflective journal would be the source of data to discover this. This chapter will focus on the methodology behind how this was carried out and the methods used to establish this.

Nature of the Study

This research has been viewed from the epistemology of constructionism, "which claims that meanings are constructed by human beings as they engage with the world they are interpreting" (Crotty, 1998, p. 43). This implies that until people were around there was no meaning of the world that existed. Consequently, it is argued that any research that is related to the human perspective would derive from this. It was considered that this research originated in the constructionism epistemology, within a critical realist stance. Critical realists believe that there is a real world that exists independently of themselves but they accept that their understanding of the world is inevitably a construction from their own perspective. "They believe that reality is arranged in levels" and that researchers "must go beyond statements of regularity to an analysis of the mechanisms, processes and structures that account for the patterns that are observed" (Denzin & Lincoln, 2005, p. 13). This research was aiming to develop meaning from the students' own interpretation of their real economic world. As Crotty (1998) noted, this would be "the construction of meaningful reality" (p. 10).

Research Approach

This study was undertaken via a qualitative research approach which best suits constructionism. In qualitative studies the information obtained "is not expressed in numerical terms" (Springer, 2010, p. 20). In this research the information would be obtained from the evidence provided by the

students' entries in their reflective journals. The key evidence was derived from the quotations extracted from the students' entries using textual analysis.

The first research question was '*to what extent do business students studying introductory economics demonstrate foundation understandings of the economic way of thinking in a reflective journal of their learning?* '. This was viewed from the theoretical perspective of the interpretative approach (Cohen, Manion, & Morrison, 2000; Crotty, 1998). This observes people in their own world and studies them in their natural settings and from their point of view. Crotty (1998) argues through a constructionism stance, "that people have been influenced by their own melange of cultures and subcultures into which 'they' were born" (p. 79). The researched are therefore an integral part of the understandings that are being created and these are fluid as society and cultures change and evolve. The people themselves make sense of their own world and their own values are integral to their interpretation. Neuman's research assumptions showing the interpretivist paradigm are shown in Table 2 below (1997, cited in Davidson & Tolich, 1999, p. 27).

Table 2. Interpretive understanding from Social Science

	Interpretive
Reason for research	to understand and describe meaningful social action
Nature of social reality	fluid definitions of a situation created by human interaction
Nature of human beings	social beings who create meaning and who constantly make sense of their worlds
Role of common sense	powerful everyday theories used by ordinary people
Theory looks like	a description of how a group's meaning system is generated and sustained
An explanation that is true	resonates or feels right to those who are being studied
Good evidence	is embedded in the context of fluid social interactions
Place for values	Values are an integral part of social life: no group's values are wrong, only different

It was further considered that the interpretive approach, as argued by Cohen, Manion & Morrison (2000), is action focused and future oriented. In the reflective journals the students were attempting to build their own understanding of the 'economic way of thinking' and demonstrate their knowledge development as part of their entries. They were directly involved in this process since

the activities were about their personal experiences and their perceptions of their own economic choices, and those in the business world. Therefore, it was considered that the theoretical perspective to be applied would be from the interpretive paradigm. This would imply that there were no precise and complete model answers when analysing aspects of their journals but more that there would be an appreciation of circles of understanding as described by Vrasidas (2001):

> An interpretivist researcher can never get to the one complete "truth" and obtain a complete understanding of the setting she is studying. ……There is a circular movement and shift of the focus of interest from the whole to the parts and vice versa. Every time the circle is completed, the researcher and the interpretation are changing. You always get closer to a more complete understanding but you never reach completeness (p. 7).

From the above statement, it was considered that the students might work through their journals using their own cycles of reflection (the individual entries). Each time a new entry was created, it would build on the previous entry or cycle in terms of their knowledge integration. Each reflection would not be entirely complete, as it needed to carry on to the next reflection, and so on. Each reflection was another piece of the jigsaw, but it was unlikely that even by the final reflection the students would feel they had the whole picture. The interpretive approach, in terms of the research, was also like this, since in examining the students' data it would build up pictures of the students' evolution of their thinking. This would probably never reach a complete conclusion, but merely provide the beginning of an understanding of how business students created their own knowledge of the 'economic way of thinking'.

Role of Researcher

Qualitative research is a subjective process in contrast to quantitative research (Sandelowski, 2011). In carrying out research into the students' journals the researcher needed to be aware of their own

biases and assumptions as a result of their cultural upbringing. This conscious awareness is known as reflexivity (Springer, 2010). This was a concern in this project, how to apply the journal and analyse it an objective way, and obtain consistency in the process, whilst avoiding one's own personal biases in terms of the topics that students have selected to discuss. Further to this, it was possible that students whose written English grammar was less sophisticated may not write such strong reflective entries. There could be some bias in analysing these through loss of clarity of expression, rather than a focus on the understanding of the economic aspects. The rubric developed for analysis (Table 3a on pages 42-43) allowed for an interpretive classification which was structured so that the economic understandings and procedures were paramount.

Further to this, since the researcher was also the teacher of one of the groups, there was inevitably involvement in the process of learning for some students which could not be avoided. It was recognised that there might be an element of bias in the interpretation of the data having been involved with some of the students. However, it was considered that the journals would provide a place where the data could be found to establish student understanding of the 'economic way of thinking' despite these factors.

Context of the Study

Setting:

The context of the study was to research one assessment (in two parts) of students' work from students studying introductory economics at one ITP in New Zealand. The research was student focused in terms of the students being involved in the research process, rather than teacher focused (looking at how the teacher teaches). The study was investigating whether students developed the 'economic way of thinking' as demonstrated in their reflective journal entries, rather than focusing on what the teacher was doing whilst teaching. The numbers of students' journals researched were dependent on numbers enrolled in the economics courses over which the researcher had no control.

Sample

55 students in total were enrolled in the three courses, and all students were invited to participate. From this group 37 students' reflective journals provided dependable data collected for the findings. Eighteen students withdrew from the course and did not complete the reflective journals, or did not provide consent to their journal being used. All the students (participants) were studying an introductory economics course at the ITP. One group (NZDipBus) was web based and the other two groups were class based. All students participating belonged to the Semester 2, 2013 cohort and no one who consented was excluded. None of the students were studying economics as a major qualification, but for the BBS group it was a compulsory component, and for NZDipBus groups it was part of the compulsory core of subjects. There was a variety of ages and mixed genders in all groups. There were international students in the BBS group, but not the online group. There were different ethnic groups within each course. Some students had studied economics at school, and for some it was their first introduction to the subject. A control group was not used because all students needed to attempt the journal tasks as part of their course assessments. It was therefore not possible to exclude one group of students during the semester.

Trustworthiness

One concern was how trustworthy the data would be in allowing for analysis and drawing conclusions about students' understanding of the 'economic way of thinking'. Trustworthiness is defined by using four indicators (credibility, dependability transferability, and confirmability) to judge "the goodness or quality criteria" (Guba & Lincoln, 2008, p. 261). The reflective journal and marking rubric had been applied for three years as a means of assessment in these same courses. It had been used to assess students' ability to apply core concepts. However, threshold concepts had not been a consideration when the journal was set up initially. It was therefore considered essential

to create a new data analysis tool that would be appropriate and trustworthy in analysing the students' understanding of each of the aspects.

Credibility/ Dependability/ Transferability/ Confirmability

It was considered that the findings would be credible if they were viewed by the respondents as being "believable" (Trochim & Donnelly, 2007, cited in Kumar, 2014, p. 219). The respondents in this study were the authors of the student entries used in the research. The students would recognise their quotations, which were extracted in their original form, as examples of what they had written and how they were categorised in a level.

Dependability of the results of the study was also considered relevant for qualitative research. This means that "the same results could be obtained if we could observe the same thing twice" (Trochim & Donnelly, 2007, cited in Kumar, 2014. P. 219). The reflective journal had been applied as an assessment for a number of years at the ITP in the study in a shorter form, but until this study the marking rubric was not well developed. In this study a new reflective journal assessment and marking grid has been created. Analysis tables with full descriptions have been developed which would allow other researchers to analyse the data and obtain the same results. It was further considered that there were enough observations and quotes to provide a plentiful source of data. The journals generated a possible total number of 703 observable foundation aspects in the 37 journals from 55 enrolments. This was considered to be sufficient data to be a dependable representative sample of the group that started and completed the course.

Transferability refers to the ability to be "generalized or transferred to other settings" (Trochim & Donnelly, 2007, cited in Kumar, 2014. P. 219). The research analysis was being applied to students' journal entries in two campuses, and covered both face to face and online students. The methods of data collection, tools and the analysis processes have been laid out on pages 37-45. It was

considered possible that the approach could be transferred in some form elsewhere in a different context, either another ITP or university within New Zealand.

Confirmability "refers to the degree to which the results could be confirmed or corroborated by others" (Trochim & Donnelly, 2007, cited in Kumar, 2014. P. 219). This would be possible if other researchers followed the exact same process of analysis of student data.

Ethical Considerations:

The process of data collection was fully approved by Massey University and the ITP in question via their ethical approvals processes. These are included in Appendices G – H. All students were invited, through an introductory letter and information sheet, to participate in the research. They were then requested to complete a consent form to demonstrate their willingness to participate in the research. These are attached in Appendices I-K. Those who consented would be part of the research group, but no pressure was placed on the students to participate in the project.

The reflective journals were a compulsory component of their course assessments. The teachers of the courses, including myself, were unaware of which students had agreed to participate in the research. The consent process and data collection was carried out by a research assistant who did not teach that course. The research assistants were provided with an instruction sheet to assist this process. All the names of the students were removed from the data collected and a number allocated to each student for recording purposes, for example **S1, S2.** The data, including participant consent forms, were held in the research assistant's locked office until the end of the semester. When all the results had been collated and grades awarded from the semester assessments data analysis was undertaken.

Methods: Data Gathering Processes and Tools:

Data are that which is deemed retrievable by the researcher (Sandelowski, 2011). The findings of this study were based on the data. In this study the data to be investigated were the student reflective journals. These were collections of their writings. As permission was required to use the journals, a letter of introduction was sent to all students enrolled in the three courses. An information sheet was also included (Appendix I and J). In the first lecture the consent process was completed (Appendix K). The reflective journal included a marking rubric modelled on a version of the table from Davies & Mangin (2007, 2008) shown in Appendix F. The journal had been refined over three years and was handed out in class or available online. This was used as a major assessment, which the students would complete, and this would be the key source of data gathering. The reflective journal is attached in Appendix L.

The journal was the key data gathering tool and it was seen as the means to discover the students' voice about the development of their 'economic way of thinking'. This was completed and collected in two parts (micro and macro), as the questions were related to the learning outcomes of the courses. The questions in the reflective journal had been revised from a version used in previous BBS and NZDipBus courses to ensure inclusion of every aspect of the 'economic way of thinking' according to Table 1 in Chapter Two. The journal also covered all the learning outcomes in the courses. The reflective journal was being employed as a compulsory assessment component worth 30% of the subject's marks.

All students, whether they had agreed to participate in the research or not, were assessed via the journal during the course. Each completed journal from participating students was photocopied and each photocopy linked to the number allocated to that student. Names were removed from this data which was stored in the research assistant's locked office. The original journals were then marked via the criteria set (shown in Appendix L). The marked journals were returned to the students as per the usual procedure at the ITP. It was anticipated that some students would withdraw from their

economics course and their data would not be analysed. If this occurred they would not have completed the whole course and the research project. Their entries were excluded from the analysis.

Data Analysis:

The second research question was '*How can the construct of threshold concepts inform our understanding of effective teaching of the 'economic way of thinking'?'* This was considered by viewing the evidence from the quotations. This was to establish which aspects were, either demonstrating that most students had either broken through the threshold in their learning, or those which were still demonstrating difficulties for students in the form of 'troublesome knowledge'. Some students would be in the 'liminal space' or transitioning in their understanding. From this evidence, the language and understandings of the threshold concepts literature researched in Chapter 2 were applied. This would assist the researcher to develop some tools and strategies that would contribute to the knowledge of teaching the 'economic way of thinking' at this introductory level. The criteria for breaking through the threshold concept was that students demonstrated transformation and irreversibility in their understanding, integration of number of ideas, that they had established a clear bounded conceptual space and that there had been some troublesome knowledge in obtaining the understanding. It was recognised the difficulty of identifying all of these set criteria for threshold concepts and so a more manageable tool was required as shown in the level 1- 3 explanations on pages 40-41.

One strategy used was text analysis explained in Denzin & Lincoln (2005, p. 870) where there was an effort to predefine a set procedure. Tables 3a and 3b (pages 42-44) and the level 1-3 explanations provided the set procedures. The student texts required reading and rereading to identify clear quotations to represent the three levels of understanding for each foundation aspect. The students were essentially writing about their personal or observed situations as applied to economic theory. It was considered the use of the analysis tables was the best technique to establish the extent to which

the students had acquired the ‘economic way of thinking’ as evidenced in their journal entries. It was concluded that the analysis of the journals would therefore be text analysis to arrive at a picture of how the students had demonstrated their understanding of economic principles within their own lives and the business world. It was considered that they were the authors of their journals and an analysis of their text (the journal entries) was being undertaken. Since there were fifteen entries in each student’s reflective journal it was decided that some simplification of the process would be necessary.

The interpretive approach was used to establish propositions. Each of the reflective journal entries was analysed by using Table 3a on pages 42-43. This focus was used as it enabled an emphasis on the key foundation aspects of the ‘economic of way of thinking’ which would facilitate finding answers to the research questions. The foundation aspects had been identified from the literature review in Table 1 on page 9 and were woven into the questions in the reflective journal. The expression ‘foundation aspects’, or ‘aspects’, has been chosen to demonstrate that the ‘economic way of thinking’ in introductory level courses has been identified as having nineteen different core concepts within it and this contributed to a complex whole. Tulloch et al., (1993) defines ‘aspect’ as a “particular component of a feature or matter” or “the appearance of a person or thing, as presented to the mind of the viewer” (p. 78). This depicts the many sides of the ‘economic way of thinking’ being considered in this thesis. It also allows for distinguishing between the basic core concepts in economics compared to possible threshold concepts as defined in Chapter 2.

Table 3a on pages 42-43 allows for three stages of understanding (levels 1-3) of the nineteen foundation aspects of the ‘economic way of thinking’. These levels were effectively placeholders, in order to categorise each student’s understanding, so that the textual analysis could be carried out later. A full explanation of the three levels created is included on pages 40-41. These were based on Davies & Mangin’s Table (2007, 2008) shown in Appendix F. Creating the language of the three levels of understanding was instrumental to analyse students’ understanding of the nineteen foundation aspects and to find relevant quotations. The Intended Learning Outcomes (ILO’s),

originally developed by Biggs and Tang (2007) from Bloom's taxonomy (p. 81), plus Ashwin's version of the SOLO taxonomy adapted from Biggs and Collis, 1982, (2008, pp 175-176) were also drawn upon as sources for the language of analysis. The explanations of the levels for analysis purposes have drawn upon the threshold concept literature using terminology such as transformation, integration and troublesome knowledge. Table 3a provides the definitions of each of the foundation aspects which students would be expected to understand. These are also included in Appendix A with full references. In analysing student journals each journal was set up with an analysis sheet (Appendix M) to record the level (1-3) for each foundation aspect for that student's journal. The results were collated and tallied using a tally sheet to provide the numbers in Table 4 on page 49. Students who did not complete an entry were recorded as level 1, demonstrating negligible understanding of the aspect included in that entry. Table 5 on page 50 recorded the total number of students who did not attempt the journal entries. The criteria for categorising the foundation aspect as a possible threshold concept was that 20 or more students were found in level 1 and few students were found at level 3.

Explanation of levels:

Level 1: Has developed negligible understanding of the 'economic way of thinking' and no transformation in their learning is evident: this would refer to a student who has not attempted to define/explain the basic economic terms within that concept; their application is either non-existent or is not connected to the basic terms clearly; uses either no model or the model is not appropriate; does not integrate the terms, application and model; lastly shows little or no attempt to reflect on the processes or that they have not shown any transformation of their understanding through the threshold. Overall their answers would usually be minimalist if attempted.

Level 2: Beginning to develop an understanding of the' economic way of thinking'. Some transformation in their learning is evident: this would refer to a student who is attempting to define basic terms within the concept but only briefly; the application is relevant to the concept but

may be unsophisticated and there may be occasional errors; an appropriate model is applied; can begin to integrate the terms, application and the model; and lastly is showing a clear attempt to reflect on the processes of their learning and troublesome areas and transform their thinking through the threshold but might not have fully emerged through the other side of the threshold.

Level 3: Has developed a sophisticated understanding of the 'economic way of thinking' and the threshold concepts. Has shown transformation in their learning: this would refer to a student who has fully defined, discussed and distinguished between the basic terms within the concept; their example applied to the terms was very rich and in depth; the model is not only appropriate it is fully labelled and sophisticated; they have integrated a number of concepts, their example and the model into a coherent whole; they are clearly reflecting on their learning and how it applies to their world; they have recognised how they have emerged through the threshold and shown evidence of doing that (Biggs and Collis, 1982, cited in Ashwin, 2008; Biggs and Tang, 2007; Davies & Mangin, 2007, 2008).

The reflective journal was one of the major components in the course and students were developing it throughout their course so it was anticipated that the analysis might demonstrate a development in their economic understanding over the whole course, though this was not necessarily assumed.

Definitions of Concepts

For the purpose of the analysis and discussion in this study, the following terms and their meanings, have been used in Chapters 4, 5 and 6.

Core Concepts: key basic ideas required for understanding economics at an introductory level. These are specific to the discipline. They are used as building blocks in the subject (Kiley & Wisker, 2009). Some examples would be scarcity, choice and factors of production.

Threshold concepts: These are concepts that are distinct within the core concepts, but have the characteristics of being transformative, integrative, bounded, irreversible and containing troublesome knowledge (Land, Meyer & Smith, 2008.

Table 3a. Economic way of thinking: Analysis table for the reflective journals

Totals of students that signify development at the three levels with the different foundation aspects

Foundation aspects of The Economic Way of Thinking	**Brief description of aspect**	**Number of students**	**Number of students**	**Number of students**	**Total number of students**
Brief description of level	**All definitions /descriptions of these foundation aspects are referenced in Appendix A**	**Has developed negligible understanding of the economic way of thinking (level 1)**	**Beginning to develop an understanding of the economic way of thinking (level 2)**	**Has developed a sophisticated understanding of the economic way of thinking and threshold concepts (level 3)**	
Scarcity/Choice	The situation in which unlimited wants exceed the limited resources available to fulfil those wants/ A decision that has to be made because of the problem of scarcity.				
Opportunity Cost/trade off	The highest valued alternative that must be given up to engage in an activity/ Producing more of one good means having less of something else.				
Rational Thinking	People are assumed to always try to get the most out of their limited resources and will weigh up the benefits and costs of a decision given the information available. They choose the option which provides the greatest benefits over the cost.				
Demand and Supply equilibriums	The willingness and ability to pay for a quantity of a good or service. This is demonstrated by the demand curve and the law of demand/ The willingness of producers to produce a product in relation to its price in the market. Bringing the two forces together creates a state of balance (if temporary)				
Assumptions/ Ceteris Paribus	Economists need to decide on the assumptions when using a model. These are usually assumptions about people's behaviour or motives/ A Latin phrase meaning all else being equal whilst a certain variable changes.				
Models/Graphs	A simplified version of reality used to analyse real world economic situations. A graph is the most commonly used model in this analysis but it could be a table or appropriate diagram.				
Scientific Way of Thinking	Testing a hypothesis in an economic model to see if it predicts correct human behaviour.				

Marginal Costs/ Benefits	Weighing up the extra benefit of an action versus the extra cost of it.				
Incentives	An incentive is something that induces a person to act. Choice is influenced in predictable ways by changes in incentives.				
The Economic Questions	What goods and services will be produced, how will the goods and services be produced and for whom will the goods and services be produced?				
Cause/Effect and Association	The error of reasoning when one confuses association and causation between variables. A model is valid only when there is a genuine cause and effect relationship				
Unintended Consequences	Economic actions usually generate indirect effects as well as the direct effects. These may be unexpected.				
Factors of Production/ Combining Resources	The resources of land, labour capital and enterprise used in producing goods and services/ the combining of these is related to the short run and long run understandings in economics				
Trade Creates Wealth	People will exchange the surplus of their production in order to increase their welfare				
Positive/Normative	Positive economics deals with facts and addresses what is verifiable whilst normative economics deals with what ought to be.				
Micro	The grouping of economic topics into the study of households and firms who make choices				
Macro	The branch of economics that studies decision making for the economy as a whole				
Production Possibility Curve (PPC)	A graph used to show the various combinations of two goods that can be produced with a given amount of resources and the available technology at that point in time				
Efficiency/Equity	Efficiency denotes the most effective use of society's resources in satisfying people's wants and needs. There are different definitions for efficiency and it is possible that technical production efficiency will not lead to equity (fairness in the distribution of economic benefits). Allocative efficiency is said to occur when no one can be made better off without making someone else worse off				
Total					

Table 3b below shows the foundation aspects of the 'economic way of thinking' and where the aspect was most likely to be located in the reflective journal questions set (Appendix L).

Table 3b. Location of foundation aspects

Foundation Aspects	**Reflective journal question where foundation aspect would be most easily located**
Scarcity and Choice:	Question 1
Opportunity cost/Trade off:	Questions 2, 8 & 14
Assumptions/ceteris paribus:	Question 4
Rational Thinking:	Question 2
Demand/ Supply and equilibriums:	Questions 2, 3 and 4
Models/graphs:	All questions
Scientific way of thinking:	Question 4
Marginal costs/benefits:	Question 6
Incentives:	Question 2 & 11
The three economic questions:	Question 1 & 7
Cause /effect and association:	Question 13
Unintended consequences:	Question 7
Factors of production/combining resources:	Question 5
Trade creates wealth:	Question 9, 10 & 14
Normative/positive economics:	Question 8
Micro:	Questions 1-6
Macro:	Questions 7-15
PPC:	Questions 1 & 8
Efficiency/Equity:	Question 8

Once the students' understanding of each of the foundation aspects was categorised into one of three levels, the journals were then searched for quotations, which represented to saturation point the levels in each of the aspects. Saturation means that the quotations being analysed were then providing information that had become redundant, and there was no new information appearing (Springer, 2010). It is noted in the Findings chapter that the students were identified by a label for example **S1, S2**. In Chapter 5 the descriptive terms are also defined for consistency purposes.

Summary

In this chapter the researcher has explained the research approach for this study and the rationale for its use. An interpretive approach applying a qualitative design and analysis was used to answer the research questions set. Within this chapter the role of the researcher, the process of how the samples of data were obtained, the data gathering tools, management processes and ethical considerations were further discussed. Finally the techniques for analysing the data have been explained using various tools to establish understanding of the' economic way of thinking' within the students' reflective journals. This enabled the identification of student quotations to be obtained on which to base the following findings and discussion chapters.

CHAPTER FOUR – Analysis of the Data

Introduction:

This chapter presents the findings from the students' journal entries as identified through Table 3a 'foundation aspects of the economic way of thinking' developed in Chapter 3 (Methodology and Methods). Threshold concepts are also a contributing factor to the analysis since it was essential to establish which of the aspects might be core concepts, but not necessarily threshold concepts, and which seem to contain characteristics of threshold concepts, in particular providing troublesome knowledge. The expression 'foundation aspects', or 'aspects', has been chosen to demonstrate that the 'economic way of thinking' has been identified as having nineteen different key ideas within it and so makes for a complex whole. Tulloch et al., (1993) defined an 'aspect' as a "particular component of a feature or matter", or "the appearance of a person or thing, as presented to the mind of the viewer" (p. 78). This depicts the many sides of the 'economic way of thinking' being considered in this project. It also avoids confusion in the use of the word 'concept', which has in some texts, been used rather loosely. An aspect may be either a core economic concept or a threshold concept.

This chapter is organised into two parts. Part one will focus on Tables 4 and 5. Table 4 demonstrates the number of students who were perceived as having achieved a particular level of understanding for each foundation aspect of the 'economic way of thinking' as defined in Chapter 3. Part two will briefly analyse the key findings from the table including identifying student quotes which represent the different levels for a selected number of aspects. There were 37 students who gave consent for their journals to be used in the research and attempted both parts of their journals. In total nineteen foundation aspects were analysed. This generated a possible total number of 703 'student foundation aspects' in the 37 journals. Some students did not attempt all questions in their journal which created

difficulties in identifying their actual understanding of the aspects within that question. Table 5 shows the numbers of students who did not attempt a particular question.

Part One: Findings

Results of classifications

Table 4 below summarises the classification of the 37 student journals, according to the 19 foundation aspects of the 'economic way of thinking' developed in Chapter 3 (Methodology), and found throughout the literature in the basic economics text books investigated in this research. It demonstrates the students' understanding on a scale of 1-3 of each of the key foundation aspects considered in this list. A full description of the levels and how they were created plus definitions of these foundation aspects is included in Chapter 3. Table 4, on page 49, was created as a starting point to enable the researcher to gain a perspective on which foundation aspects appeared to demonstrate understanding at a particular level and to allow for further examination of the quotations to support those levels identified. The list of descriptors used in the analysis is summarised below:

Most: 25 or more students;

The majority: 18-24 students;

Many: 11-17 students;

A number: 6-10 students;

Few: Up to 5 students

The students achieving level 3 demonstrated a sound understanding of the aspects, had integrated ideas and transformed their thinking. They were able to define and distinguish between key terms, applying rich examples and were reflecting on their learning. In viewing Table 4 it can be seen that most students achieved level 3 for scarcity/choice and opportunity cost/trade-off; the majority of students in demand and supply, models/graphs and production possibility curves. Many students achieved level 3 in trade creates wealth, positive/normative economics and efficiency/equity whilst a

number did so in rational thinking, assumptions, marginal costs/benefits, unintended consequences and factors of production/combining resources. The other six aspects had only a few at level 3.

Those students at level 2 in an aspect could generally define terms but their examples were less rich and often demonstrated errors in their thinking. This was most apparent in the graphs provided, or usage of the economic terminology. However, they were beginning to reflect about their learning. Some aspects generated most students at level 2 such as marginal costs/benefits, incentives, unintended consequences and micro/macro-economics. These students showed that they were transitioning through the 'liminal space', but had not fully emerged with complete confidence. They tended to have some linkages omitted or lacked integration of the language involved in those aspects. The majority of students were at level 2 in rational thinking, factors of production/resources, trade creates wealth and efficiency/equity.

Those students at level 1 had developed little or no knowledge of that aspect of the 'economic way of thinking'. Generally they did not define concepts or apply them correctly in their examples. Nor were they reflecting on their learning. The aspects which had most students at Level 1 included scientific way of thinking and the economic questions and the majority in assumptions and cause/effect versus association. Students classified in this category showed little or no evidence of having developed understanding in this aspect.

In total 206 observations emerged as being at level 3, 338 at level 2 and 159 at level 1. Of the 703 observations 544 were classified as being at level 2 or 3.

Table 4. Totals of students that signify achievement at the three levels in the foundations aspects of the 'economic way of thinking'

Foundation aspects of The Economic Way of Thinking	**Number of students per level**	**Number of students per level**	**Number of students per level**	**Total number of students**
Brief description of level	**Has developed negligible understanding of the economic way of thinking (level 1)**	**Beginning to develop an understanding of the economic way of thinking (level 2)**	**Has developed a sophisticated understanding of the economic way of thinking and threshold concepts (level 3)**	
Scarcity/Choice	0	6	31	37
Opportunity Cost/trade off	1	6	30	37
Rational Thinking	9	19	9	37
Demand/Supply/equilibriums	1	17	19	37
Assumptions/Ceteris Paribus	19	8	10	37
Models/Graphs	2	16	19	37
Scientific Way of Thinking	25	12	0	37
Marginal Costs/ Benefits	4	26	7	37
Incentives	5	28	4	37
The Economic Questions	26	11	0	37
Cause/Effect and Association	20	17	0	37
Unintended Consequences	5	25	7	37
Factors of Production/ Combining Resources	7	23	7	37
Trade Creates Wealth	3	23	11	37
Positive/Normative	13	7	17	37
Micro	4	32	1	37
Macro	1	36	0	37
PPC	6	8	23	37
Efficiency/Equity	8	18	11	37
Total	159	338	206	703

Table 4 provides a starting point for evidence of samples of student quotes.

Non-attempted entries

Table 5 below demonstrates the number of the questions which were not attempted.

Table 5. Non-attempted questions

Question Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	
Total of students not attempting the question	0	0	0	4	5	5	0	4	0	5	4	4	11	3	6	51

Questions 1- 6 were micro-economic understandings and these accounted for 14 non-attempts. Questions 7-15 were largely macro-economic understandings and these accounted for 37 non-attempts. Some key points emerged from the above findings:

- 23 out of 37 students (62%) attempted all entries and 14 students (38%) did not attempt at least one entry
- Four students did not attempt six or more questions accounting for 27 (53%) non-attempted questions of the 51 non-attempts.
- If the number is lowered to four or more non-attempted questions per student the total rises to 35 out of the 51 (69%) non-attempted questions from just eight out of 37 (22%) of the students.
- This indicates that it is just a small proportion of the students that were highly represented in this group of non-attempts. They appeared to have difficulties in attempting certain questions. The precise reasons for this cannot be elaborated in this study without having surveyed the students about their reasons for non-completion.
- It was found that the questions which were least attempted tended to be more represented near the end of each part of the journal (part one or part two) and/or they

required greater skills of integration such as question 4, 5 and 6 from part one and 8, 10, 11, 12, 13 and 15 from part two.

- The online group of students attempted all questions from the whole journal.

Part Two: Analysis

The second part is organised into three sections.

- The first section (samples of students' work at Level 3) provides analysis of observations and quotations from seven foundation aspects. They were selected because they demonstrated **that most or the majority o**f students had gained a sound understanding of the aspects and were at level 3. The foundation aspects were selected because they demonstrated clear examples of the necessary understanding of that aspect.
- The second section analyses the challenging aspects. These aspects had large numbers of students with many level 1s and 2s. The criteria for categorising the aspect as a possible threshold concept was **that in this study 20 or more students were found in level 1 and few students were found at Level 3**. It could therefore be argued that these aspects might be threshold concepts.
- The third section, 'liminal spaces', considers samples of students' entries that show little or no understanding of the aspect and this demonstrates the learner's position in relation to that foundation aspect as being in a 'liminal space'. The students are unable to return to their previous thought patterns, but they cannot move forward either. There can, however, be no "full return to the pre-liminal state" (Meyer & Land, 2005, p. 376). The students identified at level 1 or low level 2 were considered in this liminal space, and often did not attempt questions that posed difficulties.

Section 1: Samples from students' work at Level 3

Below is a selection of the findings of students' understandings identified as representative samples of quotations and observations from the journals. The selection focuses on students who achieved the level 3 criteria for that aspect (pages 40- 41). This was the main aim of the research question - to discover if students could understand the 'economic way of thinking'. Seven of the nineteen aspects have been selected because they either have the greatest number of level 3s and/or provide excellent examples of level 3 thinking. This provided a large number of quotes which was observed to saturation point. The examples chosen illustrate samples of students' entries to identify the reason for their level placement in Table 4 above. This section is organised under the seven foundation aspects selected. These were scarcity/choice; opportunity cost/trade-offs; demand and supply, unintended consequences; trade creates wealth; positive/normative economics; and production possibility curves. Noted in brackets is a summary of the question from the reflective journal in which the foundation aspect was found. The full questions are included in the reflective journal in Appendix L.

Foundation Aspect: Scarcity and choice

(Question 1: Using a model to assist them students explained an economic problem they have seen of scarcity and choice).

Most students (31/37) provided clear definitions, rich examples of the costs and benefits of choices and often could integrate their ideas into future scenarios. Definitions ranged from "Scarcity: There's not enough of something (products/ services/ resources) to satisfy everyone's wants (e.g. in Japan land is scarce). Choice: Picking between alternatives" **(S10)** to "Auckland is never going to have enough resources be it land or labour to satisfy all of their wants in regards to their transport system nor the means to purchase these" **(S14)** and "I have learnt that I must take into consideration additional expenses in order to be able to carry out the decision that I have made……find the best choice for me, which includes the opportunity cost of every situation and how that may affect myself if I choose to instead use that pathway" **(S15).** Benefits and costs were identified by **S24** who wrote "how tough it has been being an exporting manufacturer with the GFC and my business has slowed down". They further reflected "what I find interesting about decision making using economics is that I can apply the same method to a whole range of problems in my business. I think in the long run I will make more considered decisions in the future when it comes to scarcity, choice and opportunity costs". **S26** considered "choice, scarcity and opportunity cost are all closely related as the problem of scarcity forces a choice and when a choice is made opportunity cost arises as an alternative would have been given up". The majority of students were also transforming their thinking as they hadn't previously recognised they were going through this process as in **S28** when they noted "I am now able to look at a situation where I need to make a choice and work through the process logically".

Foundation Aspect: Opportunity Cost/Trade off

(Question 1 as above but extending this to opportunity cost)

Most students (30/37) could define the term clearly and integrate their scarcity/choice problem to opportunity cost and recognised the value of this for their decision making in the future, for example **S11** noted "as a result of the choice I made *'to study'* I had to make sacrifices and that the next best option *'leisure time'* is known as opportunity cost". They recognised their transformation when they said "although I am new to the concepts I have realised that the use of them occur every day …….I will use these concepts to make decisions that economically better myself". **S32** concluded "choosing to go into fulltime study means the opportunity cost, in the short term, is the reduced time I get to spend with my daughter. When making the decision originally, I didn't think it through to the extent that I now will". Students who really understood this concept recognised that the rejected option was the opportunity cost, for example **S22** noted on their personal dilemma of trying to juggle international competition with their studies "looking back on the situation I should have weighed up the benefits and costs of each decision and decided which opportunity cost is greater before I even went overseas". Students at this level could also apply the concept of 'trade-off', as in **S20** who recognised that "where I have an assignment that needs to be done and at the same time I have a class to go to, I find myself with a choice, either to work on my assignment to meet the deadlines, or to attend class at that particular time. In this instance I chose to work on my assignment, rather than go to class".

Foundation Aspect: Demand and Supply

(Question 3: Real world examples to demonstrate demand and supply forces and Question 4: setting up an experiment to demonstrate the scientific way of thinking in a question of their choice on demand and supply)

The majority of students (19/37) could integrate shifts of demand and supply and could apply the graphs correctly to a real world scenario. **S7** discussed exogenous factors shifting both demand and supply curves in the wine industry and discussed that "a loss of income across a wide range of groups in our society…drove down the demand for luxury spending such as wine" and "a boom in production created … a movement outward of the supply curve". **S12** examined the Auckland housing market and recognised that there needed "to be an increase in supply of properties in Auckland and to hopefully reduce the price by means of Government legislation fast tracking development and creating special areas for housing". They could connect the Government action to an increase in the supply curve for this to occur.

Furthermore students at this level could work through previous misconceptions and use the graphs to help them see the end results in the real world. **S22** considered the botulism scare and reflected "I thought that a decrease in demand would surely lead to a decrease in price, as suppliers would have to reduce their prices in order to sell the product. But once I produced the model for the market for baby formula I realised that the price might not decrease as much as I thought it would. It depends on how much demand decreased in relation to the decrease in supply". **S20** had reflected "how come when demand and supply both decrease, the price remained the same? It wasn't until after illustrating the situation through a graph that I can see why this would occur. I think drawing the graphs is a great way for me to see the effects of different factors and how they can affect demand and supply, or both in a

specific situation" These students had integrated parts of the whole model and begun to recognise their new thinking (transformation).

The majority of students could use the demand and supply model to evaluate a real world scenario in a different and economic way and draw future conclusions, for example **S32** who reflected on Nike producing women's sports gear inspired by traditional pacific tattoos when they wrote "if I had read this article a month ago I would have only thought about how Nike had offended the people of the Pacific Islands. I now know that demand is not only about the ability, but also the willingness to purchase goods". It was a reflective entry drawing on a number of cultural and economic aspects.

Foundation Aspect: Unintended consequences

(Question 7: the effects of pollution on the market and how their thinking has changed on this and recognising the concept of unintended consequences in their example).

A number of students (7/37) were able to explain unintended consequences and integrate the concept with their externalities examples as when **S7** wrote " an externality is where a third party is inadvertently affected by a market's production or consumption, that is the actions of a market has imposed effects on persons external to the demand and supply transaction. These externality's are unintended consequences and can be either positive or negative". They dealt with the harmful effects of smoke created as a by-product of production which "dirties the shirt of a third party, the company is imposing the cost of re-laundering the shirt without the consent of the third party". **S12** provided a comprehensive summary with clear definitions of the negative externalities of wood burners. They noted "when people are purchasing or using wood burners they are not deliberately putting dangerous smoke into the environment, this is an unintended consequence. They just want the private benefit of heat

and they are prepared to pay the private cost of the burner and wood etc. Unfortunately the smoke is merely the side effect to the third parties" and **S22** recognised that "an externality is an example of an unintended consequence. Unintended consequences are spill-over affects that weren't planned for, the social costs or benefits from a production or consumption action". They defined all relevant terms in their example of cigarette smoking and reflected that they had now realised that "unintended consequences can be measured".

Further to this the students at level 3 were demonstrating a change in their way of thinking as when **S20** provided a descriptive example about compulsory seat belts and said "seat belts work to protect people in cars from injuries in case of an accident. However, the unintended consequence in this case from government introducing seat belt laws is the increased deaths of pedestrians and cyclists from motor vehicle accidents" and **S24** who reflected "this has been a very interesting study because I would never have thought of pollution in an economic sense but now I have a whole different view on the subject. I think this is where studying economics is having a huge impact on the way I think about things that in the past I would not have given much thought to" and **S35** considered "when a company produces goods and services they intend to make that product only, but some unintended consequences may result as a side effect of their production of these goods and services such as pollution". The example was a very comprehensive study using a model for dairy farming. They reflected "before taking this course I did understand the idea of unintended consequences and how the government can try to control these as best they can but the model was new to me". Their transformation here was in bringing in the full model which they had not appreciated prior to this journal entry and would allow them further integration and linkages in other topics in economics.

Foundation Aspect: Trade Creates Wealth

(Question 9: Considering the circular flow of economic activity (CFD) diagram and substituting people into the diagram to show the flow on effects and Question 14: Considering the effect of trade on the New Zealand economy especially if imported goods were not available).

Many students were able to recognise that if countries specialise then they can become more efficient and productive and trade their surpluses creating greater wealth, for example **S1** wrote we should "encourage international injections into our CFD" and reflected "instead of thinking 'everything should be kiwi made' I can now view imported goods and services from a different perspective understanding that it is better for us to purchase it from other countries sometimes". **S7** observed that "when we export wine we gain income from the country that bought our products"……Chile can use their comparative advantage to produce more Malbec and NZ uses theirs to produce more Chardonnay than if the two countries didn't specialise in their respective varietals and this will increase global production". **S24** commented "I find this quite interesting and I was quite surprised with the learning outcome of this topic as I can now see clearly why New Zealand has moved more successfully into primary food production and why we no longer manufacture our own electrical goods."

Many students could also apply a clear two country two good model to illustrate the comparative advantage rule to justify trade, for example **S31** noted "other countries are very likely to have absolute advantage over many items that are produced but New Zealand may still have comparative advantage over some, allowing us to trade with other countries" whilst **S41** wrote "New Zealand would be stupid to make cereal local so they will import it from Australia but with meat they will make it locally. If Australia stopped exporting cereal *(for animal feed),* we will suffer a bit because we will produce less meat and it will be a higher opportunity cost". **S17** concluded their entry with "before I thought the parties would just

depend on resources availability to figure out what to produce. After I learnt this section, I realise that if the countries specialise in producing a good or service at a lower opportunity cost, there will be more benefit to the countries who participate in".

Foundation Aspect: Positive/Normative economics

(Question 8: Conflicts and trade-offs in achieving greater equity of incomes; also recognising positive versus normative economics in this process)

Many students (17/37) could apply definitions correctly to an example from the real world, as when **S39** explained "positive economics is the study of economics based on objective analysis" and added "normative economics is a perspective that incorporates a subjective analysis" recognising that most economists focus on this. **S38** reflected that normative economics carries "value judgements".

Students at this level could apply the Lorenz curve to distinguish between measuring equality of incomes (positive economics) and the concept of whether it was desirable to achieve it (normative economics) as when **S31** drew the Lorenz curve and explained "normative economics comes in when deciding what distribution of income or method is fair as that will be someone's judgement, rather than a fact. Positive economics however would be involving the actual statistics of how many people are in each income bracket as these will be facts derived from surveys conducted such as the Census". **S20** wrote succinctly about the issues: when they said "positive statements are based on facts and can be proved or disproved. Normative statements are opinion based statements such as the Government should aim to achieve complete equality of incomes". They also noted that "no one person is more accurate/better than anyone else in determining what is fair".

Many students at this level could provide interesting examples from their readings/observations ranging from **S12** who considered free dental care for children and

recognised that the provision and its effect on children's teeth was a positive statement but also added "there is always some controversy that arises when people think that their tax payer dollars should be going back to them personally and that parents should be responsible for the welfare of their children" and **S22** who wrote "I feel very strongly about this issue '*free school meals for children'*, so straight away I'm inclined to making normative statements about how children should not go hungry". **S36** provided an example for normative economics: "we should cut taxes in half to increase disposable income levels but in contrast a positive economic observation would state that big tax cuts would help many people". There is evidence to substantiate the latter statement but the first is opinion based. **S4** provided as an example of a normative statement when they said "Government needs to redistribute more income received from the taxation system to the development of better services in the public such as healthcare".

Foundation Aspect: Production Possibility Curves (PPC)

(Questions 1, 8 or 14 as above)

The majority of students could draw an accurately labelled production possibility curve and relate it to an appropriate example often reflecting on their situation, for example **S10** applied a situation for time spent either working or studying in hours for a fixed period of 40 hours a week and said "for every hour I work I lose one hour of study time (opportunity cost)" and **S22** drew a basic constant opportunity cost PPC on training for a competition sport versus study in terms of an eight hour day and noted "applying these ideas to my situation helped me understand it a bit further; it made it seem more relevant". **S31** wrote "it can be seen that the PPC could help us with time management skills and show us all the available combinations of the activities that we wish to take part in. Having these concepts of scarcity and

opportunity cost refreshed has meant that I will look into any important decisions further than I did previously and consider the costs of choosing one or the other".

A number of students could integrate the PPC model into later learning outcomes, for example **S20** applied a PPC as the equality versus efficiency trade-off. They recognised that "if the government were to attempt to change the distribution of incomes, the current combination of goods produced (determined by the current price signals) would change and allocative efficiency would be lost in the market". **S27** provided a PPC for study versus work (40 hours week) but also included the table on which to develop the PPC showing the logical thought process. They had said it "has been fairly understandable apart from getting slightly confused thinking that all PPC's had to have a curved line". **S39** showed an example of choices between driving a car versus walking to class with time and money as the scarce resources. It had a table first and then the PPC. It was a well-developed analysis and reflected "using the PPC and the model based on the days of vehicle use, I can make the choice that I would only require $45 to spend on myself. This choice allows me to make better use of my scarce resource of money". These students also provided the equity versus efficiency PPC trade-off model in Question 8 integrating the concept to other scenarios.

Section 2: Foundation Aspects Creating Challenges (few students at level 3)

Table 4 shows that certain foundation aspects appeared to be more challenging in nature. These might be 'threshold concepts' which have been described as being like portals opening up a new and previously inaccessible way of thinking (Meyer & Land, 2003). Threshold concepts have a number of qualities, in particular "they are *transformative* (occasioning a significant shift in the perception of the subject), *integrative* (exposing the previously hidden interrelatedness of something)……. *Irreversible* (unlikely to be forgotten, or unlearned only through considerable effort), and frequently *troublesome*" (Land, Meyer & Baillie, 2010, pp. ix-x). They further suggest that the transformation might occur quickly or could take a longer period of time. The criteria for categorising the aspect as a possible threshold concept was that in this study 20 or more students were found in level 1 and few students were found at level 3. This could be because they were either still in the 'pre liminal state' or having difficulties transitioning through the 'liminal space'. These were: cause/effect and association, the scientific way of thinking and the economic questions. The economic questions have been discussed later in Limitations (Chapter 6).

Aspect: Scientific Way of Thinking

(Question 4 as above) appeared to be troublesome for these students as 25 were classified at level 1 and only twelve at level 2. There were no students at level 3. If there were no students at level 3 it is arguable that transformation had not occurred and the lack of this is holding some of students back in other concepts. Gans, King Stonecash and Mankiw (2012) argue "economists try to tackle their subject with a scientist's objectivity" (p. 21) and this could be crucial for students to enable them to move forward. However, those students with level 2 entries demonstrated some scientific reasoning, and students could possibly set up an experiment, but did not connect this to the scientific way of thinking as was expected in the question. They were beginning to transition through this understanding of this possible

threshold concept and with more time they would probably transform their thinking and integrate the ideas to other foundation aspects of the subject. Some examples of the better understandings **from Level 2** are shown below:

S31 set up an elasticity of demand for ballet gear and looked at the effect of changing price on the quantity demanded. They said "ballet shoes are a necessity when choosing to do ballet so this means that there are no substitutes available. Therefore if the price was to increase slightly, no or very little change in quantity demanded would occur. In this model the elasticity of ballet shoes is 0.89 which is inelastic". The calculations were designed to fit in with their knowledge and own observation so lacked the objectiveness of scientific thinking. It was a simple attempt at an experiment within an economic context.

S24 used actual evidence from electricity prices to calculate their price elasticity of demand and noted "my theory is that my maximum electricity usage is around 1800 kwh for a month and my minimum is 900 kwh. Thus between 1800 and 900 kwh my consumption should be elastic because if price goes up I can turn off appliances to save electricity…. however between 1 and 900 kwh I would struggle to make savings so I would end up having to pay the increase in electricity price so for me this would be inelastic". This was an attempt to apply some economic scientific reasoning to their personal observations.

S22 used the opportunity to check out the model of elasticity by considering what would happen in the real world for bus fares at different times of the day and noted "during peak traffic between 8-9 a.m. and 5-6 p.m., the demand for bus services is inelastic as there are few substitutes one being a car but this involves being caught up in traffic jams". It was somewhat theoretical and they admitted "I pretty much reworded the example we did in class, but off the top of my head. To make sure I have passed through the threshold I have come up with my own example of inelastic demand for cigarettes". They were relating to their observation

of how people react if the prices of cigarettes rose as a scientific technique but had not actually carried out a survey to prove their hypothesis. If there had been more time this student could possibly have progressed to this technique to test their hypothesis.

S12 considered the hypothetical example of what would happen to demand and supply of meat products if a foot and mouth disease broke out in New Zealand. It modelled itself on the situation from UK. They wrote “the government has estimated that if an outbreak were to occur the gross domestic product (GDP) would reduce by six billion dollars in the first year and ten billion dollars in the second year (New Zealand Government, 2013)”.It was somewhat theoretical but was an attempt at some research within the limited scope of this course.

S3 considered the effect of changing the price of coffee on student demand and set up a simple exercise to test the student demand at the varying price levels. They observed “I interviewed five students over period of a week and ask them how many coffees would they purchase at four different prices”. This student recognised that one can make a hypothesis about a relationship between price and quantity demanded but one needs to test it out to prove it. They did not apply ‘ceteris paribus’ and as such had omitted a key aspect of the scientific way of thinking.

Most students who were classified as being at **level 1** either did not attempt this question, or did not refer to any example that had a scientific element in it so it is difficult to demonstrate a certain level of understanding.

Aspect of Cause/effect and association

(Question 10: Design an interesting question that you wish to find the answer to concerning one aspect of monetary control applied this year. Ensure your question enables you to demonstrate an understanding of 'cause and effect' compared to 'association'. Your reflection must apply the economic principles learned in LO6).

This aspect might also be a threshold concept because the majority (20 students) were classified at level 1 and many students (17) were at level 2. None were at level 3. Those at level 2 could largely see the relationship between a cause and an effect of an action but did not distinguish the relationship from the concept of association. They were likewise transitioning through their understanding but had not made the final transformation to enable them to see the integrative importance of the aspect. This aspect is particularly valuable in macro-economics as major events can be happening at the same time, and considerable confusion can occur as to what causes an event to occur versus events occurring simultaneously (Tucker, 2011).

Some level 2 examples are shown below as typical of those at this level.

S22 wrote a sound entry on the effects of expansionary and contractionary monetary policy recognising the effects of reducing the Official Cash Rate (OCR) on stimulating the economy, inflation and exchange rates. They wrote "low interest rates in NZ will make NZ a less attractive place for foreigners to invest their money and lead to a depreciation of the exchange rate". It used an aggregate demand and supply model correctly. However, it omitted the language requested on this aspect.

S47 asked why the OCR remained unchanged in June 2013. It showed good research on the background in terms of why the OCR is adjusted but didn't use a model or connect cause/effect versus association.

S25 could recognise the effects of the LVR restrictions from a macro sense and it reflected how their view had changed from being personal on this issue "at the beginning I believed it was highly unfair and damaging to many New Zealander's. It is a change that had to be enforced for the stability of the markets in New Zealand". It still wasn't clear on the differences between the two parts of this aspect.

Some level 1 examples had not identified the cause and effect relationship accurately nor considered association. Some examples are shown below.

S12 largely recognised the effect of LVR on their household. It did, however, make a useful connection when they said "this LVR will take the pressure off inflation" but it did not recognise some of the other variables like interest rates and got confused by terminology. It did not discuss the latter part of the question on cause and effect versus association.

S36 did not set a question clearly to see understanding for example "would lower housing price helps on economic term?" The question was half way through the entry. They tended to copy statements about the LVR from media releases.

Many students did not attempt the question and therefore were classified as being at level 1.

Section 3: The 'Liminal Space'

The phrase 'liminality' was originally developed by Victor Turner (1969, cited in Land, Meyer & Smith, 2008). It has been applied to the situation where students are wandering around rather aimlessly. Savin-Baden (2008) discusses the disjunction when the learner is awakened out of their previous thinking, but this leaves them in a 'liminal space' where they experience "oscillation between states and personal transformation" (p. 81). They cannot return to their previous thought patterns but they are not able to move forward either. In this liminal state students try to mimic an understanding of the threshold concepts but then regress into their earlier misconceptions. There can however, be no "full return to the pre-liminal state" (Meyer & Land, 2005, p. 376).

Some students were identified at level 1 or low level 2 in an aspect where there was also evidence of level 3 understanding by other students. The students identified at the lower levels were generally not sure of the aspect and often did not attempt questions that posed challenges. The expression, 'being in stuck places' has been applied to this liminal space and this seems to depict many of these students in reference to some of the aspects. They could often attempt an answer but rarely integrate the foundation aspect with other aspects. They frequently copied sections from the text or other sources possibly to hide their lack of understanding. It was also clear that students were experiencing the sense of loss in not being able to move back or go forward into the new conceptual space (Land, 2011). The examples below are taken from a number of aspects at level 1 unless otherwise stated and indicates students either in the "pre-liminal state" (Meyer & Land, 2005, p.376) or in this liminal space.

On the aspect **marginal cost/benefits:**

S13 incorrectly used the marginal concept in all the relevant questions, for example referring to total utility in their table when it should have been marginal utility, not equating marginal costs to marginal revenue where relevant, and in Question 7 they noted "once the tax has been added on, the equilibrium will shift upwards to the left, to where the market social costs (MSC) equals the marginal benefits" incorrectly describing the term 'marginal social cost' as 'market social cost'. Their graphs were sketchy, contained errors and were poorly labelled. It was an example of how students can shift back and forth in the liminal space or the "liquid learning" (Savin-Baden, 2008, pp. 76-77), which does not always appear useful; The student was clearly frustrated by what they thought they had known from previous study of the subject, and now seemed to have been undone when they were presented with new and possibly threshold concepts. They noted "it's taken me a while to figure it out in my own learning. I feel that the topic was somewhat rushed a little bit…. as long as I put in the after school study, it doesn't seem too hard. But my knowledge that I have already got in economics makes learning this topic just a little bit easier I think". This was also an example of the emotional capital and student anxiety involved in mastering threshold concepts (Cousins, 2008).

S10 recognised that "marginal revenue and marginal costs have been semi difficult to grasp" and they became confused when they said "management must concentrate its resources where the excess of marginal revenue over the marginal cost is maximum" (which should have been total revenue over total cost). This student was experiencing the "unfamiliar discourse" (Meyer, Land & Baillie, 2010, p. x) of economics. It was a low level 2 as they had applied the correct model.

On the aspect **rational thinking:**

S27 discussed incentives as something offered “in order to make you purchase more than you ordinarily would”. They did not follow through with the understanding of economic rational thinking. They also wrote “I get stuck on the language of economics and how things are worded” implying they recognised the irreversibility of their position once they knew they had to grasp the language but were not sure how to work through the liminal space.

S44 discussed influences on purchasing IPads and noted “our demand for the IPad was started from seeing the advertising of it, then the tastes of our friends who we saw had it, and then the fact that we could afford to buy it as our income was high enough to leave us with money for luxury items”. It was a general entry that could have been written without any economic knowledge from the course and did not apply the Marginal Utility=Price rule. The student had not really begun to challenge themselves by approaching the theory on rational thinking, so they were in the “pre liminal state” (Meyer & Land, 2005, p. 376) before disjunction occurs. This student was clearly confident about what they thought and understood and had not reflected on their learning, largely because they were in a comfortable zone and had not realised what they did not know.

On the aspect of **demand and supply:**

S18 provided an example of the Rugby World cup and the high prices for the All Black’s jerseys. However it only described “the price rises as being unreasonable”. It did not fully demonstrate any understanding of the demand and supply graphical model and tried to use the circular flow diagram instead looking vaguely at the different roles in a free market system. This was a student who was entering the liminal space by attempting to apply a

model but it was just one they had picked up in the early part of the text book rather than delving into the correct section, so they were still largely in the "novice understanding…..the intuitive economics of untrained persons" as described by Ashwin (2008, p. 174).

S12 described how they perceived the liminal state when they said "while learning the economic concepts to answer this question I have learnt to think behind the actual event to the factors of which has affected it. This can be tricky as, on some occasions, you are forced to think outside the square and beyond the obvious". They noted moving through the threshold and "when I looked back at my notes it just seemed to click. This was a big confidence boost for me". This student had recognised the difficulties in the 'liminal space' by the third/fourth question and was finding tools to assist them such as reading and rereading their notes.

S46 considered the question "If the price of elasticity increases what will happen to the elasticity of demand?" implying that it was the elasticity of demand that was affected by the price rather than understanding that the percentage change in price affected the percentage change in quantity demanded. They provided a very theoretical example from the text book for inelastic demand and omitted the understanding that some people may have different price elasticities of demand for petrol depending on their circumstances. The example did not show transformation of thinking or a full integration of the complexities of this aspect. It mimicked understanding through copying a graph from the text (Stewart, 2012, p. 68).

On the aspect **assumptions/ceteris paribus:**

S4 wrote "as a person increases consumption of a product- while keeping consumption of other products constant". This showed no reference to the term 'ceteris paribus' but a slight

reference to the concept. It is unknown whether the connection between the two was made. This student was similar to S18 above.

On the aspect of **unintended consequences:**

S10 provided a long discourse relating to breaches by farmers and corporations. They noted "companies that doesn't follow the Resource Management Act not only receive bad publicity and fines but lose consumer confidence and this can impact the company in terms of sales". It was more concerned with legal issues and corporate social responsibility than economics and only vaguely mentioned negative externalities in the last two sentences and no mention was made of market failure or untended consequences. This student was clearly comfortable in the realm of media stories about pollution and aspects of law but was not prepared to tackle the more complex model in this question although they did make reference to it (albeit incorrectly) in the final sentence. It was largely pre-liminal state.

S36 applied the example of the tobacco industry. Again this student focused largely on the legislation and noted "the model would require legislative arrangements to ensure that before the tobacco companies exited the New Zealand market in any way, they would be required to be bonded to cover their liabilities". Their model, which was about beer and not tobacco, was copied and pasted at the conclusion of the entry, and no linkage was made with the example provided. This was similar to S10 above but this student had further language challenges which complicated the issues.

On the aspect: **trade creates wealth**

S11 admitted that when they looked through the shops they were "shocked" by the amount of goods imported from overseas. They did recognise that if they were not available "it will have a decent effect on my household" but they had little understanding of the law of

comparative advantage at that stage. As a result they did not see the importance of the model demonstrating efficiency of specialisation and trading surpluses. They were probably still in the 'pre-liminal state' as they did not seem to be perturbed by the situation when they said with reference to buying or not buying imported goods "I just don't see the point of worrying about it". This represented a comfort zone in which they were happy to remain.

On the aspect **efficiency/equity:**

S6 made notes about aspects to discuss e.g. "define equity and efficiency as it relates to the distribution of income". It is suggested this is 'pre-liminal state' as they had not actually begun to discuss them.

Summary of Analysis

From the findings and analysis, it appears that some foundation aspects of the 'economic way of thinking' were also key learning outcomes of the course, and the focus of their studies generally. These aspects had a greater representation at level 2 and level 3 as evidenced from the 37 students' journals. These were scarcity/choice (37), opportunity cost (36), demand and supply (36), models/graphs (35), unintended consequences (32), factors of production/combining resources (30); trade creates wealth (34) and production possibility curves (31).

Those aspects which were less well represented in their learning outcomes appeared to be more challenging, and there were fewer level 2 and 3 entries. These were: the scientific way of thinking (12), cause/effect and association (17) and the economic questions (11). The course was fourteen or fifteen weeks in duration so some foundation aspects would not have been fully covered in the course and not emphasised in the learning outcomes. Only a number

of students discussed these last three aspects in their entries. It is possible that these might be threshold concepts since no students had demonstrated level 3 understanding. It was unclear whether they had gained any real transformation as yet.

The ‘liminal space’ was evident in many of the students’ entries though not necessarily in every aspect. These students were often not able to express themselves clearly in a number of aspects because they had not grasped the tools or the language of economics. It appeared that a number of students were still at the ‘novice’ level of understanding or ‘folk economics’ (Rubin, 2002). They would need more experience in the subject to integrate all of the nineteen foundation aspects of the ‘economic way of thinking’ and experience real transformation. Those students who did not attempt the questions may have been in the pre-liminal state, but this cannot be categorically stated as it is possible a lack of time management may have been the reason. It is feasible that the ‘disjunction’ they experienced (Savin-Baden, 2008) had not been turned into the more positive form of liminal space as suggested by Land et al., 2012).

CHAPTER FIVE - Discussion

Introduction

This chapter will discuss the responses to the research questions, which are the focus of this study, and make four propositions in relation to the literature reviewed and the findings from the evidence in the reflective journals. The first research question explored '***to what extent do business students studying introductory economics demonstrate foundation understandings of the economic way of thinking'*** and this has generated two propositions. These are:

1. Research findings from the reflective journals demonstrated students' understanding of foundations of the 'economic way of thinking'.
2. Research findings from the reflective journals demonstrated gaps in understanding of foundation aspects of the 'economic way of thinking'.

The second question considered '***how the construct of threshold concepts can inform our understanding of effective teaching of the 'economic way of thinking'*** and has resulted in two further propositions:

3. Teachers of introductory economics could focus their teaching on foundation aspects which have threshold concepts characteristics as a means to help identify challenging aspects of the foundations of 'economic way of thinking'.
4. Students will require some guiding tools such as a web or map of the foundation aspects of the 'economic way of thinking' to assist them integrate the core concepts. These could be developed for teachers of introductory economics.

Discussion on propositions 1- 2

There was significant evidence of students working through the aspects of the 'economic way of thinking', and being challenged to wrestle with their previous understandings of the economic language. However, some students were not able to escape from their preconceived ideas or their pre-liminal state (Land, Meyer & Baillie, 2010). Many appeared to have found themselves in the liminal space with their new emerging learning. Their journals demonstrated evidence of 'troublesome knowledge' for these students and this confirmed the literature on this characteristic of threshold concepts (Meyer & Land 2006). The research also confirms many students struggled with the 'economic way of thinking' because, as Callander (2011) proposed, "much of economics is counter-intuitive..…the answers to questions in economics are often opposite of or quite different to what you might intuitively think" (p.5). In this research the 'economic way of thinking' has been identified as containing a large number of foundation concepts sourced from thirteen introductory text books. For the purpose of this thesis these have been narrowed down to nineteen 'foundation aspects of the economic way of thinking' (Gwatney et al., 2009; Hubbard et al., 2010; Layton et al., 2012; Gans et al., 2012).

Proposition 1:

Research findings from the reflective journals demonstrated students' understanding of foundations of the 'economic way of thinking'.

In answering the research question on the extent that business students demonstrated understandings of the 'economic way of thinking', it was evident that a substantial group of students did rise to the challenge of the economic problems set for them and they applied these problems to real world issues throughout their journals. Some of these issues were

analysing their thinking when making decisions (RJ Questions 1, 2 & 3), considering economic models to solve pollution effects on society (RJ Question 7), how they personally fit their household into the circular flow of the aggregate economy (RJ Question 9) or setting their own question about monetary issues in the macro economy (RJ Question 13).

From Table 4 on page 49, 206 students' journal entries were considered to be at level 3, and 544 out of 703 were either at level 2 or 3. These students had demonstrated that they were either transitioning through their understanding on the aspects (level 2) or had gained a sound understanding of them (level 3). This involved defining and distinguishing terms, applying them to rich examples and reflecting about their learning. Those aspects which featured most prominently at level 3 were (scarcity/choice (31 students), opportunity cost (30 students), PPC (23 students), demand and supply and models/graphs (19 students), positive normative economics (17 students) and to a lesser extent trade creates wealth and efficiency/equity (11 students). The rest of the aspects had ten or less students represented at level 3 from the 37 student journals.

From Table 5 on page 50, it is seen that 23 out of 37 students attempted all entries. This might indicate that students, as Schwartzman (2010) argues, were operating the "reflectiveness (taking on the challenge of uncertainty)" (p.34). This would more likely lead to transformation through a rupture with their previous framework of understanding and then enabling them to work towards developing a new "meaning frame" (p.34). This process has been broken down into a sequence: discontinuity-> reflectiveness-> new meaning frame or sometimes depicted as confusion-> struggle->expanded knowing (Schwartzman, 2010, p. 35). A small selection is provided below as a sample of the student real world transformation to an understanding of some foundation aspects of the 'economic way of thinking' that were seen in the journals.

S20 reflected on the optimum purchase rule for the aspect on rational thinking *"in the past I have struggled to link the two concepts of the law of demand and the optimum purchase rule together, and see the relationship between the two. Once again I felt it far easier to learn through the use of models"*. This student had studied economics at high school, but the creation of their own example in the journal entry to illustrate their progress, demonstrated a level 3 transformation to understanding of this aspect. For demand and supply **S29,** a previous student of economics, noted "*I had the demand and supply concepts drilled in every year at high school and as a result I have no idea how I used to think prior to high school*". However, they had used the opportunity to reflect on a more difficult challenge in setting their own question. This was about price elasticity of demand for petrol due to the recent increase in tax levies imposed by the Budget. It was a clear entry, which though they already knew the basic concepts of demand and supply, showed development and contextualising of these concepts.

These quotes, and the models they drew, provided evidence of the three tier schema that was developed by Davies and Mangan (2007, 2008, 2010) for the basic, discipline and procedural levels that students must acquire if they are to emerge through the threshold concept.

Proposition 2

Students demonstrated in their reflective journals gaps in their understanding of some foundations of the 'economic way of thinking'.

159 out of 703 student entries showed that some students were not transitioning through a particular aspect, as they were observed as being at level 1 in that aspect. Some aspects were more heavily represented in this number, being the economic questions (26 students) scientific way of thinking (25 students), cause/effect and association (20 students), assumptions or ceteris paribus (19 students) and to a lesser extent positive/normative (13 students), trade creates wealth (11 students) and efficiency/equity (11 students). This confirmed previous literature on students studying introductory economics courses over a short period of time. Frank (2005) had stated that "exposure to introductory economics instruction was strikingly counterproductive" (p. 2), whilst Hansen, Salemi and Siegfried (2002, in Frank, 2012, p. 403) researched tests of students in basic economic principles six months after taking the course and these yielded no better results than those with no introductory economics at all. The suggestion by these authors, and confirmed by Frank (2012) in his short list of key principles (p. 405), was that students might be better with less content in their course than more. The students at level 1 in this study were most likely to be in this state of overwhelming bewilderment, which was classified as the pre-liminal state or moving towards the liminal space (Land et al, 2010).

Students' comments confirm the 'liminality' construct in the literature as developed originally by Victor Turner (1969, cited in Land, Meyer & Smith, 2008), of being in 'stuck places'. Some students tended to mimic an understanding of a particular foundation aspect, which could be either a core concept or a threshold concept, for example commenting on applying a procedure such as a production possibility curve, but then not actually doing it. **S44** noted *"the economic question of solving scarcity can be shown in a graph, that is what*

will be done instead of the first choice; there is only so much of anything a natural resource can produce such as land". However, this student did not draw the graph indicating they thought they knew the answer, but did not demonstrate it by means of a graph.

Meyer & Land (2005) state that once embarked on the journey there can be no "full return to the pre-liminal state" (p. 376). It is important that previous conceptions must be relinquished before one can move into the new conceptual space, but in the liminal state students will experience a profound sense of loss (Land, 2011). For students who have left the security of their previous understanding there is a 'disjunction' and the space in between has been described by Savin-Baden (2008) as "liquid learning" (p. 76) where students slide back and forth in their efforts to cross the threshold and which are "inherently risky and taxing" (p. 77).

In Chapter 4 a wider range of level 1's has been demonstrated. Below are shown just some of these examples.

S27 discussed incentives as something offered *"in order to make you purchase more than you ordinarily would"*. This indicates a student who is stuck in the pre-liminal state as this is a lay person's answer that could have been written without an understanding of economic rational thinking. They also wrote *"I get stuck on the language of economics and how things are worded"*, implying they recognised they needed to change in order to grasp the language but were not sure how to work through the liminal space. **S6** made notes about aspects to discuss on equity/efficiency and wrote *"define equity and efficiency as it relates to the distribution of income*". It is suggested they were reluctant to move out of the comfort of their 'pre liminal state' as they had not actually attempted to follow it through. **S38** on cause/effect and association wrote *"as prices rose so did inflation and prices for goods and services went up faster than people could spend it"*. This student wrote a historical descriptive answer

which did not really analyse the true causes of inflation by means of applying aggregate demand and supply graphs.

Table 5 on page 50 showed the number of students who did not attempt at least one question. There were 14 students who did not attempt at least one question. However, four students represented over half of the non-attempted questions of the 51 non-attempts. These four students did not attempt a large number (at least six) of the questions. These students were clearly having difficulties in attempting many questions. The exact reasons for this have not been discussed in this study because the students were not surveyed about why they did not answer questions.

It could be argued that the above students might be in the pre-liminal state or perhaps passing into the liminal space having recognised that there is a "rupture in knowing" as discussed by Schwartzman (2010, p.22) but they have formed a "defensive response", or there is an "absence of reflectiveness" (p. 29) to this rupture by not attempting to answer the question. Schwartzman implies that the defensive response is linked to an increase in emotion that prevents the student from pondering the problem further. It is noteworthy that the non-attempted questions were more heavily represented in the latter sections of each part of the journal and these questions required greater integrative skills. It is possible, due to the cumulative nature of many of the foundation aspects that students had not been able to integrate content together in the latter stages of their journal. Some aspects could be more significant than others to providing overall understanding and the omission of some questions by students may have hampered their ability to carry out later questions. It is also possible that the students who were second language English speakers could have had difficulty with this reflective style of journal as noted by Paton (2006). Neither of these were a focus in this research, but some students who clearly did not have a strong command of the English language were more likely to be less reflective about their learning and depended on copying

quotes from the text to link together their ideas. They were less likely to discuss what was happening to their learning. This would indicate that care would be needed to assist these students with the reflective process through a journal of their learning.

Discussion of Propositions 3 and 4

It is clear that the expanding literature on threshold concepts is now asking the question how useful this educational construct can be for individual disciplines. As Meyer & Land (2007, cited in Land et al., 2008) state, "identifying the sources of troublesome knowledge that constitutes a barrier to student understanding can prove a powerful way of adapting one's teaching or re-thinking course design issues" (p. xx). Economics has gained much attention from many researchers to find the answer to just this question, for example the works of Ashwin (2008); Davies & Mangan (2008); Shanahan, Foster & Meyer (2008). From this research, and the literature, it is believed that a focus on the threshold concepts may assist students to rethink their position in relation to the subject. However, it is also proposed as a result of this study, that the students may need to be given particular tools or guides to anchor their learning as they work through the many challenging ideas.

Proposition 3:

Teachers of introductory economics could focus on threshold concepts as a means to help identify the challenging foundations aspects of the 'economic way of thinking'.

Relating to research question two, an understanding of threshold concepts as an interdisciplinary construct, might be serviceable to teachers in all disciplines. This is the concern that has absorbed many educationists since the inception of the learning project by Meyer and Land (2003). As a result of this study it could be argued that threshold concepts can be particularly helpful in identifying the difference between core concepts, and those

concepts that appear to create troublesome knowledge over a short fourteen to fifteen week course of introductory economics. This should be a key perspective for teachers of subjects that have embedded threshold concepts within them. By understanding the particular aspects which are difficult for students to master, and when they do master them they have crossed the threshold; teachers are in a better position to acknowledge this and focus on these key aspects.

By looking at the characteristics of economic threshold concepts, being transformative, integrative, bounded, irreversible and containing troublesome knowledge (Land et al., 2008), this can enable teachers to create awareness for the students. An example might be the bounded characteristic. Students could be encouraged to reflect on their layman's understandings of those key terms prior to studying economics. The terms may have a precise meaning in economics acting as "boundary-markers for the conceptual spaces" (Land et al., 2008, p. x), for example the word 'scarcity' or 'savings and investment' or 'disequilibrium'. Schwartzman (2010) asked "how to ensure students' productive journey through liminality?" (p. 27). Students who are new to the subject or who have not acquired the mastery will then become more aware of what to expect, and not be too hard on themselves when they meet new challenges. The students can be alerted by the teacher to expect disjunction as a precursor to the liminal spaces. This should assist them with "locating learning bridges" to overcome "the stuckness" that may ensue for a time (Savin-Baden, 2008, p. 76). However, she notes that a better term to use than "disjunction" might be "liquid learning" (p.76) which might be more positive for the student. Land et al., (2012) also discussed the need to "oblige the learner to countenance something new and try to integrate it" (p. 2). This drawing of attention to the opportunities as well as the threats in the new learning could be an empowering force in their journey.

Srafd (1998) and McCormick (2008) considered the metaphors of understanding. Sfard argued, that if the student feels that they need to belong to the social 'community of practice', then they will be prepared to accept the cognitive conflict that is emerging due to the introduction of a threshold concept. From this conflict the learner has to actively decide whether they can absorb the new evidence, and therefore master the newfound knowledge which will enable them to build up the framework linking to other relevant core concepts (McCormick, 2008). If they do not overcome these challenges, then there will be no transformation for the learner. The student who emerges through the liminal space will have mastered the conceptual framework of that particular threshold concept. In order to do this they must have actively constructed their new understanding. However, it is most likely that some additional tool to encourage them to work through this process will be necessary. It would also imply that the teacher should reflect on ways to create that community within the class, so the students become active in creating their own answers to economic problems. The journals showed evidence that some students recognised the conflict when they were working through the liminal space by means of various methods to obtain the new way of thinking, for example **S12** on supply and demand shifts, reflected *"while learning the economic concepts to answer this question, I have learnt to think behind the actual event to the factors of which has affected it. This can be quite tricky, as on occasions, you are forced to think outside the square and beyond the obvious……when I left class and looked back at my notes it just seemed to click"*.

Threshold concepts might assist students who have studied economics at high school, predominantly NCEA level 2 or 3. Sometimes these students do not emerge through the higher level of understanding as they might have expected. Introductory economics courses at tertiary institutions would be considered to be at NCEA level 5, and so the higher level is often disconcerting for these students. They sometimes consider they already know about the

concepts and should not have to explore them any further. These students have not been particularly identified in this study, but they were evident in the journals through their discussion on some foundation aspects of the economic way of thinking. Two contrasting students' entries are depicted here: **S13** opined on negative externalities of pollution "*trying to revise on the methods as to solving or fixing (the externalities) was a little harder, as its more to do with the graphs which sometimes confuse me"* or **S22** who reflected about cost curves "*I have never really understood these concepts, at school I used to just try remember the curves for the exam"*. **S13** did not emerge through the threshold in question 7 but **S22** had done so in question 5 having recognised they were struggling and had taken the action of moving beyond theoretical text book examples to enable them to transform their thinking. Savin-Baden (2008) argued that the "catalyst to disjunction" (p. 76) was to ask them to find their own real world example. In the journal entry (question five) this was applied to discover how decision making took place in firms in relation to the short run and the long run. A simple theoretical example would not have shown this student they had a problem in their understanding without needing to apply the theory in the real world.

It is proposed that students at this level be permitted to select their own real world examples within the context of the learning outcome. By enabling them to experience the disjunction, they must reformulate their meaning systems if they are to work through their own particular thresholds for a particular foundation aspect. If students had not been made aware of the possibility of troublesome knowledge or the need to transform their thinking (two of the threshold concept characteristics), they may not have been prepared for the unlearning that they may need to do. They would have this just answered the question descriptively thinking they were struggling, but without knowing why.

In this study some of the aspects did not have a large numbers of students achieving level 3, for example rational thinking, marginal costs/benefits or unintended consequences. It is essential for teachers to know which ones fit into this category as it will mean some students will need special help, or at least the instruction may need to be geared to emphasising that concept. Many students omitted marginal costs/benefits in question 6 and a number even said they had not grasped that concept at that point in time. It was not until they worked with it again in Question 7 that they began to comprehend the full meaning of the terms marginal cost and benefits and how they could be related.

Proposition 4:

Students will require some guiding tools such as a web or map of the foundation aspects of the 'economic way of thinking' to assist them integrate the core concepts. These could be developed for teachers of introductory economics.

As a result of studying the literature on the foundation aspects of the 'economic way of thinking', and confirming the need for this understanding to succeed in economics, it has been identified that there is a "unique way of viewing the world, much of which can be taught in one or two semesters" Mankiw (2000, in Gans et al, 2012, p. xxxi). However, much of the literature cited in this research suggests that one or two semesters may be too short a time period for true understanding to emerge. From this study it is considered that business students, who are generally studying introductory economics mainly as a compulsory component of their aim to be accountants, managers or marketers, will also need to be provided with some additional tools to guide them through the liminal spaces. Some possible tools are listed below:

1. **The Web:** See Figure 2 on page 88. In economics the foundation aspects could be woven together within the learning outcomes set by prescriptions from higher authorities.

Davies (2006) argues that “threshold concepts provide *one way* of describing the way of thinking in the subject” (p.74). If this is the case they must then be somehow embedded within the curriculum structure for students to be encouraged to think like economists. By having at hand a pictorial/ visual web or poster of the aspects or transformative points of learning, teachers will be more readily alerted to them, and particularly those on the outer rings of the web. Their integrative nature can be highlighted by introducing an aspect in a particular learning outcome in which it is situated, but also demonstrating its linkages elsewhere in the course. This use is further confirmed by Land et al., (2012) when they stated students need “to get a grip on a number of economic concepts and bring them all together into a coherent relationship” (p. 6). The web might help them see the integration necessary in what may appear to be a disjointed set of ideas.

The web model created in Figure 2 has been developed in a similar format to that designed by Davies and Mangan (2008) for the demand for money (p. 40), or Carstensen and Berhard (2008) and their model of laboratory sessions (p. 148). It is considered that this web might be delivered to students during their course as a reminder to them of the way the foundation aspects link together. The web rings have been created from the numbers of level 3s evidenced in the nineteen aspects in this thesis, and extracted from the explanations (page 40-41) and Table 4 (page 49). Examples would be scarcity/choice which has 31 students at level 3 so appears in the central ring, whilst unintended consequences has seven students at level 3 so appears in the fourth (orange) ring. The list below demonstrates how the web was created:

- The central dark blue ring contained aspects with 25 or more students at level 3
- The purple ring contained 18- 24 students
- The red ring contained aspects with 11- 17 students;
- The orange ring contained aspects with just 6-10 students

- The outer yellow ring contained aspects with only 0-5 students.

The central ring of the figure therefore has the aspects of the ‘economic way of thinking’ with the most level 3 understandings. They are more likely to be core concepts, but not necessarily threshold concepts, as students advanced to level 3 more comfortably, for example scarcity/choice or opportunity cost. It is noted that a number of researchers have described opportunity cost as a threshold concept (Davies & Mangin, 2007; Shanahan & Meyer, 2006). However, from the evidence in this study, the focus was specifically directed towards this concept in all the programmes and students coped well at the basic level required.

The outer ring holds the least level 3s or possibly none. As one moves towards the outer rings the aspects are more likely to have threshold concepts characteristics, particularly troublesome knowledge, since more students were at level 1 or 2 in their thinking in these aspects, for example cause/effect and association or scientific way of thinking. Land and Meyer (2010) argue that “threshold concepts can be used to define potentially powerful transformative points in the students’ learning experience” (p. 75). If this is the case, those aspects which are more implicit or nearer the outer rings will need greater attention. Further to this, the linkages, shown by the broken lines between the aspects, were the connections emerging in this study within the ‘economic way of thinking’, and are applicable at an introductory level. There will be other linkages, but it was not considered practical to include every possible linkage. The web may enable teachers to reflect upon where a particular aspect could be purposely linked with another aspect in their teaching examples. This could be also emphasised for students as they are working through their reflective journal entries or other economic exercises. It further emphasises the likely permutations and combinations in an introductory course and demonstrates an awareness of the complexity for students in what might be their first introduction to the subject.

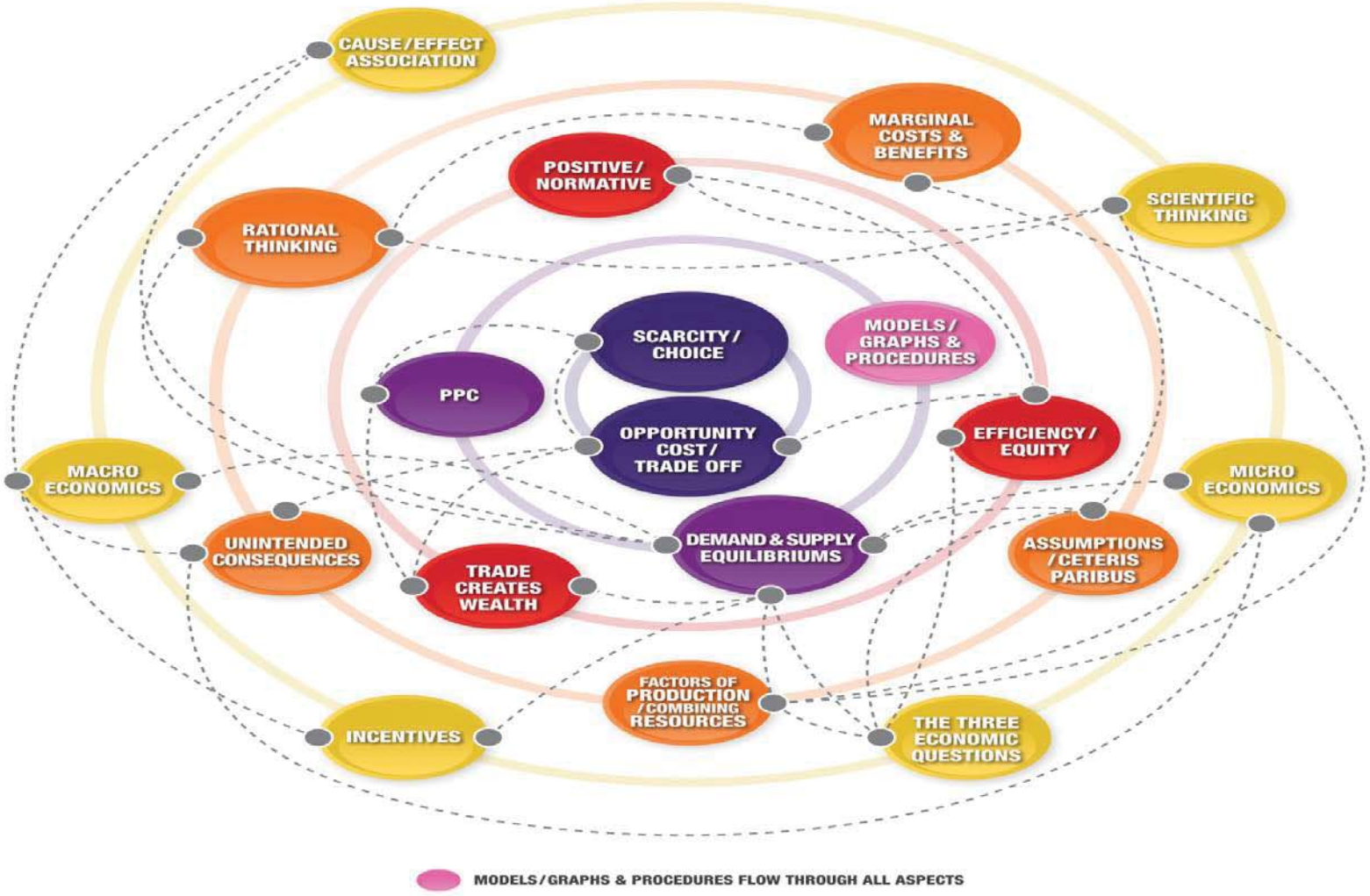

Figure 2. The Web of FoundationAspects of the 'Economic Way of Thinking'

2. A Template Guide: If a reflective journal is used as evidence of student understandings of the 'economic way of thinking' for assessment purposes, it cannot be expected that students at introductory level will know how to write reflective journal entries. They may become further confused by this alien process within the threshold concepts of the discipline. The writing of a reflective journal may even be a threshold concept in itself because it is not generally employed for students in first year courses. Without assistance in this skill some students may become disengaged from the process. Fourteen students did not attempt at least one entry and some students provided only brief and shallow entries. A guide or template could be a valuable tool to assist these more hesitant students with this process. The suggested template is shown in Table 6 on page 90. This template would support the four principles that Davies & Mangan (2008) developed (referred to in Chapter 2, page 22). Stages 2-4 of the template (Table 6) would relate to principle 1 (highlight variation in core concepts). Stages 5-6 would relate to Principles 2 and 3 (exposing students to discipline procedures and applying them). Stages 7- 8 would relate to principle 4 (regarding their learning as provisional). The template created here has been developed to be appropriate to introductory students of economics in a fourteen/ fifteen week course. As students become more confident they may be able to abandon the template and become more creative with their later journal entries. It is also suggested that a planner or timeline is provided for each group of entries to suit the course structure.

Table 6. Template Guide for Reflective Journal Entries

Suggestion of order	Action
1.	Provide a date for your entry (each entry should be a different date).
2.	Briefly explain your topic/issue/real world example you are about to discuss.
3.	What did any of the key words mean to you before you had studied Economics? For example *what would you have said scarcity meant before studying Economics?* How would you have viewed the real world issue prior to studying this subject?
4.	Define key terms in relation to the topic and reference them using the APA system. You could say something like *I now understand scarcity to mean "……..…..."* (reference).
5.	Discuss how your problem or issue relates to the terms defined.
6.	Apply a model. This could be a graph, a table, a flow diagram, a formula or a procedure. Provide a figure number relevant to the entry. Relate your new model to your discussion above as it should clearly assist the development of your reflection and what you are trying to say. The model should not be a copy and paste from the text book but adapted to your example.
7.	Reflect upon your learning. How has it changed from what you thought at the beginning of the entry or before the economics course? Comment on any aspects that were troublesome to you and what you did to break through the threshold? How would you apply this new learning in the future to integrate to other entries (possibly that you have already covered)? How are you feeling now about this topic now? Do you feel that your understanding is not complete?
8.	Check through your entry - are there any spelling or grammar errors; have you referenced correctly; ensure it is only about one – two sides in length (size12 font and 1.5 spacing).

3. **A schema** is required to overlap the web (Figure 2) and the guiding template (Table 6) so that students can appreciate the foundation aspects they may encounter in their journey of learning in this subject. One such schema could be a brief explanation of the construct of threshold concepts in a simplified form so they are prepared for the disjunction process, and the need to adopt procedures, to manoeuvre their way through the liminal space (Savin-Baden, 2008). Another that is proposed here is that the students consider that they have one huge hole (the total introductory course). Within this hole there are smaller holes in their knowledge (these could be the web of the foundation aspects identified in this study, or the learning outcomes within which the foundation aspects are embedded). Demonstrating the pictorial version of the web at this stage would be helpful. These holes need to be filled in

throughout the duration of the course. If they are not, then there will be problems to link to the other holes as they all need to be integrated in some way to form a complete understanding of the 'economic way of thinking'. As Davies and Mangan (2008) state these are "the keystones bringing form and robustness where previously there was a collection of ideas" (p.42). It is suggested in conclusion to this proposition, that the nineteen aspects of the 'economic way of thinking' are treated as the overall threshold concept. Some of the foundation aspects identified within the web would be 'mini threshold concepts', though some would be more akin to basic or core concepts, and not necessarily threshold concepts in their own right. It is noted that the three tools developed are most appropriate for students of introductory economics who are primarily studying business as their major which is relevant to a New Zealand ITP.

Chapter Summary

A number of key propositions have emerged from the discussion related to students' understanding of the 'economic way of thinking' in an introductory economics course at one ITP. A substantial group of students demonstrated their understanding of individual foundation aspects of the 'economic way of thinking' when given the opportunity to discuss and integrate economic issues. However, from this study it has been seen that a significant number do struggle with certain aspects, and also the technique of applying a reflective journal format, especially if they are not assisted in this process. It is further considered that the construct of threshold concepts, originally developed by Meyer & Land (2003, 2005), will assist lecturers to encourage students who are grappling with the more challenging parts of the foundation aspects of economics. As a result, a conceptual web has been created to assist lecturers to identify key foundation aspects that have been identified in this study, and extracted from thirteen introductory economic text books. Some of these aspects will contain characteristics of threshold concepts in their own right, and this study has

established some which do create troublesome knowledge, although they may not contain every characteristic of a threshold concept.

It is considered, by this study and some researchers (Davies, 2006; Davies & Mangan, 2008), that the integrative nature of the web of foundation aspects of the 'economic way of thinking' **is *the threshold concept***. This is possibly the real challenge for students of economics in being able to hold many new, and yet to be fully grasped concepts, together at once in such a brief and fast paced course. If students are encouraged to look at the web as a whole, and in particular those aspects which are particularly challenging (identified as having many students at level 1 and few students at level 3), they are more likely to surface from their short introductory course with the foundations of the 'economic way of thinking'. Further to this, it has been seen that students will need to be given specific assistance in the initial stages of writing about these economic aspects in order to advance through "the portal, opening up a new and previously inaccessible way of thinking about something" (Meyer & Land, 2003, p. 412). A template and schema have been provided to assist this process. By integrating the literature provided, the findings and the templates of assistance students of introductory economics could emerge with a more satisfying result from their first introduction to this subject.

CHAPTER SIX - Recommendations and Conclusions

Introduction

The key research question in this study asked whether business students in an introductory economics course at one ITP in New Zealand understood the foundations of the 'economic way of thinking'. The vehicle for evidence of this understanding was a reflective journal, or diary of their learning. This spanned all the learning outcomes of the course and embedded the key aspects identified in this research as fundamental to the 'economic way of thinking'. It is argued that teachers should target the aspects which students are finding challenging to master in their studies. These aspects, if not understood, will prevent students integrating the core concepts in their course and thinking in the fundamentally different way required in the subject of economics. This study secondly aimed to discover the aspects which had been providing blocks to their learning.

The study further researched how threshold concepts could inform this picture of understanding in how to unblock the challenging aspects for students. It was considered that the growing body of knowledge on threshold concepts in this discipline could provide assistance by targeting those foundation aspects creating challenges for students (Meyer & Land, 2006; Land et al., 2008; Meyer et al., 2010). Without this awareness of threshold concepts students would be unable to create a complete understanding of all the core concepts required to draw together the 'economic way of thinking'. They would emerge from their short introductory course with a limited and fractured perspective of the subject.

Two research questions were considered:

To what extent do business students studying introductory economics demonstrate foundation understandings of 'the economic way of thinking'?

How can the construct of threshold concepts inform our understanding of effective teaching of the 'economic way of thinking'?

This final chapter summarises the possible contribution of this study to the wider research base on the teaching of economics and the application of threshold concepts in this discipline. It focuses on how a reflective journal might be used to provide evidence of the level of students' understanding obtained in the course, whilst providing an opportunity for the students to relate to economics in a more personal way by means of examples from their own life experiences and the world of business. It makes four recommendations and provides four possibilities for future research in this area. It also notes some limitations of the study.

Summary of the Study

This study has examined in Chapter 2 some of the extensive literature on teaching introductory economics. This included a survey on chapters one and two of thirteen introductory economics texts and the key literature on threshold concepts, especially as it pertained to economics teaching. It has noted the theoretical and abstract nature of mainstream economics at the introductory level creating difficulties for students relating this to the real world. It has also considered some literature on the use of reflection and reflective journals in learning. This encouraged the redevelopment of a previously applied reflective journal assessment into two parts and created a new marking rubric to assess the students' work. This was adapted from Davies & Mangan's (2008) three tier system of conceptual change. In Chapter 3 the reasons for applying qualitative research in the interpretivist paradigm were clarified. A table for analysing the reflective journal was created which used the

nineteen foundation aspects of the ‘economic way of thinking’ identified from the literature and provided descriptions of three levels for this. The journal was therefore being used for two purposes- one as an assessment in the course and as a source of data in this research.

Many students did demonstrate in their journals an understanding of certain foundation aspects of the ‘economic way of thinking’ Quotations were selected from these aspects to demonstrate their understanding. These have been shown in Chapter 4. They were considered to be representative examples of the quotations extracted from 37 journals to saturation point. This process has been completed for every aspect. There is also evidence in the data that some students demonstrated a lack of transitioning through to a clear understanding of certain foundation aspects. The research confirmed the literature that these students were experiencing the ‘liminal space’ and a general lack of integration of the foundation aspects (Meyer & Land, 2006; Land et al., 2008, Meyer et al., 2010).

My position in this research study was researcher, but also as the lecturer of one of the cohorts in the research study. For all groups confidentiality was maintained since the journals analysed had names removed and analysis did not take place until students’ results had been finalised. There were three cohorts studied, including one online group, but no distinction has been made in the analysis between the three groups. The reflective journals were used to discover evidence of student understanding of the ‘economic way of thinking’ during a basic introductory course. The teaching methods in the three groups were different, though the content via the prescription was largely identical. This however was not the focus of the research. Feedback was provided to the students during their course as they progressed through their entries and the marking of the journals, but this has not been factored into the results. There were 37 student journals analysed.

Recommendations

From the findings of the research questions four propositions were generated and discussed in Chapter 5. These have been reformulated here into four recommendations and discussed individually in more detail. These could act as a contribution to the base knowledge in the teaching of this discipline:

1. A reflective journal could be applied to generate one source of evidence of student understanding of the 'economic way of thinking' for teachers of introductory economics at tertiary level.
2. It is recommended that teachers pay particular attention to identifying the gaps in student understanding in economics as they are emerging in the journal.
3. Teachers of introductory economics could focus on threshold concepts as a means to help identify challenging aspects of the foundations of the 'economic way of thinking'.
4. Teachers of introductory economics could use the web of foundation aspects as a tool to guide them in their teaching to constantly review whether the linkages are being emphasised as they teach the content.

Discussion of the recommendations

Recommendation 1

From Chapter 4, Table 4 on page 49 and Table 5 on page 50 plus the quotations, proposition 1 showed that research findings from the reflective journals demonstrated that a substantial group of students' showed an understanding of the foundations of the 'economic way of thinking' (entries at level 3 in Table 4). It was further noted that the aspects which contained many level 3s were taught explicitly within the content of the prescription such as scarcity/choice, opportunity cost, demand and supply, production possibility curves and models.

From the observations of the students' journals it is considered that some form of journal (diary of their learning) might provide a place where evidence of student understanding of the 'economic way of thinking' could be found. The marking grid attached in Appendix L provides the teacher with a rubric to allocate grades for levels of learning in basic terms and concepts, use of procedures/models and transformation and integration of their learning. The literature on the use of reflection illustrates the importance of encouraging reflection as a means to engage students and develop deeper forms of learning (Harris et al., 2007; Kolb, 1984; Wicks, 1996). Further to this, it is argued that students who are studying on a regular basis, as required by the journal, may be in a better position to "see their learning unfolding" (Darling, 2001, cited in Butler, 2006, p. 3) within the subject, rather than just learning for a test or examination at the end of a block of learning outcomes. It is suggested that students' work is marked and feedback provided at least twice in the semester.

Recommendation 2

It is recommended that teachers pay particular attention to identifying gaps in student understanding as they are emerging in the journal. A significant group of students demonstrated a lack of understanding in particular foundation aspects. These were classified as being at level 1 on Table 4 (proposition 2). The research confirmed the literature that these students were experiencing being in the 'liminal space' and demonstrating 'stuckness' in their usage of the economic jargon. In particular many had not transitioned to a complete understanding of the use of models/procedures and they demonstrated an unwillingness to relinquish prior naïve thinking. They frequently struggled with integrating the foundation aspects (Land et al., 2008; Meyer & Land, 2006; Meyer et al., 2010). There was further evidence of what Savin-Baden (2008) described as "liquid learning" (p. 76) and this confirms the need for focusing students on the uncertainty they will experience in this liminal space for some aspects. The aspects demonstrating this were cause/effect and

association, the scientific way of thinking, the three economic questions and micro and macro-economics.

Those foundation aspects that were more implicit within the journal questions, and/or were taught less directly, were either not represented at level 3, or had large numbers at level 1. Since the research findings from the reflective journals demonstrated gaps in understanding of some foundations aspects of the 'economic way of thinking', it is recommended that teachers pay particular attention to these areas as they are emerging in the journal. It is also important to be aware of situations where students had previously had core concepts introduced too early, as noted by some students who had rote learned concepts in former courses. If this has been the case the concept will have been "inaccessible to the student" (Davies, 2006, p. 76). Though the concept itself may not necessarily have all the characteristics of a threshold concept, it could still be important to grasp as a link to other concepts as they progress through the course, for example 'thinking at the margin'. It may therefore be important to engage with students in providing regular feedback as questions emerge from them in class or via other forms of communication. As teachers become aware of the gaps in student knowledge, possibly through drafts prior to final submission or at the end of submission of each major part, they might provide feedback to assist students work through the gaps emerging in their knowledge. The importance of feedback for student improvement is noted by Rogers (2007). This could enable a better student understanding of the theoretical aspects and how they may apply them in their chosen real world examples.

Recommendation 3

Teachers of introductory economics could focus on using the threshold concepts literature as a means to help identify challenging aspects which may be core concepts of the foundations of 'economic way of thinking'. Thus it is being used as pedagogy with which to approach the subject in a more positive frame of mind (Entwistle, 2008; Land et al., 2012). Many business students at

ITPs, and even at universities, are not studying economics as their main subject. Therefore, it is even more paramount that teachers are provided with tools to help their students through troublesome knowledge. It is considered that the value within the journal might be adapting the type of activities to enable the students to explore the subject matter as it relates to them. The journal questions/activities might be adapted to students of other ITPs within New Zealand or even globally. The importance of the questions is that they enable the students to approach and engage with the subject matter in a reflective and personal way. The journal could also provide the opportunity for the students to set their own questions to which they might find answers as proposed by Frank (2012).

It is further considered that, for teachers of economics, an understanding of threshold concepts could be used to assist students who are struggling with the disjunction in their former understanding and the new economic way of thinking (Savin-Baden, 2008). A number of students who had in the past rote learned concepts realised that they had to operate a different technique in order to carry out the activities in the journal. Rote learning was no longer a valid way of getting by in the subject as it required a higher and more integrated understanding at tertiary level as noted by S22 (page 84). This confirms Davies's (2006) observation concerning the focus on threshold concepts when he says "the power and value of the threshold concept can only be recognised by a student if they can see how it is able to act in an integrative way" (p. 76). Though not specifically investigated in this research study, the students who were truly reflecting on their learning, and emerging through to level 3, often noted the difference in their awareness and how they felt they were being transformed. It is considered that when there is an awareness of the construct of threshold concepts, teachers of economics might find a whole new lens for looking at their students' challenges, and find different techniques for approaching their subject that could engage a variety of students from different backgrounds.

Recommendation 4

Teachers of introductory economics could use the web of foundation aspects as a visual teaching resource for their teaching by acting as a guide to embed the nineteen aspects into their teaching (where applicable). It may also be adapted to use as a resource for students to emphasise the linkages between foundation aspects of the 'economic way of thinking' and as a reminder for them as they focus on economic exercises, reflective journal or otherwise, as to the integrated nature of the core concepts. The research study has confirmed that some assistance with the process of the learning of the foundation aspects is required. As Davies (2006) notes "learners are more likely to recognise the way of thinking and practising in a subject if they are explicitly assisted rather than left to pick things up by intuition" (p. 80). The tendency by teachers of these fast paced one semester courses may be to teach the direct content of the learning outcomes but sometimes forget that the foundation aspects of the 'economic way of thinking' are embedded but not always explicit within the content. These may be overlooked if not given specific attention. This study has therefore created three tools to employ and focus assistance on students working through the integrative aspects of the foundations of the economic way of thinking (proposition 4). One of these is Figure 2: The Web of Foundation Aspects on page 88, which has been designed from the evidence in this study. Those foundation aspects at the centre of the web demonstrated more level 3s, and appear to be more akin to core concepts, not necessarily creating the 'troublesome knowledge' that threshold concepts might. Those aspects at the outer limits of the web should create awareness for teachers and students of the aspects that might require greater emphasis because they may have more of the 'troublesome knowledge' characteristic of threshold concepts. An alternative way of interpreting the web might be that students can more readily adopt the aspects in the centre, and by emphasising the teaching of these, some of the aspects in the outer rings might be more easily absorbed along the way. This could also be recognition of the unequal nature of some of the aspects within the web. It could be a tool that teachers could use to ensure the aspects are woven through their curriculum so students are more confident in the whole 'economic way of thinking' at the end of their short

introductory course. It is emphasised that setting a reflective journal assessment will not necessarily mean students can carry out this type of activity initially and so a Reflective Journal Planner has been developed in Table 6 to assist students in this process. An overall schema has also been discussed so students can see why they are trying to integrate their learning through the web and the journal.

Limitations of the study

All research has limitations and this researcher considered the following were relevant:

1. Some students did not complete the course in introductory economics and as a result their data was not able to be used (seven students). Further to this, some evidence could not be used as students failed to provide consent to their journals being used for the research (11 students). Of the 55 students enrolling in the course 37 students' journals were analysed (67%).
2. Detailed study on certain aspects: the economic questions and micro/macro-economics have been excluded from this analysis because it was considered that they were wider groupings of economic knowledge rather than smaller economic ideas. They emerged as having no, or few students in Level 3, because they were not specifically questioned in the journal entries. Consequently students had not really considered them in their answers. Furthermore, for micro and macro-economics a large number of students were accurately discussing the correct type of problems for those aspects but were not defining the terms or recognising that they were discussing them. Consequently they featured highly in level 2 understandings (32 students for micro and 36 students for macro). They were also aspects which were threaded through a number of questions which further complicated the issue.
3. It was found that the questions which were least attempted tended to be more represented near the end of each part of the journal (part one or part two), and/or they required greater skills of integration such as question 4, 5 and 6 from part one and 8, 10, 11, 12, 13 and 15 from part two. This may have affected the results in some way creating more evidence of levels 1's and 2's in those questions. It possibly indicates the problem that all of the aspects could not be considered equally, and indicates for both micro and macro-economics that the later concepts in the journals were building on grasping the earlier concepts within the course content.

4. One limitation of the thesis might be that the courses studied in this investigation are designed to focus on mainstream economics principles. It therefore has not allowed an exploration of other perspectives and more complex discussions by economists of the real world economics issues which might be complicating student understanding of the subject.

Further Research

1. Further research is required into how specific teaching about the construct of threshold concepts would assist students of economics in an introductory course.
2. Further research is required into discovering whether it was the actual activities in the reflective journal that provided enough scope for personal economic based experiences and interaction with the world of business. At this stage it is unclear whether the actual journal questions and format enabled the development of a more sophisticated understanding (or lack of) for the 'economic way of thinking'. It is possible that the actual teaching of the core concepts and/or the feedback provided to students played a more important role in creating the evidence provided in Chapter 4 than the reflective journal itself. The value of the journal might be in its flexibility to vary the questions according to the business context. The journal applied in this research, and attached in Appendix L, is one example of a set of activities/questions, but further research needs to be carried out in this area. It is considered that the nineteen foundation aspects of the 'economic way of thinking', though woven into the journal questions, could be specifically geared to encourage constant review of them.
3. Many students commented on how they thought the journal affected their learning but it was not specifically tested here. It would be valuable to research student perceptions on the use of the reflective journal and how it affected their learning. This could be carried out via focus groups or personal interviews.

4. It would be valuable to carry out further research on how significant teacher feedback is for students learning how to write economic journals to develop their understanding of the 'economic way of thinking'. This could be in the form of data collection of feedback on student drafts of individual entries as it was given. It might be feedback provided on submissions of the component parts of the journal. This could further be adapted to find out why some students did not seek feedback on their journal drafts.

Conclusion

The aim of this thesis was to make a contribution to the wider research base in the teaching of the 'economic way of thinking' at an introductory level. Three points are noted:

- The research recognises from the literature in the past thirty years that teaching the 'economic way of thinking' has been a major challenge. Many students appear to have completed their introductory economics courses disillusioned and confused (Frank, 2012). One major reason appears to be the difficulties students face in relating their real world experiences to the theoretical and abstract nature of a basic economics principles course and the texts.
- The growing body of educational literature on threshold concepts within the disciplines, and particularly pertaining to economics, has provided an opportunity to revisit the above challenge (Land et al., 2010, Meyer et al., 2008).
- A reflective journal had previously been applied in a minor way for assessments in similar courses, and it was used in this research to investigate the evidence of student understanding of the 'economic way of thinking'.

This research has allowed these three areas to be brought together to assess whether there was evidence of students being able to think like economists in a short fourteen to fifteen week course in introductory economics at one ITP. The findings from this research have indicated that there is evidence in the reflective journals of students understanding some aspects of the 'economic way of

thinking'. However, there is also evidence that many students do struggle with certain aspects of the foundations of the 'economic way of thinking' and the format of writing a reflective journal. From the literature on threshold concepts it is considered that many students were floundering in the 'liminal space'. It is possible that a journal of learning might be one method that could be used to provide an alternative source of evidence to test student understanding over a wide range of foundation aspects. This could supplement other assessment procedures such as multi-choice tests and examinations.

It is concluded that the educational literature on threshold concepts might be applied in a proactive way to help teachers of economics assist students through this liminal space by targeting the aspects that students find challenging. The web of foundation aspects developed in this study could be a possible teaching resource or tool to alert teachers and students to the holistic, integrative nature and transformative properties of the threshold concept of 'the economic way of thinking' in an introductory course in economics. This is confirmed by Land et al. (2012), where they view the liminal space in a more positive light, and as a space for making new connections and resetting their old signposts. In addition, the reflective journal planner could be an additional tool to assist students to work through some type of reflective journal. This could be adapted by teachers to suit their own contexts in a short introductory course of economics at tertiary level.

One contribution of this research study has therefore been to focus on, and develop the integrative nature of the nineteen aspects of the 'economic way of thinking' as being a threshold concept in itself, and to test out whether students at one ITP do demonstrate evidence of the aspects of the 'economic way of thinking' as evidenced in the reflective journal assessment. It has been concluded that there is evidence of this learning, but also strong evidence that all students do not just naturally adopt the 'economic way of thinking'. The 'troublesome knowledge' characteristic of threshold concepts, and the difficulty of moving through the portal (Meyer & Land, 2003, 2005), have been evident throughout many journal entries. It is therefore considered that a tool is required, such as the web of the foundations aspects, to provide assistance with this. The web which has been created has

highlighted the challenging aspects identified in this study, and woven through questions set for students. Those aspects with 20 or more students found at level 1 and only a few (0-5) students found at level 3 were considered to be the most challenging. The web might be a useful technique to encourage greater understanding of the holistic, integrative and transformative properties of the threshold concept of the ‘economic way of thinking’. The research has also demonstrated that further research is necessary in the types of activities required, the importance of teaching about threshold concepts, students’ perceptions of their learning through the reflective journals and feedback during their economics courses.

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APPENDIX A: Glossary of key concepts from chapters one and two

The economic way of thinking: Seeing the world through different eyes. A logical framework that can be used to understand a wide range of economic issues and events. It is like a road map or guidebook (Gwatney, Stroup, Sobel and McPherson, 2009; Layton, Robinson & Tucker, 2012).

Scarcity: The situation in which unlimited wants exceed the limited resources available to fulfil those wants (Gwatney, Stroup, Sobel and McPherson, 2009; Hubbard, Garnett, Lewis & O' Brien, 2010).

Choice: A decision that has to be made because of the problem of scarcity (Gwatney, Stroup, Sobel and McPherson, 2009).

Rational thinking: People are assumed to be rational- that is they will always try to get the most out of their limited resources and will weigh up the benefits and costs of a decision and choose the option which provides the greatest benefits over the costs given the information available (Hubbard, Garnett, Lewis & O' Brien, 2010).

Demand: The willingness and ability to pay for a quantity of a good or service. This is demonstrated by the demand curve and the law of demand (Stewart, 2012).

Supply: The willingness of producers to produce a product in relation to its price in the market (Stewart, 2012).

Trade-off: Producing more of one good means having less of something else (Hubbard, Garnett, Lewis & O' Brien, 2010).

Opportunity cost: The highest valued alternative that must be given up to engage in an activity (Hubbard, Garnett, Lewis & O' Brien, 2010).

Models: A simplified version of reality used to analyse real- world economic situations. The word theory is often used in place of model too. (Hubbard, Garnett, Lewis & O' Brien, 2010).

Assumptions: Economists need to decide on the assumptions when using a model. These are usually assumptions about people's behaviour or motives (Gans, King, Stonecash & Mankiw, 2012; Hubbard, Garnett, Lewis & O' Brien, 2010).

Ceteris Paribus: A Latin phrase meaning all else being equal whilst a certain variable changes (Hubbard, Garnett, Lewis & O' Brien, 2010; Layton, Robinson & Tucker, 2012; Sloman & Norris, 2008).

Scientific way of thinking: Testing a hypothesis in an economic model to see if it predicts correct human behaviour (Hubbard, Garnett, Lewis & O' Brien, 2010; Gans, King, Stonecash & Mankiw, 2012).

Three economic questions: What goods and services will be produced, how will the goods and services be produced and for whom will the goods and services be produced? (Hubbard, Garnett, Lewis & O' Brien, 2010).

Incentives: Choice is influenced in predictable ways by changes in incentives (Gwatney, Stroup, Sobel and McPherson, 2009; Hubbard, Garnett, Lewis & O'Brien, 2010).

Economic systems to solve the economic questions: Traditional, free market, planned and mixed economies (Evans, 2000; Hubbard, Garnett, Lewis & O' Brien, 2010).

Marginal analysis: Weighing up the extra benefit of an action versus the extra cost of it (Gans, King, Stonecash & Mankiw, 2012).

Positive /normative economics: Positive economics deals with facts and addresses what is verifiable whilst normative economics deals with what ought to be. (Hubbard, Garnett, Lewis & O' Brien, 2010; Layton, Robinson & Tucker, 2012).

Unintended consequences: Economic actions usually generate indirect effects as well as the direct effects (Gwatney, Stroup, Sobel and McPherson, 2009).

Association versus causation: The error of reasoning when one confuses association and causation between variables. A model is valid only when there is a genuine cause and effect relationship (Gwatney, Stroup, Sobel & McPherson, 2009; Layton, Robinson & Tucker, 2012)

Factors of production: The resources of land, labour capital and enterprise used in producing goods and services (Evans, 2000; Gwatney, Stroup, Sobel and McPherson, 2009).

Trade creates wealth: People will exchange the surplus of their production in order to increase their welfare (Heyne, Boettke & Prychitko (2005).

Microeconomics/Macroeconomics: The grouping of economic topics into the study of households and firms who make choices (microeconomics) and the study of the economy as a whole (macroeconomics) (Hubbard, Garnett, Lewis & O'Brien, 2010).

Production possibility curve (PPC): A graph used to show the various combinations of two goods that can be produced with a given amount of resources and the available technology at that point in time (Evans, 2000; Gans, King, Stonecash & Mankiw, 2012).

Efficiency and Equity: Efficiency denotes the most effective use of society's resources in satisfying people's wants and needs. There are different definitions for efficiency and it is possible that technical production efficiency will not lead to equity (fairness in the distribution of economic benefits). Allocative efficiency is said to occur when no one can be made better off without making someone else worse off (Samuelson & Nordhaus, 2005, Hubbard, Garnett, Lewis & O'Brien, 2010).

APPENDIX B: Eight guideposts to economic thinking

These are explained more fully in Chapter One of Gwatney et al (2009).

- The use of scarce resources is costly; trade-offs must always be made.
- Individuals choose purposefully- they try to get the most out of their limited resources.
- Incentives matter- choice is influenced in a predictable way by changes in incentives.
- Individuals make decisions at the margin.
- Although information can help us make better choices, its acquisition is costly.
- Beware of the secondary effects: Economic actions often generate indirect as well as direct effects
- The value of a good or service is subjective.
- The test of a theory is its ability to predict.

Gwatney, J. D., Stroup, R.L., Sobel, R.S., & Macpherson, D. A. (2009). *Economics: Private and public choice* (12th ed.). Mason, Ohio: South-Western Cengage Learning (inside cover).

APPENDIX C: Six economic propositions

- *The Scarcity Principle:* Having more of one good thing usually means having less of another.
- *The Cost- Benefit principle:* Take no action unless its marginal benefit is at least as great as its marginal cost.
- *The Principle of Comparative Advantage:* Everyone does best when each concentrates on the activity for which he or she is relatively more productive.
- *The Principle of Increasing Opportunity Cost:* Use scarce resources with the lowest opportunity cost before turning to those with higher opportunity costs.
- *The Equilibrium Principle:* A market in equilibrium leaves no unexploited opportunities for individuals, but may exploit all gains achievable through collective action.
- *The Efficiency Principle:* Efficiency is an important social goal, because when the economic pie grows larger, everyone can have a larger slice.

Frank, R. H. (2012). Less is more: the perils of trying to cover too much in microeconomic principles. In G. M. Hoyt & K.M. McGoldrick (Eds.). *International handbook on teaching and learning economics*. Cheltenham, U.K.: Edward Elgar Publishing (p. 405).

APPENDIX D: Intended Learning Outcomes (ILO) verbs from Bloom's revised taxonomy

Remembering: Define, describe, draw, find, identify, label, list, match, name, quote, recall, recite, tell, write

Understanding: Classify, compare, exemplify, conclude, demonstrate, discuss, explain, identify, illustrate, interpret, paraphrase, predict, report

Applying: Apply, change, choose, compute, dramatise, implement, interview, prepare, produce, role play, select, show, transfer, use

Analysing: Analyse, characterize, classify, compare, contrast, debate, deconstruct, deduce, differentiate, discriminate, distinguish, examine, organize, outline, relate, research, separate, structure

Evaluating: Appraise, argue, assess, choose, conclude, critique, decide, evaluate, judge, justify, predict, prioritise, prove, rank, rate, select, monitor

Creating: Construct, design, develop, generate, hypothesise, invent, plan, produce, compose, create, make, perform, plan, produce

Biggs, J., & Tang, C. (2007). *Teaching for quality learning at university* (3rd ed.). Maidenhead, England: Open University Press, McGraw Hill Education (p. 81).

APPENDIX E: SOLO taxonomy: Adapted to the different levels of economic thinking

- Pre-structural: characterised by unconnected pieces of information with little or no organization or coherence.
- Unistructural: characterised by the making of simple connections between obviously related information and concepts but with no understanding of importance associated with the connection.
- Multistructural: a number of connections might be made between different concepts and terms within the subject but with a lack of understanding of their relevance to the big picture.
- Relational: The parts are understood in the whole and the student demonstrates an understanding and appreciation of the relative importance of the parts in relation to the whole.
- Extended abstract: The ability to be able to make connections not only within the boundaries of the subject but beyond it and to be able to take this understanding and make generalisations to other contexts.

Ashwin, A. (2008). (developed from Biggs & Collis, 1982).What do students' examination answers reveal about threshold concept acquisition in the 14-19 age groups. In R. Land, J.H. F. Meyer & J. Smith (Eds.) (pp. 172-184). *Threshold concepts within the disciplines.* Rotterdam, The Netherlands: Sense Publishers.

APPENDIX F: Definition and exemplification of three types of conceptual change

Type of conceptual change	Type of transformation and integration	Examples in economics
Basic	Newly met concepts some of which transform understanding of everyday experience through integration of personal experience with ideas from the discipline.	Distinctions between price/cost; income/wealth (stocks/flows); nominal/real values; investment/saving. Real money balances, natural rate of unemployment.
Discipline Threshold concepts	Understanding of other subject discipline ideas (including other threshold concepts) integrated and transformed through acquisition of theoretical perspective.	Interaction between markets, welfare economics, opportunity cost.
Procedural (in the case of economics: how are models of the economy constructed and evaluated?)	Ability to construct discipline specific narratives and arguments transformed through acquisition of ways of practicing.	Comparative statics (equilibrium, ceteris paribus), time (short-term, long-term, expectations, elasticity.

Davies, P., & Mangan, J. (2007). Threshold concepts and the integration of understanding in economics. *Studies in Higher Education*, 32(6) 711-726.

Davies, P., & Mangan, J. (2008). Embedding threshold concepts: From theory to pedagogical principles to learning activities. In R. Land, J.H. F. Meyer & J. Smith (Eds), *Threshold concepts within the disciplines*) (p. *39.)* Rotterdam, The Netherlands: Sense Publishers.

APPENDIX G: Massey University approval letter

MASSEY UNIVERSITY
TE KUNENGA KI PUREHUROA

19 June 2013

Janet Turvey
Eastern Institute of Technology
Private Bag 1201
Hawke's Bay Mail Centre
EIT Taradale
NAPIER 4142

Dear Janet

Re: HEC: Southern B Application – 13/35
Developing business students' ability to think in an economic way through reflective journals

Thank you for your letter dated 12 June 2013.

On behalf of the Massey University Human Ethics Committee: Southern B I am pleased to advise you that the ethics of your application are now approved. Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

Dr Nathan Matthews, Chair
Massey University Human Ethics Committee: Southern B

cc Dr Peter Rawlins
Institute of Education
PN500

A/Prof Nick Zepke
Institute of Education
PN500

A/Prof Sally Hansen, Interim Director
Institute of Education
PN500

Mrs Roseanne MacGillivray
Institute of Education
PN500

APPENDIX H: EIT approval letter

EIT
EASTERN INSTITUTE OF TECHNOLOGY

Reference Number 18/13

5 July 2013

Janet Turvey
C/- Faculty of Applied Science, Business and Computing
EIT

Dear Janet

I am pleased to inform you that your research project *"Developing business students' ability to think in an economic way through reflective journals"* was received and endorsed by the Research Ethics & Approvals Committee at their meeting held on 28 June 2013.

You are reminded that should the proposal change in any significant way, then you must inform the Committee. Please quote the above reference number of all correspondence to the Committee.

The Committee wish you well for the project.

Yours sincerely

J. Fifield

Jeanette Fifield
Secretary – Research Ethics & Approvals Committee

Eastern Institute of Technology
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Postal Private Bag 1201, Hawke's Bay Mail Centre, Napier, 4142, New Zealand

Tairāwhiti Campus 290 Palmerston Road, Gisborne, 4010, New Zealand P 06 869 0810 F 06 869 0825 E info@tairawhiti.ac.nz www.tairawhiti.ac.nz
Postal PO Box 640, Gisborne, 4010, New Zealand

Regional Learning Centres: Central Hawke's Bay, Flaxmere, Hastings, Maraenui, Napier, Ruatoria, Tokomaru Bay, Wairoa

APPENDIX I: Letter of introduction to students

EIT
Gloucester St.
Taradale

15 July 2013

Dear

Welcome to your Economics course at EIT this semester. Please find attached an information sheet concerning an invitation to participate in a research project being run as part of my study in the Masters in Adult Education at Massey University. This will involve the subject of Economic Principles (Econ 5.01) during the Semester 2, 2013 course. Please read this carefully so when my research assistant discusses this more fully in your first lecture you will be aware of this.

You will also be asked to complete a student consent form in that lecture and you may decline to participate in the project if you wish. However, this research will not affect your results in this course as any analysis of data collected will not be carried out until the whole course is completed at the end of November 2013. Further to this, your lecturer of this course will not be aware whether you have elected to participate or not.

I will be happy to discuss this more fully with you if you have any questions and my details are included on the information sheet for your convenience.

Kind regards

Janet Turvey (Senior Lecturer)

APPENDIX J: Participant information sheet

Project Title:

Developing business students' ability to think in an economic way through reflective journals

Researcher Introduction

My name is Janet Turvey and I am a Senior Lecturer and N.Z. Diploma in Business Coordinator at EIT. I wish to carry out the above research project as partial completion of a Master of Education (Adult Education) at Massey University. The purpose of the research is to ascertain the extent to which the use of a reflective journal/portfolio assists students ***such as you*** to develop the economic way of thinking in an introductory one semester course in economics as part of a business programme.

Project Description and Invitation

This specific research project involves students studying the introductory economics course in the BBS programme or the New Zealand Diploma in Business programme at the Eastern Institute of Technology (EIT). It is designed to investigate the degree to which business students, for example yourself, develop an understanding of the economic way of thinking by means of a reflective journal or portfolio. The reason for choosing this project is to assist you to develop a more lasting relationship with economics and to enable you to apply the economic way of thinking in a business context. This project will be carried out in three introductory economics courses in Semester 2, 2013, and possibly one course in Semester 1, 2014.

You are invited as a member of one of the above groups to be involved in this research project but it is not assumed that you will do so.

Participant Identification and Recruitment

- Recruitment method will be via completion of the participant consent form attached.
- Participant names will be included on the participant form for the purpose of linkage with the preliminary questionnaire and the reflective journal/portfolio entries.
- If you have agreed to participate in the project, a photocopy of your questionnaire and the reflective journal/portfolio will be made and a code allocated. Your name will be removed from all documents to be used as data.
- The original journal entries will be marked as part of the compulsory course components by the teacher of that group. This will be an entirely separate process to the research project.
- Selection criteria will be by consent on the participant form. All those who consent to participate will be included.
- Exclusion criteria (by lack of consent on the participation form).
- Number of participants to be involved: 20-30 Dip Bus students and 30 - 40 BBS students. These are the expected numbers on the courses.

- It is anticipated that the risk to you participating in this project will be minimal because the researcher will not be aware of which students are participating in the project as the collection and coding will be carried out by an independent research assistant. Analysis of the data will only take place after the course grades have been allocated by your teacher. Students participating will not be identified as being at the EIT.

Project Procedures

You will be involved in the following procedures as part of this project:

1. A preliminary questionnaire in Lecture 1 to gauge your basic economic understanding at the start of the course (this will take about 15 minutes). This will not be an assessed component of the course. If you choose not to participate and have your questionnaire used as part of the research project this will not affect your course grades. This activity will replace other introductory activities and all class members will do this as an introductory exercise, but only those who choose to be involved in the research project will have their questionnaires photocopied, names removed, coded and stored in a safe place. This will be administered by the research assistant. The original questionnaires will be returned to all students for discussion in class during the following lecture and you may wish to keep them to help you see how your knowledge is progressing through the course.
2. A reflective journal/portfolio which is a compulsory assessment component of the course (weighted 30%) will be created by yourself throughout the course. This will be assessed in two parts as an ongoing series of journal entries. However, for the research project the reflective journal/portfolio will be further analysed once the course has finished. This will be carried out alongside the preliminary questionnaire to investigate the extent participants have progressed their understanding towards the economic way of thinking. If you elect not to participate in the research project your course grades will not be affected. Your identity will not be known by the researcher since the research assistant will remove all identifying names from the journals.
3. The only extra time required as a result of this project is the initial discussion about the research and completion of the consent process (approximately ten-fifteen minutes in total).

Please note:

- **This research project is entirely separate to the assessment of your reflective journal/portfolio in order to complete the requirements of the course in which you are enrolled**.

Data Management

- The preliminary questionnaire will be assessed once the course has been completed. The same will occur for the two parts of the reflective journal to ascertain how students' understanding of the economic way of thinking is developing. These will be analysed by means of an assessment grid at three different levels. Some quotations from the reflective journals may be included but no identifying names will be used.
- All data will be collected by the research assistant, photocopied, numbered, linked and names removed. The originals of the reflective journal will be marked as normal and returned to students.
- The data will be stored in the office of the Business department at EIT in a locked filing cabinet. This will be held until the project report has been approved. All data will be transferred to the Massey University supervisors who will arrange for its disposal after five years.
- The final Masters report will be available in the EIT library and a summary of the findings will be made available on request to the researcher, Janet Turvey.

- The identity of the participating students will not be known by the researcher at any time during the project. EIT will not be identified in the report as the site of the research project.

Participant's Rights

Statement of Rights:

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- withdraw from the study within the duration of the course;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- be given access to a summary of the project findings when it is concluded. These will be either emailed or posted to the student on request. Students will be emailed when this is available. Please provide your email and/or postal address on the student consent form if you wish to receive a summary.

Project Contacts

- Researcher: Janet Turvey; Email JTurvey@eit.ac.nz**; 06 974 8000, extn 5181.**
- Supervisors: Peter Rawlins: Email P.Rawlins@massey.ac.nz **06 3569099 extn 8855**
  Nick Zepke: E mail N.Zepke@massey.ac.nz **06 356 9099 extn 8633**

- If you have any questions about the above project you may contact the researcher or supervisors concerning this. Please do so in writing explaining your grievance.

Committee Approval Statement

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 13/35. If you have any concerns about the conduct of the research, please contact Dr Nathan Matthews, Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5799 x 80877, email humanethicsouthb@massey.ac.nz.

APPENDIX K: Participant Consent Form

Developing business students' ability to think in an economic way through reflective journals

PARTICIPANT CONSENT FORM - INDIVIDUAL

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree to participate in this study under the conditions set out in the Information Sheet.

Please provide your email address and/or postal address if you would like to receive a summary of the findings of the research project.

Email:

Postal address:

Signature: _____ **Date:** _____

Full Name - printed _____

APPENDIX L: Reflective journal

FACULTY OF APPLIED SCIENCE, BUSINESS AND COMPUTING

REFLECTIVE JOURNAL

DUE:

Part One: August 27th

Part Two: October 25th

WEIGHTING: 30% of final grade

Part One:	54 Marks
Part Two:	81 Marks
Presentation including correct APA referencing:	10 Marks
TOTAL	145 MARKS

Instructions: All of the journal must be your own work and you should attach a plagiarism declaration form to each part of the journal. Any references to others' work must be referenced correctly using the APA referencing system.

Reflective Journal

The objective of this reflective journal is to build a record of how you are learning to think like an economist as you progress through the course. Research has shown that students better understand and retain the material they are learning if they have the opportunity to reflect on the concepts, recognise them as they apply to their everyday lives and the world around them, and write about them. The real value of the journal is for you to have somewhere to put your musings, questions, thoughts, feelings, and insights about what you are learning and how you see them manifesting in your life.

The reflective journal is a compulsory component of the course. You should write about a side to one and half sides (including models such as graphs/diagrams) for each entry but all examples must be real i.e. non-fictional and may arise from a variety of situations – activities at home, the business world, television news or newspaper articles. These will be events you have witnessed in the world around you. There are both questions from micro-economics and macro-economics.

Required:

- A minimum of fifteen entries (each entry is worth two percent) that show you have reflected on what you are learning throughout both microeconomics and macroeconomics. Each entry must be dated.
- Application of the chosen economic concept to your life or the world around you.

Marking Criteria:

It is essential to demonstrate evidence of sincere reflection, insight and successful application of fifteen (minimum) economic concepts from both microeconomics and macroeconomics illustrating how your thinking about the world around you has been transformed during the

course. Each entry expressing at least one example of the economic concept is worth 9 marks which will translate to 2% of the course. Part One, assessing reflections for learning outcomes one, two and three will be required to be handed in by August (27th) and Part two, assessing reflections for learning outcomes four through to seven will need to be handed in on October (25th).

An outline of the marking schedule is shown over the page

Marking Schedule

Note every question within each learning outcome is worth 2%.

Learning Outcome	Due date and part	Percentage allocated
LO1	Part One (one question) (27 August)	2%
LO2	Part One (three questions) (27 August)	6%
LO3	Part One (two questions) (27 August)	4%
	Total Part One	**12%**
LO4	Part Two (two questions) (25 October)	4%
LO5	Part Two (two questions) (25 October)	4%
LO6	Part Two (three questions) (25 October)	6%
LO7	Part Two (two questions) (25 October)	4%
	Total Part Two	**18%**
Total		**30%**

Suggestions for reflections:

Below are the topic suggestions. You may wish to develop these suggestions further in order to explain how the economic way of thinking is beginning to emerge for you. Note you do not have to use the suggestions provided exactly if you prefer to allow your own ideas to emerge and you remain within the learning outcome concepts. However, your reflection must relate to that element of the learning outcome.

Part One:

1. Consider one example you have witnessed over the past week(s) where you have noticed the concepts of scarcity, choice and opportunity cost, either in your own life or in the business world. Use a model to assist you to explain your economic problem. (LO1)

2. In what ways have you noticed the ideas of rational decision making as you have been carrying out your routine shopping activities (e.g. through the law of demand or the determinants of demand)? **OR** How have you witnessed the idea of incentives being used in any way? You might like to consider this as one of your shopping jobs! (LO2)

3. Consider a real world example from the news media of the forces of demand and supply in a particular market. Discuss the economic concepts you have learned. How has your understanding of these events changed due to your new knowledge from the course? Please include a copy of the news item. (LO2)

4. Make up your own interesting question that you wish to find the answer to. You must apply any of the economic principles learned in LO2 to assist you develop your answer and consider the 'ceteris paribus' assumption. You may like to set up your own experiment to demonstrate the scientific way of thinking! (LO2)

5. How has your understanding of the economic definitions of short run and long run affected the way you think businesses make decisions? Provide a real world example to demonstrate your understanding of how factors of production can be combined together indicating your new way of thinking. (LO3)

6. Have you found the concept(s) of marginal revenue and marginal costs difficult to grasp? Consider why this might be. Use an example to apply the marginal way of thinking when a business has to consider the extra costs and benefits of its actions. **OR** Consider a business you have read/heard about in the news. How would you describe its market structure and how do you think this structure affects the way it operates? (LO3)

Part Two:

7. Show how this learning outcome has altered your way of thinking about the way the government tries to solve major problems in the world today such as pollution or the exploitation of resources? Demonstrate how you would now use a model to assist you in understanding the concept of unintended consequences. (LO4)

8. Explain at least one conflict or trade off the Government experiences in trying to achieve greater equity of incomes? What methods can the government employ to gain information about the facts behind the issues? How does an understanding of positive and normative economics fit into this problem? (LO4)

9. Consider the circular flow of economic activity (CFD) diagram. Substitute the sectors for people you know who live and work in the various sectors of the economy, for example you may wish to put your family in the ‘household’ sector. Tell the story of

the CFD making it as real and alive as possible and discuss it in relation to your personal experience. (LO5)

10. Consider the importance of increasing economic growth to gains in the welfare of society. Could there be another way to look at the welfare of society? Explain your answer using examples from a search on appropriate web sites. (LO5)

11. Think about the various taxes your household pays (PAYE, GST, rates), and/or subsidies and transfer payments it receives from the government. Trace the impact on your household, the government budget and the economy (local and national) if these taxes changed. (LO6)

12. Choose any key term(s) from the monetary policy section of the course. Compare how you respond when you now hear the term to how you may have responded prior to taking the course. Did you ever 'hear' the term before? Are you any more interested in what is being said about it and about the impact of what is now being said than you were before taking the course? (LO6)

13. Design an interesting question that you wish to find the answer to concerning one aspect of monetary control applied this year. Ensure your question enables you to demonstrate an understanding of 'cause and effect' compared to 'association'. Your reflection must apply the economic principles learned in LO6.

14. When you are next out shopping, look around at the goods available and estimate the proportion of items that are imported compared to those made locally. Consider how your material standard of living would be affected if the imported goods were not available, or not available from an efficient foreign producer. How does this relate to the comparative advantage principle? (LO7)

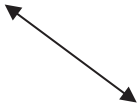
15. When the NZ$ appreciates and the price of imported goods, for example, petrol decreases you may celebrate how this impacts positively on your household budget. Reflect on how this change in the exchange rate impacts other sectors of the economy. In your mind, how do you now balance your personal self-interest (in terms of cheaper goods) with the interest of other sectors due to a lower exchange rate? Do you in fact balance these conflicting interests? Are you now more aware that what is good for us personally may not be good for the economy overall? (LO7)

Tutor Marking Schedule: Over the page are two tables showing what the tutor is looking for when marking the reflective journal/portfolio. **For each learning outcome question you will be marked out of 9 marks.** The tutor will be looking for evidence of learning (marked out of 3) in each question at three different levels. These are shown in the table below.

Possible marks / Level of understanding	(0 marks)	(1 mark)	(2 marks)	(3 marks)	Marks allocated
Understanding of key economic terms used in that learning outcome and applied to personal or business experience (basic terms)	Does not attempt to define terms at this level.	Can define some terms in a simple way. Some inaccuracies occur. Attempts to relate terms to a real world example. Little reflection shown.	Can define and discuss the terms accurately and apply at least one real world example to the terms. Only one- two errors noted. Shows development of the process of reflection.	Can define and discuss the terms accurately and apply at least one very rich real world example to the terms. Can distinguish clearly between the basic terms. Shows development of the process of reflection.	
Use of an appropriate model or procedure for that learning outcome e.g. a graph, flow chart, formula, rule, table (models and procedures)	No model demonstrated	A simple model is attempted. Many errors in this model	A model is demonstrated and applied to the example chosen. Labeling is mostly correct. Some errors may be present.	A sophisticated model is used to apply to the example selected. Labeling is correct. No errors are present in the model.	
Transformation of thinking to the economic way and integration of concepts within that learning outcome and possibly beyond; recognition of troublesome knowledge (threshold concepts)	No transformation of thought processes demonstrated e.g. no evaluations or conclusions drawn. No attempt to reflect on learning taking place.	Beginning to demonstrate transformation and integration of thought processes. Has not passed into the threshold. Does not recognise troublesome knowledge aspects in their entries. Little reflection shown about the terms and models used.	Has shown an ability to evaluate and draw conclusions. Thought processes showing some transformation and integration of concepts. Beginning to recognise the troublesome knowledge aspects of the economic concepts and is emerging through the threshold. Shows development of the process of reflection.	Has shown considerable ability to evaluate and draw conclusions. Thought processes showing real transformation and integration of a number of concepts. Clearly recognises the troublesome knowledge aspects of the economic concepts but has emerged through the threshold. Shows real reflection on learning processes.	
Marks possible	0 marks	3 marks	6 marks	9 marks	

For each learning outcome students should clearly explain an example of their reflective thinking and personal application of the ideas and concepts. The example should illustrate

how your thinking about the world around them has been transformed by learning about the economic way of looking at the world.

Possible marks  **Learning Outcome**	**0**	**1**	**2**	**3**	**Marks allocated**
LO1 (9)					
LO2 (9)					
LO2 (9)					
LO2 (9)					
LO3 (9)					
LO3 (9)					
Part One completed (54 marks)					
LO4 (9)					
LO4 (9)					
LO5 (9)					
LO5 (9)					
LO6 (9)					
LO6 (9)					
LO6 (9)					
LO7 (9)					
LO7 (9)					
Part Two completed (81 marks)					
Presentation including a correct APA reference list (10 marks)					
Total (145 marks)					

APPENDIX M: Data analysis table for students' journals

Student Number:

The table employs a scale of how the students are demonstrating the level of understanding on each foundation aspect of the 'economic way of thinking' (refer to Table 3a and 3b for the foundation aspects and explanations of level descriptions.

Foundation Aspect	Level 1	Level 2	Level 3
Scarcity/choice			
Opportunity cost/trade off			
Rational thinking			
Demand and Supply/ equilibriums			
Assumptions/ceteris paribus			
Models/graphs			
Scientific way of thinking			
Marginal costs/benefits			
Incentives			
The economic questions			
Cause/effect and association			
Unintended consequences			
Factors of production/combining resources			
Trade creates wealth			
Normative/positive economics			
Micro economics			
Macro economics			
PPC			
Efficiency/equity			