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**MOMENTS OF CLARITY: A STUDY OF
HIGHER EDUCATION TEACHERS'
PROFESSIONAL LEARNING
EXPERIENCES AND THE
TRANSFORMATIONAL PROCESS OF
CHANGE IN SELF-EFFICACY
DEVELOPMENT**

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Abstract

This qualitative longitudinal study sought to understand ‘aha’ moments experienced by a group of early career higher education teachers in Aotearoa New Zealand and the role those moments played in the transformational process of change in teacher self-efficacy development. Self-efficacy theory was foregrounded throughout the study, transformation theory provided an established framework to understand the process of transformation, and the notion of threshold concepts was used to conceptualise the ‘aha’ moment and name potential teaching threshold concepts.

Aotearoa New Zealand specific teacher self-efficacy studies are important because studies in other contexts have shown self-efficacy is a predictor of teacher motivation, resilience and persistence in the face of difficulties and self-efficacy is linked to successful student achievement. In understanding the relationship between ‘aha’ moments and how these contribute to teacher self-efficacy development, there is the potential for professional learning opportunities that support self-efficacy promotion.

Eleven early career teachers shared their experiences of ‘aha’ moments and their interpretation of the role these played in their teacher self-efficacy development. This research found that ‘aha’ moments were personal learning realisations that contributed to change in teacher self-efficacy and that the transformational development of teacher self-efficacy can be understood as a process containing four distinct phases.

Furthermore, the transformative ‘aha’ moments, and in particular those that constituted a teaching specific potential threshold concept, provided teachers with an enhanced awareness of teaching capability. Finally, mastery experiences (successful and unsuccessful) were the most commonly described source of efficacy information related to the teachers’ ‘aha’ moments.

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CHAPTER ONE:

INTRODUCTION TO THE STUDY

“Psychological procedures, whatever their form, alter expectations of personal efficacy... the conviction that one can successfully execute behaviour required to produce the outcomes” (Bandura, 1977b, p. 193).

1.1 Introduction

Self-efficacy, an integral component of social cognitive theory, is an agentic judgement of an individual’s capability to “organize and execute courses of action required to attain designated types of performances” (Bandura, 1986, p. 391). Self-efficacy is a cognitive process involving the reciprocal interactions through which the individual appraises personal, environmental and behavioural factors in relation to a specific task and domain of functioning. Self-efficacy is not the same as having the requisite knowledge of what to do. It is the belief about what one is capable of doing (Schunk & Pajares, 2004).

Self-efficacy differs from self-concept that is informed through collective self-perceptions and the reinforcement and evaluations of others (Pintrich & Schunk, 2002).

Self-efficacy also differs from the concept of confidence. As defined by Schunk and Pajares (2004, p. 120), confidence is a “trait-like self-belief of capability that fails to specify the object of that belief”.

Teacher self-efficacy is a key factor that affects student experience and successful outcomes (Schunk, Meece, & Pintrich, 2014). Teacher self-efficacy has the potential to influence teacher behaviour, impact on student learning and success, and affect an individual’s commitment to teaching and service (Ashton, James, & Singer, 1982;

Gibson & Dembo, 1984; Guskey & Passaro, 1994; Hoy & Woolfolk, 1993; Rose & Medway, 1981; Tschannen-Moran & Woolfolk Hoy, 2001).

Through the individual's appraisals of the triadic interactions of personal, behavioural and environmental factors, change in self-efficacy may occur (Bandura, 1986). The self-efficacy appraisal process has been the subject of a considerable amount of research (see for example Cervone & Peake, 1986; Pajares & Miller, 1997). Furthermore, research has occurred within the context of higher education settings in countries such as Taiwan (Chang, Lin, & Song, 2011), Australia (Roche & Marsh, 2000) and Malaysia (Velu & Nordin, 2011).

Teacher efficacy research began in the United States of America, and most of the early researchers and theorists were American (Klassen, Tze, Betts, & Gordon, 2011). In recent years teacher self-efficacy has been explored within other cultural settings thus recognising the variances that these settings bring to the concept of self-efficacy and teachers' beliefs regarding roles and responsibilities (see for example Hansen, 2005; Ho & Hau, 2004; Saricoban, 2010; Tilton, 2014; Velu & Nordin, 2011). Teacher self-efficacy investigations need to be conducted in diverse contexts to extend the generalisability and cultural adequacy of the construct (Ho & Hau, 2004). Currently, there are no studies that the researcher is aware of that have specifically investigated the teacher self-efficacy of higher education teachers in Aotearoa New Zealand.

Aotearoa New Zealand specific teacher self-efficacy studies are important because studies in other contexts, **including within higher education contexts**, have shown self-efficacy is a predictor of pedagogical behaviour linked to successful student achievement and outcomes (Chalmers & Gardiner, 2015; Maconachie, 2010). Under the current Tertiary Education Strategy (New Zealand Government, 2014) higher education

has seen an increased emphasis on student outcomes measured through course completion, qualification completion, progression to higher study, and student retention. More than ever, there is a need for higher education teachers with a strong sense of teacher efficacy to ensure positive student outcomes.

Furthermore, self-efficacy is linked to teacher motivation, resilience and persistence in the face of difficulties (Schunk et al., 2014). Teachers with high self-efficacy are more likely to develop challenging learning activities and persist with students having difficulties. They are also more likely to have positive interactions with their students and enjoy teaching. Teachers with lower self-efficacy may experience anxiety and poor job satisfaction and they are more likely to leave teaching (Cameron, Lovett, & Berger, 2007).

This qualitative 12-month longitudinal study sought to understand the moments of clarity or ‘aha’ moments that occurred during the professional learning experiences of a group of early career higher education teachers and the role those moments played in the transformational process of their teacher self-efficacy development. To understand the transformational process, the focus of the current study was on the ‘aha’ moments experienced as part of a teacher’s professional learning journey. An individual may experience a moment of clarity when there is an insightful ‘aha’, which is simultaneously accompanied by new understanding that informs their knowledge, values and/or beliefs. For the purpose of this study, ‘aha’ moments have been defined as being those moments that are experienced when there is a sudden realisation, recognition, insight or comprehension about something (Merriam-Webster, 2015). ‘Aha’ moments can be positive events, often described as ‘light bulb’ moments, or they can leave us feeling uncomfortable about the new knowledge we gain. Some ‘aha’

moments are significant ‘eureka’ experiences and others are more simple moments of clarity or understanding. These ‘aha’ moments exist when an individual figuratively steps over a learning threshold and into new knowledge and experiences a “transformed way of understanding, or interpreting, or viewing something” (Meyer & Land, 2003, p. 1).

Within the current study, a professional learning journey is defined as any teacher specific learning, formal or informal, undertaken by the teacher that informs the practice of teaching and teacher knowledge. All of the participants saw themselves as teachers regardless of their job titles¹. This study uses the words teacher and teacher self-efficacy to describe the participants and their self-efficacy as it applies to their professional role.

The study investigated the ways these professional learning moments (formal and informal) informed the transformational process of teacher self-efficacy, if transformation occurred, and how transformation related to change in teacher knowledge and pedagogy. Transformation is usually understood to mean an impactful change. This change can be as a result of a significant event or smaller iterative events that coalesce to form a change (Mezirow, 1991). Mezirow described transformation as the way in which adults “learn to negotiate meanings, purposes, and values critically, reflectively, and rationally instead of passively accepting social realities defined by others” (Mezirow, 1991, p. 3). For the purpose of this study, transformation is defined as a marked or noticeable change to meaning schemes (specifically teaching knowledge, beliefs and values) and meaning structures (Mezirow, 1991). Changes in meaning schemes lead the individual to a progressive realisation of capability, which contributes to self-efficacy development, and to a more discriminating, integrative understanding of

¹ Participants of the current study were employed as lecturers, teachers, facilitators and tutors. However, for the purpose of brevity and clarification, all participants are referred to as teachers throughout the thesis and were primarily employed to teach as opposed to do research.

a profession such as teaching. The participants identified change to their teacher self-efficacy, if change occurred. Change was not measured against an existing self-efficacy scale; rather the participants themselves interpreted and described the change in their own unique way as an increase or decrease or as a change in their understanding and perception of teaching efficacy.

Self-efficacy theory (Bandura, 1977a) was foregrounded throughout the study. Transformation theory (Mezirow, 1991) provided an established framework to understand the process of transformation of teacher self-efficacy. The notion of threshold concepts (Meyer & Land, 2003) was used to conceptualise the ‘aha’ moment and name teaching specific potential threshold concepts.

Higher education teacher self-efficacy research, such as Chang et al. (2011) and Velu and Nordin (2011), has predominantly used quantitative methodologies that have measured teacher self-efficacy in relation to the participants’ perceptions of teaching efficacy and investigated relationships with specific individual characteristics to the teacher’s background (the type of institution, gender, subject area). Current higher education teacher self-efficacy research lacks clarity about events that occur as part of a teacher’s learning journey and how these events contribute to the development of teacher self-efficacy over time. It is important that we understand “the process by which teacher efficacy develops” (Klassen et al., 2011, p. 4). Then, there is the potential to guide teachers through learning opportunities that support efficacy development.

The current study sought to understand the moments of clarity experienced by the teachers through the teachers’ unique interpretations of these events. As such, a study that used qualitative methodology suited the research question because a qualitative approach would help uncover and explain the “process of efficacy transformation and

might lead to insights into how better to enhance teacher self-efficacy” (Klassen et al., 2011, p. 4). Investigating this process through transformation theory and specifically the lens of threshold concepts provided a fresh way of exploring what happened when the teachers experienced an event that contributed to change to their meaning schemes as part of their teacher self-efficacy development. Furthermore, a qualitative approach allowed for a holistic description of each personal event (Fraenkel, Wallen, & Hyun, 2012) locating the observer in the world of the participants (Denzin & Lincoln, 2005). In doing so, the current study has the potential to understand teacher self-efficacy development in terms of the meanings constructed by the teachers and their interpretations of their ‘aha’ moments.

1.2 Research aims of the study

This study sought to understand ‘aha’ moments experienced by a group of early career higher education teachers and the role these moments played in the transformational process of their teacher self-efficacy development. One overarching question motivated the study: what are ‘aha’ moments in the transformational process of higher education teachers’ self-efficacy?

This 12-month longitudinal study used a qualitative research methodology, multiple case (Merriam & Tisdell, 2016) instrumental approach (Stake, 2005), to explore the complex phenomenon of teacher self-efficacy with the intention of understanding what happened to their teacher self-efficacy when the higher education teachers experienced ‘aha’ moments. Moreover, the study investigated the ways these moments informed the transformational process of teacher self-efficacy development, if transformation or change occurred, and how transformation related to change in teaching knowledge and pedagogy.

1.3 Rationale for the study

Higher education teachers, outside of the Faculty or School of Education, are rarely trained as teachers (Appleby & Barton, 2012). As a result, what they have learned about teaching has been learned informally, by observing teaching from the position of a student, through their observations of and discussions with their colleagues and by learning to teach as they do it.

Within the compulsory education sector (elementary/primary and secondary/high school) research has shown that the first few years of teaching are vitally important for keeping “teachers in teaching but also in assisting them to develop their teaching practice and grow professionally” (Cameron et al., 2007, p. 32). Data concerning the number of early career teachers who leave teaching from the compulsory school sectors are documented (McKenzie & Santiago, 2005). In Aotearoa New Zealand, approximately 37 per cent of all early career teachers leave teaching after the first three years (Cameron et al., 2007). Teachers who leave teaching from the higher education sector is not documented. Teacher attrition is an issue in terms of the time and cost involved in the recruitment and induction of new staff. Furthermore, high attrition can lead to a lack of consistency and can be detrimental for the growth of a programme. This ultimately can have a negative impact on student outcomes.

Moreover, if we have a greater understanding of teacher self-efficacy within the higher education context and the transformational process of self-efficacy development, including the events that trigger that process, then there is the potential to develop targeted professional learning opportunities that support academic staff and self-efficacy development. This, in turn, will enhance the experience for both the teacher and the

student. As previously noted, there is a link between teacher self-efficacy and positive student achievement.

1.4 Context of the study

This study was conducted in two higher education institutions, a polytechnic² and a university, in Aotearoa New Zealand from July 2014 to July 2015. Both institutions have multiple campuses located throughout Aotearoa New Zealand and both offer courses across a range of discipline areas.

The teachers, at the time of the study, worked as higher education teachers at either institutions teaching courses from Level 1³ through to supervising Masters students at Level 9 on the New Zealand Qualifications Framework (New Zealand Qualifications Authority, 2015). The teachers had all taught for more than 12 months and less than four years. No teachers had prior formal teaching experience before beginning their current teaching position and they could all be referred to as dual-professionals: individuals who have subject or vocational expertise who become higher education teachers in their discipline area.

1.5 How I came to this research

Prior to beginning this research, I worked in pre-service and in-service teacher education. Although this involved working with teachers from all sectors of education, I mostly worked with pre-service and initial teachers within the higher education sector. I am passionate about helping educators to improve pedagogy and to become efficacious teachers. I want them to enjoy teaching and to do so with confidence.

² A higher education institution that delivers technical, vocational and professional courses (New Zealand Qualifications Authority, 2017).

³ Levels are based on complexity, in terms of what a graduate is expected to know, understand and be able to do as a result of learning, with Level 1 the least complex and Level 10 the most complex (New Zealand Qualifications Authority, 2015).

The process of teacher self-efficacy development has fascinated me for years. In an Australian study, Roche and Marsh (2000) argued that a number of higher education teachers have not received pre-service or in-service professional development that specifically targets teaching pedagogy or the ‘art of teaching’. They illustrated this point in saying that higher education teachers complete master’s and doctoral degrees and are then deemed to be able to teach their subject (Roche & Marsh, 2000). It is expected that the higher education teacher will learn the art of teaching ‘by doing’ and that they will naturally know if their teaching is effective or not. This is not always the case.

I began thinking about this research when I was completing my Master’s of Education (Administration and Leadership). It was at this time that I was introduced to the notion of threshold concepts. I began to notice how some of the early career higher education teachers at my own institution and those I trained described ‘aha’ moments that they had experienced in their teaching and how these moments of clarity made them feel as teachers particularly in relation to their teaching efficacy. I began to hypothesise that threshold concepts could provide a lens through which the transformational process of teacher self-efficacy development could be conceptualised and understood.

1.6 Thesis overview

This thesis is organised into seven chapters. Chapter One introduces the study and states the aims and rationale for the study. Chapter Two reviews the literature concerning self-efficacy theory, transformation theory and the notion of threshold concepts. The review identifies a gap in the literature suggesting that fresh insights into the transformational process of teacher self-efficacy may potentially be gained using transformation theory to understand the process by which meaning schemes are changed. Chapter Three presents the research framework, discusses case study methodology and the methods used to gather and analyse data. Two chapters present the findings contributing to a

more holistic understanding of the teachers' experiences with each chapter providing a different lens through which to understand this phenomenon. Chapter Four presents the findings from the 11 unique case studies and Chapter Five presents the findings from the cross-case analysis. In Chapter Six, the findings are synthesised and discussed with reference to the literature. The final chapter, Chapter Seven, completes the thesis by presenting the conclusions, including limitations of the study, and implications for theory and practice as well as recommendations for further research.

CHAPTER TWO:

LITERATURE REVIEW

“Doing a literature review is like participating in a dialogue with that community”

(Merriam & Tisdell, 2016, p. 91).

2.1 Introduction

The purpose of this literature review is to locate the current study within the body of work that precedes it and to enter into a dialogue with that community. This study drew together self-efficacy theory (Bandura, 1977a), transformation theory (Mezirow, 1991) and the notion of threshold concepts (Meyer & Land, 2003). The following synthesis of the literature anchors the study into this theoretical framework and identifies a gap within the literature. The intention of the current study is to contribute to filling this gap.

Self-efficacy theory (Bandura, 1977a), and more specifically teacher self-efficacy, is examined first as this is the central focus of the current investigation. Self-efficacy affects the choices people make, effort, persistence and achievement in relation to their behaviour. Teacher self-efficacy can “affect teaching practices and job satisfaction, and ultimately students’ learning” (Schunk et al., 2014, p. 306).

The chapter will then turn to the notion of threshold concepts (Meyer & Land, 2003). The notion of threshold concepts is a tool in the identification of potential teaching threshold concepts. By their nature, threshold concepts are transformative (Meyer & Land, 2003). They transform an individual’s perception of a subject and allow a new way of thinking about that subject. Threshold concepts are useful in offering a lens through which to view the conceptual shift that may influence the process of transformation to teacher self-efficacy development.

The third section of the chapter discusses transformation theory (Mezirow, 1991). Based within a constructionist paradigm, transformation theory provided a “comprehensive, idealized, and universal model consisting of the generic structures, elements and processes of adult learning” (Mezirow, 1994, p. 222). This theory contributed to an understanding of the process of transformation within an ‘aha’ experience and how meaning is constructed, validated and reformulated within the social conditions that influence this process. Transformation theory is an umbrella in which the notion of threshold concepts sits.

The final section of this chapter brings these theories and notion together and in doing so identifies a gap in the literature. It is suggested that fresh insights into the transformational process of teacher self-efficacy development, at a particular time when an individual experiences an ‘aha’ moment, can be gained using this combined framework.

2.1.1 Procedure

The selection of literature that informs this review used the following procedures. The databases ERIC via EBSCOhost, A+ Education, Education Source and Discover, were searched for articles written in English with ‘efficacy or self-efficacy’, ‘teacher or teaching’, ‘lecturer’, ‘tertiary or higher education or university’ and ‘threshold concepts’ in the article title or as key words. A similar search was conducted through the university’s library collection using the same search words. The initial search resulted in a broad selection of an extensive amount of literature particularly within self-efficacy research. The following primary foci informed the selection of literature: seminal self-efficacy research; teacher self-efficacy research; higher education self-efficacy research; seminal threshold concept research and publications; and research that investigated threshold concepts experienced by teachers.

Revision of the resulting hits determined if the literature provided relevant information for the current study. Other searches were conducted where an article or book referred to literature or a concept that were not included in the original search, for example attribution theory (Weiner, 1986) and transformation theory (Mezirow, 1991). Not all of the read literature that has informed this study is included in this review. Only those items deemed to add immediate value to the current study are included.

2.2 Self-efficacy

2.2.1 The development of self-efficacy theory

Self-efficacy is an abstract concept that is complex, multi-dimensional and contextually bound. Self-efficacy is defined as an individual's future orientated belief in their ability to succeed, or not, at a particular task in a specific situation. Self-efficacy beliefs strongly influence an individual's thoughts and behaviour when approaching a task (Bandura, 1986).

The early work in the study of learning theories greatly influenced self-efficacy research. Pavlov, Thorndike and Tolman put forward three principles of learning (Yancey, 2016). Tolman's *principle of expectancy* was a departure from what had come before. He provided a cognitive explanation for learning and behaviour as opposed to the less complex stimulus-response explanations offered through Pavlov's *principle of contingency* and Thorndike's *principle of effect*. Tolman argued that an individual's cognitive thoughts on what they expect would happen if they perform a certain action guide their complex behavioural choices. The individual bases their behavioural choices on their belief about the best way to achieve a task or goal. Tolman's work has strongly influenced current understanding of the role of cognitions in self-efficacy. Based in

Tolman's work, two main strands of theory concerning self-efficacy emerged; Rotter's (1966) social learning theory and Bandura's (1977a) social cognitive theory.

Rotter (1966) conceived of self-efficacy as the extent to which an individual believes they could control the reinforcement of their actions. Rotter described 'locus', taken from the Latin for place or location, as being either internal (the individual believes they could control events in their life) or external (the individual believes that their life is controlled by external environmental factors that are beyond their control). For example, teachers with a high internal locus of control believe that events that occur are a result of their own actions. If their students do well in an activity, such as an exam, this is due to the hard work of the teacher and the teacher's own personal commitment. Similarly, if the same teacher's students fail the exam, the teacher may attribute blame to the teacher's lack of ability. Conversely, a teacher with a high external locus of control would attribute external factors to their students' success or failure, such as the exam being too easy or the exam being too difficult. This early work has contributed to current understanding about the reasons people attribute for their successful or unsuccessful mastery experiences, which in turn affects self-efficacy beliefs. This is discussed shortly.

The second and more dominant theory that has informed self-efficacy research is located in social cognitive theory (Bandura, 1986). Social cognitive theory places human agency at its core; people are proactively engaged in their own success and development (Schunk & Pajares, 2005). Bandura (1986) identified a three-way reciprocal system consisting of – cognition (perceived ability to perform a task), environment (the setting or context) and behaviour (the task being performed). A key aspect to social cognitive theory is that humans are agentic and a product of learning.

What we think is a major determiner of who we are, what we do, and what we feel (Bandura, 1986). Bandura (1977a) defined self-efficacy theory, a key component of social cognitive theory, to be a cognitive process in which people construct future-oriented beliefs, or efficacy expectations, about their capacity to perform a task within a given situation.

Perceived efficacy is a future-oriented judgement of competence rather than the actual level of competence. This will, in turn, result in the amount of effort an individual will expend in the pursuit of goals, how much they will persist in the face of adversity, how they will rebound from temporary setbacks, and the degree to which they will exercise some control over events that affect their lives. People with a high sense of self-efficacy believe that they can, to some degree, exert control over a specific situation and this will affect how they interact with their world (Bandura, 1997).

Self-efficacy theory proposes a second expectation, outcome expectancy. Distinct from efficacy expectations, outcome expectancy is the individual's estimate of the likely consequences of performing that task at the expected level of competence (Bandura, 1993). Efficacy expectations precede and inform outcome expectancy. If an individual has a low sense of self-efficacy concerning a particular task, then they will most likely also have low or poor outcome expectancy.

There has been some criticism about the possible overlap between outcome expectancy and efficacy expectations (see for example Eastman & Marzillier, 1984; Teasdale, 1978). The main thrust of the criticism was that outcome expectancy and efficacy expectations were not clearly differentiated in their definitions as both contained expectations of outcome (Eastman & Marzillier, 1984). Bandura responded to these criticisms by arguing that the meanings of terms and phrases he used in his definitions

had been misunderstood and that there had been “simply a misreading of the definition of efficacy” (Bandura, 1978, p. 241). Furthermore, Bandura (1993) made a distinction between outcome and efficacy expectations. He argued that individuals believe that certain behaviours will produce certain outcomes. However, if they do not believe they can perform the necessary activities, the individual may not attempt the task or may give up at the first dissuading factor.

Self-efficacy is informed through four key sources of information: mastery experiences (that are indicators of capability); vicarious experiences (that alter efficacy beliefs when comparisons are made with the attainments of others); verbal persuasion (which can indicate to individuals that they possess certain capabilities); and physiological and affective states (from which individuals partly judge their capabilities, strength and vulnerability to failure) (Bandura, 1977a, 1997).

Enactive mastery experiences enhance self-efficacy the most as previous successful mastery experience will likely result in the individual believing that a similar level of success will occur in the future (Bandura, 1977a). Conversely, previous unsuccessful experience will likely result in the individual believing that the likelihood of success is low thus having a negative effect on self-efficacy and motivation to attempt the task.

Unsuccessful mastery experiences can be more influential on self-efficacy than successful mastery experiences (Schunk et al., 2014). This is discussed shortly.

The second source of self-efficacy information comes through vicarious experiences such as observing the successful, or unsuccessful, accomplishment of another. Vicarious experiences can result in the comparison with the other and the observer judging the likelihood of their success at the task. The observation of another failing at a specific task may result in the individual believing that they also lack the capability to succeed.

This can dissuade them from attempting the task, thus reducing their self-efficacy. How closely the observer identifies with the model and how credible the model moderates the efficacy effect with those being more closely aligned and/or credible having the greatest effect (Bandura, 1977a).

The third source of self-efficacy information is verbal persuasion in the form of encouragements or discouragements. The value the individual places on the source of the verbal persuasion will contribute to the effect on self-efficacy. If the source of the verbal persuasion is highly regarded then the effect will be greater than if the source is less credible (Bandura, 1977a). Although positive verbal persuasion may be attributed to raised self-efficacy, this is not sustainable if the subsequent performance of the task is poor.

The final source of self-efficacy information is physiological and affective states. Emotions, such as fear or anxiety, accompanied by physiological symptoms, such as nausea or shaking, may contribute negatively to an individual's self-efficacy if the individual believes that these will result in or are indicators of a reduced likelihood of success. Conversely, if the individual believes that these affective and physiological symptoms will not negatively affect their likelihood of success, and in some instances they may contribute to that success, then the symptoms and emotions will be viewed positively thus enhancing efficacy expectations (Bandura, 1977a).

Bandura (1977a) noted that information acquired through the sources of efficacy information does not automatically influence self-efficacy but rather it is the cognitive appraisal of these sources that informs self-efficacy. Cognitive appraisal includes the consideration and critical reflection of factors such as perceptions of ability, effort expended, task difficulty, patterns of success and reasons for success or failure (Schunk

& Pajares, 2004). Cognitive appraisal and critical reflection links self-efficacy with transformation theory (Mezirow, 1991). This is discussed shortly.

Attributions, reasons an individual gives for their success or failure at a particular task (Weiner, 1986, 2010), is one of these contributing cognitive factors. Individuals generally tend to seek reasons for failure more than they do for success or they seek reasons when the outcome is unexpected. A key aspect that links attribution theory (Weiner, 1986) to self-efficacy theory is that attributions may indirectly influence expectancy by influencing motivation, affective associations and behaviour (Maddux, 1995). If success is attributed to an internal or controllable factor, for example, effort, then self-efficacy is enhanced. However, if success is attributed to something the individual perceives as uncontrollable, for example, luck or chance, then self-efficacy may not be strengthened even if the mastery experience was successful (Pintrich & Schunk, 2002). Attributions are closely linked with expectancy beliefs and expectancy principle (Weiner, 1986). Failure that is attributed to stable, internal attributions, for example, ability, has the most detrimental effect on expectations and ultimately self-efficacy (Brophy, 2010).

Another contributing cognitive factor is negative bias, or negativity effect (Rozin & Royzman, 2001), the notion that negative events, thoughts and experiences have a greater impact on an individual's psychological state and processes than do neutral or positive events. For example, negative student feedback will have more of an impact on the teacher's self-efficacy than positive student feedback. People may use negative events, such as unsuccessful mastery experiences, to adapt their practice (Morris & Usher, 2011). These adaptations, Morris and Usher (2011) concluded, can result in either a negative or a positive influence to teacher self-efficacy. This finding has

importance because ‘aha’ moments can be the result of either a negative or positive event or experience.

An individual’s concept of ability can also influence self-efficacy (Bandura, 1993). If an individual believes that ability is an acquired skill that can develop over time, they will be more likely to attempt a challenging task. If the individual views setbacks and mistakes as part of the learning process, then self-efficacy may not be adversely affected. However, if the individual believes ability to be something that is inherited or fixed, the individual may be less likely to attempt a challenging task, as failure will confirm their lack of ability. Consequently, failure and/or avoidance of the task will further negatively influence self-efficacy (Dweck, 1999).

Behavioural factors also influence self-efficacy development. People select activities that they believe will result in success and they avoid activities that will potentially result in failure (Schunk et al., 2014). As such, self-efficacy plays a vital role in who we are, the choices we make in life and the competencies that we develop (Bandura, 1977a). Self-efficacy has the ability to influence thoughts about the likelihood of future success and to act as a self-fulfilling prophesy (Bandura, 1986). For example, teachers with a low sense of efficacy may avoid planning activities they believe exceed their capabilities and they may not persist with students having difficulties (Schunk et al., 2014). As such, the students are less likely to succeed and the teachers will not feel efficacious, thus confirming the teacher’s low sense of efficacy.

Motivation is also linked with self-efficacy (Klassen & Tze, 2014; Schunk et al., 2014). Bandura (1993) offered that an individual’s future-oriented belief in their personal efficacy to motivate and promote learning will have a direct bearing on behaviour choices and that the individual is more likely to be motivated to pursue tasks for which

he or she has high self-efficacy. Bandura argued that an individual with a strong self-efficacy is more likely to persevere when faced with dissuading factors and challenges. In line with Rotter's (1966) internal/external locus of control, Bandura (1993) described an individual's ability to cope with dissuading circumstances as their coping self-efficacy. A teacher with high coping self-efficacy is more likely to be comfortable with stress and anxiety that accompany any difficulties and they believe that they are able to exert some degree of control over the situation. These same teachers are also more likely to set goals to ensure that they achieve the task and to demonstrate perseverance.

Goals are critical in the self-evaluation of progress and in judgements of self-efficacy (Schunk & Usher, 2012). This is supported by Bandura (2013) who stated that people set themselves goals and performance standards, and then enjoy self-satisfaction and positive self-efficacy when the goals are achieved. Positive analysis of progress against goals will strengthen self-efficacy and motivation. A discrepancy between progress and a goal may decrease self-efficacy and motivation for some, whereas for others the analysis of progress may increase motivation as the individual strives to work harder (Maddux, 1995).

Values can also potentially influence task selection, as well as outcome expectations, motivation and self-efficacy (Hartnett, 2016; Schunk & Usher, 2012). Values, defined by Schunk and Usher (2012), are an individual's perception of the importance of learning or behaving in a certain way. Whereas, efficacy expectations ask can I do it, values ask do I want to do it. People form value judgements about tasks and the consequences of the outcomes. If an individual places high value on a task, they are more likely to demonstrate high motivation in achieving the task. As such, goals will be set. The successful attainment of the goal(s) strengthens self-efficacy (Schunk et al.,

2014). For the tasks that have low or little value the individual may decide not to undertake the task (Hartnett, 2016).

Bandura (2013) noted that self-efficacy functioning is also influenced by self-regulatory efficacy. Self-regulatory efficacy includes the self-efficacy to do what one knows how to do particularly in the face of varied dissuading conditions such as distractions or stress and tiredness. Perceived self-efficacy to perform a task, such as sticking to a classroom management strategy, may be high but when faced with work pressures and classroom commitments the degree of self-regulatory efficacy may vary.

Self-efficacy development is a socially and contextually bound concept. Education environments and the socio-cultural factors associated with schools can cause the development of an individual's self-efficacy to be problematic (Schunk & Pajares, 2004). Schunk and Pajares argue that in young children there is little to no differentiation between effort and ability. As children grow into adulthood, effort is often devalued in favour of ability. The peers around them may further influence this. For example, highly efficacious and skilful students who value the friendship of less-talented peers may purposely perform poorly in the hope that their peers accept them. In a similar way, teachers who are concerned with what their colleagues think of them may believe that the effort required to explain a complex concept as a public indicator of a lack in their own personal teaching ability. As such, they may avoid exerting such effort.

The colleagues working within the education environment also influence teacher self-efficacy. People form beliefs about the collective capabilities of the group to which they belong and they form beliefs about their likelihood of success within that environment (Bandura, 1997). Bandura (1993) argued that collective teacher efficacy is significantly

related to student achievement and the academic climate of an institution. In a similar way, Hoy and Woolfolk (1993) and Chong and Kong (2012) noted that teacher efficacy can be enhanced through a healthy institutional climate and supportive colleagues.

Gender is another possible influencing factor on self-efficacy (Chang et al., 2011; Hemmings & Kay, 2009; Velu & Nordin, 2011). Chang et al. (2011) and Velu and Nordin (2011) noted significant statistical differences in the perception of self-efficacy between male and female faculty members across all three areas of teaching, research and service. In contrast, Hemmings and Kay (2009) concluded that there was no significant difference between male and female academic staff in terms of their teacher self-efficacy. These findings are inconclusive.

Another area of increased interest is self-efficacy research within various cultural settings. Self-efficacy research began in the United States of America, and most of the early researchers and theorists were American (Klassen et al., 2011). In recent years, self-efficacy, and in particular teacher self-efficacy, has been explored within other cultural settings thus highlighting the variances that these settings bring to the concept of self-efficacy and teachers' beliefs regarding their roles and responsibilities (Ho & Hau, 2004; Saricoban, 2010). Ho and Hau (2004) determined there were cultural differences between the Australian and Chinese teachers in relation to the teachers' understanding of their teaching responsibility and their perception of teacher self-efficacy. For the Chinese teachers, guidance of their students was an integral component of teacher efficacy and as such, it informed their perception and efficacy evaluations. This was not the case with the Australian teachers.

Within Aotearoa New Zealand, there is recent increased interest in studies concerning self-efficacy (see for example Cheesman, 2016; Furness, 2013; Meissel & Rubie-

Davies, 2016). In their study that investigated the self-efficacy of school students within Aotearoa New Zealand, Meissel and Rubie-Davies (2016) argued that “there is substantial evidence indicating that various psychological processes are affected by cultural context” (p. 92). Other research into the difference between the psychological measured responses of students from non-Western cultural backgrounds compared with those from Western cultural backgrounds concluded that there is a difference between responses of students from individualistic cultures compared with the responses of students from collectivist cultures (see for example Lau & Lee, Maehr & Zusho, McLnerney & Ali, Xiang, Lee & Shen as cited in Meissel & Rubie-Davies, 2016). While the focus of these studies were the learners themselves, the results are likely to be relevant to teacher self-efficacy too.

The current study was located within Aotearoa New Zealand and had the potential to include participants who have a collectivist view of teacher self-efficacy. That is, an understanding that considers family and group goals as an integral aspect of efficacy. Aotearoa New Zealand has a number of diverse cultures offering a unique environment for studying teacher self-efficacy. The cultures present within Aotearoa New Zealand “represent sections of individualist, collectivist, indigenous, colonial and immigrant cultures” (Meissel & Rubie-Davies, 2016, p. 92). As a country, its people are predominantly influenced by the dominant Western culture of the colonial settlers who came from the United Kingdom and other parts of Europe and are assumed to reflect similar beliefs. *Māori* are the indigenous peoples of Aotearoa New Zealand. The most recent statistics indicate that just over 15 per cent of people in Aotearoa New Zealand identified as *Māori* (New Zealand Government, 2013). Their cultural traditions are collectivist and as such, their perceptions of self-efficacy may have an influence on the culture of modern day New Zealanders. Two of the 11 participants who took part in the

current study identified as *Māori*. Of the remaining nine participants, six identified as *pakeha* (a non-*Māori* New Zealander typically of European descent), and the remaining three participants were immigrants to Aotearoa New Zealand. Possible evidence of self-efficacy and cultural influence was anticipated in the current study.

Despite the recent interest in self-efficacy research within Aotearoa New Zealand, no studies were located during the literature search that specifically investigated the self-efficacy of higher education teachers within Aotearoa New Zealand. The lack of self-efficacy research in general within Aotearoa New Zealand was noted by Meissel and Rubie-Davies (2016) who stated that self-efficacy research that considers cultural differences is comparatively nascent. Moreover, researchers working in other cultural settings, for example in Australia and China, argued that further teacher self-efficacy investigations need to be conducted in diverse contexts to extend the generalisability and cultural adequacy of the construct (Ho & Hau, 2004). This is identified as a gap in the literature.

2.2.2 Teacher self-efficacy and its implications for teaching and learning

Teacher self-efficacy research has investigated self-efficacy of educators within all sectors of education, from those working in early childhood through to those working with adult learners (see for example Armor et al., 1976; Hansen, 2005; Maconachie, 2010; Riggs & Enochs, 1990; Roche & Marsh, 2000; Soodak & Podell, 1993; Tschannen-Moran & Woolfolk Hoy, 2001). Collectively, studies indicate teachers, regardless of which level they teach and the teacher training they have or have not received, all experience a sense of teacher self-efficacy. Teacher self-efficacy is defined as a teacher's belief or perception about how effective he or she is as a teacher in positively influencing student learning (Chang et al., 2011; Guskey & Passaro, 1994).

Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) described teacher efficacy as the efficacy judgements made by teachers through the assessment of resources, support and constraints in specific teaching contexts.

Building on Bandura's work, Tschannen-Moran and Woolfolk Hoy (2001) determined that the concept of teacher self-efficacy has significant implications for learning as teacher self-efficacy has the potential to influence teacher behaviour and impact on student learning. This is supported by Pajares (2008) who argued that beliefs, including belief in oneself, are the best indicators of the decisions individuals make. Teachers with a strong sense of teacher self-efficacy demonstrate persistence, set high expectations for their students, and give feedback that criticises low expectations rather than incorrect responses (Gibson & Dembo, 1984). These teachers are also less likely to demonstrate angry or impatient interactions (Ashton et al., 1982). Furthermore, teachers with a strong belief in their teacher efficacy will be more likely to use materials and activities in an attempt to engage and motivate students (Guskey & Passaro, 1994; Rose & Medway, 1981), believe that their actions will result in a positive outcome (Armor et al., 1976; Tschannen-Moran & Woolfolk Hoy, 2001), exhibit greater enthusiasm for teaching (Guskey & Passaro, 1994), have greater commitment to teaching and are more likely to stay in the teaching profession (Hoy & Woolfolk, 1993). These seminal findings continue to be confirmed by more recent studies (see for example Hemmings, 2015; Klassen & Tze, 2014; Wyatt & Dikilitaş, 2016).

Due to a limited amount of self-efficacy research concerning higher education teachers, the studies drawn on in the current review are not limited to this context but rather cover a range from compulsory and post-compulsory education contexts. The concept of teacher self-efficacy, although dependent on context, is still the same concept.

Classroom atmosphere, as an example, is partly determined by the teacher's belief in their instructional self-efficacy. A teacher who believes strongly in his or her instructional abilities will demonstrate a greater degree of creativity in their teaching. In contrast, a teacher who has a low sense of instructional self-efficacy will be less likely to be creative and he or she is more likely to construct classroom environments that undermine students' sense of self-efficacy and success (Bandura, 1993). For instance, the teacher with a low sense of instructional self-efficacy may teach using lock-step sequences of instructions that have the potential to lose students along the way. This teacher may not be comfortable in deviating from a lesson plan to assist the students in maintaining progress. In contrast, the teacher with a high sense of instructional self-efficacy will be more likely to adapt their teaching and to demonstrate a variety of teaching approaches.

Researchers investigating teacher self-efficacy have also addressed the assumption that teacher self-efficacy is context specific (see for example Ashton, Buhr, & Crocker, 1984; Riggs & Enochs, 1990; Rubeck & Enochs, 1991). Curriculum-specific research concluded that teacher self-efficacy is a hierarchically organised, multi-dimensional construct (Ashton et al., 1984; Soodak & Podell, 1996). A teacher may have a high sense of teacher self-efficacy in one curriculum area or when working with one kind of student and at the same time experience a low sense of teacher self-efficacy in other subjects or with different students (Riggs & Enochs, 1990; Rubeck & Enochs, 1991).

2.2.3 Teacher self-efficacy research requires expansion

Quantitative instruments that measure teacher self-efficacy predominates the research. One of the earliest instruments developed to measure teacher self-efficacy was the scale that was designed as part of the seminal study, *The Rand Report* (Armor et al., 1976).

Since then other instruments have been developed that include the popular *Teacher Efficacy scale* (TES) (Gibson & Dembo, 1984), the *Ohio State Teacher Efficacy Scale* (OSTES) (Tschannen-Moran & Woolfolk Hoy, 2001) and several shortened versions (see for example Hemmings & Kay, 2009; Hoy & Woolfolk, 1993; Soodak & Podell, 1993; Velu & Nordin, 2011; Woolfolk & Hoy, 1990). Other more recent scales are based on these in one way or another or on the advice offered by Bandura (cited in Urdan & Pajares, 2006). Such scales all measure cross-sectional teacher self-efficacy. They do not provide an in-depth understanding of the transformational process that may occur when a teacher experiences change to their self-efficacy or the events that contributed to that change. This is identified as a gap in the literature.

Longitudinal or phased design studies that measure change to teacher self-efficacy over time were located in the literature (see for example Holzberger, Philipp, & Kunter, 2013; Mongillo, 2011; Woolfolk Hoy & Burke Spero, 2005). One of these studies, Woolfolk Hoy and Burke Spero (2005) is a typical example of this type of research. The study consisted of three phases of self-efficacy data gathering that followed a particular group of elementary teachers over a three-year period. The study measured the teachers' sense of teacher efficacy during the first quarter of teacher training (in the first year), near the end of their teacher training (at the end of the second year) and at the end of the first year of teaching (the third year of the study). Woolfolk Hoy and Burke Spero (2005) concluded that the first few years of a teacher's career provided evidence of malleable teacher self-efficacy development. This conclusion is supported by other studies (see for example Chang et al., 2011; Dunkin, 1995; Morris & Usher, 2011; Soodak & Podell, 1996). Morris and Usher (2011) argued that teacher self-efficacy solidifies within the first four years of a professional career. In a similar way, Chang et al. (2011) and Dunkin (1995), who investigated the development of teachers' self-

efficacy of higher education teachers in Taiwan and Sydney respectively, reported findings that were consistent with other studies. They also concluded that teacher self-efficacy is malleable during the first few years of teaching and self-efficacy solidifies around year four or five of teaching. In an American based study, Soodak and Podell (1996) concluded that there is a gradual increase in self-efficacy, as measured using Gibson and Dembo's *Teacher Efficacy Scale* (1984), over the first few years of teaching that Soodak and Podell claimed is consistent with experience or years of service. While these studies provide evidence that self-efficacy is malleable during this time and that self-efficacy tends to solidify around four to five years of teaching service, the studies do not provide insight into the events and experiences that contribute to or influence the process of self-efficacy development.

Two conclusions, which can be drawn from these studies, are that a longitudinal study is better suited to the investigation of the transformational process of teacher self-efficacy development as transformation might occur over a period. Secondly, to capture the potential transformational process of teacher self-efficacy, the most appropriate participants would be early career teachers who would be more likely to experience this transformation.

2.2.4 The higher education teacher is seen as a subject expert and not a pedagogical expert

Research into higher education teachers' self-efficacy has predominantly had a particular emphasis on the teachers' efficacy within the three key areas of research, service and teaching with the focus on the teacher as the subject expert rather than the pedagogical expert (for example see Chang et al., 2011; Roche & Marsh, 2000; Velu & Nordin, 2011). Previously, higher education teachers received very little pedagogical

training (Appleby & Barton, 2012). During the early 2000s, Roche and Marsh (2000) suggested that higher education teachers complete master's or doctoral degree study in their discipline areas and they are then deemed able to teach.

In the Roche and Marsh (2000) and Velu and Nordin (2011) studies, conducted in Australia and Malaysia respectively, the 'teacher as the subject expert' dominated the participants' responses. These teachers gave higher scores for the teacher self-efficacy questions that focused on subject knowledge than the questions that asked about classroom management and the delivery of course material thus indicating lower pedagogical efficacy. Chang, Lin and Song (2011) argued that there was no statistical difference in the pedagogical skills between the teacher trained and non-trained higher education teachers in Taiwan. Although Chang et al. (2011) claimed there was no statistical difference between the two groups it is important to note that this might be because the 'training' within the universities in Taiwan is only a very brief three-hour session. It is unrealistic to expect this minimal amount of pedagogical training would result in a significant difference.

There were few teacher self-efficacy studies conducted within the higher education setting that focused on the pedagogical skills of teachers rather than their subject knowledge. One such study, by Dunkin (1995), investigated the teacher efficacy perceptions of Australian early career higher education teachers' pedagogical skills. Dunkin (1995) concluded that the early career teachers had simple, unidimensional concepts of effective teaching on which they based their self-evaluations. These teachers named one or two pedagogical self-evaluation strategies. For example: teaching as structuring learning; teaching as motivating learning; teaching as encouraging activity and independence in learning; or teaching as establishing

interpersonal relations conducive to learning. In comparison, the more experienced higher education teachers demonstrated a multi-dimensional view of teacher effectiveness using all four pedagogical self-evaluation strategies. Furthermore, the more experienced teachers reported higher confidence in their pedagogical skills. Dunkin's study suggests that a teacher's pedagogical skill does have a relationship with the development of a teacher's self-efficacy. Dunkin (1995) also supports previous studies conducted in other sectors of education that investigated the change in teacher self-efficacy of the early career teacher compared to the more experienced teacher (see for example Gibson & Dembo, 1984; Guskey & Passaro, 1994). The Dunkin (1995) study raises the question, should higher education teachers also be supported in the development of their pedagogical skills as these skills appear to have a relationship with the formation of teacher self-efficacy. If so, there is a need to expand the current understanding of the higher education teacher's efficacy concerning pedagogical skills and the events or 'aha' moments that occur within the context of teaching that potentially contribute to efficacy development.

Saroyan and Trigwell (2015), during their review of recent academic research in higher education teachers' professional learning, raised similar questions with a particular focus on teachers' pedagogical skills and academic development within the higher education context. One study identified, Chalmers and Gardiner (2015), investigated the link between higher education teachers' pedagogical skills and change in student learning. Although Chalmers and Gardiner do not investigate teacher self-efficacy per se, their study does provide a link between teachers' enhanced sense of capability and increased measurable student outcomes.

2.2.5 Formal and informal professional learning experiences affects teacher self-efficacy

For the purpose of the current study, the professional learning journey means any teacher specific learning, formal or informal, undertaken by the higher education teacher that informs the practice of teaching and teacher knowledge. The literature search located little research that investigated informal professional learning and teacher self-efficacy. This is an emerging field and as such was identified as gap in the literature.

However, teacher efficacy research has investigated the role of formal professional learning within formal professional development initiatives and the link with teacher efficacy development. Joyce and Showers (1995), Bumen (2009), Chalmers and Gardiner (2015); Karimi (2011) and Chong and Kong (2012) all argued there is a positive measurable relationship between formal professional development and teacher self-efficacy. The main thrust of their arguments was that when teachers have opportunities to apply and see new strategies modelled and to engage in peer coaching through professional development initiatives, these activities enhance teacher self-efficacy through an enhanced sense of capability. Furthermore, Bumen (2009) concluded that professional development programmes that increase teachers' instructional skills provided teachers with effective teaching strategies and increased the likelihood of teachers achieving successful mastery experiences, the strongest predictor of self-efficacy. Bumen (2009) argued that the professional development programmes that included participant interaction further increased opportunities for vicarious and mastery experiences and created settings that included positive verbal persuasion.

Positively affecting teachers' beliefs is likely to happen with longer term professional development programmes that push teachers to reflect critically on their teaching (Chong & Kong, 2012). Mezirow (1994) identified that most often critical reflection takes place within the context of problem solving. Critical reflection, is a key aspect of transformation and is necessary for change to occur (Mezirow, 1991, 2000; Taylor & Cranton, 2012). Professional development opportunities provide "a platform to create teacher efficacy doubts, which foster a transformative disequilibrium, thus triggering a change toward teaching and learning" (Chong & Kong, 2012, p. 267). Positive shifts in teacher self-efficacy, as argued by Chong and Kong (2012), occur when compelling feedback forcefully disrupts an individual's belief in his or her capabilities.

Compelling feedback which forcefully disrupts an individual's belief in his or her capabilities is referred to by Mezirow (1991) as a disorienting dilemma that triggers the transformation process. While Mezirow was not addressing self-efficacy per se, he did explain transformation as the result of dealing with disorientating dilemmas and problem solving. An individual experiences a disorienting dilemma when they have an encounter that does not fit into their pre-existing meaning structure. The disorienting dilemma leads to critical reflection as the individual reviews their original meaning structure. This is followed by rational discourse that includes recognition of the discontent and then action to find a solution to the problem. 'Aha' moments can occur within the context of problem solving and may include a disorienting dilemma.

It needs to be noted that a disorienting dilemma is one event that can trigger change to self-efficacy. It is not the only event. Mezirow also describes the accumulation of smaller changes to meaning schemes. This is discussed shortly.

The Aotearoa New Zealand higher education setting, as in many other cultural settings, is not devoid of formal professional development opportunities. However, opportunities vary across institutions and in many cases, these are not compulsory for academic staff to attend. The literature provided evidence of a link between formal professional development and the enhancement in teacher self-efficacy (see for example Ross & Bruce, 2007). Informal professional development, that is teachers learning the art of teaching ad hoc, situated within practice, has a much higher occurrence for the early career higher education teacher (Mills, 2014). As such, there is a need for research concerning these informal professional development events. ‘Aha’ moments are a means by which we can capture these informal professional development events and understand the change to teacher pedagogy and knowledge that contribute to capability evaluations and self-efficacy development.

The studies located within the literature that make the link between self-efficacy development and transformation theory focussed more on the outcome of the change rather than the process of transformation (see for example Cove, McAdam, & McGonical, 2008; Jones, 2009; Mills, 2014). However, one study conducted with pre-service secondary/high school teachers in Canada, focused on the process of self-efficacy change. Black (2015) identified Mezirow’s (2000) reflection or self-examination stage as being a critical stage in facilitating the teacher’s learning and change to teaching confidence. Teacher confidence was interpreted by Black (2015) as being teacher self-efficacy for specific teaching tasks. Black (2015) used Mezirow’s (1991) transformation theory as a lens through which to analyse the personal reflections of 22 in-service teachers over a three-month period of practicum and on campus instruction. Challenges or obstacles to the participants’ self-efficacy development identified included effective classroom management, successful curriculum planning

and implementation, positive rapport with students, and supervising teacher approval. Transformational learning theory was used to explain the teachers' "effortful cognitive processing to confront their disorientating dilemmas" (Black, 2015, p. 86). Black does not expand beyond this to describe the process of transformation of self-efficacy.

Those working within the threshold concepts field have also used transformation theory to understand change. Meyer, Land, and Baillie (2010) described crossing a threshold as resulting in "transformation or reconfiguring of perspectives" (p. xii). Their use of transformation is an operational characteristic of the notion of threshold concepts and was more in keeping with a shift in consciousness. The current study uses Mezirow's (1991, 2000) transformation theory to theorise the transformation process as a superset of transformation that helps to explain the notion of threshold concepts and what happens when teachers experience 'aha' moments. The current study has also opted to use the term 'meaning schemes' rather than 'habits of the mind' as they are referred to in later literature concerning transformational learning. The reason for this is that the term 'meaning schemes' provides common language between transformation theory and the notion of threshold concepts.

Transformation theory and the notion of threshold concepts are mutually supportive. Transformation theory provided the current study with an established framework to understand the process of change to teacher self-efficacy and the role 'aha' moments played in that change. The notion of threshold concepts provided a means to conceptualise the 'aha' moment and to name potential teaching thresholds concepts.

2.3 Threshold concepts

The notion of threshold concepts is a relatively recent notion that is not as extensively researched as self-efficacy (Bandura, 1977a) or transformation theory (Mezirow, 1991).

Threshold concepts are useful in understanding how the individual may experience unfamiliar teaching specific knowledge and threshold concepts provide a lens through which the events that influence change to teacher self-efficacy can be understood.

Threshold concepts are defined by Meyer and Land (2003) as theoretical points on the learning landscape over or through which an individual passes. Once a threshold has been crossed there is a transformation in perception, including identity of self, and previously inaccessible knowledge becomes accessible (Meyer & Land, 2003).

Threshold concepts have been used to explain the transformational process identified in the learning process (Meyer & Land, 2003), student engagement (Zepke, 2013), the conceptualisation of experiencing knowledge, including teacher professional development (Cove et al., 2008; Kinchin & Miller, 2012; McLean, 2012), in higher education pedagogical design and practices (Harlow, Cowie, Peter, & McKie, 2016) and threshold concepts have been linked with higher education teacher professional development in an attempt to enhance teaching efficacy (Northcote, Reynaud, Beamish, Martin, & Gosselin, 2011).

Meyer and Land (2003) suggested that there exists a phenomenon in learning they term 'threshold concepts'. Threshold concepts are not the core concepts that inform a subject; rather, they occasion a significant shift in the perception of a subject and are central to understanding and mastery of the subject. The notion of threshold concepts is often described as being 'conceptual gateways' or 'portals' that lead to a previously inaccessible, and possibly 'troublesome', way of thinking, interpreting, or viewing something. These portals are conceptualised as being key or critical points in the learning landscape that allow the individual to gain a greater depth of understanding that goes beyond epistemological dimensions to a new way of seeing things including ontological dimensions around self, feelings, and values. Various examples of threshold

concepts identified by researchers have included *abstract numbers* and *heat transfer* (Meyer & Land, 2003, 2005), *otherness* (Cousin, 2003) and *student-centredness* (Kinchin & Miller, 2012).

According to Meyer and Land (2003, 2005, 2006) five distinct properties characterise threshold concepts. They are transformative (both of understanding and of the individual); irreversible (unlikely to be unforgotten or to be unlearned without considerable effort); integrative (they bring previously unconnected ideas into a new and powerful formation); bounded (having terminal frontiers, bordering with thresholds into new conceptual areas); and troublesome (requiring the letting go of familiar understanding or of prior knowledge).

Liminality is a transformative state in the process of learning that occurs within a theoretical liminal space (Mezirow, 1991; Turner, 1969). Turner (1969), working within anthropological studies and rites of passage, described a liminal space that encompassed the entire process of transition or transformation extending beyond the threshold and one that included the assimilation of the individual back into the group as a changed person. The act of assimilation described by Turner (1969) included ontological repositioning. This description aligns with Mezirow's (1991, 2000) reintegration phase within transformation theory. The reintegration phase includes the reintegration of the individual's new perspective as the individual re-enters society as a changed person. In redefining Turner's (1969) definition, Meyer and Land (2003, 2005, 2006) described liminal space as a simultaneously physical and mental fluid space before a threshold; incorporating cognitive dissonance, reformulation of meaning and a shift in ontology. The individual occupies the liminal space moving from one state or position of knowing to another "transforming and being transformed" (Meyer & Land, 2005, p. 380). Within this conceptual space the individual engages with previously held beliefs and certainties

and in doing so recognises shortcomings in the existing understanding thus rendering them problematic (Land, 2013; Land, Rattray, & Vivian, 2014).

According to Meyer and Land (2003, 2005, 2006), liminal space incorporates a number of properties. These include potentially troublesome knowledge, oscillation, confusion and mimicry. These occur as the individual moves between old and emergent understandings encountering potentially ‘problematic’ or ‘troublesome’ knowledge as they attempt to make sense, often copying the language and behaviour expected of them before they come to full understanding and finally cross over the threshold. The process of transformation may be rapid or protracted over a long period. As noted by Dewey (as cited in Land et al., 2014, p. 200), the process of change requires “troublesome knowledge to undertake the alteration of old beliefs”.

More recently, Land (2013) and Land et al. (2014) extended the conversation regarding the definition of liminal space. In doing so, they described a more refined understanding of the processes the individual experiences in crossing a threshold. This included a provoked state of liminality, transformation as the individual engages with the new or modified knowledge and a shift in subjectivity (Land et al., 2014). This aligns with Mezirow’s (1991, 2000) description of transformation, dissonance and how meaning schemes are altered. However, Land (2013) and Land et al. (2014) do not extend the liminal space beyond the threshold and their conception of liminal space is limiting. The current study will argue that this aspect of the notion requires further exploration and discussion.

In an attempt to provide the reader with a means to conceptualise and understand the process of knowledge transformation that occurs when an individual encounters and crosses a threshold, Land (2013) and Land et al. (2014) used a tunnel metaphor. They

noted using a diagrammatic metaphor is problematic as there is the risk of portraying the crossing of a threshold in an essentialist manner containing predictability in the individual's trajectory. The tunnel as depicted by Land et al. (2014), is at risk of being too restrictive and does not acknowledge that humans are unpredictable and that the process of crossing a threshold may not be linear. The metaphor does not take into account human agency, efficacy expectations and the ontological repositioning that occurs after crossing a threshold. Drawing further on the use of the tunnel metaphor, Land et al. (2014) described the physical aspects of the metaphoric tunnel as dark and foreboding. They noted, if the tunnel is long, the sense of direction and progress can become obscured. As such, the individual may look to escape or leave the theoretical tunnel at the earliest possible opportunity. However, if the individual is aware of and understands the process in crossing a threshold, they are then more likely to be patient, to persevere and not leave the tunnel prematurely when faced with dissuading factors. These characteristics align with a highly efficacious individual and provide a link with self-efficacy theory. How an individual interacts with the properties within the liminal space may potentially be influenced by their sense of self-efficacy. As such, self-efficacy may be a determining factor in the experience of threshold concepts.

Baillie, Bowden, and Meyer (2013), in describing the Threshold Capability Integrated Theoretical Framework, argued that a "true learner is never in a permanent post-liminal state" (p.242). As such, liminality ceases to be a clearly differentiated linear sequence of pre-liminal, liminal and post-liminal states. In their article, they perceived liminality as "continual waves of less and more comfortable liminality" (Baillie et al., 2013, p. 243) with the individual perpetually existing within liminal space. As such, the post-liminal space and the pre-liminal space overlap.

The wealth of literature that now exists is testament to how the notion has resonated with many academics across disciplines. It is important to note that the notion of threshold concepts is still developing. There has been ongoing discussion concerning the original five properties as identified by Meyer and Land (2003) and whether all are necessary for an individual to cross a threshold. At a conference, Land (as cited in Barradell, 2013) proposed the addition of two new properties, *discursive* and *reconstitutive*. These two new properties are currently being discussed in the literature (see for example Land, Meyer, & Flanagan, 2016). Furthermore, the original description of liminal space has generated discussion (Land et al., 2014). What is evident from the literature is that there is room for further discussion on the notion of threshold concepts.

As a result of Land's (2011) study using co-inquiry with pre-service teachers to improve teaching and learning experiences, Land noted that there is often a lack of consensus concerning the experiencing and identification of thresholds, troublesome knowledge and 'stuck' places experienced by individuals. What is important, Land (2011) argued, is the fact that the discussion concerning professional learning journeys is occurring. This stance is supported by earlier work that noted the process of learning as being a "form of journey, during which the [learner] not only gains insights great and small, but is also changed as an individual by new knowledge" (Meyer & Land, 2007, p. 14). This lack of consensus is the main thrust of Rowbottom's (2007) criticism against the notion of threshold concepts. This is discussed shortly.

Studies involving threshold concepts have focussed on the link between threshold concepts and the impact of these on teacher knowledge and pedagogy. Wallace (2010) used threshold concepts as the framework to explain the shared experiences of professional learning and liminality, paying particular note to the transformation of pedagogy for preservice teachers. Wallace (2010) noted that the state of liminality will

be experienced differently by different teachers. He argued that teachers experiencing liminal space require careful support and nurturing from peers due to the factors that act within liminal space and the troublesome nature of questioning intuitive understanding. This particular research raises an important idea. Even though there are common properties within liminal space, the experience of liminality may be unique to the individual.

Wallace (2010) also asserted that people in a community of practice, like teaching, with conflicting ideas are instigators of uncertainty and can be considered as initiating creative tension. Wallace's understanding of creative tension aligns with cognitive dissonance used in transformational learning theory (see for example Mezirow, 1991, 1994, 2000; Taylor & Cranton, 2012). Wallace (2010) theorised that when a teacher experienced creative tension, usually from being moved outside of their comfort zone to a liminal state of reflection, there existed an opportunity for professional development and learning to occur. He argued that this provides a locus for reflection and analysis, key components in transformation theory.

Atherton, Hadfield, and Meyers (2008) investigated the ontological shift of teachers, in particular their ideological beliefs and the affective nature of threshold concepts.

Atherton et al. (2008) posited that the ideological beliefs formed through conscious and unconscious ideas are not easily manipulated. They concluded that knowledge only came for their study participants after ontological transformation and a change in the teacher's self-perception.

Emotional repositioning has also been the subject of research within threshold concept studies. Cousin (2006) and Atherton et al. (2008) argued that emotional repositioning occurs when individuals experience the uncomfortable nature of questioning once held

ideas, beliefs and knowledge that occurs during ontological shift. Land (2011) went further in describing emotional repositioning by noting a total sense of loss that can arise. The notion of ontological shift is important because the concept of self-efficacy may be an ontology with multiple beliefs or ways of being within various contexts.

Threshold concept identification within discipline subject areas such as economics and the sciences have been well documented in recent years (see for example Davies & Mangan, 2007; Scott, 2015; Wilson, 2014). Furthermore, there is a growing body of literature concerning threshold concepts within almost every discipline area. Barradell (2013) warned that the ready acceptance of an emerging notion has at times lacked the rigour that perhaps it should, and that a number of important questions remain unanswered. One of these questions is the identification of threshold concepts.

Those working with threshold concepts tend to agree that they are difficult to identify due to the fluid nature and interpretation of threshold concepts (Barradell, 2013). It is because of these two factors that there is criticism of the notion. Rowbottom (2007) set out to demystify the notion and to call for further analysis. He argued that the five properties that distinguish threshold concepts: “probably irreversible, possibly often (though not necessarily) bounded’, and ‘potentially (though not necessarily) troublesome” (Meyer & Land, 2005, pp. 7-8), make threshold concepts empirically impossible to isolate. Rowbottom (2007) argued that the empirical identification of threshold concepts is unobtainable stating that something cannot simultaneously be X but not necessarily X. Furthermore, Rowbottom (2007) argued that threshold concepts are not definable because what is deemed a threshold concept for one individual may not be a threshold concept for another. This, he posited, is reliant on the individual’s conceptual scheme initially possessed.

Since Rowbottom's (2007) article was published, there has been continued interest in how threshold concepts are identified. Kiley and Wisker (2009) offered that the main way of identifying that a threshold had been crossed was through a change in behaviour, such as speech. Others have used the evidence of troublesome knowledge and cognitive dissonance as an indicator of a threshold concept (see for example Rodger, Turpin, & O'Brien, 2015; Wallace, 2010). However, as Barradell (2013) warned, the implication that troublesome knowledge and/or cognitive dissonance are the most critical properties in the identification of a threshold concept may be incorrect since it implies that anything that is conceptually challenging could be treated as a threshold concept. This also ignores the possibility that cognitive dissonance can be viewed by the individual as a positive motivator (Maddux, 1995).

Within the literature, there is also a lack of agreement concerning the properties of threshold concepts in their identification. Davies and Mangan (2007) argued that a threshold concept should incorporate all five properties. In contrast, Irvine and Carmichael (2009) argued that very few threshold concepts possessed all five properties. To add to the discussion, Atherton et al. (2008) go so far as to state, "that the idea of a threshold concept is in itself a threshold concept" (p. 4).

The literature search located a small number of studies that identified specific teaching related threshold concepts. Two examples shown here, Cove, McAdam, and McGonigal (2008) and Northcote et al. (2011), provide evidence of how varied the identification of threshold concepts can be.

Cove et al. (2008) investigated threshold concepts experienced by beginning primary/elementary and secondary/high school teachers during their one-year pre-service course, and during the school session immediately following. Cove et al. (2008)

defined the threshold concepts experienced by their participants as “conceptual gateways to confident progress in professional knowledge” (p. 2). Cove et al. (2008) identified ten threshold concepts based initially on the ‘troublesome’ knowledge experienced by their participants during classroom management, teaching methodologies and assessment. To ascertain if these threshold concepts resulted in perspective transformation or conceptual shifts as described by Cove et al. (2008), the researchers sought evidence of changed pedagogical behaviour and speech. Cove et al.’s (2008) definition of perspective transformation differs from that of Mezirow (1991, 2000). Cove et al. (2008) used the term to refer to a general change in knowledge, values and/or beliefs.

The refined concepts are noted below in summary form and they may not be restricted to the professional learning of first year primary/elementary and secondary/high school teachers only.

- 1. Teaching is about learning.*
- 2. The same curriculum can be effectively taught in different ways by different teachers.*
- 3. Language creates ethos, atmosphere and positive working relationships in the classroom.*
- 4. In class behaviour management is most effective when the teacher contributes to ethos and structures.*
- 5. The teacher realises what makes reflection work, and its importance in learning to teach more insightfully and effectively.*
- 6. The teacher comes to understand his or her own role in the mentoring process and what the aim of mentoring is.*
- 7. ‘Professionalism’ is seen as attaining the confidence and ‘earning’ the freedom to make an informed and considered choice about how the curriculum should be taught to a certain group of learners.*
- 8. Relationships matter in teaching and learning.*

9. There is a realisation that teaching and learning take place in 'communities' that overlap and affect each other, positively and negatively

10. There emerges an energising sense of 'owning' or 'earning' a professional identity, confidently and realistically understood (Cove et al., 2008, pp. 5-12).

In contrast the threshold concepts identified by Northcote et al. (2011) are less descriptive and more akin to other threshold concepts named throughout the located literature. In their identification of threshold concepts, Northcote et al. (2011) focussed on the integrative and transformative nature more so than the 'troublesomeness' of the concept. Their identified threshold concepts were:

1. The distinctive nature of the online learning environment

2. Student attention

3. The nature of online communication

4. Relationships

5. Identity

6. High quality learning

7. Humanisation

8. Sense of place

9. Technological concerns (Northcote et al., 2011, p. 76).

There is a noticeable difference between the descriptive nature of the threshold concepts identified by Cove et al. (2008) and those identified by Northcote et al. (2011). The threshold concepts identified by Cove et al. (2008) appear to be more general knowledge units about teaching.

What is clear from the literature is that threshold concepts and the identification of them is still emerging. There appears to be no one definitive answer to how threshold concepts are identified. In saying this, Rowbottom (2007) is correct in his assertion that

what is deemed a threshold concept is reliant on the individual's conceptual scheme initially possessed. He also calls for further discussion on the topic.

The inability to definitively identify threshold concepts needs to be considered within the current study. As such, any threshold concepts detected within the current study were considered as being 'potential' threshold concepts rather than definite threshold concepts.

One aspect that studies located in the literature search do agree on is the transformative nature of threshold concepts. This is due to the changed knowledge, values and/or beliefs and ontological repositioning that occurs after an individual has crossed a threshold (Land et al., 2014). The use of transformation theory (Mezirow, 1991, 2000) provided the current study with a more robust theoretical foundation and highly regarded framework on which to identify 'aha' moments as giving rise to a potential teaching specific threshold concept or not. In keeping with Northcote et al. (2011), the current study focussed on the transformative nature of 'aha' moments and the marked or noticeable change to the teacher's knowledge, value and/or belief. Confirmation that conceptual shift or perspective transformation concerning knowledge, values and/or beliefs had occurred was self-reported by the teachers in the current study or as evidenced through a change in behaviour (for example specific teaching knowledge such as the process of learning) and/or speech (whereby the individual is able to explain a concept in depth).

The Northcote et al. (2011) study was the only study located that explicitly linked threshold concepts with enhanced teacher capability. Northcote et al. (2011) posited that after their teachers crossed a threshold specific to the context of on-line teaching they experienced enhanced capability and an enhanced sense of teaching efficacy as a result

of the new or modified teacher specific knowledge gained. The teachers in the current study were specifically asked if the ‘aha’ moment and any resultant knowledge contributed to change to their teacher self-efficacy. This is discussed further in Chapter Three.

The chapter will now turn to discussing transformation theory (Mezirow, 1991, 2000). Transformational learning occurs in a similar way to when an individual formulates self-efficacy beliefs using values, beliefs and assumptions as a lens through which they interpret their experiences.

2.4 Transformation theory

Within adult learning, Mezirow (1991, 2000) posited transformation theory and transformative learning to explain how adults adjust and modify existing meaning structures. Transformation theory has been intensively researched within adult education (for example see Mezirow, Taylor, & Associates, 2009; Taylor, 2007; Taylor & Cranton, 2012) and “remains the most robust theoretical elucidation of learning in the whole corpus of literature concerned with transformative learning” (Hoggan, Mälkki, & Finnegan, 2017, p. 49).

Mezirow (1991, 2000) defined transformation as a marked or noticeable change that occurs whereby learners change meaning schemes⁴ (specific knowledge, values and/or beliefs) and meaning structures through critical reflection on their experiences. This encompasses “figuring out how taken-for-granted facts are warranted... [and] critically examining the epistemic assumptions supporting one’s values, beliefs, convictions, and preferences” (Mezirow et al., 2009, p. 23). The current study has adopted Mezirow’s (1991, 2000) understanding of transformation to mean a marked or noticeable change in

⁴ By 2000, this was relabelled as ‘habits of mind’.

meaning schemes that make up meaning structures whereby an individual adds to or integrates ideas within an existing scheme. In doing so, this provided identification of the process of transformation of teacher self-efficacy within the current study with a robust and well-researched framework and a focal point for understanding ‘aha’ moments. Transformation theory was not used within the current study to explain all transformative changes to self-efficacy. It was used to understand only those that occurred within the process of experiencing an ‘aha’ moment.

Transformation theory sits within a constructionist paradigm and aligns with social learning theory. Transformation is reliant on the cognitions of the individual and the social interactions of the individual with the world around them. As such, learning is profoundly social. How the individual interprets their experiences is central to how they make meaning and to their learning development (Mezirow et al., 2009).

Having an experience, however, is not enough to effect a transformation. It is the effective critical reflection that follows the experience that leads to transformative learning (Merriam, 2004). As noted, a key feature of transformation theory is reflection. This links transformation theory with self-efficacy theory. Individuals critically reflected on their experiences. Within self-efficacy theory, these reflections, described as cognitions, inform self-efficacy. Within transformation theory, these critical reflections lead to transformation. During reflective periods there is potential for self-efficacy to change as the individual cognitively appraises the events that led to the transformation.

Mezirow (1991) argued that meaning schemes change and perspective transformation occurs when the individual adds to or integrates new or modified knowledge through a process of “active recognizing and again reinterpreting a previously learned experience”

(p. 6). Transformative learning occurs when there is a significant and irreversible change in the way an individual experiences, conceptualises and interacts with the world (Hoggan et al., 2017).

Development that results from transformational learning is understood as being progressive over time and usually positive in nature (Merriam, 2004). Changes in meaning schemes lead the individual to a progressive realisation of capacity, that can inform self-efficacy, and to a more discriminating, integrative understanding of a task, such as teaching. This second aspect also links transformation theory with self-efficacy development.

Another link between self-efficacy theory and transformational theory is perspective transformation. Perspective transformation refers to change to one's meaning perspectives (Mezirow, 1991) and aligns with ontological repositioning. Perspective transformation involves critical reflection of assumptions and it represents a developmental shift in understanding, or having a new world view (Mezirow, 1994). "Perspective transformation may be the result of a major event in one's life" (Mezirow, 1994, p. 224) triggered by a disorienting dilemma, a life crisis or life transition or incremental because of an accumulation of transformations in meaning schemes (Mezirow et al., 2009). Previous experiences within a social context inform meaning perspectives. Much like self-efficacy beliefs, meaning perspectives filter the way people make meaning of present and future experiences (Hoggan et al., 2017). Not all 'aha' experiences and change to self-efficacy involves perspective transformation. Perspective transformation occurs less frequently and usually as a result of a disorientating dilemma or as a result of changed meaning schemes over a period of time (Mezirow, 1991).

Transformation, within the current study, is understood to mean an impactful change described by Kroth and Cranton (2014, p. 94) as a “jarring of assumptions that leads to subsequent revision of those assumptions”. This change can be as a result of a significant event or smaller iterative events that coalesce to form a change. Mezirow (1991, p. 3) described transformation as the way in which adults “learn to negotiate meanings, purposes, and values critically, reflectively, and rationally instead of passively accepting social realities defined by others”. Hoggan et al. (2017) argued that minor changes with minimal affect to an individual’s meaning perspectives do not merit the description transformation. They state that transformative learning differs from everyday learning in its depth (the degree to which a meaning perspective is affected), breadth (the context within which change occurs) and relative stability (the notion that the change cannot be temporary or easily reversed). They argue that everyday learning is bound by context whereas meaning-making affects all of the contexts within which an individual operates. This argument is important in establishing the difference between an ‘aha’ moment that provides evidence of a minor change in knowledge, values and/or beliefs compared with one that provides evidence of an impactful change. These three characteristics of depth, breadth and relative stability align with those used in the identification of potential threshold concepts. Therefore, the current study will adopt the following criteria in the identification of those moments that were transformative compared with those moments that were not. Transformative ‘aha’ moments must constitute a noticeable or impactful change in the individual’s teaching knowledge, values and/or beliefs. This change will be context specific (to the context of teaching), result in changed behaviour and contain knowledge, values and/or beliefs not easily reversed. ‘Aha’ moments that do not contain these three components will be identified as being non-transformative.

Hoggan et al. (2017) are correct in pointing out the varied uses and understanding of the term ‘perspective transformation’. However, their argument does not take into account the accumulation of minor changes to previously held beliefs and assumptions that can result in perspective transformation and inform capability evaluations. This critique is supported by Land et al. (2014) who argued minor changes in meaning schemes can also result in transformation of meaning perspectives and the subsequent crossing of a conceptual threshold.

When the individual is no longer able to make meaning of the present experience based on their previous meaning schema, a disorientating dilemma may occur (Mezirow, 1991). Mezirow (1991) identified a state of disorientating dilemma that may be understood to be the same or very similar to a state of cognitive dissonance (Wallace, 2010) or a provoked state of liminality (Meyer & Land, 2003; Turner, 1969). Mezirow (1991) noted that change to an established perspective can be painful as “they call into question deeply held personal values and threaten our very sense of self” (Mezirow, 1991, p. 168). It should be noted that change to self-efficacy could also be due to factors other than a disorientating dilemma. The understanding of transformational change as presented in the current study does not exclude potential change to self-efficacy that may occur as a result from an impactful, positive mastery experience. As mentioned, ‘aha’ moments are most likely to occur within the context of problem solving.

2.5 Gaps in the literature

There is a need for this research, because currently there is a lack of understanding of specific events such as ‘aha’ moments and how these contribute to the transformational process of self-efficacy development. The experience of an ‘aha’ moment provides a means through which the process of change can be understood. Transformation is a

consequence of the new or modified knowledge, value and/or belief gained from experiencing the 'aha' moment. Transformational learning guides the individual to a progressive realisation of capacity (Mezirow, 2000), that informs self-belief, including self-efficacy, and to a more discriminating, integrative understanding of a task, such as teaching.

This review has identified a number of gaps in current understanding about teacher self-efficacy and the process of self-efficacy development. Current studies do not provide an in-depth understanding of the transformational process that may occur when a teacher experiences an event that contributes to transformation in their meaning perspectives and in self-efficacy. Such studies would help explain the “process of efficacy transformation and might lead to insights into how better to enhance teacher self-efficacy” (Klassen et al., 2011, p. 4).

Only one study, Black (2015), was located in the search that provided a link between transformation theory (Mezirow, 1991) and self-efficacy theory (Bandura, 1977a). Self-efficacy is a meaning perspective and its development requires critical reflection as part of the cognitive appraisal of the four sources of efficacy information. Through the use of transformation theory (Mezirow, 1991) there is the potential to make this link explicit. Furthermore, the literature review identified a gap that would place moments of clarity, or 'aha' moments', within the transformational process of teacher self-efficacy development. In doing so, the current study contributes to current understanding of the link between transformation theory (Mezirow, 1991) and self-efficacy theory (Bandura, 1977a).

The literature search provided an abundance of teacher self-efficacy research concerning teachers working within the compulsory education sectors. In contrast,

research concerning teachers working within the higher education sector was limited. Of those studies that were located, the literature search provided very few studies that specifically investigated the pedagogical skills of higher education teachers. This is important because many early career higher education teachers are employed predominantly as teachers as opposed to researchers (Mutch, 2017).

The literature provided evidence of a link between formal professional development learning experiences and the enhancement in teacher self-efficacy (Bumen, 2009). Informal professional development learning experiences have a much higher occurrence for the early career higher education teacher (Mills, 2014). There is a need to understand the link between informal professional development learning experiences and transformation in self-efficacy. To-date, no literature was located that investigated informal professional development learning experiences that occur as part of a teacher's self-efficacy development.

Teacher self-efficacy investigations need to be conducted in diverse contexts to extend the generalisability and cultural adequacy of the construct (Ho & Hau, 2004). There were very few studies located within the literature search that were conducted within Aotearoa New Zealand and none located that were conducted within the higher education sector in recent years. Studies that investigate higher education teacher's self-efficacy within Aotearoa New Zealand are needed because studies in other contexts have shown self-efficacy is a predictor of pedagogical behaviour linked to successful student achievement and outcomes.

The literature review also identified gaps in the literature concerning the notion of threshold concepts. How threshold concepts are identified is not agreed on. The process of crossing a threshold concept and the relationship of the experience with self-efficacy

requires further investigation. Furthermore, the understanding of liminal space within the notion of threshold concept is in need of reconceptualisation. “The notion of liminal space has remained relatively ill-defined, something of a ‘black box’ within the Threshold Concepts Framework” (Land, 2013, p. 3). The current study paid particular attention to the experiences of the early career higher education teachers before, during and after an ‘aha’ experience and in doing so contributes to current understanding of liminal space.

2.6 Chapter summary

Research concerning teacher efficacy and specifically research concerning that of teachers working in higher education was presented to provide an understanding of the research that informed the current study. This situates the current study within this field.

Bandura (1997) and Schunk and Usher (2011) offered that self-efficacy has the potential to influence behaviours and the environment which in turn is affected by them. Social cognitive theory (Bandura, 1986), of which self-efficacy theory is a central feature, involves a three-way reciprocal system consisting of cognition, environment and behaviour. In a similar way, Mezirow (2000) described transformation as being reliant on the cognitions (through reflection) of the individual with their social interactions with the world around them. Meyer and Land (2005), working within the notion of threshold concepts, described an interaction between the individual and theoretical liminal space before a threshold: transforming and being transformed.

The conclusions from the literature have importance in that they indicate that a longitudinal study is suited to the investigation of the transformational process of teacher self-efficacy development as transformation might occur over a period.

Secondly, to capture the potential transformational process of teacher self-efficacy, the

best participants would be early career teachers who would be more likely to experience this transformation due to the developing nature of their teacher self-efficacy.

CHAPTER THREE:

METHODOLOGY & METHODS

“It is thus important to understand the philosophical foundations underlying different types of research so that you can make informed decisions as to the choices available to you in designing and implementing a research study” (Merriam & Tisdell, 2016, p. 2).

3.1 Introduction

This chapter contains three main sections. The first section presents the research questions and Crotty’s (1998) research framework that was employed in the construction of the study. The epistemology that underpinned the study, the theoretical perspective that informed the philosophical stance of the study and the methodology that determined the selection of methods are presented. The second section of this chapter describes the methods used. These included case study method, strategies for ensuring quality, the selection of the study sample and the ethical considerations used in the design of the study. The third section of this chapter describes the implementation of the methodology as evident through the methods and the study procedures and data collection sequence. These include the data coding and data analysis procedures.

3.2 Research questions

One overarching question motivates the current study: what are ‘aha’ moments in the transformational process of higher education teachers’ self-efficacy? Following from this four research sub-questions were developed:

1. What ‘aha’ moments are experienced during the professional learning journey of second and third year higher education teachers?
2. How are ‘aha’ moments related to change in teacher self-efficacy?

3. What are the properties of ‘aha’ moments and how do they relate to changes in teacher self-efficacy?
4. In what ways have these ‘aha’ moments informed individual teacher knowledge and pedagogy and how does this relate to self-efficacy development?

3.3 Research framework

Crotty (1998) described a scaffolding framework for the construction of the social research process. This was to provide a guide for emerging researchers wishing to embark on research. The framework included four elements that a researcher should consider in the construction of the research process:

- Epistemology: the researcher’s theory of knowledge that guides the theoretical perspective;
- Theoretical perspective: the philosophical stance informing the methodology and providing the context for the process;
- Methodology: the strategy or plan of action that links the selection of methods to the desired outcomes; and
- Methods: the techniques or procedures used to gather and analyse data (adapted from Crotty, 1998).

Crotty’s (1998) framework was used in the current study to provide a “sense of stability and direction” (p. 2). The inclusion of these elements in this chapter also renders explicit the theoretical assumptions that underpinned and contributed to the trustworthiness of the study’s findings.

3.3.1 Epistemology

Epistemology is the nature of knowledge and “*how we know what we know*” (Crotty, 1998, pp. 9, italics in original). The perspective of situated constructivism grounded the current study. Constructivism holds that meaning is negotiated through our engagement with the world (Crotty, 1998). Situated constructivism recognises multiple realities and values differences.

As noted in the literature, teachers consciously construct their self-efficacy through their engagement with their world. The use of situated constructivism aligns with self-efficacy theory (Bandura, 1977a) because efficacy beliefs are social and cultural constructions formed according to the setting within which they reside. What is efficacious teaching in one setting or for one individual may not be deemed efficacious in another. In a similar way, transformation theory and the notion of threshold concepts are also situationally constructed. Threshold concepts are bound by the discipline within which they occur. The researcher suggests there are multiple experiences of teacher self-efficacy perceptions and multiple experiences of transformation that share common characteristics. Furthermore, ‘aha’ moments experienced in teacher formal and informal professional learning contexts, had the potential to provide a conduit through which threshold concept learning could occur and teacher self-efficacy is enhanced.

3.3.2 Theoretical perspective

The theoretical perspective is the stance or theoretical lens that informs the choice of methodology and links methodology with epistemology (Crotty, 1998). The current study followed a social science qualitative research design (Cohen, Manion, & Morrison, 2011) informed by interpretivism and more specifically, symbolic interactionism, whereby the study sought to understand how individuals interact with their social world (Denzin & Lincoln, 2005). Symbolic interactionism includes aspects

such as language, communication, interrelationships and community. Crotty (1998) described the symbolic interactionist view of knowledge as being determined by social interactions that inform perceptions. This description is echoed by Cohen et al. (2011) who noted that symbolic interactionists direct their attention at the nature of interaction and the dynamic activities occurring between people. Interpretive research begins with the participants who make up the study and in understanding their interpretations of their perceptions and the world around them. For the current study, the teachers' interpretations of their 'aha' moments resulted in their perception of change to his or her teacher self-efficacy.

Teaching is a social action with dynamic activities and interactions, which influences teachers' cognitions, affects and actions. The current study was informed by social cognitive theory (Bandura, 1986), which holds that learning occurs in a social context with dynamic interactions of personal factors, environmental factors and behaviour. A key aspect of social cognitive theory is that humans are agentic and a product of their own learning. What we think is a major determiner of who we are, what we do, and what we feel (Bandura, 1986). Self-efficacy theory (Bandura, 1977a), a key component of social cognitive theory, holds that people construct future orientated beliefs about their ability to succeed, or not, at a particular task in specific situations.

3.3.3 Research methodology

The research methodology of the current study was based on a constructivist paradigm, that recognises that reality and interpretations are built on social and cultural construction. Research methodology is the strategy or plan that guides the study methods and techniques for data gathering (Crotty, 1998). Studies that have investigated teacher self-efficacy are typically grounded in social cognitive theory (Bandura, 1986) and have given attention to the interactions between teachers and students as well as the

interactions between teachers and the institutional environment (Gibson & Dembo, 1984; Meijer & Foster, 1988; O'Neill & Stephenson, 2011; Riggs & Enochs, 1990).

In the selection of appropriate methodology careful consideration is given to the research question (Mutch, 2013). As such, the researcher was conscious of the overarching research question: what are 'aha' moments in the transformational process of higher education teachers' self-efficacy? This overarching question required in-depth exploration.

Qualitative research is more appropriate for researchers who are more "interested in the quality of a particular activity" (Fraenkel et al., 2012, p. 426). Denzin and Lincoln (2005) described qualitative research as consisting "of a set of interpretive, material practices that make the world visible" (p. 3). These practices include interpretation of "phenomena in terms of the meaning people bring to them" (p. 3). Self-efficacy beliefs, the focus of this study, are the result of interpretation by the individual of the sources of efficacy information. The participants interpreted and retold their experiences and the researcher interpreted the data and discussed the findings through her interpretation of the findings.

Literature concerning higher education teacher self-efficacy is lacking (Hemmings, 2015). Of the higher education teacher self-efficacy studies located, many were quantitative. These studies lacked detail about the events that occurred as part of a teacher's learning journey and how these events contributed to the development of teacher self-efficacy. The current study sought to understand the events through the 'aha' moments experienced by the participants and the teachers' unique interpretations of these events. As such, qualitative methodology suited the research question and purpose of the study. A qualitative study would help explain the process of efficacy

transformation (Klassen et al., 2011) and has the potential to understand self-efficacy change as observed through the experiences of the participants. This will enhance the current understanding provided through quantitative studies and adds to current understanding of self-efficacy more generally. A study that seeks to understand rather than measure has the potential to delineate characteristics of perspective transformations (Merriam, 2004).

Furthermore, a qualitative study was required because it allowed for a holistic description of particular events and supported an understanding that people construct meaning through their interaction and interpretation of such events (Fraenkel et al., 2012). Moreover, a qualitative study locates the observer in the world of the participants (Denzin & Lincoln, 2005). In doing so, qualitative research has the potential to understand the phenomenon of teacher self-efficacy in terms of the meanings constructed by the teachers. When attempting to understand what someone means often involves values, intentions, feelings and normative concepts defined by their contexts. This is seldom amenable to empirical testing (Mezirow, 1994).

A longitudinal study was required to capture potential 'aha' moments and what happened before, during and after the experience and to establish any relationship with transformation of self-efficacy as interpreted by the participants. In setting the length of the study, the researcher must recognise when data saturation has occurred (Denzin & Lincoln, 2013) or to design the length so saturation does not occur. The current study was conducted over 12 months. This period was selected because it afforded the researcher with the opportunity to track change in self-efficacy and to gather evidence of the properties of transformation before, during and after an 'aha' moment across an academic year. This was a consideration because different events occur at different

times throughout the year. Conducting the study longer than 12 months would potentially have resulted in data saturation because the same academic events occur approximately at the same time each year.

As the notion of threshold concepts was employed to conceptualise and name the ‘aha’ moments and potential teaching threshold concepts, it is important that the researcher was not restricted by the properties as described in the literature (see for example Meyer & Land, 2003, 2005, 2006). To ensure that other properties that fell outside the literature were captured, if they exist, the researcher did not discuss the notion of threshold concepts with the participants. Furthermore, all evidence that did not sit within the notion of threshold concepts was also included in the findings.

Meyer and Land (2003, 2005) described transformational characteristics within the notion but these are not fully theoretically developed. Therefore, the use of Mezirow’s (1991, 2000) well researched and respected transformation theory was used to understand the process of transformation of teacher self-efficacy as a result of the ‘aha’ experience, if change or transformation occurred, and in understanding the existence of conceptual shifts and how meaning schemes change.

3.4 Methods

Methods are the activities or techniques that are used in a research study to gather data (Crotty, 1998). The researcher used a case study approach to identify and explore the teachers’ interpretation of their teacher self-efficacy and ‘aha’ moments.

3.4.1 Case study

The research methodology used in the current study was case study because such an approach provided the opportunity for a rich chronological narrative (Cohen et al., 2011) of the transformational process as well as an understanding of the teachers’

perceptions and interpretation of their experiences (Freebody, 2003). Case study allows for the blending of the description of events with analysis, focuses on individuals and their interpretations of their experiences and case study highlights specific phenomenon that are relevant to the case (Cohen et al., 2011).

The term case study is used in qualitative research to describe “a study that focuses on a bounded object, usually an individual, group, setting or concept” (Mutch, 2013, p. 216).

Case study is suited to research that inquires “into processes and relationships” (Denscombe, 2007, p. 38) and seeks to investigate the ‘how’ and ‘why’ of an event or phenomenon (Yin, 2009). Furthermore, “case study method allows investigators to retain holistic and meaningful characteristics of real-life events” (Yin, 2009, p. 4).

Creswell (2008) described case study research as a qualitative approach in which a bounded system (a case) or multiple bounded systems (cases) are explored over time, through in-depth data collection using multiple sources of information. The unit of analysis determines the “choice of what is to be studied” (Stake, 2005, p. 443).

Different researchers use different terms to describe the variety of case study approaches available. These include terms that focus on the outcome of the case: explanatory (used to answer a question that provides links between events and outcomes), exploratory (used to explore situations where there are no clear outcomes) or descriptive (used to describe a phenomenon and the real-life context within which it occurs) (Yin, 2009). Other approaches place the focus on the object rather than the outcome: intrinsic (where the case is of particular interest and the findings are not meant to be generalised), instrumental (where the researcher wishes to understand an issue or phenomenon and wishes to generate theory) and collective (where the researcher wishes to explore and compare within and between cases) (Stake, 2005).

Similar to Stake's (2005) collective approach, Merriam and Tisdell (2016) described the consideration of a single or multiple case study approach. A single case study approach is used when the case itself is of particular interest. A multiple case study approach is used when the researcher wishes to compare findings across two or more cases.

The current study adopted a multiple case (Merriam & Tisdell, 2016) instrumental approach (Stake, 2005) where the researcher wished to understand a phenomenon and expand the current theory concerning the development of teacher self-efficacy. The current study consisted of 11 unique cases that investigated the bounded concept of 'aha' moments and the transformational process of self-efficacy of higher education teachers working in Aotearoa New Zealand within a bounded timeframe of 12 months. Each teacher's experiences formed a unique case.

3.4.2 Data gathering

Data gathering are the techniques employed by the researcher through which data is collected (Denzin & Lincoln, 2005). The current study used semi-structured face-to-face interviews, reflective journals and visual representations.

Interviews

The use of interviews as a method of data collection in qualitative research is not new. An interview is a purposeful conversation between the researcher and the participant through which information is exchanged (Bogdan & Biklen, 2003). Interviews afford the researcher with a means of gathering data concerning past experiences and of events that cannot be easily observed (Merriam & Tisdell, 2016). Participants have unique experiences and as such structured interview questions would potentially be restrictive. Therefore, open-ended questions allowed for the exploration of phenomena as they arose. Furthermore, open-ended questions could result in unexpected or unanticipated

responses (Fraenkel et al., 2012) allowing for a more valid investigation that does not run the risk of excluding this unexpected data.

Social desirability bias, whereby respondents answer questions in a manner that they hope will be viewed favourably, is potentially an issue with any research involving human participants (Ashton et al., 1984). Studies that investigate teacher self-efficacy are, by their very nature, reliant on self-reporting. Studies have attempted to mitigate social desirability bias with the use of norm referenced questions (see for example Ashton et al., 1982). Ashton et al. (1984) concluded that teachers use norm referencing to evaluate their effectiveness in terms of their performance as teachers. This is supported by Bandura (1993) who offered that norm referencing, or social comparison as he termed it, affects performance through its impact on self-regulation and personal efficacy.

Ashton et al. (1984) argued that people will respond more accurately when asked to compare themselves against other teachers, rather than self-referenced questions. This warrants further discussion as norm reference questions do pose another problem: the direction of the social comparison. As noted in the literature, vicarious experiences play an important role in self-efficacy information and in the maintenance of self-efficacy (Bandura, 1977a). One example of vicarious learning is modelling. Through vicarious experiences and modelling people learn and then attempt to replicate the modelled behaviour. Particularly within the context of professional development, modelling is considered a form of upward social comparison: the comparison with an individual who is more capable (Vrugt, 1994). Social comparison may also be a downward comparison with someone who is worse. Vrugt (1994) posited that downward social comparison is

prompted by an individual's need to strengthen their self-esteem and to confirm their own self-efficacy.

Another issue with norm reference questions arise because teachers usually teach isolated from other teachers, with few opportunities to observe colleagues and to receive feedback about teaching (Bagheridoust & Jajarmi, 2009). As such, judgements can be limited and biased contributing to an uncertain sense of competence. As previously mentioned, Dunkin (1995) concluded that early career teachers had simple, unidimensional concepts of effective teaching on which they based their self-evaluations. The purpose of the current study was to understand the experiences of early career higher education teachers from the perspective of the participants and their own personal self-efficacy development. As such, norm reference questions should be avoided in favour of self-reference questions. However, the researcher is mindful that self-efficacy judgements can still be inaccurate, that is too high or low, particularly given they are often made by early career teachers with reference to unidimensional concepts of effective teaching.

The current study used semi-structured interviews, which included a number of predetermined open questions that allowed for cross-case comparison (see Appendices 5-10). The six bi-monthly interviews explored recent events, the content of the teachers' reflective journals and were used for gathering in-depth data during the visual representation activity discussions.

Reflective journals

Northcote et al. (2011) reported in their study that the use of participant reflective journals was very successful for gathering data concerning self-efficacy evolution and to demonstrate change over a specific period of time. The teachers in the current study

used reflective journals between the bi-monthly interviews to record thoughts, feelings and perceptions of ‘aha’ moments as they occurred, or as close to the occurrence, and to note any changes to their teacher self-efficacy⁵. Northcote et al. (2011) used two prompt questions in the journals to standardise the responses. The current study employed a similar method (see Appendix 11).

Visual representation

The participant visual representation activity is an expansion of the traditional definition of concept and mind mapping to contain a less structured method of visual representation that includes drawings and spatial arrangement or positioning. Wheeldon and Faubert (2009) noted that qualitative research often requires less traditional understandings of concept and mind mapping to align with the theoretical starting point of the research. The current study was based within a theoretical perspective of interpretivism and more specifically, symbolic interactionism. The visual representational activities provided a conduit through which the participants could make sense of their experiences during the retelling section of the interviews. Kinchin and Miller (2012) noted that visual representations have the capability to overcome barriers such as the fear of using incorrect language or inadequate vocabulary when discussing an event. In addition, visual representations can provide the researcher with an insight into the thoughts of the participant (Bagnoli, 2009).

When using visual representations, participants potentially became more aware of their own thoughts, opinions and emotions as the unconscious became conscious as “the cognitive process required to draw leads to more succinct presentation of the key elements of participants experiences” (Kearney & Hyle, 2004, p. 376). Visual representations have the potential to generate complex or abstract ideas that are difficult

⁵ Seven of the 11 teachers kept a reflective journal. The remaining four chose not to.

for participants to articulate and for the researcher to capture through interview questions alone (Crilly, Blackwell, & Clarkson, 2006). Graphic constructions used in visual representations can also demonstrate an understanding or relationship among different concepts including the event, the participants, respondent's perceptions, emotions and values.

The visual representation activity was used in the current study during five of the six interviews to elicit data about the events and properties that surround 'aha' moments and the transformational process of teacher self-efficacy development. The fifth interview did not use the activity. The fifth interview had a particular focus on establishing the participant's perspective of self-efficacy and the questions did not lend themselves to a visual representation activity. The method contributed to the depth of description and allowed participants to explore fully their own interpretations of their experiences. Some participants also included visual representations in their reflective journals.

In keeping with the theoretical perspective of the current study, interpretivism, the researcher was mindful not to place her own interpretations onto the visual representations. The narrative that accompanied the representations was used for data gathering and the representations themselves were used to support the narrative. The representations were not analysed in their own right because the researcher did not want to place her interpretation on the events depicted through the representations.

3.5 Ensuring quality

The place of validity and reliability within qualitative research has long been an issue. Recent developments in postmodern research have resulted in a shift in the conceptualisations of and a subsequent lack of consensus concerning validity and

reliability (Merriam & Tisdell, 2016). Validity, as described by Merriam and Tisdell (2016), asks how research findings match with reality. Merriam and Tisdell (2016) noted that the researcher is the primary instrument of data gathering and analysis and as such reality is open to interpretation. They argued that reality is ever changing and can be affected by the process of gathering data. Denzin and Lincoln (2013) look to and question a study's findings in an attempt to ensure validity. They ask "are these findings sufficiently authentic" (p. 246) and can the findings be acted on with security to "construct social policy or legislation based on them?" (p. 246).

In a similar way, reliability is problematic in qualitative research because human behaviour is not static. Furthermore, what an individual may experience is no less or more reliable than another individual's experience (Merriam & Tisdell, 2016). This most certainly is the case with self-efficacy beliefs. Lincoln and Guba (1985) defined reliability in qualitative research as being credible through dependability or consistency in that the results are consistent and make sense given the data that is presented.

Merriam and Tisdell (2016) suggested that to ensure validity and reliability in qualitative research the study must be conducted rigorously and the findings must "ring true to readers, practitioners, and other researchers" (Merriam & Tisdell, 2016, p. 238). Careful consideration must be given to the way in which data are collected, analysed, and interpreted.

Merriam (1998) described six strategies to enhance internal validity and increase credibility of the findings: 1) triangulation, 2) member check, 3) long term observations, 4) peer examinations, 5) participatory or collaborative modes of research, and 6) researcher subjectivity. The researcher has chosen to adopt these strategies as they align with her understanding of research validity and reliability.

3.5.1 Triangulation

Merriam (1998) noted multiple sources of information should be sought and used as “no single source of information can be trusted to provide a comprehensive picture” (p. 137). Data gathering in the current study was across 11 unique cases using three methods with the potential for triangulation within each case and across cases. This included 65 semi-structured interviews, 35 reflective journal entries, and 53 visual representation activities. Data from each of the data gathering techniques was compared across cases to provide a complete and comprehensive picture.

3.5.2 Member check

Member checking involves taking data back to the participants for them to check for accuracy (Merriam, 1998). Interpretivism is open to researcher subjectivity and as such can be a concern in ensuring research quality. The returning of interview transcripts and case summaries ensured an accurate record of the interview and an accurate interpretation of the teacher’s experiences by the teacher and by the researcher.

Any study must not cause the participants any harm. Member checking also allowed the participants the opportunity to remove any information from their data that could potentially identify the participant or cause them harm.

3.5.3 Long term observations

A longitudinal study through long term observation is one where the researcher observes participants and collects data over a period of time (Merriam, 1998). The advantage of long-term observation is the ability to observe change and the impact of change over an extended period. A disadvantage of long-term observation is the potential for participants to withdraw from the study partway through. The current study

included a longitudinal data-gathering period of 12 months spanning one academic year. No participants withdrew from the study during this time.

3.5.4 Peer examinations

Peer examinations, asking colleagues to comment on the findings as they emerge, also enhances research quality (Merriam, 1998). Preliminary findings, a developing theoretical framework and the data gathering visual representation method, were shared with colleagues through conferences in Aotearoa New Zealand and Australia and workshops in Aotearoa New Zealand resulting in refinements and enhanced analysis.

3.5.5 Participatory or collaborative modes of research

Participatory or collaborative modes of research, involving participants in all phases of research, not only ensures quality, but also ensures that participants are made to feel confident that their information is being treated with the utmost care (Merriam, 1998). The researcher returned teachers' transcripts for checking, consulted with the teachers before conference presentations and workshops, and the teachers were asked to comment on preliminary findings and their individual case summaries.

3.5.6 Researcher subjectivity

Qualitative research is value laden (Bogdan & Biklen, 2003). As such researcher subjectivity in qualitative research, and more specifically when using a case study approach, can be viewed by some as a concern (Burns, 2000). The concern arises in the selection of evidence or the interpretation to support phenomena. However, as Fraenkel et al. (2012, p. 429) noted "it is impossible for the researcher to stand apart from the individuals he or she is researching". The researcher was mindful of researcher subjectivity and employed Merriam's (1998) validity and reliability strategies to mitigate, where possible, any potential researcher bias.

3.6 Sampling

Onwuegbuzie and Collins (2007) noted that case studies do not need to contain a large number of participants. To establish the existence of a transformational process, the current study used 11 second and third year higher education teachers from a range of disciplines and course levels across the higher education sector. Each teacher and setting constituted a unique case.

Context and the social structures that surround teachers in their professional journeys were noted in the literature as being influencing factors on teacher self-efficacy (see for example Cove et al., 2008). The self-selection of participants across disciplines and institutions provided data that was not restricted to one discipline or setting. The sample also provided a number that allowed for an in-depth investigation of each case while at the same time affording the opportunity to compare across cases.

The literature indicated that teacher self-efficacy stabilises after four to five years of teaching (see for example Chang et al., 2011; Morris & Usher, 2011). To capture change in self-efficacy and ‘aha’ moments therefore, the sample needed to include teachers who are most likely to experience these. The researcher did not invite first year higher education teachers to participate in this study as the time commitment would potentially place extra stress on them while they are still coming to terms with their new role. Those invited were teachers who had more than 12 months and less than four years teaching experience.

The literature indicated that there is still debate concerning a difference in the perception of teacher self-efficacy between male and female faculty members (for example see Chang et al., 2011; Velu & Nordin, 2011). The self-selected sample in the

current study provided an approximate gender balance (five male and six female). The sample size was small and findings are not intended to be generalisable.

3.7 Context of the study

This study was conducted in two higher education institutions in Aotearoa New Zealand over a 12 month period. The first interviews were conducted at the beginning of July 2014 and the final interviews took place in the last week of July 2015.

The teachers, at the time of the study, worked as higher education teachers at either the university or polytechnic. Seven teachers worked at the polytechnic and the remaining four teachers worked at the university. This number resulted from self-selection. The teachers came from five campuses located throughout Aotearoa New Zealand. No teachers had prior formal teaching experience before beginning their current teaching position and they could all be referred to as dual-professionals: individuals who have subject or vocational expertise who became higher education teachers in their subject area. Six teachers had recently completed or were part way through adult teaching qualifications. Five teachers were involved in an institutional formal professional development programme aimed at improving teaching pedagogy and knowledge and enhancing teaching effectiveness.

3.8 Research ethics

Fraenkel et al. (2012) stated that protecting the participants from physical and psychological harm through the careful attention to ethical considerations is the responsibility of every researcher. Ethical diligence can relate to both the subject matter as well as to the methods and procedures (Burns, 2000). As such, the design of the current study addressed a number of ethical considerations through the researcher's university ethics committee. These considerations included informed consent, the

privacy, anonymity and confidentiality of participant data, the right of the participant to withdraw from the study, working with *Māori* participants and the participants' right to review and remove data from their case.

3.8.1 Informed consent

Informed consent is a fundamental ethical principle of any research project. Participants must be given the opportunity to understand the nature and purpose of the research and their decision to participate in the study must be free from any form of coercion (Burns, 2000). Prior to the study commencement, an information sheet explaining the study, the participants' role and time commitment was provided and a copy of this emailed to the teachers (see Appendix 2).

3.8.2 Privacy, anonymity and confidentiality

Participants must be assured that the data that is collected from or about them is held in confidence (Merriam, 1998). Where total anonymity is not possible, due to the small number of higher education institutions in Aotearoa New Zealand, it is imperative that the researcher does the utmost to ensure that the participants are confident in the researcher's ability to keep them safe from any potential harm. The use of pseudonyms or coding should be used to mask the teacher's identity and the removal of any identifying names such as colleagues' names, course names, and or institutional names must be removed (Burns, 2000; Fraenkel et al., 2012).

The current study used pseudonyms to maintain the participant's confidentiality. Information linking the teacher to their pseudonym was stored separately and only available to the researcher. Access to data was restricted to the researcher. The transcriber employed had access to the recorded interviews only. She signed a confidentiality agreement (see Appendix 12) and she was unknown to the teachers.

3.8.3 Right to withdraw

Burns (2000) reminds the researcher that the right of the participant to withdraw at any stage of the study is part of ethical research practice. The right to withdraw is an important aspect when conducting interviews and when conducting a longitudinal study such as the present study. The researcher clearly stated the right to withdraw at the beginning of the study and during interviews if the teacher became upset. No teachers withdrew from the study and all of the teachers completed the interviews they attended. One teacher missed the fifth interview due to personal reasons.

3.8.4 Researcher actual or perceived position of power

It is imperative that the researcher does not have an actual or perceived position of power over the participants (Burns, 2000). Some of the teachers knew the researcher, however the teachers' participation in the study was voluntary. Furthermore, the researcher did not work directly with any of the teachers nor was she in a position of power or influence over any of the teachers. At the time that the data gathering occurred, the researcher worked in a higher education institution in Aotearoa New Zealand in academic quality and she was not employed as an academic staff member.

3.9 Research procedures

Prior to beginning this study, an ethics application was submitted to the researcher's university ethics committee. Massey University Human Ethics Committee granted ethical approval (10 March 2014 Southern B, Application 14/06).

Once the ethics approval was received, a letter requesting access to an institution and to undertake the outlined research (see Appendix 1) was sent to the two higher education institutions. Following approval by the institutions, a staff member at each of the institutions identified potential participants who met the study criteria (that is, academic

staff who were in their second or third year of teaching). Each institution's staff member sent potential participants an email inviting them to take part in the research. An information sheet was attached to the email (see Appendix 2).

The participant sample of 11 resulted from self-selection of all who responded to the invitation. The researcher contacted the teachers via email to arrange a time that was mutually convenient for their first interview (see Appendix 3). Copies of the information sheet and participant consent form (see Appendix 4) were attached to this email.

Before the first interviews began for the study proper, the researcher discussed the purpose of the research, provided a copy of the information sheet explaining the study and time commitment and answered any questions. Once satisfied the teachers signed a participant consent form (see Appendix 4).

The current study included a small-scale pilot study consisting of three participants separate from the study sample. The purpose of the pilot was to test the initial interview questions and the manageability of the visual representation activity. The participants of the pilot were approached by the researcher and they included one early career, one mid-career and one highly experienced higher education teacher. The three pilot participants came from across three distinct discipline areas. The three pilot participants' data were not included in this study. The pilot did raise questions regarding the setting up of the visual representation activity and what the researcher would do if any of the participants refused to undertake this activity. This feedback informed how the researcher approached the set-up of the visual representation activity and the interview questions for the first interview.

3.10 Data collection

The teachers were interviewed six times, approximately every two months, over the 12-month period using semi-structured interview questions (see Appendices 5-10). One teacher was interviewed five times over the 12 months. Due to personal reasons, this teacher missed interview five. The interviews were conducted face-to-face in person with the exception of one teacher who was interviewed four times via skype and twice in person. Each interview took approximately 45 minutes to one hour and was recorded using a personal audio recording device. The purpose of the first interview was to gather demographic information including the school or faculty to which the teacher belonged, how long they had been teaching, to investigate retrospective ‘aha’ moments that may have occurred in the first year(s) of teaching, to introduce the reflective journal prompts (see Appendix 11) and to introduce the visual representation activity. The other five interviews explored more recent ‘aha’ moments, investigated developing theory and discussed reflective journal entries. The teachers identified and recounted what they understood to be ‘aha’ moments. Their identification of an ‘aha’ moment was not totally in keeping with that of the researcher (a sudden realisation, recognition, insight or comprehension about something) however, all teacher identified ‘aha’ moments have been included in this study.

Transcripts were returned to teachers via email, before the next scheduled interview, to be checked for accuracy and to allow the teachers to remove any information about which the teachers were uncomfortable (see Appendix 13). One teacher removed large sections of the fourth interview and two other teachers made small changes to their transcripts to enhance clarity. Email communication was used to arrange a time for the next interview.

An Excel spreadsheet was created to record and manage the booking of interview times, receipt of checked transcriptions, and the scanning and storage of data. Paper copies of each teacher's scanned reflective journals and visual representations were kept in a locked filing cabinet in the researcher's home office.

At the completion of the data gathering process the teachers were provided with copies of their transcripts, images of visual representation activities, pdf copies of reflective journal entries, a summary of their case study, and an authority for release form (see Appendix 13). The researcher met with each teacher after the final interview, with the exception of one who was contacted via email. The meetings occurred so the content of the case summary could be discussed ensuring that the information used in the summary was an accurate interpretation of the teacher's experiences. The teachers did not suggest any changes to their case summaries. These discussions were not recorded and no data was gathered during the meetings. All 11 teachers returned signed release forms (see Appendix 14).

3.11 Data analysis

Data collection and analysis is a simultaneous activity in qualitative research (Merriam, 1998). Both inductive and deductive analysis was ongoing throughout the study consistent with interpretative methodology. Fraenkel et al. (2012) defined inductive analysis as being conducted through "immersion in the details and specifics of the data to discover important categories, dimensions, and interrelationships" (p. 428). Analysis focused on the symbolic interactions recounted by the teachers with a view to understanding the teachers' unique experiences. Developing theory that included an extended understanding of liminality and evidence of self-efficacy change before the 'aha' moment, was investigated during subsequent interviews.

Deductive analysis is defined by Fraenkel et al. (2012) as “testing theoretically derived hypotheses” (p. 428). Self-efficacy theory (Bandura, 1977a) was foregrounded as the lens through which the researcher identified themes. Transformation theory was used to understand any impactful and irreversible change in teaching specific knowledge, values and/or beliefs. The notion of threshold concepts (Meyer & Land, 2003) was used during the conceptualisation of ‘aha’ moments and in identification of any potential teaching specific threshold concepts. Themes, new or modified knowledge, values and/or beliefs and properties that initially sat outside theory were noted and analysed. For example, data was grouped under the node ‘Other’ and the sub-node with the heading of ‘Ways for dealing with negative moments’ or ‘A second change to self-efficacy after the event’.

Merriam (1998) advocated the use of qualitative data analysis software in facilitating data management and analysis. A project was created for the current study within *NVivo* (www.qsrinternational.com) a qualitative software programme. The teachers provided their own pseudonym for their case and the 11 unique case study files identified by the teachers’ pseudonyms were created within the project file. The case files held separate interview files, which stored each teacher’s interview audio files, transcriptions, interview summary notes, scanned visual representation activities and reflective journal entries.

The analysis of all data must be conducted in a rigorous manner with a clear audit trail (Denscombe, 2007). The *NVivo* memo feature was used as part of the audit trail to capture reflections and for theory generation. Interview summary notes adapted from Miles and Huberman (1994) (see Appendix 15) were kept as part of the audit trail to record the researcher’s thoughts and any follow-up questions that were generated through inductive data analysis.

It is important that during analysis the researcher focuses on what the data is saying rather than what the researcher wants the data to say (Cousin, 2009). The researcher was acutely mindful of the tension between inductive and deductive analysis and the influence of researcher bias (Cousin, 2009; Fraenkel et al., 2012). During analysis, previously coded data was returned to numerous times as part of an iterative process with a critical eye to ensure that bias was not present. Furthermore, the researcher was active in reading for alternative explanations and characteristics that sat outside current understandings and theory.

All data for each interview was analysed first, for example interview one for all cases, followed by interview two and so on. In the first instance, the analysis and coding was high level with each teacher's interview data read and listened to alongside the recording of initial thoughts. Aspects requiring further investigation were noted and these were incorporated into the subsequent interviews.

At the completion of the data-gathering period, coded data analysis was conducted using *NVivo*. Data for each interview was coded first using open coding. Chunks of text were coded into: demographic information that included discipline areas and institutions; broad ideas and themes and included the identification of statements that indicated teacher self-efficacy; identification of 'aha' moments, teacher pedagogy and knowledge; and a node named 'other' to capture data that was of interest but did not immediately appear to sit within the high level nodes. The data were constantly reviewed to ensure consistency in coding across the cases. Common interview questions were given an identifying number. For example, interview one, question one and teachers' responses were coded against each node.

Each unique case study was then analysed across the 12-month data-gathering period. Self-efficacy theory (Bandura, 1977a) was foregrounded in the analysis and themes particular to the individual cases were extracted. The teachers' perceptions of the concept of self-efficacy were noted. Sources of efficacy information were coded as well as reasons the teachers gave for their sense of self-efficacy and any change.

'Aha' moments, as identified by the teachers, were analysed. Properties of 'aha' moments were examined with particular attention given to those that occurred in the spaces before, during and after the 'aha' moment and how 'aha' moments resulted in change to self-efficacy, if change occurred. This was self-reported by the teachers or as evidenced through changed speech or behaviour. For example, when a teacher described a change to the way they delivered content material using a scaffold approach as opposed to delivery that does not take into account the learners' level of knowledge before the delivery of new content. In the event that the teacher demonstrated changed speech or behaviour but did not self-report a noticeable change in conceptual knowledge values and/or beliefs, the researcher questioned the teacher to establish the existence of a conceptual shift. For instance, when a teacher described a change to how they spoke to students the researcher questioned why this change had occurred.

As there is an ongoing discussion in the literature concerning the identification of threshold concepts, it is important that the characteristics used during identification are robust. Transformation theory (Mezirow, 1991) provided this robust framework. 'Aha' moments were identified as either transformative or not. Those 'aha' moments that were identified as transformative contained a noticeable or impactful change in knowledge, values and/or beliefs or perspective transformation. This change was context specific (to the context of teaching), resulted in changed behaviour and contained knowledge not

easily reversed. The use of the word transformative is a means to describe the specific ‘aha’ moments and in doing so differentiates them from the other ‘aha’ moments that did not provide evidence of a noticeable or impactful change that resulted in changed behaviour and knowledge that is not easily reversed. The transformative ‘aha’ moments were then examined for their potential as a threshold concept within the context of teaching. The teachers did not name the threshold concepts themselves although their descriptions did inform the names. Drawing from the literature, the researcher identified and named the potential threshold concept, if one existed.

The content of the reflective journals and visual representations were not analysed in detail unless they provided data not discussed during the interview. Reflective journals and visual representations provided data that was explored and captured as part of the interview transcript, provided prompts during the interview and were used in support of the teachers’ experiences. Where entries contained information that was not discussed during the interview, this information was analysed in the same manner as the interview transcript data. As such, journal entries were read to ensure all aspects of the teacher’s experiences were captured. Journal entries were scanned and stored as pdfs with the interview file that immediately followed the entry. For example, if a journal entry was written after interview two but before interview three, the data was stored within the interview three file.

The visual representations provided drawings that held personal meaning to the participants. Not all of these meanings were expressed during the interview and as such, any analysis by the researcher would have placed her own interpretation on these. This became evident when the teachers were retelling their events represented through their drawings. For example, the use of a symbol has many meanings that are context and

culturally specific. The visual representations, which included a photographic record or pdf scan of a drawing, were stored within the interview within which they were generated.

High-level parent nodes created with *NVivo* were reviewed and child sub-nodes (nodes within parent nodes) were created as analysis became more refined. For example, the parent node 'Properties of 'aha' moments' was refined into nine child sub-nodes that included 'Emotions', 'Physical Reactions', 'Triggers'. The node 'Triggers' was further refined to include six child sub-nodes (see Appendix 16).

Individual case summaries were written in chronological order beginning with a summary of the first interview's events. This was done to provide an understanding of each teacher's experiences since they began teaching and more importantly over the 12 months of the study. The case summaries focused on the selection of 'aha' moments and any changes to the participant's teacher self-efficacy. Summaries included text concerning visual representations and journal comments. Each individual summary was returned to the teachers for checking to ensure the accuracy of the teacher and researcher's interpretation.

The 11 case studies were compared for commonalities with themes and experiences grouped and analysed. Commonalities and unexpected findings were checked against the literature and raw data. Cousin (2009) stressed the importance of avoiding premature closure or the enforced categorisation of data. This has been avoided through the analysis of the evidence, that which confirms and that which disconfirms any developing theory. Attention was paid to experiences or characteristics that sat outside, or as an extension of, self-efficacy theory, transformation theory and the notion of threshold concepts. Rival interpretations were considered and have been included in the

audit trail. For example, data that indicated transformation in self-efficacy before an ‘aha’ moment was unexpected but evidenced.

3.12 Chapter summary

This chapter has provided an understanding of the methodology and methods used in the current study that have informed the theoretical framework and the selection of activities to gather and analyse data. Situated constructivism (Crotty, 1998) guided this study and in doing so the study recognised multiple realities, and valued differences. Interpretivism, the theoretical perspective used in this study, accepts that individuals interact with their world (Denzin & Lincoln, 2005) making sense through their social interaction. This aligns with self-efficacy theory (Bandura, 1977a) the focus of this study.

The current study adopted a multiple case (Merriam & Tisdell, 2016) instrumental approach (Stake, 2005) with 11 self-selected participants. Strategies for ensuring research quality were provided in this chapter. These strategies were evidenced through the research procedure used. The data collection and data analysis procedures, including the use of *NVivo* qualitative software analysis programme, were described in detail. Both inductive and deductive analysis was ongoing throughout the study consistent with interpretative methodology.

The thesis now presents the two findings chapters. Chapter Four presents the teachers’ individual cases summaries and Chapter Five presents the cross-case findings.

CHAPTER FOUR:

CASE SUMMARIES

“I had an epiphany moment” (Jon Interview 1).

4.1 Introduction

One overarching question motivated the current study: what are ‘aha’ moments in the transformational process of higher education teachers’ self-efficacy?

The findings of the study are organised across two chapters. This is to provide a greater understanding of the teachers’ experiences with each chapter adopting a different lens through which to understand the phenomenon of self-efficacy change. Chapter Four focuses on the findings from the 11 unique case studies and addresses the first research sub-question:

1. What ‘aha’ moments are experienced during the professional learning journey of second and third year higher education teachers?

Chapter Four begins with the teachers’ descriptions of ‘aha’ moments. Each unique case is summarised. The ‘aha’ moments experienced by the teachers, before the study and specifically over the 12 months, are provided in chronological order to contribute to an understanding of each teacher and their experiences as part of their professional learning journeys. Each case summary includes a brief note concerning the change to the participant’s teacher self-efficacy over the 12 months of the study. Chapter Five presents the findings from the cross-case analysis and addresses the remaining research sub-questions.

4.2 'Aha' moments and self-efficacy information

As noted in Chapter One, 'aha' moments have been described as being those moments that are experienced when there is a sudden realisation, recognition, insight or comprehension about something (Merriam-Webster, 2015). A summary of all of the 'aha' moments that were identified and recounted by the teachers is included. These were not always in keeping with the researcher's definition of an 'aha' moment, however no 'aha' moments that the teachers recounted were left out.

All of the teachers were able to describe what an 'aha' moment was for them and therefore had an understanding on which to base their responses to the interview questions. Common descriptions of an 'aha' included the point when "something clicked" (Aaron Interview 3), a "peak experience... [or] penny drop moment" (Aaron Interview 3), "realisations" (Sarah Interview 6) and/or a "revelation" (Anne Interview 1). Some teachers expressed the moment as a word or sound such as "wow" (Anne Interview 1), "yay!" (Cate Interview 1), "oh here we go" (Eddy Interview 3) and "oooh sweet. I've found it" (Eddy Interview 6). One teacher described a quieter "oh right" (Aaron Interview 1) almost as a sense of relief.

Each 'aha' moment was examined using the criteria of a marked or noticeable change in teaching specific knowledge, values and/or beliefs or perspective transformation. Change noted in this study was each teacher's interpretation of their experiences and has been described using the teachers' language, for example, increase, decrease, massive and huge. Change was not measured using a scale. This change had to be within the context of teaching and it had to contain knowledge not easily reversed. If an 'aha' moment met these criteria, it was identified as being 'transformative' and the moment was then examined for its relationship to a potential threshold concept. Potential threshold concepts are indicated throughout the current study using italic font.

The data gathered in this study would suggest that the ‘aha’ moments experienced by the teachers, as part of their professional learning journeys, were personal experiences that contained commonalities and differences. These commonalities and differences are presented throughout this chapter and in Chapter Five.

As noted in Chapter Two, self-efficacy has four principle sources of efficacy information: mastery experience; vicarious learning; social persuasion; and physiological and affective responses. Within each of the case summaries, the data concerning each ‘aha’ moment and the source(s) of efficacy information is identified and presented within each event. This is to make explicit the link between each event and self-efficacy. Table 4.1, at the end of this chapter, provides a summary of the teachers’ ‘aha’ moments.

4.3 Case studies

Individually, each case study tells a unique story of each teacher’s experiences from when they began teaching with particular attention given to the 12-month period of the study. The 11 case studies are ordered randomly in this chapter and the order is not meant to imply importance. Where a case mentions change to teacher self-efficacy, knowledge, pedagogy or a trigger of an ‘aha’ moment, this is discussed further in Chapter Five.

4.3.1 Sarah

Sarah was 26 years old at the beginning of the study and she had 18 months full-time teaching experience. Sarah worked in a polytechnic teaching in the area of Health Science. Sarah was in the process of completing an adult teaching qualification and she

was active in an institution wide formal professional development initiative⁶. Being involved with this formal professional development initiative led to an increased consciousness of her professional learning as a teacher and of her ‘aha’ moments. “I think I’m only conscious of them [‘aha’ moments] because I’m in the [name of professional development] programme” (Sarah Interview 1).

Sarah had a vicarious understanding of an efficacious teacher. She came from a family of teachers and her mother was a teacher and Sarah often “discuss[ed teaching] with her [mother]” (Sarah Interview 4). Having that history and support behind her had an influence on her teacher self-efficacy and “play[ed] a positive role”.

Sarah did not feel that her teacher self-efficacy had changed, as interpreted by her, in regards to an increase or decrease over the 12 months of the study. Rather, Sarah felt that her perception and understanding of effective teaching had changed. When asked to think about her teacher self-efficacy at the end of the study compared with it at the beginning, Sarah commented that her teacher self-efficacy at the beginning of the study might have been an “overestimation” of her ability (Sarah Interview 6). In contrast to this statement, throughout the study Sarah did describe changes to her self-efficacy after her ‘aha’ moments.

Sarah identified ‘aha’ moments as personal realisations. She described three ‘aha’ moments as part of her professional learning journey; two took place before the study began and one during the study. All three moments involved mastery experiences that contributed to an enhanced sense of teacher capability.

⁶ The focus of this initiative was the improvement of learning outcomes for *Māori* students through relationships and effective teaching pedagogy.

The first 'aha' moment occurred when Sarah initially began teaching and was recounted during the first interview. Sarah said that she had originally taught in a "traditional way of information transfer" with the teacher standing at the front of the classroom because that was how she thought she should teach. When her students were not engaged in their learning and when attendance was low, Sarah "realised that it [the teaching technique she was using] doesn't work in 2013 and 14". Sarah described being concerned about the situation but she felt that there was no negative affect to her teacher self-efficacy. "I'm not an individual that would often feel low in self-esteem. So my immediate response was not what am I doing wrong but more, how can I do things differently?" Sarah confused self-esteem with her self-efficacy in this statement. However, during later interviews she demonstrated a more specific understanding of teacher self-efficacy.

Sarah described how she changed her teaching from the teacher at the front of the classroom who imparts knowledge to the teacher who is "beside the students physically... engaging them in discussion" (Sarah Interview 1). Sarah experienced mastery success in engaging her students when she tried some new teaching techniques that included "group work and questioning". She described the moment as "massive". After this moment, Sarah felt as a teacher, she had become "softer and more human... rather than some ice queen standing in the front".

This moment was identified as being transformative because the 'aha' moment provided evidence of a noticeable change in Sarah's specific teaching knowledge concerning student engagement that is not easily reversed. Sarah provided evidence of this through her self-reported change to her behaviour. She "implement[ed] more tasks that were interactive rather than speak[ing] at them; got [the students] into groups and talked about things" (Sarah Interview 1). The moment was identified as being related to the potential threshold concept of *interactive teaching*. Sarah described this as teaching

which involved active student participation and engagement. Following the ‘aha’ moment, Sarah described a shift regarding her understanding of effective student learning from being teacher-centred to a more student-centred approach. This included student participation and engagement and of her role in that engagement. The ‘aha’ moment resulted in a change to Sarah’s classroom presence and her self-reflection about her role as a teacher. Sarah described a “major increase” to her self-efficacy after she experienced successful teaching using the new interactive teaching techniques.

The second transformative ‘aha’ moment occurred three weeks before the study began and also was recounted during the first interview. The ‘aha’ moment arose following a suggestion made by Sarah’s professional development coach to “write out the outline of the lecture on the board and as we go through the lecture tick them off” (Sarah Interview 1). The suggestion by the coach contributed to Sarah realising that students learn more effectively when the learning processes are clear and “students are following what you are saying” (Sarah Interview 1). Sarah made a link between the lecture outline that constituted ‘scaffolded’ content and student learning, and she crossed the potential threshold of *instructional scaffolding*. Sarah understood this to mean teaching or instruction is more effective with the layering of content knowledge so “they [students] achieve some sort of success”. This ‘aha’ moment was identified as being transformative and related to a potential threshold concept because of the noticeable change in how Sarah understood the process of learning and in her perception concerning her assumption of students’ prior knowledge. Before the event, Sarah had not considered that knowledge could be taught in a manner that layered new knowledge on top of existing knowledge. Sarah described this as fine-tuning her teaching practices and that the ‘aha’ moment resulted in an enhanced sense of capability and “improved self-efficacy” because she felt she was “making a difference” in the students’ learning.

Since the moment, Sarah reported a noticeably changed pedagogy in how she structures her lessons and introduces new content. “Start with what they know and go from there” (Sarah Interview 4).

During the final interview Sarah described a third transformative ‘aha’ moment that contributed to her crossing the potential threshold of *learner autonomy*. For Sarah, *learner autonomy* meant students having the “tools” (Sarah Interview 6) for learning and the teacher allowing the students the “power” to take charge of their own learning. Sarah attributed the formal professional development as a catalyst for this ‘aha’ moment. She felt that the professional development helped her realise that teaching is “about giving students the tools they need to drive their own learning and be independent of you. It’s all about using their power”. Sarah’s knowledge of student learning prior to this final ‘aha’ moment was further modified and there was noticeable change to her belief concerning the control and ownership of learning. Sarah described this ‘aha’ moment as having a “huge” impact on her self-efficacy. Since this moment, Sarah’s pedagogy changed and she now encourages students to have greater control over their learning by asking them what it is they “are interested in knowing about to do with the subject” (Sarah Interview 6).

4.3.2 Cate

Cate was 30 years old at the beginning of the study. She worked in a polytechnic teaching in the area of Health Science. Cate had completed a bachelor’s degree and an adult teaching qualification. At the beginning of the study, Cate had approximately two and a half years full-time teaching experience. Over the 12 months of the study, Cate described a gradual decrease to her teacher self-efficacy with small moments of joy along the way (Cate Interview 6 and see Appendix 17).

Cate described three 'aha' moments; two occurred before the study and one during the study. These moments constituted examples of successful and unsuccessful mastery experiences. Cate also described searching to find the 'aha' knowledge and she was aware that she had not yet found it.

The first 'aha' moment occurred a few months before the study began and was recounted during the initial interview. The 'aha' was in relation to using simulated settings as safe learning environments for the students to experience various workplace scenarios such as a patient going into cardiac arrest. "I knew that the simulation lab existed... where you can feel that adrenalin, you can feel that rush and you can feel that moment" (Cate Interview 1). This 'aha' moment was not identified as being transformative because it did not contain a marked or noticeable change in knowledge, values and/or beliefs and it was not related to a potential threshold concept. Cate already knew about the simulation lab and there was no modification to her knowledge about the lab. Cate felt that this moment had reminded her about her approach to teaching to "focus students to encourage them to nurture their relationships wider".

Cate described a second 'aha' moment that she experienced a few weeks before the study and was also recounted during the first interview. This moment occurred when Cate became aware that some of the students were not as committed to learning and acting as professionally as she felt they should have been. The moment left Cate feeling negative and "incredibly frustrated" (Cate Interview 1). Cate interpreted these feelings as a negative impact on her teacher self-efficacy and she felt that her belief in teaching had altered slightly because of this experience. "I'm teaching adults that eventually are going to go forward and be my colleagues". Although this moment contributed to a change in her self-efficacy, this 'aha' moment was not identified as being transformative because it did not contain evidence of a marked or noticeable change to

her knowledge, values and/or beliefs. Cate did mention a slight change to her beliefs concerning student commitment to learning but this change did not fit within the criteria used in the current study, namely a marked or noticeable change, not easily reversed and resulting in changed behaviour.

Cate's third 'aha' moment occurred just before the third interview when she was talking with a group of students about trauma. "Their version of trauma was traumatic injury. Whereas we are saying, what is the difference between someone that's a 'status 1' or 'resus' versus a trauma?" (Cate Interview 3). During this conversation with students, Cate realised that she had incorrectly assumed the students had prior knowledge and understanding of the term trauma and that the students' understanding of "trauma was [different to] a healthcare professional's definition of trauma". Cate described the moment as "huge" and it was identified as being transformative. It led Cate to cross the potential threshold of *instructional scaffolding*. Cate described *instructional scaffolding* as layering knowledge beginning with "them tell[ing] me where we are at rather than me assuming [they] know". Cate underwent a noticeable shift in her knowledge concerning "the process" of how students learn and about prior student knowledge. Cate said that the 'aha' moment had caused her to reflect on her teaching and she changed the way she approached teaching new concepts. She now asks the students "what they know" and scaffolds the content knowledge from there. This knowledge provided Cate with an enhanced sense of capability that she did not have before the 'aha' experience and she felt that there was an increase in her self-efficacy.

During the second interview, Cate was aware that she was searching for and had not yet found an 'aha' moment that would assist her to "find different ways to approach a cohort of students [in regards to classroom management]. Quite how to do that yet, I'm not quite sure" (Cate Interview 2). Cate interpreted her inability to find the 'aha'

moment as a decrease to her teacher self-efficacy. She described this as “not feeling particularly efficient”. Cate was aware that “something need[ed] to change” and she experienced troublesome dissonance. She was “frustrated” and “unsure”. This is discussed further in Chapter Six.

4.3.3 Eddy

Eddy was 28 years old at the beginning of the study. He worked in a polytechnic teaching in the areas of Trades and Technology. Eddy had completed a diploma and an adult teaching qualification. At the beginning of the study, Eddy had approximately three years full-time teaching experience.

Eddy had a very malleable teacher self-efficacy that “changes all the time” (Eddy Interview 4) with frequent increases and decreases to his teacher self-efficacy during the 12 months of the study (see Appendix 18). The level of respect shown by students and his manager affected Eddy’s teacher self-efficacy. This had an impact on his self-confidence, which Eddy understood to mean his teacher self-efficacy, and in his belief in his capability as a teacher.

Eddy described three ‘aha’ moments that all occurred during the time of the study that included successful and unsuccessful mastery experiences and physiological and affective states.

Eddy’s first ‘aha’ moment took place just before the second interview when Eddy received a rebuke via email from his manager. The email was unexpected because Eddy had been involved in a series of conversations in passing with his manager and his understanding of the conversations was very different from the email. This transformative moment resulted in noticeably changed knowledge and behaviour. The moment contributed to Eddy reflecting on his understanding of communications and he

crossed the potential threshold of *ambiguity in communications*. He understood *ambiguity in communications* to mean that often people do not always give “straight answers” (Eddy Interview 2) and that there can be more than one interpretation of a message. When asked visually to represent the moment Eddy drew a teardrop (see Appendix 19). Part way through the drawing Eddy changed from using the blue pen to the red. He said this moment made him feel “angry. That made me sad and angry and unhappy and pissed off... I thought I am going back to a little kid feeling, like I am in trouble”. Eddy interpreted these emotions as a major decrease to his teacher self-efficacy and personal self-confidence. The moment was identified as being related to a potential threshold concept because of the noticeable change in knowledge concerning the ambiguous nature of communication including how teachers communicate with students. Eddy reported that he had changed the way he approaches communication because of this moment.

During the third interview, Eddy described a second transformative ‘aha’ moment that occurred when he was attempting to solve a problem concerning a student who Eddy was struggling to keep engaged in his class. The student was offered a job in another city and had asked if he could finish the course and the required assessments early. At first, Eddy was reluctant to agree to this because the student had been difficult and disruptive in class. “When [Eddy] stopped and [wrote] down the facts [assessments that need to be completed and how these could be achieved] it made things clearer”. Eddy had allowed his own negative thoughts about the student to cloud his judgement regarding the possibility of completing the assessments. Eddy experienced a noticeable shift in his understanding about the impact of his personal thoughts on his behaviour as a teacher when he reflected on his actions. He crossed the potential threshold of *the impact of deficit thinking*. Eddy described *the impact of deficit thinking* as his own

deficit thoughts as the teacher. These thoughts about students can “cloud judgements and negatively affect the teacher’s attitude and behaviour” (Eddy Interview 3). The influence of the new knowledge was evident through his speech when he was recounting how he had written down the facts and realised that the facts did not include his deficit thinking. “Okay no. I can’t have that, I can’t judge on that”. Eddy felt that because of this new knowledge he had “increased confidence and self-awareness” and that his self-efficacy had substantially increased.

Just before the final interview, Eddy stated that he had experienced an ‘aha’ moment and realisation “that it’s not always the student that has the problem. It’s myself that I need to look at” (Eddy Interview 6). This moment came about as a result of critical reflection and it is closely related to the previous ‘aha’ moment. The latter moment constituted evidence of a modification of the knowledge gained in the previous moment and further self-reported change in behaviour. The transformative ‘aha’ moment was identified as a separate potential threshold concept of *false perceptions*. Eddy described *false perceptions* as his incorrect beliefs about his students “thinking that it is their fault”. Eddy’s knowledge gained in the previous ‘aha’ moment underwent further noticeable modification and he became aware of how his false perceptions were having an influence on his attitude and behaviour towards his students. Eddy felt the moment resulted in him realising that he was not “as good a teacher that [he] thought [he] was”. During this interview Eddy appeared to be very down and he described the ‘aha’ moment as resulting in a major decrease to his teacher self-efficacy. “Yeah, it’s really low at the moment even though I’ve stopped doing what I was doing in regards to judging students in a wrong way”.

4.3.4 Aaron

Aaron was 36 years old at the beginning of the study. He worked in a polytechnic teaching in the area of Creative Arts and he had a bachelor's degree. At the beginning of the study Aaron had just over two years full-time teaching experience.

Throughout the study, Aaron struggled to identify and to describe 'aha' moments as part of his formal or informal teacher professional learning journey. Equally, Aaron struggled to describe his teacher self-efficacy and changes to it. "It [teacher self-efficacy] probably has [changed] but I can't tell you how" (Aaron Interview 6).

Many of Aaron's responses would indicate him seeking researcher approval as he often asked if his responses to the interview questions were the correct answers or "is that what you want?" (Aaron Interview 3). Aaron also mentioned imposter syndrome during three different interviews. This important aspect influenced his self-belief as a teacher. "It's about accepting that yeah I'm here for a reason. I do know what I am talking about and if I don't, I can damn well find out... Again it's me telling myself yeah I know this".

Aaron identified and recounted one 'aha' moment that occurred during the study when he described how "anyone can deliver a specified content, it is just how you deliver it that impacts the students... it's about gaining people's trust" (Aaron Interview 3). The 'aha' moment constituted knowledge that trust can have an influence on student learning. "You're getting the students into the situation where they trust what you say enough to let it in". The knowledge that Aaron mentioned as part of his 'aha' moment was not identified as resulting in changed knowledge or as a potential threshold concept. Aaron stated that this was knowledge he already had and that there was no

modification to his existing knowledge. Furthermore, there was no self-reported change to behaviour. It was unclear why he had identified this as an ‘aha’ moment.

4.3.5 Jon

Jon was 34 years old at the beginning of the study. He worked in a university teaching in the area of Social Sciences and he had completed a doctoral degree. At the beginning of the study, Jon had approximately two and a half years full-time teaching experience.

Jon described a “fluid, iterative development” (Jon Interview 3) or change to his teacher self-efficacy over the 12 months of the study. He interpreted this as a gradual increase to his teacher self-efficacy and to his confidence in teaching course content. He visually represented this increase as a line graph (see Appendix 20).

Jon recounted two ‘aha’ moments; one occurred before the study and the other during the study. Both of Jon’s moments involved successful mastery experiences.

Jon described an ‘aha’ moment which he called an “epiphany moment” (Jon Interview 1) that occurred before the study began when he was a practice client for a doctoral student doing research on motivational interviewing. Jon recounted this moment during the first interview. “It really made an impact on me, and the reason was that I was pretty stressed because I never used to keep a ‘to do’ list... it made everything very salient to me about what I needed to do”. This moment resulted in Jon developing efficient strategies and in him feeling that he “work[ed] more efficiently and being less stressed because [he was] completing more tasks within the timeframe”. This moment included a substantial change to Jon’s knowledge and it could be argued that it constituted a potential threshold concept. The knowledge Jon gained led to new strategies for personal time management rather than a shift in knowledge specific to teaching. The knowledge potentially may have been irreversible and it may have contributed to him

being a more efficacious teacher but there was no evidence of this in what he said or in his teaching behaviour that he discussed in the interviews.

Jon's second 'aha' experience occurred before the fifth interview. Jon described how he tried "a different way of tackling something that [he] had made a mess of last time. This time it went really well so that was just like a progression. So I guess I've learned through [something] not going well" (Jon Interview 5). The moment resulted in Jon learning that there are various ways and strategies for dealing with problems such as students plagiarising. This moment did not provide evidence of a transformative change in his knowledge, values and/or belief about teaching nor did it lead to a potential threshold concept. The moment, however, did result in Jon feeling a sense of enhanced teacher capability, that he described as a slight increase to his teacher self-efficacy, because he learned through a previous unsuccessful mastery experience followed by a successful experience.

4.3.6 Grace

Grace was 31 years old at the beginning of the study. She worked in a polytechnic teaching in the area of Creative Arts. Grace had completed a bachelor's degree and an adult teaching qualification. She was involved in an already mentioned institutional wide formal professional development initiative. At the beginning of the study Grace had just over 14 months full-time teaching experience.

Grace experienced a number of events and 'aha' moments as part of her professional learning journey that resulted in new teacher knowledge and change to her teacher self-efficacy. Grace's teaching efficacy appeared to be very fluid and was considerably affected by external events including a redundancy and change to her physical appearance. At the end of the study, Grace commented that she was at the "point of

getting [her] confidence back” (Grace Interview 6). Grace visually represented the 12 months of the study as her “teaching journey” with a number of events that contributed to emotional fluctuations (see Appendix 21) which she interpreted as positive changes and negative changes to her teacher self-efficacy.

Grace described four ‘aha’ moments; two moments occurred before the study began and two occurred during the study. Grace experienced successful and unsuccessful mastery experiences and she experienced physiological and affective states, for example “anxiety” (Grace Interview 6) and disturbed sleep. These are discussed further in Chapter Five.

During the initial interview, Grace recounted a major ‘aha’ moment that she experienced when she first began teaching. The moment occurred after Grace had marked the students’ first assignment. Prior to this assignment, Grace stated that she “didn’t know whether [her] teaching was an effective way for them to learn” (Grace Interview 1). She referred to the assignment as a “bench marker” of her effectiveness as a teacher and if she was “doing the right thing; is teaching the right place for [her]?” The ‘aha’ moment occurred because of the “students getting it” (demonstrating the required skill and knowledge to pass the assignment). Grace experienced an “emotional high... [that] validated [her] choices that [she] had made to come and teach”.

The transformative ‘aha’ moment constituted noticeable change to Grace’s teacher knowledge and values. It resulted in a shift in her understanding about the power relationship between the student and teacher in the learning context as well as the value of the contribution of student perspective in student learning. The ‘aha’ moment led Grace to the potential threshold concept of *student voice* when Grace connected the value of student feedback in shaping her delivery of content. She described *student*

voice as the teacher listening to and using the students' perspective and comments to "adapt" (Grace Interview 1) and enhance teaching. "I made a point at the end of each assessment talking to them about what they liked, what could have been done better, in order to adapt my teaching to how they wanted it to be delivered". Grace indicated the point at which she experienced the 'aha' and the positive change to her teacher self-efficacy by circling the moment on her visual representation in yellow pen (see Appendix 22). This 'aha' moment had a positive impact on her understanding of teaching that Grace interpreted as a major increase to her teacher self-efficacy.

The second 'aha' moment Grace recounted took place two months before the study began and also was recounted during the first interview. Grace described an incident when a student had verbally attacked her during class. Grace felt that "there's nothing [she could have done] to fix this". This moment constituted unsuccessful mastery experience and physiological and affective states. Grace's personal confidence and teacher self-efficacy were adversely affected after the student stated, "I don't like you. You're a horrible individual". This experience had a negative impact on Grace's personal self-confidence that Grace interpreted as a decrease to her teacher self-efficacy.

The 'aha' moment resulted in Grace realising that she needed to "set boundaries" (Grace Interview 1). Grace referred to this 'aha' moment in subsequent interviews and she stated that this experience made her anxious because she had not been "able to control that situation". This transformative 'aha' moment was impactful, Grace experienced noticeable change in her understanding about the importance of working relationships in the teaching environment, and she reported substantial change to her pedagogy. The moment constituted the potential threshold concept of *boundaries in effective teaching*.

The third ‘aha’ moment took place after Grace was assigned to teach on a level two programme. Grace had been struggling with a disruptive student and she was anxious about the situation “because of [her] bad experiences with that student last semester [Grace] was very, very nervous. [She] was very wound up about it. [She] started having nightmares” (Grace Interview 2). Grace and her manager met with the student to discuss the situation. It was during this discussion that Grace saw the “façade drop and [she] saw a vulnerable student in front of [her] who didn’t value himself”.

Grace described this ‘aha’ moment as being “massive” (Grace Interview 2) and resulted in a major increase in her self-efficacy because she had “learned so much not only about [herself] but about how she teach[es] and why [she] teach[es]”. This moment led to the ‘aha’ realisation that teaching also includes “paying attention to the holistic needs of students” and the moment potentially included perspective transformation concerning her beliefs about students. Grace described how she truly understood the concept of *te whare tapa whā*⁷, a concept that had been introduced to her during a recent formal professional development session. Grace stated that the ‘aha’ moment “heightened the fact of how vulnerable students can be... external factors impact on them in a huge way... There are things that aren’t in the curriculum but they’re just as important”.

The ‘aha’ moment was identified as being transformative and the concept of *te whare tapa whā* was named as a potential threshold concept. Understood within education, this concept relates to the student and the four basic ‘beliefs of life’ and the influence that these have on a student’s ability to successfully learn. Grace went from viewing her

⁷ *Te whare tapa whā* is a Māori philosophy model developed by Professor Sir Mason Durie. The model is based on a holistic view of health as a four-sided concept representing four basic beliefs of life: *Te taha hinengaro* (psychological health), *Te taha wairua* (spiritual health), *Te taha tinana* (physical health), *Te taha whānau* (family health). *Te whare tapa whā* is also applicable to education and teaching.

students as “faceless” (Grace Interview 2) people in her class to people who experience external factors that impact on their learning. “Like, if they don’t get paid or if they have to go to court [for criminal offenses]”.

During the final interview, Grace described a fourth ‘aha’ moment that she experienced during a meeting between the teaching team and the students. Grace made a conscious decision to “sit with the students” (Grace Interview 6) rather than the staff as she would normally have done. Grace said doing this “was like flipping a switch” and she felt “very connected to these students and alongside their journey with them”. The moment led to Grace physically experiencing the classroom and “thinking about their learning from the students’ perspective”. This was something that her professional development coach had also asked Grace to do. As a result of reflection and the previous potential threshold of *te whare tapa whā*, Grace’s perception of student learning and her understanding of the power relationship between the students and the teacher were further modified.

During her planning time Grace crossed the potential threshold of *student centred learning* when she realised that placing the students at the centre of her teaching was within the context of her lesson plan. She described *student centred learning* as teaching to the specific needs and aspirations of students by “asking them what is it they want[ed]”. Grace stated that she now consciously places the “student at the centre of learning” (Grace Interview 6). Because she had an increased understanding of learning and increased sense of capability, Grace felt that this ‘aha’ moment led to an increase in her teacher self-efficacy. This ‘aha’ moment was identified as containing a potential threshold concept because Grace experienced a substantial conceptual shift in her understanding about student learning and about her role as a “facilitator” (Grace Interview 6) of that learning.

4.3.7 Tame

Tame was 41 years old at the beginning of the study. He worked in a polytechnic teaching in the area of Trades and Technology. Tame had an adult teaching qualification and he completed a bachelor's degree during this study. Tame was also involved in the institutional wide formal professional development initiative. At the beginning of the study, Tame had approximately 20 months full-time teaching.

Tame felt that the change to his teacher self-efficacy over the 12 months was one of "continuous progression" that he was "adding to it all the time. I don't see it as a going back at all" (Tame Interview 6). Tame drew this as a series of steps with the direction of his teacher self-efficacy shift indicated by arrows (see Appendix 23).

Tame described four 'aha' moments, one that occurred before the study and three that occurred during the study. Tame's moments included mastery experiences, vicarious experiences and verbal persuasion.

Tame described an 'aha' moment during the first interview that took place a few years before the study began. The 'aha' moment brought about a change to his career. The 'aha' happened when Tame was reflecting on a conversation he had had with a student. The moment "motivated [Tame] or gave [him] confidence" (Tame Interview 1) to go into teaching. The moment was not identified as transformative within the criteria of the current study. However, the moment did provide evidence of a life-changing event that could be identified as being transformative within that sense. The moment resulted in changed behaviour that led him to become a teacher.

Tame shifted campuses before the second interview. At the new campus, he was given a class of students partway through their course. At the end of the semester, Tame

received negative student evaluations that resulted in a temporary but major decrease to his teacher self-efficacy, as interpreted by Tame.

Tame discussed the student evaluations with his colleagues and sought their advice. The conversations and suggestions made by his colleagues led to a transformative ‘aha’ moment and realisation that students learn best “when they are engaged and interested” (Tame Interview 2). This moment contributed to Tame crossing the potential threshold of *student engagement*. This was a concept Tame had been discussing with his professional development coach. Tame’s understanding of *student engagement* was different from the other teachers’ understanding of *interactive teaching* and that is why it is noted separately. Tame understood *student engagement* as getting the students “interested” in learning. Tame experienced a noticeable change to his knowledge concerning the nature of the learning process and how best to engage students in the “joy of learning”. Tame provided evidenced of a shift in his meaning scheme that was apparent in his self-reported pedagogy and in the way he spoke about his students.

During the second interview, Tame described a moment that occurred during a conversation he had with another higher education teacher: both had been students at the polytechnic at the same time. The ‘aha’ was the recognition of the change in their role from student to higher education teacher, and that they had “come full circle back to where it had begun” (Tame Interview 2). This moment did not contain a potential threshold concept or any evidence of transformative change in knowledge, values and/or beliefs about teaching. It is unclear why Tame thought this to be an ‘aha’ moment.

Tame described a “really good ‘aha’ moment” during the fourth interview to do with a colleague and the realisation that his sense of teaching capability and teacher self-efficacy could be enhanced through the shared knowledge of a more experienced

colleague. Tame had spent time talking with and observing the more experienced colleague teach. This moment did not meet the criteria of a transformative ‘aha’ moment. Tame did not describe any specific teacher knowledge gained through his observations or discussions. He did, however, feel that his self-efficacy was increased because of this ‘aha’ moment.

4.3.8 Aroha

Aroha was 31 years old at the beginning of the study. She worked in a university teaching in the area of Social Sciences. Aroha had completed a master’s degree. At the beginning of the study, Aroha had two years full-time teaching experience.

Aroha viewed ‘aha’ moments as experiences, positive and negative, that added to her teaching knowledge base and resulted in increased teacher self-efficacy. Over the 12 months of the study, Aroha described a gradual increase to her teacher self-efficacy and visually depicted her professional learning journey as a growing plant (see Appendix 24). “I came with knowledge so I didn’t start as a seed. I feel like I have had to work to make the growth. I feel I have had to provide my own fertiliser” (Aroha Interview 6).

Aroha described two ‘aha’ moments; one that took place just before the study and one during the study. Aroha’s moments both included verbal persuasion and physiological and affective states.

During the first interview, Aroha described an impactful ‘aha’ moment that took place a few weeks before the study began during an on-campus block course for distance-learning students⁸. A group of distance-learning students challenged Aroha about her teaching pedagogy. At first, Aroha felt very uncomfortable when her understanding of teaching was challenged but during the interview she felt that this experience meant that

⁸ Students who do not study on-site at an educational provider but rather complete their study via distance education either on-line or through correspondence style study guides.

she would be “more prepared” (Aroha Interview 1) for challenges in the future should they arise. The transformative ‘aha’ moment contributed to Aroha crossing the potential threshold *the distinctive nature of distance-learning students’ learning needs* when she realised that there was a “differences between [distance-learning] and internal students and their needs” and how these differences related to pedagogy. Aroha understood *the distinctive nature of distance-learning students’ learning needs* to mean that distance-learning students do not have the same access to lectures, tutorials and to lecturers, as do the internal students. Because of this, distance-learning students require different types of pedagogy. When Aroha thought about how she would alter her pedagogy for the distance-learning students, she felt “nervous about the unknown. A bit flustered and a bit unsure” (Aroha Interview 1). She interpreted the negative feelings as a major decrease to her self-efficacy. Aroha said that the moment had resulted in an increased “knowledge base” about how she “respond[s] to student questions” and challenges. In subsequent interviews, Aroha described a substantial change to her pedagogy that will be discussed further in Chapter Five.

Aroha experienced a second ‘aha’ moment after she received negative student evaluations that led to a period of reflection. Aroha described feeling extremely upset and disappointed and in her reflective journal entry, she described a decrease to her teaching confidence (see Appendix 25). The ‘aha’ moment triggered by the student evaluations led to Aroha reflecting on the students’ comments and to her experiencing a transformative ‘aha’ moment that led to the potential threshold of *the value of feedback*. Aroha understood this to mean seeing past the “poor scores and negativity” (Aroha Interview 2) that may be mentioned in student evaluations and using this feedback to enhance her teaching practice. This moment was transformative because of the noticeable change that took place in Aroha’s understanding and values concerning

student feedback and the importance of this for improving teaching. “It’s about valuing the student feedback, being able to look through some of the harsher comments and take from it and learn from it in a really constructive way”. Even though Aroha originally described a decrease to her teaching confidence, she felt the knowledge she gained had substantially increased her teaching capability and her self-efficacy.

4.3.9 Liz

Liz was 45 years old at the beginning of the study. She worked in a university teaching in the area of Health Science. Liz had completed a master’s degree and was working on her proposal for her doctoral degree. At the beginning of the study, Liz had approximately two years teaching experience.

Liz felt that her overall teacher self-efficacy had not changed in terms of increasing or decreasing over the 12 months of the study. However, she did describe a change to her perception of teacher effectiveness.

Liz described two ‘aha’ moments she experienced as part of her professional learning journey, one that occurred before the first interview and one during the study. Liz commented that for her ‘aha’ moments had “not occurred until recently” (Liz Interview 1). The reason she gave was it was not until recently that she had the time to “engage in collegial discourse” and to reflect.

Liz described an ‘aha’ moment that she experienced just before the study began that she recounted during the first interview. Liz had noticed that the students she was teaching could not do long division. Liz had incorrectly assumed that “because they were studying at university that they would be able to do basic mathematics” (Liz Interview 1). This moment was identified as being transformative because it led to the impactful realisation that knowledge must never be assumed and the moment resulted in changed

teacher behaviour. “It’s about building on the foundation of what students already know”. Liz crossed the potential threshold of *instructional scaffolding* after she reflected on the level of knowledge the students had and how she was going to raise that level to what was required. “We had to do a quick brake-stop and really bring these kids up... and to regroup their knowledge”.

Prior to this moment, Liz had not thought of teaching as a process of layering knowledge. She struggled with how she would implement her new knowledge. “I have just identified a massive problem and now I don’t know how am I going to fit it in?” (Liz Interview 1). Liz described an increase to her personal confidence after this event because she felt supported by her team when she brought this issue to their attention and because of “the feedback from the more tenured [colleague]”.

During the final interview, Liz returned to the long division ‘aha’ moment she had mentioned during the first interview. She stated that this ‘aha’ moment had caused her to reflect and because of the reflection, she experienced a “realisation [about] the environment. Oh, my God they’re just having to pass these students. No one is checking on them” (Liz Interview 6). The knowledge Liz gained during her first ‘aha’ experience underwent modification during the second ‘aha’ moment. She felt that the environment of the institution had an impact on the quality of the students’ education, in her view a negative impact. Liz visually depicted her realisation as a lens through which she now saw the educational environment (see Appendix 26). Although this ‘aha’ provided evidence of a marked or noticeable change in Liz’s knowledge, it did not provide evidence of potentially irreversible knowledge nor did Liz report any change to her behaviour. As such, the ‘aha’ moment was not identified as being transformative or linked to a potential threshold concept.

4.3.10 Anne

Anne was 31 years old at the beginning of the study. She worked in a polytechnic teaching in the area of Health Science. Anne had completed a doctoral degree and two adult teaching qualifications. She was involved in the already mentioned institutional wide formal professional development initiative. At the beginning of the study, Anne had approximately three and a half years full-time teaching experience.

Anne described 'aha' moments as "a positive influence because they made [her] re-think" (Anne Interview 1). This resulted in reflection and enhanced teacher knowledge. Many of these events began with negative experiences and resulted in Anne questioning previously held beliefs and assumptions. Over the 12-month study, Anne described an increase to her teacher self-efficacy, change to her perception of students and change in her understanding of her role as a teacher. The factors that influenced this change are discussed throughout this case.

Anne described four 'aha' moments; two occurred before the study and two during the study. All of Anne's moments included mastery experiences and verbal persuasion. Action followed self-reflection. "I try to turn those negative observations into positives. So that didn't go so well. Next time I am going to try this" (Anne Interview 2).

Anne described a significant 'aha' moment she experienced at the beginning of her teaching career that she recounted during the first interview. Anne described it as "a really powerful moment because it happened back in 2012, and I still think of it as one of my big, big moments" (Anne Interview 1). The 'aha' moment happened during a class when Anne realised that a student "could do division with single digit numbers, but as soon as we moved into long division problems she'd get so far and then she's completely confused. Fundamentally she didn't realise that 1 and 1.0 were the same

number” (Anne Interview 1). The moment was identified as being transformative because it resulted in a substantial change to Anne’s understanding of teaching and student learning. Anne realised that for effective teaching one must never assume student knowledge. This realisation led to Anne crossing the potential threshold of *instructional scaffolding* and a noticeable change in her understanding of the learning process. Anne understood *instructional scaffolding* to mean that teaching or instruction is more effective when content knowledge is layered. This “begins with establishing the students’ prior knowledge” (Anne Interview 1). This ‘aha’ moment resulted in what Anne called “essential teacher knowledge” and an increase in her self-efficacy.

During the second interview, Anne reported that her “biggest recent revelation” (Anne Interview 2) was to do with assumptions and deficit thinking. Anne and her team felt that the students were not “motivated enough [and] they’re just doing this [studying] because their parents have put pressure on them” (Anne Interview 2). Other deficit thoughts included a dislike of the cohort that began mid-year and the problems associated with teaching them. The staff found “the students more difficult to teach” (Anne Interview 2). The second transformative ‘aha’ moment occurred during painful self-reflection after Anne read a number of negative course evaluations. Anne experienced a marked change in her understanding about her students and her behaviour as a teacher. This ‘aha’ moment led to the potential threshold concept of *the impact of deficit thinking*, a concept introduced to her during a recent professional development session. Anne described this concept as “having pre-conceived notions and assumptions” (Anne Interview 2) about the students’ abilities. Anne felt that these assumptions had a negative impact on her attitude towards the students. Because of the new knowledge and her critical self-reflection, Anne felt that her teacher self-efficacy was negatively affected “in a big way”.

In a reflective journal entry that was written before the third interview (see Appendix 27), Anne described an ‘aha’ moment that made her realise that teaching and the role of the teacher may extend beyond the classroom. This ‘aha’ moment included evidence of a reformulation and refinement of the knowledge Anne had gained during her earlier ‘aha’ concerning her assumptions about students. Anne commented that she felt her “knowledge was being refined with each ‘aha’ experience” (Anne Reflective Journal 3).

During the interview when the journal entry was discussed, Anne spoke about *te whare tapa whā*, a concept that had been introduced to her during a recent formal professional development session. Anne described the knowledge that she had gained through the ‘aha’ moment she had written about in her journal and how her understanding of her role as a teacher had noticeably changed concerning the holistic nature of education and her role as a teacher that “extends beyond the classroom” (Anne Interview 3). *Te whare tapa whā* was identified as a potential threshold concept. Anne felt that this knowledge had “helped [her] to become a better teacher” and had contributed to a “large” increase in her self-efficacy.

Anne experienced a fourth ‘aha’ moment which occurred just before our fifth interview when she took another teacher’s class. During the lesson she realised “that the students are okay if you say I don’t know the answer to that but hey let’s find out” (Anne Interview 5). Although Anne described this as a “powerful moment”, the moment was not identified as constituting a marked or noticeable change in Anne’s knowledge, values and/or beliefs or result in any reported change to her pedagogy. However, it did add to Anne’s sense of teaching capability and a small increase in her self-efficacy.

4.3.11 Matt

Matt was 34 years old at the beginning of the study. He worked in a university teaching in the area of Science. Matt had completed a doctoral degree and had attended professional development teaching and learning seminars organised by his institution. At the beginning of the study, Matt had approximately three years full-time teaching experience.

Matt felt that his teacher self-efficacy and his teaching confidence increased before the study began but was unchanged over the course of the study. He represented this as a plateau on a line graph (see Appendix 28). “So it’s kind of a plateau now. I now think that my teaching is at an acceptable level, which is good enough that I don’t have to work a lot on my teaching” (Matt Interview 6).

Matt described two ‘aha’ moments; one occurred before the study and the other during the study. Both moments included mastery experiences.

Matt described an impactful ‘aha’ moment that occurred when he first began teaching that he recounted during the initial interview. The moment occurred when Matt was struggling to engage students in his lectures. During a lecture, the technology failed and Matt was unable to teach using his prepared PowerPoint presentation. He had to “jot the things on the white board”. As part of this process “the students loved it [and started] asking a lot of questions” (Matt Interview 1). The moment led to Matt making the realisation that this way of teaching was what he was looking for to engage students. The transformative ‘aha’ moment contributed to Matt crossing the potential threshold of *interactive teaching*. Matt understood this to mean teaching which involved active student participation and engagement such as “students talking and questioning during the lecture” (Matt Interview 1). *Interactive teaching* was identified as a potential

threshold concept because Matt experienced a noticeable change in his knowledge about teaching and the delivery of content that went from “information transfer” (Matt Interview 1) to teaching that involved two-way interactions between the teacher and the students. Matt stated that this moment resulted in him feeling “more confident” and “more satisfied with [his] teaching” (Matt Interview 1). Matt interpreted his satisfaction as a major increase to his teacher self-efficacy.

During the second interview, Matt described an ‘aha’ moment he experienced when he tried a new teaching strategy he had learned at a professional development session. Matt realised that he could use every day concepts and “day to day examples” (Matt Interview 2) that students were already familiar with and layer “new knowledge on top” (Matt Interview 2). Matt made the link between the familiar concepts and the new-layered concepts in how to approach student learning and he crossed the potential threshold of *instructional scaffolding*. He described how he “looks around in the office or the lab or at home to search for examples to explain the things [content knowledge] in a simpler way”. Matt experienced a noticeable change in his understanding of the learning process that included using familiar concepts as a base on which to teach new concepts. He felt that this transformative ‘aha’ moment had majorly improved his teaching “ability and [his] confidence as a teacher”. He self-reported change to his pedagogy because of this transformative ‘aha’ moment. This is discussed further in the next chapter.

4.4 Summary of cases

A common feature of nine of the 11 teacher’s description of self-efficacy change over the year was one of gradual change, either positive or negative. Positive change to self-efficacy, described by the teachers as an increase, was linked to increased capability,

personal confidence and increased teaching specific knowledge, values and/or beliefs. Negative change to self-efficacy, described by the teachers as a decrease, was linked to a particular negative experience or an accumulation of negative events. Two teachers did not describe teacher self-efficacy change over the course of the 12 months.

Mastery experiences were the most commonly experienced source of self-efficacy information as described by eight of the 11 teachers. Three teachers described verbal persuasion and five teachers described physiological and affective states that resulted in changes to their self-efficacy. Only one teacher described an 'aha' moment that included vicarious learning as a source of efficacy information. The influence of these sources of efficacy information is discussed further in Chapters Five.

The teachers experienced a variety of 'aha' moments (30). From the data there appears to be no discernible differences across disciplines or institutions as to the actual experience, but rather variation in the context of the experience. The majority of the 'aha' moments (21) contained evidence of a marked or noticeable change in teaching knowledge, values and/or beliefs, changed teaching behaviour and knowledge that is not easily reversed. These 'aha' moments were identified as being transformative. Of the 21 transformative 'aha' moments, four common potential threshold concepts and nine potential threshold concepts unique to individual cases (within the discipline of teaching) were identified. The teachers also described nine non-transformative 'aha' moments.

Although there were some similarities in the potential threshold concepts and the knowledge that the teachers gained, the individual case summaries provide evidence that each teacher's experience was unique to them and to their interpretation of their experience.

Table 4.1 that follows provides a summary of the ‘aha’ moments experienced by each teacher. Beside each ‘aha’ moment, the source(s) of efficacy information is noted.

Table 4.1. Summary of teachers' 'aha' moments with source(s) of self-efficacy information

Teacher	NON-TRANSFORMATIVE	
	Marked or noticeable change to knowledge, values and/or beliefs	Minimal or no change to knowledge, values and/or beliefs
Sarah	<ul style="list-style-type: none"> Interactive teaching (mastery) Instructional scaffolding (mastery) Learner autonomy (mastery) 	
	<ul style="list-style-type: none"> Instructional scaffolding (mastery) 	<ul style="list-style-type: none"> The place of simulated settings Commitment to learning varies (mastery)
Eddy	<ul style="list-style-type: none"> Ambiguity in communication (mastery/ physiological and affective) The impact of deficit thinking (mastery) False perceptions (mastery) 	
Aaron		<ul style="list-style-type: none"> Influence of trust on student learning
Jon	<ul style="list-style-type: none"> To do list (mastery) 	<ul style="list-style-type: none"> Ways and strategies for dealing with problems (mastery)
Grace	<ul style="list-style-type: none"> Student voice (physiological and affective) Student centred learning (mastery) Boundaries in effective teaching (mastery/ physiological and affective) Te whare tapa whā (mastery) 	
Tame	<ul style="list-style-type: none"> Engaging students (mastery, verbal persuasion) 	<ul style="list-style-type: none"> Teaching career Changed role (mastery) The power of shared knowledge (vicarious)
Aroha	<ul style="list-style-type: none"> The distinctive nature of distance-learning students' learning needs (verbal persuasion/ physiological and affective) The value of feedback for effective teaching (mastery/physiological and affective) 	
Liz	<ul style="list-style-type: none"> Instructional scaffolding (mastery/ physiological and affective) 	<ul style="list-style-type: none"> The impact of the environment on teaching and learning
Anne	<ul style="list-style-type: none"> Instructional scaffolding (mastery) The impact of deficit thinking (verbal persuasion) Te whare tapa whā (mastery) 	<ul style="list-style-type: none"> Teachers do not have to be the knowledge expert (mastery)
Matt	<ul style="list-style-type: none"> Interactive teaching (mastery/ physiological and affective) Instructional scaffolding (mastery) 	

Note. Identified teaching specific potential threshold concepts are named using italic font

CHAPTER FIVE:

CROSS CASE FINDINGS

“I think it [self-efficacy development] was a process. It happened through this observation, post-observation, observation, post observation process that was ongoing” (Sarah Interview 6).

5.1 Introduction

Chapter Five presents the findings from the cross-case analysis and addresses the remaining research sub-questions:

2. How are ‘aha’ moments related to change in teacher self-efficacy?
3. What are the properties of ‘aha’ moments and how do they relate to changes in self-efficacy?
4. In what ways have these ‘aha’ moments informed individual teacher knowledge and pedagogy and how does this relate to self-efficacy development?

Chapter Five begins with the teachers’ understanding of teacher self-efficacy and seeks to answer the second research sub-question: how are ‘aha’ moments related to change in teacher self-efficacy? The data is organised and reported according to the similarities in how the teachers evaluate their teacher efficacy as the teachers’ evaluation informs their understanding of their self-efficacy, change to teacher self-efficacy and the sources of self-efficacy information.

The chapter then turns to the third research sub-question. Common themes and properties of ‘aha’ moments are analysed across the 11 case studies. These include the triggers that led to or contributed to ‘aha’ moments, the process of self-efficacy

transformation including the phases evident when teachers experienced ‘aha’ moments and the teachers’ representations of these events.

To address the final research sub-question, the data is organised under the headings of knowledge and pedagogy. This section provides evidence of conceptual shifts, increased awareness and perception of teaching. Finally, changes in pedagogy identified include teacher management, relating to others, feedback, the teaching process, teacher thoughts and attitudes and teaching materials. These findings will show that change in teaching specific knowledge and pedagogy resulted in an enhanced sense of capability and contributed to self-efficacy development.

5.2 Teachers’ perception of teacher self-efficacy

The teachers had varied perceptions concerning their teacher self-efficacy and they used a range of effective teacher self-evaluation strategies. The range is reported as a continuum based on Dunkin’s (1995) definition of multidimensional and unidimensional concepts of effective teacher self-evaluation strategies. The teachers who used a larger number of effective teacher self-evaluation strategies had a more specific understanding of teacher self-efficacy on which they could base their interpretations of any self-efficacy change. In contrast, the teachers who used a small number of teacher self-evaluation strategies, including two teachers who stated that they did not have any understanding of their self-efficacy, had a less specific understanding of teacher self-efficacy on which they could base their interpretations of any self-efficacy change.

5.2.1 Group One - Multidimensional concepts of effective teacher self-evaluation strategies

Two teachers each demonstrated a highly specific understanding of teacher self-efficacy. There was a clear understanding of the distinction between teacher self-efficacy and personal confidence. “Your self-confidence is a very personal thing; your teaching confidence is to do with content and technique” (Cate Interview 5).

The group one teachers used four effective teacher self-evaluation strategies that included successful student completions, student progression onto further study or into employment, student feedback and student independence in learning. These teachers set high professional expectations of themselves that included reflection as an integral aspect. They were aware that they had to be “careful [when] reflecting that [they were] not too harsh on [themselves]” (Anne Interview 2). These teachers described a stable sense of self-efficacy and viewed their teacher development as an on-going process. “You kind of think you’ve got it and then you realise that there is a whole another level that you need to learn” (Cate Interview 3).

Self-regulation and agency were features of these two teachers’ practice. They were “responsive and adaptive” (Anne Interview 5). They demonstrated high motivation and self-regulatory efficacy, “giving myself mentally a rev up before I went into the class so I was on my ‘A’ game for them, for all groups of students” (Anne Interview 2).

A third teacher’s understanding of teacher self-efficacy was slightly less specific than that of the two just discussed but she also placed at the multidimensional end of the continuum. Her teacher self-efficacy became more specific part way through the study. For example, this teacher began mentioning teaching specific goals in relation to her professional growth as a teacher. “I knew they [teaching goals] were always important

but I never necessarily knew how to drive the goals for teaching” (Sarah Interview 5). This teacher attributed the change to her understanding of teacher self-efficacy and effectiveness to the professional development initiative she was involved in and to the support provided by her professional development coach. In addition, unlike the first two teachers, the third teacher aligned her personality with her understanding of her teacher self-efficacy and during the first two interviews equated self-esteem with teacher self-efficacy. “I’m not an individual that would often feel low in self-esteem” (Sarah Interview 1). This changed from the third interview onwards. “It [self-efficacy] is not connected to self-esteem really is it?” (Sarah Interview 3).

The three teachers at the multidimensional end of the continuum were conscious that “there’s always room for improvement” (Anne Interview 1). They were active in seeking out professional development opportunities, formal and informal, that would enhance their teaching capability.

5.2.2 Group two - Mid-continuum teachers

Two teachers were mid-range on the continuum. Their understanding of teacher self-efficacy was noticeably less specific than the previous three teachers mentioned. Both teachers used two self-evaluation strategies of effectiveness. One strategy used was an evaluation of their content knowledge. “I think it’s really knowing material and being able to deliver it really well” (Aroha Interview 2). The second strategy was student feedback through course evaluations. “Had a bad week last week. Lost confidence in myself... [student] surveys back” (Aroha Reflective Journal 1).

Both teachers articulated teacher specific tasks, however, these teachers understood his or her teacher self-efficacy also to mean their personal self-confidence as a teacher. “I’m building my confidence and it’s going to take a long time” (Aroha Interview 2).

One of these two teachers also understood teacher self-efficacy to include the support of others around him and his outcome expectation responses usually mentioned other people. “I think in future I can only be successful if our team is successful” (Tame Interview 6). This teacher was of *Māori* descent and he had a close connection with his *marae*⁹. When describing his teacher self-efficacy he referenced his family, his *whakapapa*¹⁰, in knowing who you are and where you come from. “If it wasn’t for my ancestors or even for my father and my grandmother, well my *tūpuna*¹¹, I wouldn’t have these opportunities” (Tame Interview 1). This teacher drew himself and his family surrounded by his ancestral home as his representation of his teacher self-efficacy (see Appendix 29). This teacher found it difficult to say statements about his teaching efficacy particularly if these included recognition of personal abilities. This came through during the interviews and had an impact on his responses.

Both mid-range teachers demonstrated a degree of agency. Negative moments resulted in ownership of the problem and action. This included a “reflective process of analysing it for what it is and try and take out the personal element. Then I try and work out what I could do or I could have done differently” (Aroha Interview 6).

There was no evidence of self-regulation; however, equally, there was no evidence of avoidance in dissuading situations.

5.2.3 Group three - Unidimensional concepts of effective teaching self-evaluation strategies

Four teachers were identified as unidimensional concepts teachers, that is, they generally used one concept to evaluate the effectiveness of their teaching; feedback

⁹ The meeting ground or focal point of a *Māori* community.

¹⁰ Genealogy and those who came before.

¹¹ An ancestor or grandparent.

from students and managers. Self-validation and validation by others was an important aspect of the feedback. “I just want them all to like and listen to me” (Eddy Reflective Journal 3 Appendix 30). In another journal entry, one teacher wrote about the link between being liked and her teacher self-efficacy after the students wrote positive comments about her on the classroom windows (Grace Reflective Journal 3 Appendix 31). “That told me I was good at what I did” (Grace Interview 5).

A feature of the group three teachers was the malleable nature of their teacher self-efficacy. Both positive and negative moments resulted in major change to self-efficacy. “It [teacher self-efficacy] goes up and down all the time” (Eddy Interview 1).

These same teachers described less specific understandings of teacher self-efficacy. Teacher self-efficacy, self-esteem and self-confidence were understood to be either the same concept or very similar. “You take a big knock in your [personal] confidence when things aren’t going well, self-efficacy as well” (Jon Interview 6).

The group three teachers’ self-regulation was poor. Following negative experiences, three of the four group three teachers adopted self-protection and avoidance strategies. This was because the teachers did not know how to respond to the student or manager’s feedback. Common descriptions given by the teachers included negative emotions and behaviours such as “feeling sour” and being “standoffish” (Eddy Interview 2).

5.2.4 Group four - No concepts of effective teaching self-evaluation strategies

Two teachers struggled to evaluate and articulate their teacher self-efficacy. They were at the ‘no concept’ end of the continuum placed off to the right of it. One teacher stated that he felt “relatively effective but [he could not] actually see it” (Aaron Interview 2) and the other teacher had “no idea where to put myself; I haven’t been to any of the

[professional development] programmes. I am kind of floating around, clueless, afraid I'm going to be a floating mine and that I'd do damage" (Liz Interview 1).

It is evident from the continuum that each teacher's use of teacher self-evaluation strategies and understanding of their teacher self-efficacy varied. As such, understanding influenced how the teachers interpreted change to their teacher self-efficacy and supports the use of a qualitative research design for the current study. Table 5.1 that follows provides a summary of the capability evaluation of teacher self-efficacy presented on a continuum with the most specific multidimensional group on the far left and the teachers who had no concept of teacher self-efficacy on the far right of the continuum. The features demonstrated by each group are listed for comparison.

5.3 'Aha' moments and change in teacher self-efficacy

To address the second research sub-question, the study focused on each teacher's perception of their teacher self-efficacy and the strategies he or she used to evaluate their teaching effectiveness at the time of the interviews. Change was not measured against a recognised scale. Rather, the teachers identified and interpreted the degree of change and as such, these are open to subjective interpretation. Change was not measured because the focus of the current study was not on the degree of change per se, although this is noted in the findings as evidence of the relationship between an 'aha' moment and change in self-efficacy. The primary focus of the current study was on the transformational process of change in self-efficacy development. The teachers recounted their interpretations through their reflective journals, visual representations and through the recorded interviews.

Table 5.1. Summary of teachers' capability evaluations of teacher self-efficacy and features of each group

	GROUP ONE Multidimensional	GROUP TWO Mid-range	GROUP THREE Unidimensional	GROUP FOUR No concepts
Number of concepts	Used four concepts to evaluate the effectiveness of teaching	Used two concepts to evaluate the effectiveness of teaching	Used one or two concepts to evaluate the effectiveness of teaching	No concepts used to evaluate the effectiveness of teaching
Criteria	Successful student completions, student progression onto further study or into employment, student feedback and student independence in learning	Evaluation of their content knowledge and student feedback	Feedback from students and managers	
Understanding of teacher self-efficacy	Highly specific understanding of teacher self-efficacy. A clear understanding of the distinction between teacher self-efficacy and personal confidence	Less specific understanding of teacher self-efficacy. Teacher self-efficacy confused with personal self-confidence	Least specific understanding of teacher self-efficacy. Teacher self-efficacy, self-esteem and self-confidence were understood to be the same concept	Unable to articulate teacher self-efficacy
Validation	No evidence of the importance of validation by others		Self-validation and validation extremely important	
Self-regulation/agency	High self-regulation and agency	A degree of agency. No evidence of self-regulation. No evidence of avoidance	Poor self-regulation. Adopted self-protection and avoidance strategies	

5.3.1 Change to teacher self-efficacy

Only the group one, two and three teachers experienced ‘aha’ moments that resulted in change to their self-efficacy. The group four teachers reported no change in terms of a positive or negative change with one of the group four teachers describing a change to her perception of teacher effectiveness. The teachers used the words *increase* or *up* and *decrease* or *down* to describe their interpretation of change to their teacher self-efficacy. As such, the current study will also use these words. The teachers differentiated between degrees of change using the words *significant*, *huge* or *massive* to mean a major change. Other words included *temporary* to describe teacher self-efficacy that changed beyond the level at which it was before an ‘aha’ moment however, the change was not maintained for a prolonged period; that is, the teacher’s self-efficacy underwent further change soon after. The teachers also used the words *stable* and *fluctuating* to describe a fixed or malleable teacher self-efficacy, respectively. These subjective descriptions were checked during the visual representation activities and noted in the reflective journal entries.

The findings of this study would suggest that change to teacher self-efficacy may be related to an ‘aha’ moment. The ‘aha’ moments that gave rise to potential threshold concept knowledge and accompanied by mastery experiences, appear to have substantially contributed to this change. The teachers described change to their teacher self-efficacy related to 25 of the 30 ‘aha’ moments recounted. These included all 21 transformative moments that provided evidence of marked or noticeable change in teaching knowledge, values and/or belief and four non-transformative moments. Of the remaining five non-transformative ‘aha’ moments, four did not include any description of change to teacher self-efficacy and one ‘aha’ moment included a description of

changed perception to do with the institutional environment. This information is summarised in Table 5.2.

Increase in teacher self-efficacy

Five separate 'aha' moments contributed to a positive change in teacher self-efficacy that the teachers interpreted as an increase in their teacher self-efficacy. These moments were all described in positive terms and all resulted in an enhanced sense of capability that the teachers interpreted as contributing to the increase. "It [teacher self-efficacy] has increased. It's changed because I see that the students that I am teaching are happier... I feel like I know what I'm doing now" (Jon Interview 6).

Major increase in teacher self-efficacy

The teachers described a major increase in teacher self-efficacy related to 13 of the 21 transformative 'aha' moments. For 12 of the 13 transformative 'aha' moments, the teachers attributed the major change to teaching specific knowledge, value or belief gained and an enhanced sense of capability. "It [teacher self-efficacy] would actually spike because I feel that confidence of 'okay I can fix this'. It does get better because you've had that 'aha' moment" (Eddy Interview 6 Appendix 18).

One non-teaching related 'aha' moment was described as having a major positive impact on teacher self-efficacy. The teacher described this moment as including "positive affect" and as "an epiphany moment" (Jon Interview 1). This teacher was identified as a group three teacher and he confused personal self-confidence with his understanding of teacher self-efficacy. In another discipline the use of a 'to do' list as an organisational tool may have been identified as a potential threshold concept. Within the current study it was not, because the 'to do list' was more related to the teacher's

personal time management and personal self-confidence. The ‘aha’ was not specific to the discipline of teaching.

Decrease in teacher self-efficacy

One ‘aha’ moment was described by a teacher as having contributed to a decrease in her teacher self-efficacy. This teacher was identified as a group three teacher. The decrease may be because the teacher interpreted a negative impact to her personal confidence as a decrease in her teacher self-efficacy. “It really knocked my confidence” (Grace Interview 1). The teacher described this event as a negative moment that also resulted in a decrease to the teacher’s sense of capability. “It makes me anxious. My tummy’s all squirmy. I think it’s me not being able to control that situation” (Grace Interview 1). Although this moment was described as a decrease and not a major decrease, the teacher referred to the impact of this event during subsequent interviews.

Major decrease in teacher self-efficacy

Seven ‘aha’ moments contributed to major decreases in teacher self-efficacy, as interpreted by the teachers. Six ‘aha’ moments were identified as being transformative moments resulting in a marked or noticeable change. The teachers described all seven moments as negative experiences that resulted in a negative impact on their sense of capability at the time of the experience. “I was devastated. I was lost. I didn’t think I was good enough and I questioned whether teaching was actually where I wanted to be. You have that self-doubt. It [teacher self-efficacy] nose-dived” (Grace Interview 2).

The teachers who described major decreases to their teacher self-efficacy were those identified as being group two and group three teachers as shown in Table 5.1. The teachers’ interpretations of the events closely aligned to the teachers’ perception of teacher self-efficacy that included loss of personal confidence statements and evidence

of negativity bias. “Most of this reflection is about me losing my confidence in some of the lecturing that I’ve done or in the delivery of my [course]” (Aroha Interview 2).

No relation between ‘aha’ moments and change in teacher self-efficacy

Three teachers described four ‘aha’ moments that were identified as being non-transformative moments, that is, the moment did not result in any noticeable change to the teachers’ knowledge, values and/or beliefs. Furthermore, the moment did not relate to change in teacher self-efficacy. It was difficult to ascertain why the teachers thought that these moments were ‘aha’ moments. One possibility is because the moment made them generally feel good about themselves. The change in self-belief did not provide evidence of being transformative.

Changed perception of the institutional environment and teacher self-efficacy

One ‘aha’ moment was described by a teacher as contributing to a changed perception of the institutional environment. “I have had an eye opener” (Liz Interview 6). Other ‘aha’ moments already mentioned also contributed to changed perceptions. These however, were as a coalescence of contributing factors and have already been noted in the findings (see for example section 4.3.1 Sarah and 4.3.10 Anne). For instance, one teacher stated that her perception of her teaching efficacy was enhanced because of “a number of reasons. Realisations that I made by myself. Realisations that I made through [professional development]. By observing other people, by getting feedback from the students” (Sarah Interview 6).

5.3.2 ‘Aha’ moments and the sources of self-efficacy information

The individual case descriptions, provided in Chapter Four, presented the findings concerning each ‘aha’ moment and the source(s) of efficacy information identified within each event. This chapter presents the cross-case findings under each of the four

sources of efficacy information. In doing so, these findings link the sources to the ‘aha’ event and provide evidence that ‘aha’ moments do relate to change in self-efficacy.

These findings also indicate that mastery experiences, both successful and unsuccessful, contributed most frequently to change in teacher self-efficacy.

Mastery experiences

The highest frequency of change to teacher self-efficacy included enactive mastery experiences (both successful and unsuccessful). Ten teachers described 19 ‘aha’ moments that their interpretation of the events resulted in either a major increase or decrease to teacher self-efficacy. Of those 19 moments, 14 involved mastery experiences. The teachers described how they tried “a different way of tackling something” (Jon Interview 5) or used a new teaching strategy learned at a professional development session, for example the use of “day to day examples” (Matt Interview 2). These successful experiences contributed to an increased sense of capability that the teachers described as contributing to increased teacher self-efficacy.

The teachers’ interpretations of unsuccessful experiences contributed to a decrease or major decrease in teacher self-efficacy. For example, one teacher was unsuccessful at “controlling the situation” (Grace Interview 1) and another teacher had been unsuccessful in “engaging the students” (Tame Interview 2). Both teachers’ interpretation of these events resulted in a decreased sense of capability in specific teaching tasks such as classroom management and a decrease in their self-efficacy.

Vicarious learning

One ‘aha’ moment included evidence of vicarious learning. This experience contributed to an increased sense of teaching capability that the teacher believed contributed to an increase in his teacher self-efficacy. “[His colleague] had been teaching that programme

for 24 years... Just to observe and just see how she operates... So that's sort of been really good for me" (Tame Interview 4). It is also interesting to note that the teacher who described this moment included others in his perception of teacher effectiveness (see section 4.3.7 Tame).

Verbal persuasion

Three teachers described three 'aha' moments that included evidence of verbal persuasion. All three 'aha' moments resulted in major negative changes to teacher self-efficacy. The teachers placed high value on the source of the feedback, students, and used this feedback as a main source of efficacy evaluation. "I got the [student] survey back. I felt irritated about some of the comments because I felt there was a justification for why things had been a certain way. I wish that students knew how busy I was" (Aroha Interview 2).

Negativity bias was evident in the findings with the contribution of the negative feedback being major. "There was some positive feedback, but it was quite hard to see the positive feedback" (Aroha Interview 2).

Physiological and affective states

Five teachers described six 'aha' moments that included physiological and affective states. The teachers' interpretation of physiological and affective states influenced their interpretation of change to their teacher self-efficacy. The five teachers understood affect response, for example anxiety and nervous anticipation, to be negative emotions that contributed to the teachers feeling "ineffective" (Aroha Interview 1) and "not in control" (Grace Interview 1). Three of the group three teachers interpreted any negative emotion experienced within an 'aha' event as a decrease or major decrease to his or her teacher self-efficacy.

One of the group three teachers also interpreted her positive affect response as an “emotional high” (Grace Interview 1) that occurred after she marked the students’ assignments. The teacher described how she felt when her students showed they were “getting it” [demonstrating the required skill and knowledge to pass the assignment] (Grace Interview). The teacher interpreted this emotional high as a major increase to teacher self-efficacy.

Other findings relating to physiological and affective states are presented later in this chapter in section 5.4. Table 5.2 that follows provides a summary of the teachers’ experiences and their interpretations of the change in their teacher self-efficacy related to each ‘aha’ moment.

5.4 The properties of ‘aha’ moments and the relationship to self-efficacy

This section of the chapter presents the properties of the ‘aha’ moments experienced by the teachers and addresses the third research sub-question: what are the properties of ‘aha’ moments and how do they relate to changes in self-efficacy? Findings are grouped into the triggers that contributed to the teachers experiencing an ‘aha’ moment, the stages that were evident during the teachers’ experiences of their ‘aha’ moments, the properties within each phase and the teachers’ representations of their ‘aha’ moments.

The findings show the experience of an ‘aha’ moment can be conceptualised as a transformational process containing phases. Change to teacher self-efficacy was evident throughout each of these phases. The properties identified within each phase, dissonance, troublesome knowledge, and oscillation, had the potential to influence self-efficacy, and in turn, self-efficacy had the potential to influence the effect of the property.

Table 5.2. The teachers' interpretations of change to their teacher self-efficacy related to an 'aha' moment

Interpretation of change	'Aha' moments	Source(s) of efficacy information
Increase	<ul style="list-style-type: none"> • <i>Instructional scaffolding</i> • <i>Student centred learning</i> • Teachers do not have to be the knowledge expert • Ways and strategies for dealing with problems • The power of shared knowledge 	<ul style="list-style-type: none"> • Mastery • Mastery • Mastery • Mastery • Vicarious
Major increase	<ul style="list-style-type: none"> • <i>The impact of deficit thinking</i> • <i>Instructional scaffolding</i> • <i>Interactive teaching</i> • <i>Learner autonomy</i> • <i>The value of feedback for effective teaching</i> • <i>Te whare tapa whā</i> • To do list • <i>Student voice</i> 	<ul style="list-style-type: none"> • Mastery • Mastery X4/ physiological and affective • Mastery X2/ physiological and affective • Mastery • Mastery/ physiological and affective • Mastery X2 • Mastery • Physiological and affective
Decrease	<ul style="list-style-type: none"> • <i>Boundaries in effective teaching</i> 	<ul style="list-style-type: none"> • Mastery/ physiological and affective
Major decrease	<ul style="list-style-type: none"> • <i>False perceptions</i> • Commitment to learning varies • <i>Ambiguity in communication</i> • <i>Student engagement</i> • <i>The impact of deficit thinking</i> • <i>The distinctive nature of distance-learning students' learning needs</i> 	<ul style="list-style-type: none"> • Mastery • Mastery • Mastery/ physiological and affective • Mastery/ verbal persuasion • Verbal persuasion • Verbal persuasion/ physiological and affective
No change	<ul style="list-style-type: none"> • Teaching career • Changed role • Influence of trust on student learning • The place of simulated settings 	
Change in perception	<ul style="list-style-type: none"> • The impact of the environment on teaching and learning 	

Note. Identified teaching specific potential threshold concepts are named using italic font

5.4.1 'Aha' triggers

All of the teachers described their 'aha' moments, regardless of whether these were unexpected or not, as being instigated or triggered by something such as an event or by an individual. The data provides evidence of five common triggers experienced by the teachers: reflection; trying something new; challenge of teacher beliefs and behaviours; formal professional development; and feedback from others. One trigger was unique to one teacher: observing colleagues. Triggers all occurred in the initial phase of experiencing an 'aha' moment. No 'aha' moments occurred without a triggering event or an individual.

Reflection

Reflection, described as "reflecting" (Aroha Interview 2) or "thinking and pondering" (Anne Interview 4) about their teaching, was mentioned by five teachers as being a trigger of eight 'aha' moments. Reflection included "talking with others" (Aaron Interview 1) as well as personal self-reflection. "I started thinking about it... reflecting... and [the] feedback from one of [the] evaluations actually got me thinking... So that was a bit of a revelation for me" (Anne Interview 2).

The group one and two teachers (see section 5.2) reported reflection as being integral to effective teaching. One teacher said that her "biggest revelation" or 'aha' moment occurred because of a reflection (Anne Interview 2). During the act of reflecting, teachers described changes to their self-efficacy. "I remember sitting there for the rest of the day... just examining myself... I was questioning what I had been doing with a whole lot of students... My self-efficacy was not good at that point" (Anne Interview 2). Reflection is a key component in transformational learning (Mezirow, 2000). All of the teachers who mentioned reflection in the recounting of their 'aha' moments also provided evidence of a transformative 'aha' moment.

Trying something new

Four teachers described four ‘aha’ moments triggered because they had tried something new. This included physically sitting in a different location; trying a new teaching strategy; examining an issue in a factual way rather than allowing emotion to cloud judgement; and trying a new delivery technique. “It was an ‘aha’ moment because this [was] the first time I tested myself in something. Now I feel more relaxed about teaching and my thinking process has definitely changed” (Matt Interview 2).

Challenge of teachers’ beliefs and behaviours

Six teachers described six ‘aha’ moments that were triggered because their beliefs and/or behaviours as teachers were unexpectedly “challenged” (Aroha Interview 1). Beliefs included belief about his or her ability as a teacher; belief concerning assumed student knowledge and belief that a “colleague would support [them]” (Jon Interview 5). The initial affect to self-efficacy was negative with all of the teachers reporting a decrease immediately following this trigger.

Three of these teachers had their beliefs about student knowledge challenged after they had incorrectly assumed that students studying in higher education would have a certain level of basic knowledge. One of these teachers also incorrectly assumed that the students’ understanding of certain terms such as trauma would be “the same as a healthcare professional” (Cate Interview 3). This belief was challenged when the students demonstrated a very different understanding.

Three teachers described ‘aha’ moments triggered after students and managers challenged their teaching behaviour. The challenge by students made one teacher feel uncomfortable but at the same time it forced her to “think about different [delivery] medium” (Aroha Interview 1). Two group one teachers also provided evidence of

challenging their own behaviour. “I had to really consider whether or not I was being too soft [with her teaching because] obviously this isn’t effective” (Cate Interview 1). Challenging one’s own behaviour was not evident in any of the group two, three or four teachers.

Formal professional development

Professional development appears to have contributed to triggering a number of ‘aha’ moments experienced by the teachers. Five teachers mentioned formal teacher professional development as being a trigger of nine ‘aha’ moments. Furthermore, formal teacher professional development was forefront in the teachers’ narratives. “There’s a lot of things [about teaching] that I am questioning because of [professional development]” (Tame Interview 6). In a previous interview the same teacher stated that he felt that as a result of being involved in the formal professional development “[he] look[ed] at teaching differently now... having much more understanding” (Tame Interview 5). In a similar way two other teachers in the same professional development initiative attributed many of their ‘aha’ moments to the “realisations that I’ve made through the [professional development]” (Sarah Interview 6). For the fourth teacher the professional development initiative had helped her to identify as a teacher and to “feel that [she was] no longer faking it” (Grace Interview 6).

The four teachers who were involved in the same formal professional development initiative experienced a high number of ‘aha’ moments compared with the other teachers not involved in formal professional development. Three of the teachers involved in the formal professional development experienced four ‘aha’ moments each and the fourth teacher experienced three ‘aha’ moments. “My training with [professional development] it’s really made me question and reflect on my pre-

conceived notions. It's challenged my thinking... it's really changed the way that I think about students" (Anne Interview 4).

A number of concepts that have been named as potential threshold concepts, *the impact of deficit thinking*, *instructional scaffolding*, *te whare tapa whā* and *student centred learning* were introduced to the teachers through formal professional development. "It's [the concept of *te whare tapa whā*], that we learnt in [professional development name], heightened the fact of how vulnerable students can be" (Grace Interview 2). A fifth teacher who mentioned professional development experienced one 'aha' moment that he attributed to attending a professional development workshop. This teacher was not part of the same professional development initiative as the other four teachers. "I learned from those [professional development] seminars like giving real life examples. So now I will be using these type of things in my teaching in front of the whole class" (Matt Interview 5).

Feedback

Three teachers described three 'aha' moments triggered by social persuasion in the form of student course evaluations and feedback from colleagues. Negative feedback prompted the teacher to think about their teaching. The three teachers described a decrease to their self-efficacy immediately following the receipt of the negative feedback. "Nobody wants to hear criticism and so reading end of programme feedback, it is painful... but it's important to think about why did they feel that way" (Anne Interview 2).

Observing colleagues

One teacher said that observing colleagues teach resulted in an 'aha' moment. This vicarious learning triggered "a really good 'aha' moment" (Tame Interview 4) and

contributed to the realisation of the power of shared knowledge in supporting effective teaching. Although the teacher stated that the moment made him feel good, there was no reported change to self-efficacy connected with this trigger.

5.4.2 Phases and their relationship to self-efficacy

The teachers described a common transformational process with distinct phases that occurred when they experienced their ‘aha’ moments. All of the teachers described a before and after, including “two afters” (Anne Interview 1 and see Appendix 40), with some teachers also describing the moment the ‘aha’ occurred. The identification of the *antecedent phase*, *during phase*, *proximal after phase* and *distal after phase* align with Mezirow’s (1991) transformational learning phases.

Antecedent phase

All of the teachers described a phase before the ‘aha’ moment occurred that has been identified as an *antecedent phase*. Some teachers were aware of this phase before they experienced their ‘aha’ moment and others only became aware retrospectively after the moment occurred. This phase included the already mentioned trigger, for some a feeling of dissonance brought about through a disorientating dilemma, self-examination and critical examination, recognition that they had experienced similar events, exploration of options and the planning of a course of action.

The findings revealed that the teachers interacted with the properties (for example, troublesome knowledge, oscillation and dissonance) within the *antecedent phase*, changing and being changed by these properties. These interactions influenced each teacher’s interpretations of their self-efficacy and any change that may have occurred at this time.

Some of the teachers described a provoked state of liminality and cognitive dissonance in the *antecedent phase*. Three teachers described awareness that change was occurring or that change needed to occur. “I guess understanding that I have to find different ways to approach a cohort of students [in relation to classroom management]. Quite how to do that yet, I’m not quite sure” (Cate Interview 2). The *antecedent phase* was recursive. The same teacher felt as though she was “going around in circles” (Cate Interview 2).

Four visual representations included a distinct liminal phase before an ‘aha’ moment. One teacher drew a space within the tunnel (see Appendix 32) and he spoke about entering the tunnel and moving along the space. Another teacher visually represented her experience of her ‘aha’ moments as an Archimedean Spiral (see Appendix 33). “It is like a journey... that most often goes in circles” (Sarah Interview 2). A third teacher drew herself reflecting or thinking in a thought bubble before the ‘aha’ moment (see Appendix 34) and the fourth teacher drew a line that became tangled like a knot before his ‘aha’ moment (see Appendix 35). These visual representations are discussed further in section 5.4.3.

There is evidence of a lack of teacher specific knowledge in the *antecedent phase*. Five teachers described their pre-aha self when compared with their post-aha self as lacking teacher knowledge, being “clueless” (Liz Interview 1) or unsure and “I didn’t know what to do” (Eddy Interview 1). This sense of helplessness had a negative impact on their self-efficacy. “I feel like it is decreasing because I don’t know what to do” (Cate Interview 4).

During the *antecedent phase*, teachers described a number of emotions and physical reactions. These included not being able to “sleep properly [and] having nightmares” (Grace Interview 2). These physiological and affective states were in response to the

properties within the *antecedent phase* that included a sense of cognitive dissonance and the troublesome nature of the new or modified knowledge. Most of the affective states described included confusion, nervousness, anxiety, anticipation, worry, stress, being scared, “frustrated [and] a little bit lost” (Cate Interview 2). The teachers interpreted these affective states as a decrease to their teacher self-efficacy within this phase. Only one teacher described a sense of knowledge about how he would “face those challenges” (Tame Interview 2). This confidence appeared to reinforce his teacher self-efficacy. He did not feel that his teacher self-efficacy would decrease greatly within the *antecedent phase*. “If it did it would only be for a short time and then it would go back up again” (Tame Interview 6 and see Appendix 23).

Prior successful or unsuccessful experiences contributed to how the teacher responded to the properties within the *antecedent phase*. The teacher who had not been successful with prior experiences felt “very wound up” (Grace Interview 2) and anxious because she had “had those conversations before and they [had] gone south”. She described a decrease to her teacher self-efficacy during this time. The teacher who had successful prior experiences felt confident and a sense of “certainty because whatever those hurdles are [within the *antecedent phase*, he] will be able to get through” (Tame Interview 2). It was something he had “faced and done many times” (Tame Interview 3).

There was an awareness of a difference in teaching and pedagogy before the teachers experienced their ‘aha’ moments compared with after. One teacher described how she had taught “at the front” (Sarah Interview 1) before she crossed the potential threshold of *interactive teaching*. This changed after her ‘aha’ moment and she described her teaching as now being “alongside the students” (Sarah Interview 1).

Perception of the teacher's physical presence in front of students was also different in the *antecedent phase* when compared with other phases. Prior to the 'aha' moment two teachers perceived themselves as the "big scary teacher" (Grace Interview 1) or like an "ice queen" (Sarah Interview 1). A third teacher described how he stood on a platform in the classroom to make himself physically "taller than the students" (Eddy Interview 1).

There was a difference in teacher self-efficacy in the *antecedent phase* compared with other phases. Teachers described their self-efficacy as being "not flash" (Aaron Interview 1), "in the deep end" (Jon Interview 1) or "spiralling down" (Eddy Interview 6). This was usually in response to the properties within this phase that included dissonance and resulted in the teacher feeling frustrated.

Frustration within the *antecedent phase* became problematic as teachers became 'stuck'. Because of 'being stuck', one teacher was close to leaving teaching. She described a major decrease to her teacher self-efficacy during this troublesome period. "It's made me re-evaluate whether it is something I want to do long-term... If this is indicative of how it's going to be in the future, nah too hard basket. I will find something else to do" (Cate Interview 2)¹².

During phase

The *during phase* was identified as the theoretical point at which the teachers experienced the 'aha' moment and acquired the knowledge and skills specific to teaching that resulted in marked or noticeable changes to their meaning schemes. Not all of the teachers were able to describe what they experienced during the moment of the 'aha' or to pinpoint the exact moment that the 'aha' occurred. One teacher referred to

¹² Subsequent to the completion of the data-gathering period, this teacher left teaching.

'aha' moments in his reflective journal as only being visible "through the fog of hindsight" (Appendix 36).

For those who did identify the moment of the 'aha', positive or negative affect was evident. Teachers described feeling "encouraged" (Cate Interview 1) and "elated" (Anne Interview 1) as well as "disconcert[ed]" (Anne Interview 1), "conflicted, defensive", and a bit "sorry" for themselves (Aroha Interview 2). One teacher described feeling "anger... and going back to that little kid feeling" (Eddy Interview 1). He said he was tearful and "insecure" (Eddy Interview 2). During the 'aha' moment, the teacher's interpretation of the positive affect resulted in an increase to teacher self-efficacy and his or her interpretation of the negative affect resulted in a decrease to teacher self-efficacy.

Physical reactions in the *during phase* that accompanied the positive and negative affect were evident. Reactions included "red cheeks [and] gesturing quite a bit" (Aroha Interview 1 and see Appendix 37) and being "slack-jawed... [and] pretty limp" (Liz Interview 1 and see Appendix 38). In the *during phase* one teacher "burst into tears" (Grace Interview 1) and another laughed because the teaching specific knowledge she had been looking for was now "so obvious" (Sarah Interview 1).

Visual representations of the point of the 'aha' or the *during phase* included a light bulb (see Appendix 40) and a duck "all calm on the surface and paddling underneath the water" (Anne Interview 6 and see Appendix 39). For this teacher trying to give the appearance of being calm and "maintain composure" (Anne Interview 6) was an important aspect of experiencing 'aha' moments and being professional.

Proximal after phase

The data would suggest that a space exists after the ‘aha’ moment that is proximal in distance and time to the ‘aha’ moment that has been termed the *proximal after phase*. There was evidence of ontological repositioning and change to self-efficacy within this phase. All of the teachers said they were changed or different in some way after they experienced their ‘aha’ moments. Some of the teachers described the change to their teacher self-efficacy as “temporary” (Anne Interview 1) within this phase. Change to behaviour included the provisional trying of the new or modified knowledge and the reintegration into one’s life based on the new perspective.

Reflection was mentioned as a trigger of ‘aha’ moments in section 5.4.1. Reflection was also evident for seven teachers after an ‘aha’ moment in the *proximal after phase*. Reflection “made [her] question and reflect on [her] pre-conceived notions (Anne Interview 4) and to “re-think how [she] deliver[s] the material” (Anne Interview 1). Reflection occurred over varied time. This included one teacher who “reflect[ed] for a couple of weeks” (Aroha Interview 6) and another teacher, whose reflection of an event that occurred 12 months earlier, had contributed to a second ‘aha’ or “realisation” (Liz Interview 6).

The ‘aha’ moments were identified by the teachers as being positive or negative experiences. All of the teachers experienced positive and negative affect in the *proximal after phase* that some teachers interpreted as their sense of self-efficacy. Teachers described teaching as being “a lot more enjoyable” (Aaron Interview 1) and that their students were “more satisfied” (Matt Interview 1). Common phrases included “satisfaction, celebration and elation” (Anne Interview 1) and one teacher said that she felt “not as heavy” (Aroha Interview 1). Teachers described feeling “validated” (Grace

Interview 6), “less stressed” (Jon Interview 1), “more confident” (Matt Interview 1) and “a sense of accomplishment [and] success” (Sarah Interview 2).

Each teacher’s interpretation of the positive affect in the *proximal after phase* resulted in an increase to their teacher self-efficacy and their interpretation of the negative affect as a decrease to their teacher self-efficacy. The teachers described negative feelings of “guilt” (Anne Interview 1) or being “very sad” (Aroha Interview 2) when they thought about previous cohorts and their own personal lack of specific teacher knowledge or incorrect belief about students prior to the ‘aha’.

Some of the teachers described positive feelings in the *proximal after phase*. For example, being “elated” (Anne Interview 1) and a “sense of relief” (Aaron Interview 1). Positive moments did not always result in positive affect. For example, one teacher described two positive ‘aha’ moments however, these both resulted in negative affect. She said she felt “shocked... [and she was] examining herself” (Anne Interview 1) after one ‘aha’ moment and after another ‘aha’ moment she said she felt “really sick [and] guilty” (Anne Interview 2). The teacher thought about the students from previous years that she felt she might have failed because of her lack of teaching knowledge and her incorrect belief concerning the students’ and their motivation to study. The teachers identified the new or modified knowledge and belief as a contributing factor to the decrease or increase in their teacher self-efficacy in the *proximal after phase*.

Other teachers who identified negative ‘aha’ moments described initial negative affect in the *proximal after phase*. Teachers described feeling “a little bit let down...and I was *hoha*¹³ with myself for a while” (Tame Interview 1). Other emotions were “anger, [being] very insecure” (Eddy Interview 2), feeling “ineffective... at a loss... [and]

¹³ *Hoha* is a Māori word that means annoyed in this context

incredibly frustrated” (Cate Interview 1). The teachers interpreted negative affect as contributing to decreased teacher self-efficacy: “I think it decreases dramatically because it [negative affect] scrambles everything” (Cate Interview 1).

The information that pertains to change to pedagogy within the *proximal after phase* is presented in section 5.5.

Distal after phase

A second after phase that was further away in time and space to the point of the ‘aha’ was identified and named the *distal after phase*. During the *distal after phase*, further reintegration and ontological repositioning occurred. All of the teachers in the study described a difference to how they felt about the event and the new or modified knowledge, value and/or belief in *the distal after phase* compared with the *proximal after phase*. The teachers described feeling positive and an increased sense of teacher self-efficacy well after the ‘aha’ moment. This was because they believed that the specific knowledge or changed value and/or belief had “added value” (Tame Interview 6) to their teaching. Even teachers who had experienced a negative event and decrease to their self-efficacy in the *proximal after phase* felt positive in the *distal after phase*. This finding was unexpected. The teachers commented that it, the negative ‘aha’ moment, had provided them with “knowledge that [they] needed to know” (Aroha Interview 2). Furthermore, this teaching specific knowledge, value and/or belief had contributed to an enhanced sense of “capability and teacher self-efficacy” (Anne Interview 3).

A summary of these findings within this section of the chapter are presented below in Table 5.3 with the main features of each phase described.

Table 5.3. Summary of the phases of ‘aha’ moments and the common features

Phase	Features
<i>Antecedent phase</i>	<ul style="list-style-type: none"> • Provoked state of liminality, troublesome, counter-intuitive knowledge that is discursive in nature. • Some awareness before the ‘aha’ moment; others only aware retrospectively. • Pre-aha self was different in some way or lacking teacher knowledge, different perception of physical presence and a difference in pedagogy. • Physiological and affective responses included anxiety, confusion, nervousness, anticipation, worry, stress, being scared and frustration. • Physical reactions included disturbed sleep.
<i>During phase</i>	<ul style="list-style-type: none"> • The moment of the ‘aha’ difficult to pinpoint for some, others were highly identifiable. • Positive or negative affect evident; elation, feeling encouraged, as well as disconcerted, conflicted, defensive and feelings of insecurity. • Physical reaction accompanied the positive and negative affect.
<i>Proximal after phase</i>	<ul style="list-style-type: none"> • Ontological repositioning - Teachers engaged with the new or modified knowledge and attempted to understand their altered way of being. • Reflection a key feature. • Changed pedagogy and behaviour. • Positive affect interpreted by the teachers as increased teacher self-efficacy and negative affect interpreted by the teachers as decreased teacher self-efficacy.
<i>Distal after phase</i>	<ul style="list-style-type: none"> • Further ontological repositioning - A difference to how they felt about the new or modified knowledge in the distal after phase compared with the proximal after phase. • Reflection a key feature. • Experiences, positive and negative, viewed as value-added, enhanced capability through teacher specific knowledge that the teachers interpreted as increased teacher self-efficacy.

Note. Transformational phases are named using italic font.

5.4.3 Representations of ‘aha’ moments

Teachers described and drew a variety of representations to conceptualise their interpretations of their experiences of ‘aha’ moments and the transformational process of their teacher self-efficacy. The representations have been included in the cross-case analysis rather than under each teachers’ individual case narrative as there were common themes and images. Themes include a journey or a process, images and symbols.

Journey or process

Six teachers visually depicted their interpretation of their experience of an ‘aha’ moment as a journey or process. Depictions included evidence of a space or phase before and two spaces or phases after an ‘aha’ moment and a journey or process that was recursive.

One teacher drew a tunnel (see Appendix 32) with the tunnel forming the space before a “light at the end” (Tame Interview 2) which represented the ‘aha’ moment. For this teacher, ‘aha’ moments were conceptualised as a series of connected tunnels. During the third interview the same teacher returned to the ‘aha’ event that had prompted the tunnel drawing and he described how he was “starting to exit that tunnel because the light’s there” (Tame Interview 3). He spoke of his next challenge and the next ‘aha’ moment and he talked about entering another tunnel. “I will go into the tunnel knowing more than what I knew before I entered this tunnel [pointing at the tunnel drawn in interview 2]” (Tame Interview 3).

Another teacher described ‘aha’ moments and the transformational process of her teacher self-efficacy as an “on-going recursive process” (Sarah Interview 6). She represented this process as an Archimedean spiral (see Appendix 33). “It denotes something that is never ending... and it goes in circles... it just gets bigger and bigger... my ability, my confidence, feelings of self-efficacy” (Sarah Interview 2).

A third teacher also represented his ‘aha’ experiences and teacher self-efficacy as a journey but one that was linear. He drew a line with a knotted section indicating cognitive dissonance before the ‘aha’. This teacher then indicated on his drawing with his finger that he would back track to find the “correct direction” (Aaron Interview 2

and see Appendix 35) before continuing on his way. The ‘aha’ moment was indicated with an X after the knot.

The teachers also used line graphs to represent a journey or a process. One teacher drew a line graph (see Appendix 20) to represent “an iterative, fluid and reflective process including trial and error” (Jon Interview 3). The teacher indicated in brown pen the point on the graph when he experienced the ‘to do’ list ‘aha’ moment. In a similar way another teacher used a line graph (see Appendix 18) to represent how his teacher self-efficacy “would spike because [he felt] that confidence of okay [he could] fix this” (Eddy interview 6). The ‘aha’ moment was indicated as being the top of the spike. The teacher’s self-efficacy would then drop “down to a mid-range and then as it [the knowledge as a result of the ‘aha’] actually starts to work, it [teacher self-efficacy] is at a high range” (Eddy Interview 6).

Images and symbols

Seven teachers drew images and symbols to represent their ‘aha’ moment or how they felt about their self-efficacy at the time of the interview. The images and symbols were very personal to each teacher and carried varied meanings. As such, interpretations of these were left up to the teachers and the descriptions provided by the teachers formed the basis for data analysis.

Symbols included a Peace Symbol (see Appendix 41) with each segment labelled by the teacher as an integral part of her role as a teacher. This teacher wanted the students to know that she “comes in peace” (Grace Interview 2) as a supportive friend. Another symbol was Mr Yuck, a North American symbol used to warn children away from dangerous medicines or chemicals. The teacher drew this to represent a negative ‘aha’ moment and the teacher’s declining self-efficacy (see Appendix 42).

As already mentioned, one teacher drew a duck appearing calm on the surface of the water but paddling furiously underneath (see Appendix 39). This representation was of the point at which the teacher experienced the 'aha'. It was important for this teacher to appear outwardly calm. Another teacher drew a red coloured tear/blood drop to represent the emotion he felt and the impact of this on his teacher self-efficacy (see Appendix 19). "I suppose it made me feel very insecure... so tears 'cos that's what you feel like at the time... It was an angry tear. It looks a bit like a blood drop" (Eddy Interview 2).

Three teachers drew an image of themselves reflecting or thinking. Two teachers drew mirrors (see Appendices 40 and 43) with their reflections in the glass to represent themselves after the 'aha' moment. "I don't really like the reflection but then I work on it... examining, and questioning myself" (Anne Interview 2). Another teacher drew an image of her crying after the trigger but before the 'aha' moment as she thought about the negative student feedback that she had just received (see Appendix 44).

5.5 'Aha' moments and teacher knowledge and pedagogy

This section presents the findings that address the way 'aha' moments informed individual teacher knowledge and pedagogy and how this related to self-efficacy development and addresses the final research sub-question.

5.5.1 Knowledge and self-efficacy development

All of the teachers described gaining new or having modified knowledge because of at least one of their 'aha' moments. Changes to knowledge were identified as a marked or noticeable change in teaching knowledge, values and/or beliefs or perspective transformation with attention given to the degree, breadth and stability of that change.

The findings indicate that enhanced teaching specific knowledge, which included values

and beliefs, contributed to the teachers feeling an enhanced sense of capability and teacher self-efficacy.

Meaning schemes

Change to meaning schemes, defined in Chapter Two, is the restructuring or modification of existing meaning structures (way of thinking). A key aspect used in the identification of potential threshold concepts in the current study was the marked or noticeable change in knowledge, values and/or beliefs, as reported by the teachers, evidenced through changed speech and self-reported changed behaviour. All potential threshold concepts related ‘aha’ moments included evidence of conceptual shift in teaching specific knowledge, values and/or beliefs. The non-threshold related ‘aha’ moments did not provide this evidence with the exception of the ‘to do list’. The ‘to do list’ was not identified as a potential threshold concept within the discipline of teaching but may be identified as one within another context. This section will focus on the common conceptual shifts and the identification of potential teaching specific threshold concepts.

Prior to experiencing the ‘aha’ related potential threshold concept moments the teachers described a number of incorrect assumptions that they had concerning content knowledge acquisition. “It is about how they manage to go through that process [of learning new knowledge] and how they manage to achieve” (Grace Interview 2). Prior to the teachers experiencing a conceptual shift there was a general feeling of being “frustrated and impatient [and] thinking, why doesn’t [the student] get this?” (Anne Interview 1). Incorrect assumptions about knowledge acquisition meant that students missed vital aspects of foundational knowledge when the teachers taught new higher-level concept without the correct knowledge base. A common statement was that the teacher felt that their “thinking process about teaching had changed” (Matt Interview 2)

from the teacher as the “explainer of concepts” (Sarah Interview 1) to the teacher who layered knowledge “building on the foundation of what students already know” (Liz Interview 1).

Conceptual shifts concerning the teachers’ understandings of effective teaching methods were also evident in the findings. Teaching as “information transfer” (Matt Interview 1) with the teacher as “the individual in front, knowing everything trying to teach the students that know nothing [and] very little input from the students” (Sarah Interview 1) became teaching by asking “students [to] talk and question” (Matt Interview 1). These teachers experienced shifts in their understanding of how effectively to engage students as active participants in their own learning and for two teachers there was shift in their understanding of the power relationship between the students and teacher. “I suddenly felt very connected to these students and very alongside the journey with them as opposed to teaching at them in the traditional teaching sense... I hadn’t been giving them enough control (Grace Interview 6).

Conceptual shifts also occurred in how the teachers’ understood their own thoughts and attitudes about the students. Teachers came to understand the influence that these thoughts and attitudes can have on their relationships and student success. “Deficit thinking can actually be really damaging without realising it we might be limiting what our students can achieve” (Anne Interview 4).

Conceptual shifts in the teachers’ beliefs concerning who their students were as individuals also occurred. Changed understanding included an understanding of the students’ holistic needs. “There are things that aren’t in the curriculum but they’re just as important that we address those so that they can continue to be here” (Grace Interview 2). These conceptual shifts and jarring of assumptions allowed the teachers to

see and understand who their students were and “how vulnerable students can be... and [how] external factors impact on [students] in a huge way” (Grace Interview 2).

Conceptual shifts also included understanding students’ needs and specifically the learning needs of distance-learning students. This particular conceptual shift added “to [the teacher’s teaching specific] knowledge base” (Aroha Interview 1) and pedagogy. This is expanded on shortly.

As noted in Chapter Two, threshold concepts are defined as theoretical points on the learning landscape over or through which an individual passes affording the individual new or modified knowledge (that can include values and/or beliefs) central to mastery of a discipline. They are not absolute but rather are decided contextually within each context, in this case teaching.

The following potential threshold concepts were named. They are ordered alphabetically and include both unique and commonly experienced thresholds:

1. *Ambiguity in communication*
2. *Boundaries in effective teaching*
3. *False perceptions*
4. *Instructional scaffolding*
5. *Interactive teaching*
6. *Learner autonomy*
7. *Student centred learning*
8. *Student engagement*
9. *Student voice*
10. *Te whare tapa whā*
11. *The distinctive nature of distance-learning students’ learning needs*
12. *The impact of deficit thinking*

13. The value of feedback for effective teaching

Each potential threshold concept provided evidence of conceptual shift, resulted in an enhanced sense of capability and enhanced sense of teacher self-efficacy. This is discussed in Chapter Six.

Perspective transformation involves critical reflection of assumptions and it represents a developmental shift in understanding, or having a new worldview. Although the teachers collectively described critical reflection and changes to assumptions, only two teachers provided evidence of what could potentially be identified as being perspective transformation of beliefs. These teachers described a noticeable change to their understanding concerning students. One teacher experienced perspective transformation because of cognitive dissonance that led her to try something new. During a faculty/class meeting, she sat with the students rather than at the front of the room with the staff. The teacher described how this act was like “flipping a switch” (Grace Interview 6). As a result of the realisation and the subsequent critical reflection she felt that her world view had changed. “I am a teacher whereas previously I was a designer who taught. Now I’m a teacher and those things are very, very different” (Grace Interview 6).

The other teacher who provided evidence of perspective transformation experienced this as a result of a number of changed meaning schemes over a period of time. Her understanding of student knowledge, the reasons why students attend the institution to study and the learning process underwent major change. This teacher described how these ‘aha’ moments had “really challenged [her] assumptions. It has challenged my thinking... it has really changed the way that I think about students (Anne Interview).

Increased awareness

The teachers described a theme of increased awareness as part of change to their teaching knowledge, values and/or beliefs. Phrases such “I think it’s made me aware” (Anne Interview 2) of “never assum[ing]” student knowledge (Anne Interview 1) and being more “cautious” (Grace Interview 1) were common responses. Increased awareness also included an awareness of personal “thoughts and the influence of these on what [he] thinks” (Eddy Interview 3). “Rather than spending the whole term thinking that it is their fault, it’s like actually [Eddy] it’s to do with you as well” (Eddy Interview 6).

Increased awareness of teaching behaviour was also evident. This included an awareness “about how body language can send really strong signals in the class” (Anne Interview 2) and of “classroom management” (Grace Interview 6). The teacher who experienced the ‘to do’ list ‘aha’ moment included awareness of aspects that were not directly related to the knowledge that the ‘aha’ moment led to. Because of the ‘aha’ moment the teacher realised how he had been “trained to be a nervous wreck when it came to planning” (Jon Interview 5). The use of the ‘to do’ list helped to retrain his thinking and behaviour and enhanced his awareness of his actions.

Perception of teaching

Changed meaning schemes also resulted in changes to the teachers’ perceptions of teaching and of themselves in the role of teacher. One teacher described realising that he had gone “full circle from a student” (Tame Interview 2) at his institution to a teacher. Another teacher described a change that saw a shift in her perception of the institution within which she taught (see 4.3.9 Anne).

Changed perception concerning teacher effectiveness was evident due to enhanced teacher specific knowledge. At the end of the study one teacher felt her teacher self-efficacy at the beginning of the study may have been a “false sense” (Sarah Interview 6) of efficacy. Changed perception included a changed “perception of what an effective teacher is” (Sarah Interview 6).

5.5.2 Pedagogy and self-efficacy development

Data concerning changes to teaching pedagogy is presented separately from data concerning changes to the teachers’ knowledge, as teaching pedagogy is the applied use of teaching specific knowledge. Ten teachers described using new teaching pedagogy or teaching strategies after experiencing ‘aha’ moments and changed meaning schemes. Pedagogies included teacher management strategies; ways of relating with others; use of feedback; the teaching process; teacher thoughts and attitudes; and teaching materials. Not all ‘aha’ moments resulted in a change to teaching. However, all transformative and related potential threshold concepts ‘aha’ moments did result in changed pedagogical behaviour and enhanced self-efficacy. As previously noted in this chapter (see section 5.3.2), successful pedagogical experiences provided the teachers with an enhanced sense of capability and enhanced self-efficacy.

Teacher management strategies

Teacher management included management of themselves and classroom management strategies. Management strategies enhanced the teacher’s sense of self-efficacy through an enhanced sense of knowing what to do when faced with a specific issue. Changed behaviour allowed teachers to “work more efficiently” and to be more “relaxed for teaching” (Jon Interview 1). Teachers introduced new strategies such as “three different forms of warning” (Cate Interview 1) and one teacher “set boundaries [in the

classroom]” (Grace Interview 1) after she crossed the potential threshold of *boundaries in effective teaching*.

Relating with others

Changed teaching pedagogy after ‘aha’ moments included how the teacher related with others. For example, one teacher’s pedagogy became more “patient-centred” (Cate Interview 1) and a second teacher changed the way he communicated with his manager and students after he crossed the potential threshold of *ambiguity in communications*. In future he “would set up a meeting [with] the appropriate people” (Eddy Interview 2) and be more aware of how communication needs to be clear to avoid ambiguity. Due to the changed way the teachers related with others, including students, the teachers felt the improved relationships were an indication of enhanced capability.

Feedback

How teachers used feedback was also different after they experienced some ‘aha’ moments. One teacher introduced student feedback into her assignment design after she crossed the potential threshold of *student voice*. She described how as a result of this ‘aha’ moment she “made a point at the end of each assessment [to] talk to them about what they [the students] liked, what could have been done better, in order to adapt [her] teaching to how they wanted it to be delivered” (Grace Interview 1). Other teachers became less defensive when they received negative feedback after their ‘aha’ moment and as such they used the feedback to “enhance teaching” (Aroha, Interview 3). For three of the teachers, feedback was no longer viewed as something to be afraid of but rather a tool for improving teaching efficacy.

Teaching process

Changed pedagogy included change to how lessons were structured. The potential threshold concept of *instructional scaffolding* contributed to five teachers describing a change to the way they presented content. One teacher's comment provides a summary of what the other teachers expressed. This teacher now begins with "so this is what we are going to cover today. Tell me what you know rather than, this is what we are doing today" (Cate Interview 3).

Because one teacher crossed the potential threshold of *student centred learning* her teaching became more student-centred and she encouraged the students to "bring in [their own] articles to do summaries on" (Grace Interview 6). Student success, because of the new teaching process, provided the teachers with evidence that their teaching had been effective. This, in turn, influenced their sense of teacher self-efficacy.

Teacher thoughts and attitudes

Teachers described change to their thoughts and attitudes after an 'aha' moment or moments. This has already been mentioned in this chapter (see Section 5.4.2). Other examples of changed teaching behaviour included the conscious effort to "talk to students individually" and "realising that even just allowing yourself to think arrrgh can colour attitude" (Anne Interview 2). This resulted in this teacher feeling an enhanced sense of teaching capability and improved relationships with students.

Teaching materials

Changed teaching pedagogy included change to teaching materials. The teachers felt more motivated to use innovative teaching materials and the successful use of these materials added to their sense of teacher self-efficacy. "I've stopped using PowerPoint

presentation. My lectures are more interactive, students talk during the lecture; they discuss the things with me. Teaching is more enjoyable” (Matt Interview 1).

One teacher developed “a different form of teaching with them [the distance-learning students]... like recordings put on [the learning management system]; videos of [her] talking put on [the online learning platform]” (Aroha Interview 1). This teacher did “a lot more news and forum posts. I’ve encouraged them to start a discussion point. So I’ve kind of been more proactive and less hands-off” (Aroha Interview 2).

Finally, this section concludes with a comment from a teacher who felt that her teaching had changed greatly because of her ‘aha’ moments or realisations:

In the very beginning, I saw myself as the teacher, the individual in front, knowing everything trying to teach the students who know nothing. I have moved to a more collaborative environment in the classroom. I really made that journey from lecturer to facilitator now (Sarah Interview 6).

Each teacher’s experience was unique to the context within which it occurred and was dependent on the teacher’s interpretation of his or her experience. As such, the change to teaching specific knowledge and pedagogy was also unique to each teacher and setting. A summary of the findings from this section as well as results that was presented in Chapter Four is presented in Table 5.4 that follows. All ‘aha’ moments, those that were transformative and those that were not, have been included in the table alongside the change in knowledge and pedagogy.

Table 5.4. Summary of ‘aha’ moments and changed or modified knowledge and pedagogy

‘Aha’ moments	Changed or modified knowledge	Changed or modified pedagogy
• <i>Ambiguity in communication</i>	<ul style="list-style-type: none"> • People can have different interpretations of the same message. 	<ul style="list-style-type: none"> • Discussions within organised meetings and confirmed understanding of messages.
• <i>Boundaries in effective teaching.</i>	<ul style="list-style-type: none"> • Awareness that boundaries are important in establishing a safe teaching environment. 	<ul style="list-style-type: none"> • No longer allows students to discuss personal matters in the classroom.
• Changed role		
• Commitment to learning varies	<ul style="list-style-type: none"> • People may not share the same passion about learning and being professional. 	<ul style="list-style-type: none"> • Introduced three forms of warning of what’s coming up and no second chances.
• <i>The impact of deficit thinking</i>	<ul style="list-style-type: none"> • Understanding of own thoughts and attitudes and the influence of these on teacher behaviour. 	<ul style="list-style-type: none"> • Before class - internal dialogue to rev oneself up. Conscious of body language. • Taking personal emotion out of teaching and tasks related to the role as teacher.
• <i>The distinctive nature of distance-learning students’ learning needs</i>	<ul style="list-style-type: none"> • Understanding that distance-learning students require different pedagogy. 	<ul style="list-style-type: none"> • Delivery style that included recorded lecturers and videos, increased number of news and forum posts.
• <i>Student engagement</i>	<ul style="list-style-type: none"> • Understanding of the learning process and of the importance of student engagement. 	<ul style="list-style-type: none"> • Changed activities to improve student engagement.
• <i>False perceptions</i>	<ul style="list-style-type: none"> • Understanding of own thoughts and the influence of false perceptions. 	<ul style="list-style-type: none"> • Identified the ‘problem’ as him and not the students. Taking action to address own false perceptions.
• Influence of trust on student learning		
• <i>Instructional scaffolding</i>	<ul style="list-style-type: none"> • That learning occurs as layers of knowledge. • Effective teaching processes for teaching content knowledge. • Knowledge should not be assumed but built on top of an existing base. 	<ul style="list-style-type: none"> • Mindful of his manner in class and seeking more understanding about trust through reading. • Made learning explicit. Wrote lecture outlines on the board and ticked them off as the lecture progressed. • Start by establishing the students’ prior knowledge and teaching content in layers of knowledge. • Changed teaching process. Begins by establishing what students already know and layer from there. • Structured teaching to fill the gaps of missing information. • Used familiar concepts to explain unfamiliar content by beginning with what is already known.
• <i>Interactive teaching</i>	<ul style="list-style-type: none"> • Intentional planning to foster student engagement. 	<ul style="list-style-type: none"> • Two-way interaction between students and teacher, more activities, small group discussions, less reliance on PowerPoint presentations.

‘Aha’ moments	Changed or modified knowledge	Changed or modified pedagogy
<ul style="list-style-type: none"> • <i>Learner autonomy</i> 	<ul style="list-style-type: none"> • Control and ownership of learning. Active learners. 	<ul style="list-style-type: none"> • Interactive tasks, group work, feedback-feedforward recognition of prior learning.
<ul style="list-style-type: none"> • <i>Student centred learning</i> 	<ul style="list-style-type: none"> • The power relationship between the student and teacher further modified. Placed student at centre of learning. 	<ul style="list-style-type: none"> • Allowed students to have greater control of learning. • Students at the centre of learning including planning and activities. Students bring own articles in to summarise.
<ul style="list-style-type: none"> • <i>Student voice</i> 	<ul style="list-style-type: none"> • The power relationship between the student and teacher in the learning context. The value of student voice. 	<ul style="list-style-type: none"> • Adapted teaching, where appropriate, according to how the students wanted it to be delivered.
<ul style="list-style-type: none"> • Teachers do not have to be the knowledge expert 	<ul style="list-style-type: none"> • That students will not judge you if you say that you do not know the answer. 	<ul style="list-style-type: none"> • Less anxious in the classroom. Asks students to work with her to find the answers.
<ul style="list-style-type: none"> • Teaching career 	<ul style="list-style-type: none"> • Studied to become a teacher. 	<ul style="list-style-type: none"> • Studied to become a teacher.
<ul style="list-style-type: none"> • <i>Te whare tapa whā</i> 	<ul style="list-style-type: none"> • A awareness of students’ holistic needs outside the classroom. 	<ul style="list-style-type: none"> • Changed delivery based on the students’ needs. Care of holistic needs including food in classroom. • <i>Te Reo</i> in the classroom and greater attempt to make contact with non-attenders. Worked to create a family like atmosphere.
<ul style="list-style-type: none"> • The impact of the environment on teaching and learning 	<ul style="list-style-type: none"> • Knowledge of the limitations and politics of her colleagues. 	<ul style="list-style-type: none"> • More patient-centred teaching.
<ul style="list-style-type: none"> • The place of simulated settings in teaching 	<ul style="list-style-type: none"> • The shared knowledge of a more experienced colleague for more effective teaching. 	<ul style="list-style-type: none"> • Used feedback to improve teaching.
<ul style="list-style-type: none"> • The power of shared knowledge 	<ul style="list-style-type: none"> • Shift in understanding of the value of student feedback. 	<ul style="list-style-type: none"> • Developed effective strategies for working efficiently.
<ul style="list-style-type: none"> • <i>The value of feedback for effective teaching</i> 	<ul style="list-style-type: none"> • A awareness that he had been trained to be a nervous wreck and that the ‘to do’ list could help in retraining. 	<ul style="list-style-type: none"> • Approached students in a non-confrontational way. Gave them a way of fixing the issue before it became formalised.
<ul style="list-style-type: none"> • To do list 	<ul style="list-style-type: none"> • Various ways and strategies for dealing with student related issues. 	
<ul style="list-style-type: none"> • Ways and strategies for dealing with problems 		

Note. Identified teaching specific potential threshold concepts are named using italic font.

5.6 Chapter Summary

This chapter began by providing the teachers' perceptions of their self-efficacy and the evaluation strategies the teachers used. This provided a context for understanding the teachers' interpretations of change, if change occurred, and each teacher's response to their 'aha' moments. The chapter then presented the ways in which 'aha' moments were related to the transformational process of the teachers' self-efficacy development. Those 'aha' moments that included a marked or noticeable change in teaching knowledge, values and/or beliefs and included mastery experiences appear to have substantially contributed to teacher self-efficacy development.

The second section of this chapter presented the properties of 'aha' moments including the transformational phases. The findings suggest that change in teacher self-efficacy has the potential to be conceptualised through a transformational process that included four phases: *antecedent phase*, *during phase*, *proximal after phase* and *distal after phase*. The findings also suggest that change in teacher self-efficacy has the potential to occur throughout all four phases with the properties acting on and being acted on by the teachers.

The third part of this chapter presented the findings pertaining to 'aha' moments, specific teacher knowledge gained, changed pedagogy and how these related to self-efficacy development. All of the teachers described gaining new or having modified knowledge (including values and/or beliefs) because of at least one of their 'aha' moments. Ten teachers described using new teaching pedagogy or teaching strategies after experiencing 'aha' moments and noticeable or impactful change to their meaning schemes. Not all 'aha' moments resulted in a change to pedagogical behaviour.

However, all transformative and related potential threshold concepts 'aha' moments did

result in changed pedagogical behaviour and enhanced self-efficacy. These findings show changed knowledge, values and/or beliefs and successful pedagogical experiences provided the teachers with an enhanced sense of capability and enhanced teacher self-efficacy.

In the chapter that follows, these findings and the findings from Chapter 4 are drawn together and will support discussion of key ideas relating to this research.

CHAPTER SIX:

DISCUSSION

“Each teacher must, as an individual, make the breakthroughs that will transform his or her realisation of what learning can be” (Cove et al., 2008, p. 1).

6.1 Introduction

This qualitative 12-month longitudinal study sought to understand the moments of clarity or ‘aha’ moments that occurred during the professional learning experiences of a group of early career higher education teachers in Aotearoa New Zealand and the role those moments played in the transformational process of their teacher self-efficacy development. One central question motivated the study: what are ‘aha’ moments in the transformational process of higher education teachers’ self-efficacy?

Following on from this four research sub-questions were developed:

1. What ‘aha’ moments are experienced during the professional learning journey of second and third year higher education teachers?
2. How are ‘aha’ moments related to change in teacher self-efficacy?
3. What are the properties of ‘aha’ moments and how do they relate to changes in self-efficacy?
4. In what ways have these ‘aha’ moments informed individual teacher knowledge and pedagogy and how does this relate to self-efficacy development?

Self-efficacy theory (Bandura, 1977a) was foregrounded throughout the study.

Transformation theory (Mezirow, 1991, 2000) provided an established framework to understand the process of transformation of teacher self-efficacy development. The

notion of threshold concepts (Meyer & Land, 2003) was used to conceptualise the ‘aha’ moment and to name potential teaching threshold concepts.

From the synthesis of findings, within and across the 11 case studies, this thesis offers the following four propositions:

- 1) ‘Aha’ moments were personal professional learning realisations that contributed to change in teacher self-efficacy;
- 2) A common transformational process of teacher self-efficacy contained four distinct phases;
- 3) Potential threshold concept-related ‘aha’ moments provided teachers with enhanced awareness of teaching capability;
- 4) Mastery experiences were the most common source of efficacy information related to ‘aha’ moments.

6.2 ‘Aha’ moments were personal professional learning realisations that contributed to change in teacher self-efficacy

From the findings there appears to be no discernible differences across disciplines or institutions involved in this study as to the actual experience, but rather variation in the context of the experience. Following a synthesis of the findings, it is proposed that ‘aha’ moments shared a common process (discussed in section 6.3) but were personal occurrences with unique outcomes with the potential to contribute to change in teacher self-efficacy development. Just how ‘aha’ moments contributed to change in self-efficacy is discussed throughout this chapter.

The teachers' 'aha' experiences contained a number of commonalities and some differences. The majority of the 'aha' moments, 21 comprised a marked or noticeable change in teaching knowledge, values and/or beliefs. These 'aha' moments constituted three main themes: 1) the teaching environment (interactive teaching, engaging students, student centred learning, student voice, trust, boundaries and strategies for dealing with difficult students); 2) knowledge about learning (instructional scaffolding, learner autonomy and the power of shared knowledge) and 3) knowledge concerning the participant's role as the teacher (deficit thinking, the ambiguous nature of communication, false perceptions and the value of feedback). The categorisation of the 'aha' moments is not definitive and as such could be open to argument. The placement of the 'aha' moments within each of these themes was done according to the common experiences described by the teachers.

No two teachers engaged with their 'aha' moments in exactly the same way. Each 'aha' moment was dependent on the teacher's existing meaning schemes (knowledge, values and/or beliefs) and how their individual cognitions interacted, influenced and were influenced by their behaviour and environmental contexts. Within social cognitive theory (Bandura, 1986), this finding was not surprising. Social cognitive theory acknowledges the uniqueness of individuals and their experiences and it places human agency at its core (Schunk & Pajares, 2005). If 'aha' moments are considered the point at which the individual crosses a threshold, as this study has done, then recent research within the threshold concepts field also supports this finding. Wallace (2010) argued that different teachers would experience the space of liminality and the crossing of thresholds differently.

Each teacher's interpretations of any change to his or her self-efficacy were also unique to the individual. For example, two teachers experienced similar 'aha' moments when

they realised that their negative thoughts and assumptions about students were having a negative effect on their attitude and behaviour towards teaching. Following their 'aha' moments, both teachers crossed the potential threshold of *the impact of deficit thinking*. However, the context, the trigger of the two 'aha' moments and the interpreted resultant change to self-efficacy varied. One teacher experienced his 'aha' moment while trying to find a solution regarding a difficult student who wanted to complete the course early and the other teacher experienced her 'aha' moment while she was reflecting on her attitude towards a particular cohort of students. This finding was unexpected and indicated that different events can contribute to the crossing of the same threshold. This finding also provided evidence that human learning is unpredictable and, as noted by Mezirow (1991), learning is dependent on the individual's previous meaning schemes.

Each teacher's responses to the 'aha' moments were also unique to the individual.

Using the previous examples, immediately following the first teacher's 'aha' moment, he felt positive affect and he believed that his teaching efficacy had substantially increased because he now had a better understanding of what he should do in similar future situations should they arise. In contrast, the second teacher experienced negative emotions that included guilt and remorse. She interpreted and articulated the negative emotions as an initial decrease to her self-efficacy. These findings were also unpredicted, as the researcher assumed that the same or similar threshold would result in similar affect responses. This assumption was because there was no literature that was located that paid particular attention to the possibility of varied affects.

However, when these findings are examined from the perspective of a social cognitive paradigm (Bandura, 1986), whereby understanding is constructed as a result of the interaction of thoughts, behaviours and the environment, the findings are consistent. Personal experiences, and variation in these experiences, can be explained through

attribution theory (Weiner, 1986) whereby differences may result according to the reasons people give for success or failure. These different reasons can be categorised and therefore understood along the dimensions of internal and controllable or external and uncontrollable and stable or unstable. The second teacher, in this example, placed blame internal to herself resulting in guilt and remorse. Her subsequent interpretation of the guilt and remorse resulted in a decrease to her self-efficacy.

Personal experiences and variation in these experiences are not described within Meyer and Land's (2003, 2005, 2006) literature concerning threshold concepts. However, Rowbottom (2007), in his criticism of threshold concepts, argued that no two people experience a threshold concept in exactly the same way. The findings from the current study aligns with Rowbottom's (2007) argument.

The literature generally refers to 'aha' moments as positive events or 'joyful breakthroughs' (see for example Northcote et al., 2011). This was not the case for some of the teachers in the current study. Some of the teachers described moments that resulted in tears and feelings of anger. Affect response, as a result of cognitive dissonance and ontological repositioning, is described in the threshold concept literature by Atherton et al. (2008), Cousin (2006) and Land (2011). They noted that there could be an affective element to crossing a threshold when the individual experiences the uncomfortable nature of questioning once held ideas, beliefs and knowledge. Land (2011) described feelings of guilt and a total sense of loss that some individuals may experience in ontological repositioning. This is similar to Mezirow's (1991) self-examination with feelings of guilt or shame. In most cases, the teachers interpretation of these affect responses resulted in change to the teacher's self-efficacy.

Representations of 'aha' experiences also were unique as were the teachers' interpretations of their experiences. Self-efficacy theory (Bandura, 1977a), transformation theory (Mezirow, 1991, 2000) or the notion of threshold concepts (Meyer & Land, 2003, 2005, 2006) were not discussed with the teachers and as such, there was little chance that these theories could have influenced each teacher's interpretations and representations of their personal 'aha' experiences. When asked to visually depict an 'aha' experience and their self-efficacy the teachers provided a variety of representations that included linear drawings and graphs, symbols and pictures.

A common representation was of a journey (some lineal and others more discursive or circular) or of a process. These however, were not the only representation. The teachers also drew symbols. Symbols were very personal to the teacher and carried varied meanings. As noted by Cousin (2006), learning is both affective and cognitive. The use of personal symbols and images is indicative of the affective aspect evidenced during the ontological shifts that occurred as part of the transformational process.

Of interest, were the tunnel (see Tame and Appendix 32) and the Archimedean Spiral (see Sarah and Appendix 33). Although one visual representation was lineal and the other was recursive, the narratives that accompanied both representations provided evidence of a series of liminal spaces that follow on from the previous one with the teacher not ever being in a post liminal state. This finding was consistent with Baillie et al. (2013) who offered that the individual experiences "continual waves of less and more comfortable liminality" (p. 243).

The variety of representations drawn by the teachers in this study suggested that the representations of 'aha' moments and/or crossing a threshold described in the literature

are restrictive and the diagrammatic metaphor of the tunnel used is problematic and essentialist (see Land, 2013; Land et al., 2014). The findings from this study indicated that the conceptualisation of such an event, like the event itself, was personal to the individual's interpretation and context. As such, personal visual conceptualisations are important particularly if accompanied with an explanatory narrative.

6.2.1 Perception of self-efficacy and self-efficacy development

It was anticipated that the teachers in the current study, all of whom had between 14 months to approximately 3 ½ years full-time teaching experience, would provide evidence of teacher self-efficacy development (see for example Chang et al., 2011; Dunkin, 1995; Morris & Usher, 2011; Woolfolk Hoy & Burke Spero, 2005). The findings of the current study confirmed this (see Table 5.2). Furthermore, the findings indicated that a contributing factor to the change in teacher self-efficacy was the 'aha' moment(s) and the new or modified knowledge values and/or beliefs that these 'aha' moments resulted in. This is discussed in section 6.4.1.

Nine teachers identified change to their self-efficacy since they began teaching and over the 12 months of the study because of specific 'aha' moment(s) that he or she interpreted as contributing to an increase or decrease to their teaching capability. Of the remaining two teachers, one teacher identified change following an 'aha' moment in terms of a changed way of viewing the institutional environment. For the remaining teacher, although he described one 'aha' moment and he felt that his teacher self-efficacy had undergone change over the course of the study, he struggled to articulate how.

The teachers had varied perceptions concerning their teacher self-efficacy and they used a range of self-evaluation strategies. As such, the specificity of understanding of their

self-efficacy influenced how the teachers interpreted their experiences and any change to their self-efficacy. This is important to discuss in this chapter, as the theoretical perspective of this study, interpretivism, is open to critique. In making this perspective explicit in the discussion, the researcher intends to bring to the fore the theoretical lens that has informed this investigation.

For the current study, there appeared to be a relationship between the teachers' self-evaluation strategies used and the specificity of understanding concerning teaching efficacy. The teachers who used multidimensional concepts to evaluate the effectiveness of their teaching (the group one teachers) demonstrated a highly specific understanding of teacher self-efficacy. They used four self-evaluation strategies that included a higher degree of teacher task specificity than those used by the other teachers. These included teaching as structuring learning; teaching as motivating learning; teaching as encouraging activity and independence in learning; and teaching as establishing interpersonal relations conducive to learning. These teachers had a clear understanding of the distinctions between self-efficacy and self-confidence. Their teacher behaviour provided evidence of highly efficacious teachers: persistence with difficult students, high self-regulation and they set high expectations for themselves and their students. This finding is consistent with the literature (Bandura, 1993; Dunkin, 1995; Pajares, 2008). For these teachers, change to self-efficacy was not confused with change to self-esteem or self-confidence.

The group two teachers' understanding of teacher self-efficacy was noticeably less specific than the group one teachers but more specific than the group three teachers' understanding. The group two teachers confused general personal self-confidence and teacher self-efficacy. At the end of the study, the group two teachers were more closely aligned with the group one teachers and they demonstrated more efficacious behaviour

than they had at the beginning of the study. For example, the group two teachers viewed student feedback as a positive thing to improve teaching. This was not the case at the beginning of the study when feedback was seen as a criticism of their ability as a teacher.

The teachers who used unidimensional concepts to evaluate the effectiveness of their teaching (group three teachers) demonstrated a noticeably less elaborated understanding of teacher self-efficacy. The group three teachers understood teacher self-efficacy, personal self-esteem and personal self-confidence to be interchangeable. When the group three teachers described a decrease or an increase to their self-esteem or personal confidence, these teachers interpreted this as a decrease or an increase, respectively, to their teacher self-efficacy. This was not restricted to just within the classroom.

It is not uncommon for early career teachers to demonstrate less specific understanding of teacher self-efficacy compared with more experienced teachers (Woolfolk Hoy & Burke Spero, 2005). What was unexpected was the variety evident in the participants' teacher self-efficacy perceptions and the two group four teachers who struggled to articulate their teacher self-efficacy. As noted in the literature, collectively, studies indicate that all teachers, regardless of which level they teach all experience a sense of teacher self-efficacy (see for example Armor et al., 1976; Gibson & Dembo, 1984; Hansen, 2005; Riggs & Enochs, 1990; Roche & Marsh, 2000; Soodak & Podell, 1993; Tschannen-Moran & Woolfolk Hoy, 2001). The two group four teachers who struggled to articulate their teacher self-efficacy appear to be somewhat different to those reported in the literature. Many early career teachers lack the vocabulary to express the concept (Kinchin & Miller, 2012) rather than not having a sense of teacher efficacy. This may have been the case with the two group four teachers.

It could be assumed that the teachers in the current study who demonstrated the most elaborated understanding of teacher self-efficacy and those who used multidimensional concepts of self-evaluation strategies (group one teachers) would potentially be those who had taught the longest. In the current study, there appeared to be no relationship between teaching experience and specificity of understanding concerning teaching efficacy. This finding was different from the literature (see Dunkin, 1995; Soodak & Podell, 1996). The current sample is too small to draw any conclusions.

Many of the teachers had not heard of the concept of self-efficacy before the study nor had they considered this in terms of their teaching. A common statement among the participants, with the exception of the two group four teachers, was that their understanding of teacher self-efficacy at the end of the study was clearer (meaning more elaborated) compared with that at the beginning of the study. For example, the teachers who had crossed the potential threshold of *instructional scaffolding* were able to articulate clearly at the end of the study how they went about introducing new content knowledge to students using a scaffolded approach. This knowledge about teaching and learning was absent at the beginning of the study with teachers describing how content had been taught as blocks of information without consideration of the students' prior knowledge.

There were other potential contributing factors to the change in each teacher's understanding of teacher self-efficacy. One of these was a growing awareness through the study interview questions and through, in some cases, formal professional development initiatives. The role of formal professional development is discussed shortly (see section 6.4.3). Another contributing factor that aligns with the literature (see for example Dunkin, 1995) is the link between the development of pedagogical skills and the development of teacher self-efficacy. This is also discussed in section 6.4.3.

6.3 A common transformational process of teacher self-efficacy contained four distinct phases

In this section, the findings concerning the common transformational process and the properties found during the teachers' experiences of 'aha' moments and change to self-efficacy are synthesised. It is argued that the experience of an 'aha' moment can be conceptualised as a transformational process containing four distinct phases: *antecedent phase, during phase, proximal after phase* and *distal after phase*.

This section also extends the current discussion in the literature concerning liminal space. Evidence across Chapter Four and Five is synthesised to argue that liminal space and liminality extends beyond the point of the threshold.

6.3.1 Evidence of a common transformation process

As noted previously, the experience of an 'aha' moment was a personal professional learning experience unique to the individual based on existing meaning schemes and how the teacher interacted with their cognitions and individual contexts. Building on the seminal works of Bandura (1977a), Mezirow (1991, 2000) and Meyer and Land (2003, 2005, 2006) the current study has identified a common process that existed during the teachers' experiences of 'aha' moments and in the transformational process to their teacher self-efficacy development. The process was constituted within a fluid liminal space that surrounded and included four theoretical phases of *antecedent phase, during phase, proximal after phase* and *distal after phase*. The current study argues that liminal space surrounds and encapsulates the entire process extending beyond the 'aha' moment. This reconceptualised liminal space is more in keeping with Turner's (1969) original description than the one offered by Meyer and Land (2003, 2005, 2006) and supports the current study's argument. Within the extended liminal space, transformation to teacher self-efficacy has the potential to be understood.

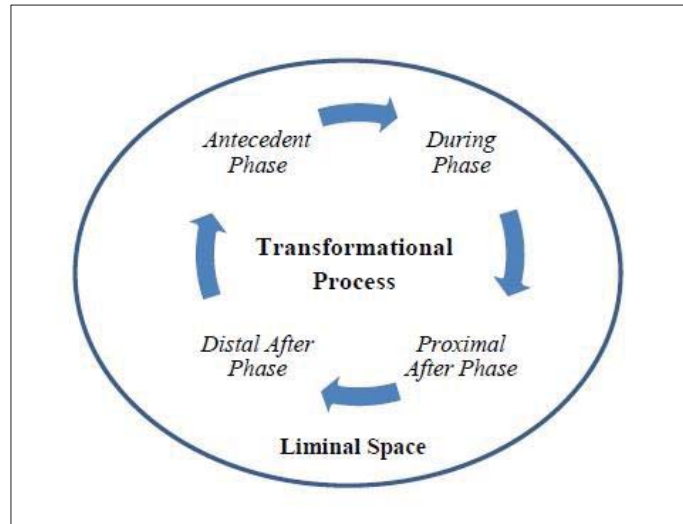


Figure 6.1. Diagrammatic representation of the transformational process of self-efficacy development

The phases identified in the transformational process are supported by the phases identified in Mezirow's (1991) transformation theory. Within the *antecedent phase*, Mezirow's (1991) phases one to six were evident: a disorientating dilemma; self-examination with feelings of guilt or shame; a critical assessment of epistemic, sociocultural, or psychic assumptions; recognition of one's discontent and the process of transformation are shared and that others have negotiated a similar change; exploration of options for new roles, relationships and actions; and planning a new course of action. Within the *during phase*, Mezirow's (1991) phase seven, acquisition of knowledge and skills for implementing one's plans, was evident as the 'aha' moment or moment of clarity. Within the *proximal after phase*, Mezirow's (1991) phases eight and nine were evident: provisional trying of new roles and building of competence; and self-confidence in new roles and relationships, and his final phase, ten, a reintegration into one's life on the basis of conditions dictated by one's new perspective, was evident as part of the *distal after phase*. This study has opted to group Mezirow's (1991) phases into before, during and two after phases as this is how they were described by the

participants in the current study. Within each of the proposed four phases, common experiences were identified.

The current study identified triggers as a common first step in entering the process of transformation and the first phase, the *antecedent phase*. All of the teachers in the current study experienced a trigger in the form of an event or individual. The triggers identified included reflection, trying something new, the challenge of the teacher's beliefs and behaviour, formal professional development, feedback and observing others. Without a trigger, there was no 'aha' moment. It was surprising that triggers were also identified for the 'aha' moments that resulted from unexpected events. These triggers only became visible through hindsight or when the trigger coincided with or briefly preceded the 'aha' moment. For example, two teachers individually discovered that their students could not do basic maths. In both events, the trigger (feedback from the students) only briefly preceded each 'aha' moment.

The literature concerning transformation theory (see for example Mezirow, 1991, 2000; Mezirow et al., 2009; Taylor & Cranton, 2012) and threshold concepts (see for example Cousin, 2006; Meyer & Land, 2003, 2005; Meyer & Land, 2007) describe the pre-self (pre-transformational or pre-liminal). However, they do not specifically identify a trigger of the process of change other than in some cases the introduction of a new concept, usually by an individual such as a teacher. The identification of triggers in the current study would indicate there is a pre-process state that varies from the other states involved in the transformational process. The trigger initiates the individual's shift out of the pre-process state into the transformational process.

6.3.2 Properties within each phase had the potential to influence self-efficacy

Within each of the phases, there was evidence of an interaction between each teacher's behaviour, cognitions and self-efficacy (including their self-efficacy on entering the phase), with the properties within each of the four phases that contributed to changes in teacher self-efficacy. This finding provides a link between self-efficacy theory (Bandura, 1977a), transformation theory (Mezirow, 1991, 2000) and the notion of threshold concepts (Meyer & Land, 2003, 2005, 2006).

Cognitive dissonance had the potential to influence self-efficacy

Cognitive dissonance is one event that can contribute to change in self-efficacy. It is not the only event. However, the majority of the 'aha' moments described in the current study occurred within the context of problem solving. The presence of cognitive dissonance and reflection confirm this. Cognitive dissonance was evident throughout the *antecedent phase* and the *proximal after phase* and included being aware that something needed to change or had changed. In some cases, cognitive dissonance resulted in the teachers experiencing 'troublesomeness' or disquiet as meaning schemes were challenged and/or realigned.

The teachers used a variety of words to describe the problematic nature of experiencing cognitive dissonance, and of letting go of strongly held knowledge, values and/or beliefs. Words included uncertainty, frustration, anger and defensiveness. These findings are consistent with the literature concerning transformation theory (Mezirow, 1991; Mezirow et al., 2009) when the individual undergoes critical self-examination and experiences dissonance. These findings are also supported by Wallace (2010) who described similar experiences when his participants encountered dissonance.

Early work concerning the notion of threshold concepts described cognitive dissonance within the pre-aha liminal space only (Cousin, 2006; Meyer & Land, 2003, 2005, 2007). In publications that are more recent, the description of cognitive dissonance after the threshold is now being considered (see for example Land, 2013; Land et al., 2014). This aligns more closely with Turner's (1974) conceptual liminal space that exists after the threshold has been crossed and includes a phase he termed 'integration'. Turner's 'integration' phase involves the reintegration of the individual into the social group and a period of adjustment to the altered state of being that may include cognitive dissonance.

Cognitive dissonance did not always include a sense of negativity. Some teachers spoke of their excitement, during the *antecedent phase*, at the prospect of what was to come when they reached the 'aha' moment. For example, one teacher spoke about his sense of awareness of the challenges ahead as he journeyed towards the 'aha' moment (he had previous successful mastery experiences during similar events) and two other teachers spoke of small goals which resulted in actions they had undertaken to ensure they reached their 'aha'. These included reading about the topic and critical self-reflection. These examples are consistent with Bandura's (1997) perceived efficacy and Maddux (1995) who argued that individuals may use an event like cognitive dissonance to motivate them. This may have been the case in the current study, as the teachers believed that they could exercise agency and they were motivated to action. For example, the findings in the current study provided evidence of excitement and goal setting within the pre-aha liminal space. This aligns with social cognitive theory but problematises the dark and foreboding nature of the tunnel metaphor described by Land et al. (2014). Three teachers did not describe a sense of foreboding but rather they

described positive anticipation. These behaviours would indicate that these teachers were highly efficacious (Bandura, 1997) and that their outcome expectancy was high.

Self-efficacy on entering the phases

The group one teachers, who had a specific understanding of teaching efficacy, did not describe major fluctuations, as interpreted by them, to their teacher self-efficacy within the *antecedent phase*. In contrast, the group three teachers, who had the least specific understanding of teaching efficacy, were more likely to describe fluctuations with all four group three teachers describing their teacher self-efficacy as going up and down frequently within the *antecedent phase*.

The group three teachers adopted avoidance tactics and on occasions gave up within the *antecedent phase*. The teachers felt that they had little or no control over their environment and they blamed a lack of success on factors external to themselves.

Previous experiences of failure arouse anxiety and weakened self-efficacy for similar future activities (Dweck, 1999). This was evident in the current study. The group three teachers described anxiety when they thought about or encountered a situation similar to a previously unsuccessful one. This finding is consistent with self-efficacy theory that states that enactive mastery experiences, successful or in this case unsuccessful (of which unsuccessful experiences are more impactful on self-efficacy than successful ones), are a key source of efficacy information (Bandura, 1977a; Schunk et al., 2014). The group three teachers' expectation of future success diminished and the addition of anxiety (physiological and affective state information) heightened his or her sense of pending failure.

In contrast, the group one teachers were more likely to demonstrate persistence with students and teaching when they encountered 'troublesomeness' or when they became

‘stuck’ within the *antecedent phase*. Their behaviour included persisting when faced with dissuading conditions that included fatigue. In keeping with the literature (see for example Klassen & Tze, 2014; Schunk et al., 2014), the group one teachers demonstrated motivation in setting teaching specific goals to improve teaching. These teachers usually attributed success and failure to internal, controllable and stable factors. As noted by Maddux (1995), the analysis of failure or a lack of progress may increase motivation as the individual increases effort which is controllable. This was certainly the case with the group one teachers describing and demonstrating a high degree of agency.

Ontological repositioning and self-efficacy

The findings suggest that ontological repositioning and the process of letting go of previously held beliefs had the potential to contribute to teacher self-efficacy.

Ontological repositioning was evident in the *proximal after phase* and the *distal after phase* and aligns with Mezirow’s (1991) tenth phase that constitutes a reintegration into one’s life on the basis of conditions dictated by one’s new perspective.

During the *proximal after phase*, the reception of the new knowledge or new way of being, was influenced by factors like the value the individual placed on the source of the new knowledge in the case of feedback (Bandura, 1977a) and by negativity bias (Rozin & Royzman, 2001). For example, how teachers received negative student evaluation comments had a greater impact on the teachers than did the positive comments. This can be explained by self-efficacy theory that states negative verbal persuasion from a valued source will have a greater impact than verbal persuasion from an unvalued source. The teachers’ interpretations of their negative responses resulted in a decrease to their teacher self-efficacy.

In the *distal after phase* teacher self-efficacy had the potential to undergo further change as the teachers became familiar with the new knowledge and way of being or as Turner (1969) put it, the new became the norm. Using the example above, in the *distal after phase*, the teachers described how they became accustomed to the knowledge delivered through the negative student evaluations. This knowledge had forced the teachers to examine critically their delivery techniques. The teachers' subsequent actions to develop new delivery techniques and any success in using the new techniques contributed to each teacher's sense of capability.

Physiological and affective states influenced self-efficacy development

The findings also suggest that physiological and affective states, in response to the properties within each phase, had the potential to contribute to change in teacher self-efficacy. This finding is consistent with Bandura (1977a) and Schunk and Usher (2012) who noted that physiological and affective states, such as nervousness and increased heart rate, are indicators of personal efficacy or inefficacy. How the teachers interpreted these physiological and affective states within each phase resulted in changed teacher self-efficacy. On ten occasions, the teachers' interpretation of feelings such as joy and elation resulted in an increase to teacher self-efficacy and on seven occasions, the teachers' interpretation of tears and/or being flushed in the face resulted in a decrease to their teacher self-efficacy.

Positive 'aha' moments did not always result in positive affect. Some of the teachers experienced negative affect when they compared their post-aha self and knowledge with that of their pre-aha self and knowledge. It was common for the teachers to express disappointment in their pre-aha self. Land (2011) noted that the process of reflection following an 'aha' moment can be uncomfortable with individuals describing affective responses that can include a sense of loss or guilt when they thought about their pre-aha

self. This was evident in the current study when the teachers reflected on how they had taught students before the 'aha'. In some cases the teachers felt guilt when they thought about the students that they may have let down through their lack of teaching knowledge. This may be because the teachers attributed their lack of teaching knowledge to an internal, controllable and/or stable factor (Pintrich & Schunk, 2002) and as such blamed themselves for the failure. This finding is consistent with Mezirow's self-examination with feelings of guilt or shame (Mezirow, 1991). Furthermore, failure (in this case failure to effectively teach the pre-aha students) that is attributed to stable, internal attributions has the most detrimental effect on self-efficacy (Brophy, 2010). The effect of this on the teacher's self-efficacy was impactful but not long lasting as their self-efficacy underwent further change in the *distal after phase*.

Some teachers also experienced shock during the *proximal after phase* and others felt physically sick. Although the teachers described initial negative affect, they felt that their teacher self-efficacy had substantially increased in the *distal after phase* because they had undergone a substantial change in their understanding of teaching and student learning. A common statement made by the teachers concerning such events was that it, the 'aha' knowledge (that included values and beliefs), was information about teaching and themselves as teachers that they needed to know. Furthermore, having this information made them feel stronger and more capable as teachers if or when faced with similar events in the future.

Agency and self-efficacy

Some of the teachers demonstrated agency within the *antecedent phase* and the *proximal after phase*. The group one teachers felt they had control and they consciously acted on the environment and on events within the *antecedent phase*, for example using

breathing and self-motivation techniques. The group two teachers demonstrated some degree of agency and only felt in control over some of the factors that were mostly internal controllable factors, such as their level of content knowledge. Both group one and group two teachers used previously successful strategies to face challenges they encountered within the *antecedent phase* and the *proximal after phase*. These included taking control of their thoughts and actions. For example, the teachers used internal dialogue, they sought advice from other colleagues and they tried new teaching strategies learned during professional development sessions. In contrast, the group three teachers did not provide evidence of agency. Consistent with attribution theory (Weiner, 1986, 2010), these teachers believed they had little to no control over the environment and as such they were less likely to persist when faced with challenges within the *antecedent phase*. It was surprising that the group three teachers also self-reported that they had a strong sense of self-efficacy, which was not consistent with their actions. This was because the group three teachers did not have a specific understanding of teacher self-efficacy and they confused self-efficacy with self-esteem and self-confidence.

Additionally, the group three teachers who included feelings of self-confidence and self-esteem in their understanding of teacher self-efficacy were more susceptible to the negative and dissuading elements within the *antecedent phase* and the *proximal after phase*. For example, two teachers reported major decreases to their teacher self-efficacy in the *proximal after phase* because their self-confidence had taken a knock. Neither teacher provided evidence of agency in addressing the cause of the negative event/aha.

Oscillation and being 'stuck' had a negative influence on self-efficacy

Oscillation and a prolonged period within the *antecedent phase* had the potential to contribute to a decrease to teacher self-efficacy. The teachers who were not able to

reach the 'aha' (those who had become 'stuck') and/or those who spent a long period of time within the *antecedent phase* described a decrease to their teacher self-efficacy. For the teacher who became 'stuck' for a prolonged period within the *antecedent phase*, her interpretation of this event resulted in a major decrease to her teacher self-efficacy and she left teaching just after the completion of the data gathering period. It is important to note that this teacher came from the group one teachers. Her teacher self-efficacy was not malleable and did not fluctuate. The prolonged period within the *antecedent phase* had become more than she was prepared to handle. This finding is consistent with Land et al. (2014) who noted that through a prolonged period of oscillation and being 'stuck' within the pre-aha liminal space, the sense of direction and progress can become obscured and as such, the individual may look to leave the situation.

Reflection and self-efficacy

Reflection was evident within the *antecedent phase*, *proximal after phase* and *distal after phases*. It was common for the teachers to return to previous 'aha' experiences and to reflect on these. For example, one teacher reflected on an 'aha' that had occurred 3 ½ years earlier and another teacher reflected over a period of approximately six months during the course of the study. Reflection occurred as the teachers integrated the new knowledge that challenged their strongly held beliefs and values. Reflection resulted in some teachers reporting a negative change to their teacher self-efficacy as a result of the teachers interpretation of the event. No teachers reported increased teacher self-efficacy because of critical reflection on their pre-aha knowledge values and/or beliefs. This finding was surprising. One teacher described a course of action following her critical reflection. She had not enacted that action at the time the interview occurred or during any subsequent interviews.

Reflection is an integral aspect of transformation theory and is required for change to occur (Mezirow et al., 2009; Taylor & Cranton, 2012). Mezirow (1994) identified that most critical reflection takes place within the context of problem solving. All of the teachers in the current study who experienced a transformational ‘aha’ moment did so while reflecting on how to solve a problem for example, helping a student who did not understand basic mathematics. Within self-efficacy theory, cognitions play an important role in self-efficacy development. The findings of the current study concerning cognitions and the role of reflection are supported by both self-efficacy theory and transformation theory.

Sense of capability and self-efficacy

Outcome expectations and sense of capability were enhanced in the *distal after phase* because of the new or modified teacher specific knowledge, values and/or beliefs. In most cases, this contributed to an increased sense of teaching efficacy. This finding is consistent with Northcote et al. (2011) and Gosselin et al. (2016) who posited that after teachers crossed a teaching specific threshold, they experienced enhanced capability and an enhanced sense of teaching efficacy. This change was attributed to the new or modified teacher specific knowledge, value and/or belief gained. This is discussed further in section 6.4.

Of interest, was that all of the teachers who had experienced a negative event, thoughts and/or experiences during the *antecedent, during* and/or *proximal after phases* felt positive and reported an increased sense of teacher self-efficacy in the *distal after phase*. The teachers commented that the negative ‘aha’ moment provided them with essential teaching specific knowledge that they believed was necessary for effective teaching, for example using student feedback to enhance teaching. This would indicate that for the teachers who experienced a negative event and reported an increased sense

of self-efficacy, they understood capability to be an acquired skill. As such, setbacks and mistakes were viewed as part of the learning process and self-efficacy was not adversely affected. This is in keeping with the literature (see for example Bandura, 1993), whereby the individual is more likely to attempt a challenging task, like problem solving, if they view ability as an acquired skill or as developmental.

No teachers in the current study described a positive event, thoughts and/or experiences during the *antecedent*, *during* and/or *proximal after phases* who then reported a decreased sense of teacher self-efficacy in the *distal after phase*. This includes the teacher who described her actual ‘aha’ moment as positive because she had discovered the reason why her student was struggling with understanding decimal points. The teacher then experienced a strong sense of guilt in the *proximal after phase* when she reflected on how she may have let her previous students down. The teacher then went on to described an increase to her self-efficacy in the *distal after phase*. This thesis recognises that a positive event, thoughts and/or experiences might possibly result in a decreased sense of teacher self-efficacy in the *distal after phase* due to ontological repositioning. There was, however, no evidence of this in the current study.

6.4 Potential threshold concept-related ‘aha’ moments provided teachers with enhanced awareness of teaching capability

The considerable findings concerning ‘aha’ moments are discussed in this section with reference to types of ‘aha’ moments, the role of professional development and changes evident in each teacher’s knowledge and pedagogy.

6.4.1 ‘Aha’ moments and changed teacher knowledge and pedagogy

Collectively, the teachers described change to their teacher self-efficacy as a result of 25 ‘aha’ moments (21 transformative and four non-transformative). The distinction made

between the 'aha' moments that were transformative and those that were not, were based on Mezirow's (1991) transformation theory using the evidence of a marked or noticeable change in knowledge, values and/or beliefs, that was not easily reversed and within the context of teaching. Evidence of this was provided through self-reporting by the teachers or changed speech and/or behaviour. For all of the 21 transformative moments, the teachers were able to describe clearly the new or modified knowledge they had gained because of the 'aha' moment. It is important to note that changed values and/or beliefs were often referred to as knowledge. For example, the teacher who described a change to her belief concerning the students' motivation for study described her changed belief as changed knowledge of her "pre-conceived notions and assumptions" (Anne Interview 2) about students.

In contrast to transformative 'aha' moments, the teachers' ability to describe the new or modified knowledge, values and/or beliefs for the non-transformative moments were not clear. Approximately half (four of the nine) of the non-transformative moments included an awareness of new or modified knowledge. Unlike the knowledge that resulted from the transformative 'aha' moments the non-transformative knowledge did not provide evidence of an impactful change to meaning schemes. For example, teachers described the knowledge as something they already knew about but the event had reminded them of this or knowledge that did not result in an impactful change. The remaining five 'aha' moments did not include any reference to new or modified knowledge, values and/or beliefs.

Changed perceptions concerning the role of the teacher and the specificity of effective teaching contributed to the teachers describing an increased sense of capability that contributed to teacher self-efficacy development. For example, four teachers described how they originally understood the role of the teacher to be the person who transfers

content knowledge rather than helping the students to discover this knowledge. After experiencing their transformative 'aha' moments and crossing the potential thresholds of *student-centred learning*, *learner autonomy* and *interactive teaching*, their perception changed to the teacher as the facilitator of the learning process. This finding is supported by Northcote et al. (2011) who described enhanced perception and capability after participants crossed thresholds.

Change to teaching specific knowledge and capability was evident in the teachers' descriptions of their changed pedagogy. For the examples above, these descriptions included activities that were student driven, group based tasks, a two-way interaction between the teacher and student and less reliance on PowerPoint presentations. The increased sense of capability was further enhanced when each teacher experienced successful mastery experiences in using the new or modified teaching techniques. Mastery experiences are discussed shortly.

Changed perception also included a changed understanding regarding the specificity of effective teaching and teacher self-efficacy. At the beginning of the study, six teachers were identified as being either group two or three teachers and as such, they demonstrated a less or least specific understanding of teaching efficacy. This excludes the two group four teachers placed to the far right of the continuum. At the completion of the data gathering stage, four of these teachers (the two group two teachers and two group three teachers) demonstrated behaviour consistent with teachers who had a more specific understanding of teacher self-efficacy. This behaviour included the use of teaching specific vocabulary and the use of capability evaluation strategies more consistent with the group one teachers. For example, the teachers had moved from using student feedback as a form of validation to using it positively to inform their teaching.

The teachers also described their increased teaching knowledge as an increased awareness of their thoughts and beliefs, and as part of their changed perception. This may be because the teachers were asked to think and talk about their experiences or equally this could be attributed to the teachers developing a more specific understanding of teacher self-efficacy. These findings are supported by Land et al. (2014) and Wallace (2010) who noted that teachers who engage in thinking, questioning and practising as part of professional development are more likely to experience “transformation” (Wallace, 2010, p. 5).

Changed pedagogy was used to confirm that a marked or noticeable change in knowledge, values and/or beliefs had occurred. The teachers reported change to pedagogy after every transformative ‘aha’ moment and after some, but not all, non-transformative ‘aha’ moments. Changed pedagogy included the use of a new or modified teacher management strategy; different ways of relating with others, which included change in power relationships; the value and use of feedback; changes to the teaching process; an awareness and change to teacher thoughts and attitudes; and the use of new teaching materials.

Change to pedagogy after the transformative ‘aha’ moments can be accounted for by the teaching specific knowledge that accompanied the crossing of a threshold. The literature would suggest that once the teacher underwent a conceptual shift they were unlikely to return to their previous way of teaching (Meyer & Land, 2003, 2005, 2006). The findings in the current study support this. There was no evidence of a return to previous pedagogy within the data gathering timeframe. Moreover, there was no evidence that knowledge was regressive in nature (that is, knowledge that returned the teacher to a former or less developed state).

6.4.2 Enhanced awareness of their teaching capability and self-efficacy development

Potential threshold concept-related 'aha' moments provided teachers with enhanced awareness of their teaching capability and contributed to self-efficacy development.

Where a transformative 'aha' moment included evidence of a potential teaching specific threshold concept, this was identified. The non-transformative related 'aha' moments lacked evidence of a marked or noticeable change and were more akin to teaching or self-management strategies rather than essential teaching related concepts.

According to the notion of threshold concepts, threshold concepts include a significant shift in the perception of a subject and are central to understanding and mastery of the subject (Meyer & Land, 2003). This study did not set out to confirm this but does propose that the teaching specific threshold concept knowledge gained through the transformative 'aha' moment(s) did contribute to an enhanced sense of capability and an enhanced sense of teacher self-efficacy. This is one of the conclusions of the research.

Other studies may have identified some of the 'aha' moments in the current study as potential threshold concepts. For example, the 'aha' that contributed to the realisation of the influence of trust on student learning or the 'to do list'. In both cases, the teachers in the current study did not provide evidence of marked or noticeable change to knowledge, values and/or beliefs specific to teaching after experiencing their 'aha' moments. One teacher stated that he already knew about the importance of trust and the other teacher provided evidence of changed knowledge outside of teaching to do with his personal time management. The hesitation to definitively identify threshold concepts is supported by criticisms of the notion (see for example Barradell, 2013; Rowbottom, 2007). This research has elected to use the word potential until the identification of threshold concepts is established.

Although a number of potential threshold concepts identified in the current study were different to those in other studies (see, Cove et al., 2008; Kinchin & Miller, 2012; Northcote, 2003), there were a number that were similar. For example, *student centred learning* identified in the current study mirrors *student centred learning* described by Kinchin and Miller (2012) and *the distinctive nature of distance-learning students' learning needs* is similar to the *distinctive nature of the online learning environment* as identified by Northcote et al. (2011).

The potential threshold concept related 'aha' moments were reported to have resulted in changed teacher self-efficacy immediately after the 'aha' moment (within the *proximal after phase*) as interpreted by the teachers as an increase (2), a major increase (12), a decrease (1) or a major decrease (5). For example, some teachers experienced a noticeable change in teaching knowledge after they crossed the threshold of *instructional scaffolding*. The teachers gained teaching specific knowledge to do with the process of teaching and learning. The teachers felt that the new knowledge had substantially increased their teaching capability and subsequently their teacher self-efficacy.

Although the non-threshold concept related 'aha' moments also resulted in changed teacher self-efficacy, the teachers described a lesser impact of the change. Five of the nine non-threshold concept related 'aha' moments were reported to have contributed to an increase (3), a major increase (1) or a major decrease (1) in teaching efficacy. For example, one teacher experienced an 'aha' moment that resulted in the realisation that there are various ways and strategies for dealing with plagiarism. This moment contributed to the teacher feeling a sense of enhanced teacher capability because he had gained a new strategy and he reported an enhanced sense of teacher self-efficacy.

The 'aha' moments identified as containing teaching specific threshold concept knowledge resulted in changed teaching efficacy described by the teachers as a major change (positively and negatively) more times than the non-threshold concept moments. This change appeared to be because of enhanced teaching efficacy that the teaching specific threshold concept knowledge afforded. A comparison between the impact of the threshold concept and the non-threshold concept knowledge on teaching capability was not located in the literature. Previous studies have investigated threshold concepts and the progress in professional knowledge (see, Cove et al., 2008; Northcote, 2003) and more recently teacher self-efficacy (Gosselin et al., 2016). These studies claimed that their teachers experienced enhanced teaching efficacy after they gained threshold concept knowledge because this type of knowledge contributed to enhanced capability. The findings from the current study propose a similar claim.

It needs to be noted that the degree of impact (increase, major increase, decrease and major decrease) has not been measured using a scale. There is a noticeable limitation to this finding. The teachers reported the degree of impact from their interpretation and narration of events. This study acknowledges that this finding requires further empirical research.

In some cases, the knowledge gained after an 'aha' moment was clearly integrative with teachers describing knowledge connections and further 'aha' moments. Four teachers described potential threshold concept related 'aha' moments and teaching specific knowledge that underwent subsequent modification through the experience of a later 'aha' moment and the crossing of a successive threshold. For example, the potential threshold concept of *the impact of deficit thinking* contributed to a teacher crossing the threshold of *false perceptions*. The potential threshold concept of *interactive teaching* contributed to two teachers also crossing the potential threshold concept of *instructional*

scaffolding. This finding suggests that there may be a chronological element in experiencing some ‘aha’ moments and threshold concepts. This is an area of threshold concept research that is under discussion (see for example Baillie et al., 2013). The integrative characteristic of the notion of threshold concepts (Meyer & Land, 2003, 2005, 2006) makes the possibility of chronological crossing of thresholds a logical conclusion.

Although the teachers crossed common thresholds, the change to their pedagogy was not identical. This finding was unexpected. Although threshold concepts and pedagogy are discussed in the literature (see for example Cove et al., 2008; Kinchin & Miller, 2012; McLean, 2012; Northcote et al., 2011), there is no discussion as to whether pedagogy could be different after crossing a threshold. As such, the researcher had assumed that common threshold concepts would result in common pedagogical practices. The findings indicated that pedagogical behaviour following the crossing of a threshold was dependent on the context and on the individual teacher. For example, five teachers crossed the most common potential threshold concept of *instructional scaffolding*; however, changed pedagogy was unique to the individual teacher. For example, one teacher made the learning process explicit for the students by crossing items off the lecture outline as the teacher moved through the lecture. A second teacher began lessons by establishing what the students already knew. A third teacher used everyday objects on which to build new content knowledge. Finally, a fourth teacher went about structuring teaching to fill any knowledge gaps that the students had. This finding would indicate that, just like the experiences of ‘aha’ moments, as described in section 6.2, the pedagogical change that follows an ‘aha’ moment is also unique to the teacher and the context within which teaching and learning occurs.

6.4.3 Professional development and ‘aha’ moments

This study set out to investigate the professional learning journeys of higher education teachers. The definition of professional learning journeys used in the current study is any teacher specific learning, formal or informal, undertaken by the higher education teacher that informs the practice of teaching. This study did not set out to establish the relationship between formal professional development and the teachers’ ‘aha’ moments. What became evident at the conclusion of the study was that the teachers who were involved in formal professional development initiatives experienced more ‘aha’ moments than did the other teachers in the study and they also crossed a greater number of thresholds. Collectively, the five teachers involved in formal professional development experienced 17 of the 30 ‘aha’ moments.

The prevalence of professional development within the teachers’ narratives who were involved in the professional development initiatives may have been because, as argued by Bumen (2009), professional development has the potential to support teacher motivation to try new skills and strategies and it provides teachers with the vocabulary to name teacher specific knowledge. This finding is in contrast to the argument put forward by Mills (2014) who claimed that early career teachers experience a greater prevalence of informal learning opportunities than they do formal opportunities.

Unprompted, three of the five teachers who were actively involved in formal professional development initiatives credited the formal professional development as being the reason they were questioning previously held beliefs and trying new ideas. Seven transformative ‘aha’ moments occurred because of the introduction of a concept or concepts during a formal professional development session, *instructional scaffolding* (2), *the impact of deficit thinking* (1), *interactive teaching* (1), *learner autonomy* (1) and *te whare tapa whā* (2). Knowledge about the concept(s) was forefront in the teacher’s

minds thus increasing the likelihood and motivation of the teacher to use it in their teaching. For example, the concept of *te whare tapa whā*, (a Māori philosophy based on a holistic view of an individual) was introduced to two of the teachers during a formal professional development workshop. Both of the teachers described how this concept influenced how they interacted with their students. During their interactions with students, both teachers individually crossed the potential threshold of *te whare tapa whā* and experienced conceptual shifts concerning the holistic nature of education and the impact of this on a student's ability to learn.

Professional development has been viewed as a conduit through which to introduce teaching specific threshold concepts with the intention of enhancing teacher capability (see for example Cove et al., 2008; Kinchin & Miller, 2012; Wallace, 2010). After the teachers engaged with the concept introduced to them through professional development, they grasped the relevance of it. For example, the teacher who wrote the outline of the lecture on the board, at the suggestion of her professional development coach, engaged with the concept as she went through ticking each stage off. It was at this point that she made the connection between her action and the process of learning and she crossed the potential threshold of *instructional scaffolding*.

As noted, professional development was instrumental in the transformative 'aha' moments. No non-transformative 'aha' moments were identified as a result of professional development. This finding supports the use of professional development in assisting teacher self-efficacy development.

6.5 Mastery experiences were the most common source of efficacy information related to ‘aha’ moments

The final conclusion that the current study makes is that mastery experiences (successful and unsuccessful) were the most commonly described source of efficacy information related to the teachers’ ‘aha’ moments. Eighteen of the transformative ‘aha’ moments and four non-transformative ‘aha’ moments included mastery experience as a source of efficacy information. Where successful mastery experiences supported changed pedagogy, teacher self-efficacy was more likely to undergo a positive change in the *distal after phase* even if it had undergone a negative change in the *proximal after phase*. Mastery experiences, the strongest source of self-efficacy information (Bandura, 1977a), provided the teachers with indicators of capability. For example, the teachers who crossed the potential threshold of *instructional scaffolding* and who had subsequent successful mastery experiences using this knowledge reported an increase (1) and a major increase (4) to teacher self-efficacy. Equally, the teachers who experienced unsuccessful mastery experiences across a variety of potential threshold concepts reported a decrease (1) and a major decrease (5) to their teacher self-efficacy.

The teachers also described other sources of efficacy information, for example physiological and affective states. However, these were less frequent. Three teachers described three transformative ‘aha’ moments that included verbal persuasion, such as feedback from students or managers. The three teachers placed significant value on the source and they all described what they interpreted as major decreases to their teacher self-efficacy. The amount of decrease was also influenced by negativity bias (Rozin & Royzman, 2001). For example, one of the three teachers described student feedback that she had received. Even though she acknowledged that she had also received some positive comments, she felt that the negative comments had more of an impact.

Physiological and affective states have already been discussed in this chapter (see sections 6.3.2). Vicarious experiences are discussed in the next section.

6.6 The cultural setting has the potential to influence self-efficacy

Conducting this research within Aotearoa New Zealand had the potential to bring to light any cultural differences in the teachers' perceptions of their teacher self-efficacy. It is important to note that culture manifests in many forms that include organisational, social and class, to name a few. The indigenous people of Aotearoa New Zealand, the *Māori* people, have a collectivist cultural tradition. Two participants indicated that they were of *Māori* ethnicity. One had a very close connection with his *marae* and culture and the other participant did not. Of the remaining teachers, six teachers identified as *pakeha* and three teachers were recent immigrants to Aotearoa New Zealand from a mix of cultural backgrounds.

The researcher anticipated that the influence of the collectivist cultural tradition would have been more evident in the teachers' responses. This was not the case. Although all of the teachers mentioned colleagues and the support they received from their colleagues, only one teacher provided evidence of collective thinking in his perceptions of teacher efficacy. This teacher self-reported that he had the close cultural connection to his *Māori* ethnicity. He was also the only teacher who mentioned an 'aha' moment that included vicarious learning as a source of efficacy information. This teacher was keenly aware of the power of shared learning in enhancing his teaching efficacy. This finding was interesting but is too small in number to draw any conclusions within the context of this study. As such, this finding requires further investigation.

6.7 Chapter summary

This chapter has discussed the synthesised findings of the individual case narratives and the cross-case findings in relation to ‘aha’ moments, the process and properties that can be conceptualised through the experience of an ‘aha’ moment and the role these experiences have in the transformational process of teacher self-efficacy development.

The findings suggest that ‘aha’ moments experienced by this group of teachers were personal professional learning realisations that were unique to each teacher and context but shared a common process containing theoretical phases of *antecedent phase*, *during phase*, *proximal after phase* and *distal after phase*. How each teacher responded to the properties within each of the four phases and their perception of their teacher self-efficacy on entering the transformational process, contributed to changes to his or her teacher self-efficacy.

The findings also indicate that ‘aha’ moments provided the teachers with new or modified knowledge, values and/or beliefs that informed their professional learning journey and an enhanced sense of teaching capability. The successful or unsuccessful mastery experience, when the teacher applied the knowledge through their pedagogy, confirmed the teacher’s capability the most.

CHAPTER SEVEN:

CONCLUSIONS AND IMPLICATIONS

“I really made that journey from lecturer to facilitator now. Everything has changed. My teaching and mostly my self-efficacy” (Sarah Interview 6).

7.1 Introduction

This chapter provides a summary of the key conclusions from the research. The contributions to teacher self-efficacy research and the developing notion of threshold concepts are presented. This is followed by the implications for practice that this research has determined and suggestions for future research. This chapter concludes with the limitations of the study and some personal thoughts.

7.2 Research conclusions

The current study builds on previous teacher self-efficacy research with the purpose of better understanding the transformational process of teacher self-efficacy development that may occur when teachers experience ‘aha’ moments. Drawn from the research, this thesis offers four overall findings:

‘Aha’ moments were personal professional learning realisations that contributed to change in teacher self-efficacy.

‘Aha’ moments were personal professional learning realisations directly experienced by each teacher (that is, ‘aha’ moments cannot be experienced indirectly through a substitute). The representations of ‘aha’ moments and interpretations of any change to his or her teacher self-efficacy were also unique to the individual teacher. Each ‘aha’ moment was dependent on the teacher’s existing meaning schemes (concerning their

knowledge, values and/or beliefs), their sense of self-efficacy on entering the transformational process and how the teacher interacted with the properties within each of the phases in the transformational process.

A common transformational process of teacher self-efficacy existed that contained four distinct phases.

‘Aha’ moments may have been unique to each individual teacher, however the experience of an ‘aha’ moment can be conceptualised as a common transformational process containing four distinct phases: *antecedent phase*, *during phase*, *proximal after phase* and *distal after phase*. These phases sit within an encompassing liminal space. Within each of the phases, there was evidence of a reciprocal interaction between each teacher’s behaviour, cognitions and their self-efficacy with the properties within each phase (for example, dissonance and troublesome knowledge). This reciprocal interaction contributed to the transformational process of teacher self-efficacy.

Potential threshold concept-related ‘aha’ moments provided teachers with enhanced awareness of teaching capability that contributed to transformation in self-efficacy.

The ‘aha’ moments that were identified as giving rise to potential threshold concepts were reported to have resulted in changed teacher self-efficacy and enhanced outcome expectancies because the teachers gained teaching specific knowledge to do with the process of teaching and learning. The teachers felt that the new knowledge or changed value and/or belief had substantially increased their teaching capability if or when faced with similar events in the future. This was true for ‘aha’ moments that the teachers reported as being a negative event as well as positive events.

Mastery experiences were the most common source of efficacy information related to ‘aha’ moments.

Mastery experiences (successful and unsuccessful) were the most commonly described source of efficacy information related to 18 of the 30 ‘aha’ moments. The subsequent successful or unsuccessful mastery experience, when the teacher applied the knowledge gained as a result of the ‘aha’ moment, contributed to confirming the teacher’s capability and sense of self-efficacy.

7.3 Contributions to knowledge

This qualitative study has provided a fresh way of exploring what happens to teacher self-efficacy when teachers experienced an event such as an ‘aha’ moment that contributed to change to the teacher’s meaning schemes and to his or her self-efficacy.

This study contributes to current self-efficacy research in identifying a process of transformation of teacher self-efficacy that includes four theoretical phases of *antecedent phase, during phase, proximal after phase* and *distal after phase*. This study suggests that within each of the phases there are common properties and experiences.

The interaction between each teacher’s behaviour, cognitions and self-efficacy (including their self-efficacy on entering the phase), with the properties within each phase has the potential to contribute to the change in the teacher’s self-efficacy.

Furthermore, the teacher generally interpreted their physiological and affective responses within each of the phases as indicators of their self-efficacy.

Within the *antecedent phase*, there exists a provoked state of liminality. This includes cognitive dissonance and awareness that change is or has occurred. Some individuals experienced discursive and troublesome knowledge, oscillation and frustration. Within this space, self-efficacy may be negatively influenced if the individual is unable to

control the effect of these properties. If the individual had a strong sense of self-efficacy on entering the *antecedent phase*, the influence of the troublesome knowledge and oscillation were less likely to have a negative impact. The *during phase* or the ‘aha’ moment was difficult to pinpoint for some and for others it was highly identifiable. Affect response was prominent within the *during phase* and strongly influenced the teacher’s interpretation of any resultant change to their self-efficacy. In the *proximal after phase* and the *distal after phase* ontological repositioning occurred as the individual engaged with the new or modified knowledge, value and/or belief. Self-efficacy had the potential to undergo further change and development as part of the ontological repositioning as the new became the norm.

The four phases provide a link between self-efficacy theory (Bandura, 1977a), transformation theory (Mezirow, 1991, 2000) and the notion of threshold concepts (Meyer & Land, 2003, 2005, 2006) that has not previously been made. This is important because there is an abundance of research that has measured teacher self-efficacy at various points in a teacher’s development. The current research used the notion of threshold concepts to help explain the unique events that may contribute to self-efficacy development as they occur. Furthermore, in linking the notion of threshold concepts with transformation theory and self-efficacy development, threshold concepts are better understood in regards to their applicability for teacher self-efficacy development.

This study adds to the current literature concerning self-efficacy in that it has provided an understanding of teacher self-efficacy in terms of the meanings constructed by the teachers and their interpretations of their ‘aha’ moments. The qualitative approach used in the current study provided a holistic description of each personal event and has contributed to an enhanced understanding that the higher education teacher’s

professional learning journey includes personal realisations, in the form of ‘aha’ moments, which inform their self-efficacy development.

Furthermore, this study contributes to current understanding concerning the informal professional learning events experienced by teachers that were detectable through ‘aha’ moments. This was identified as a gap in the current literature concerning self-efficacy development. Thirteen of the 30 ‘aha’ moments in the current study were identified as informal professional learning events that contributed to the transformational process of self-efficacy development. As such, it is important that there is an understanding of these informal professional learning events that contribute to self-efficacy transformation as this will allow for effective support for self-efficacy development outside of the formal professional development setting. This is discussed further in section 7.4.

This study has contributed to current understanding concerning the notion of threshold concepts. Barradell (2013) warned that the ready acceptance of the emerging notion has, at times, lacked the rigour that perhaps it should and that a number of important questions remain unanswered. This study concludes that one aspect of the notion that requires further discussion is the conceptualisation of liminal space. This study suggests that the definition should be reconceptualised to encompass the entire process extending beyond the threshold and that there is no end point to liminality; rather there are “continual waves of less and more comfortable liminality” (Baillie et al., 2013, p. 243).

Another aspect concerning the notion of threshold concepts that this study contributes to is knowledge about the process of threshold concept identification. This contribution to knowledge adds to the discussion offered by Kiley and Wisker (2009). In using Mezirow’s (1991, 2000) transformation theory in the identification of potential

threshold concepts, this study has focussed on the transformative nature of the ‘aha’ moment, in particular the impactful and irreversible change in teaching specific knowledge, values and/or beliefs. This contribution to knowledge goes part way in addressing Rowbottom’s (2007) criticism that the identification of threshold concepts is unobtainable. The current research recognises this is an area requiring further investigation and discussion.

Another criticism offered by Rowbottom (2007), what is deemed a threshold concept for one individual may not be a threshold concept for another, is supported by this study. The teachers in this study provided evidence of potential threshold concepts that were common as well as those that were unique to the individual teacher. The current study suggests that threshold concepts are reliant on the individual’s conceptual scheme initially possessed, as also suggested by Rowbottom (2007). However, this study goes a step further in suggesting that how the individual experiences a threshold concept is also reliant on the individual’s self-efficacy within that discipline, in this case teaching.

Those teachers with a strong sense of self-efficacy were more likely to persist with dissuading and problematic properties within the *antecedent phase* and as such, they were more likely to cross the threshold. The significance of this finding is that self-efficacy may be a determining factor in the experience of threshold concepts. Previous research concerning threshold concepts has not considered this. In order to guide teachers towards experiencing thresholds that enhance teacher’s capability and self-efficacy development, there is a need to consider the teacher’s initial understanding and sense of self-efficacy. This will then result in ensuring that the teacher is most likely to have an ‘aha’ experience that enhances their teacher self-efficacy development.

The final contribution to knowledge is the use of the visual representation activity as a technique for data gathering in regards to self-efficacy development. The current study

expanded previous use of this technique to help understand the events and the properties present when an individual encounters an experience that potentially has an influence on their self-efficacy. This technique has the potential to be used in future self-efficacy development research.

7.4 Implications for practice

Paying attention to higher education teachers' self-efficacy and being able to identify when a teacher has become 'stuck' in their professional learning journey or is at risk of leaving teaching is important because self-efficacy is a predictor of pedagogical behaviour linked to successful student achievement and outcomes (Bandura, 1977a; Schunk et al., 2014; Tschannen-Moran et al., 1998). The implication of this, drawn from the current study, relates to teacher capability development and self-efficacy enhancement. When there is evidence that a teacher has become stuck within the *antecedent phase* all measures should be taken to support the teacher and to gently guide the teacher towards the 'aha' moment. Failure to do so may result in the teacher experiencing a negative change to their self-efficacy and they may choose to leave teaching. For example, the group one teacher who became stuck for a prolonged period within the *antecedent phase* because she could not find an effective approach for classroom management could be coached through the situation. An observation of her teaching would help to pinpoint the actual issue. Once identified, this issue could be addressed with the teacher being provided with effective strategies to try. This style of proposed coaching is similar to the transformative coaching as described by Fisher-Yoshida (2009) and to the coaching described by the teachers in the current study who were involved in the institutional professional development initiative. Within both coaching methods, individual teachers are paired with a professional development coach who works alongside the teacher guiding them in their professional development. This

transformative coaching method would be effective in assisting teachers to find their own transformational 'aha' moment.

Another implication that this current study raises is in regards to adult teaching qualifications and professional development for higher education teachers. As noted in the literature, this is potentially lacking (see for example Appleby & Barton, 2012). The literature indicated that informal professional learning events have a much higher occurrence for the early career higher education teacher than do formal professional learning (Mills, 2014). This was not the case in the current study with a higher occurrence for those 'aha' moments initiated through formal professional learning. Furthermore, as indicated in the literature (see for example Roche & Marsh, 2000), higher education teachers are less likely to receive pre-service or in-service professional development that specifically targets teaching pedagogy. The conclusions of the current study would suggest that professional development, whether it is formal or informal, is an integral component in teacher self-efficacy development. This is supported by the literature (see for example Bumen, 2009; Chong & Kong, 2012; Joyce & Showers, 1995; Karimi, 2011). The teachers in the current study who were involved in formal professional development initiatives experienced more 'aha' moments than did the other teachers in the study and they also crossed a greater number of potential thresholds. This then indicates that professional development opportunities that specifically enhance pedagogical skills and the 'art of teaching' are required. As such, pedagogically based professional development should be encouraged within higher education institutions particularly for early career teachers. What are needed are professional development workshops that specifically target the teaching environment, knowledge about the learning process and knowledge concerning the role as the teacher. For

example, workshops to introduce the concept of student-centered learning, instructional scaffolding and pedagogy for enhancing distance learning pedagogy.

Informal professional development is more difficult to influence. The implications from the current study would indicate that these are also important moments in teacher self-efficacy development requiring further investigation. Informal professional learning opportunities could be encouraged by establishing a climate that supports these events through professional communities of practice (where teachers come together to share and support each other through open discussion) (Wenger, McDermott, & Snyder, 2002) and/or the ‘buddy’ system (where early career teachers are partnered with a more experienced colleague) (DiGeronimo, 1993).

Finally, many of the professional learning opportunities offered within higher education are based on vicarious learning experiences. As the literature (see for example Bandura, 1977a) and this study indicate, mastery experiences are the most influential source of efficacy information. As such, mastery experiences should be the base for professional learning opportunities. For example, professional development that allows the teacher the opportunity to practice within a simulated environment so that opportunities for failure are not as high and if failure does occur, this will not have the same consequences as it potentially could in an actual class. Alternatively, the teacher could try a new strategy or approach within their class and then reflect on the outcome of using the new strategy or approach. The latter type of guided mastery learning is similar to the professional development coaching that some of the teachers in the current study experienced.

7.5 Future research

This study did not set out to establish the relationship between formal or informal professional development and the teachers' 'aha' moments. What became evident at the conclusion of this study was that professional development (formal and informal) that guides teachers towards 'aha' moments through coaching and mastery experiences may be the most appropriate form of professional development. This provides a basis for further research that could potentially investigate this relationship with the intention of establishing effective professional development that would be most suited for enhancing self-efficacy development.

As part of the current study, the teachers also identified change in their teacher self-efficacy because of factors other than 'aha' moments. Data concerning these factors were gathered during the study. This data was not used because the data did not fit the focus of the current study. There is the potential to extract this data for analysis thus informing another study.

As noted in this study, the degree of impact of the 'aha' moments on the teachers' self-efficacy was not measured using a scale. There is the potential to develop a scale that incorporates the four phases of *antecedent phase*, *during phase*, *proximal after phase* and *distal after phase*. This would allow for the measurement of self-efficacy at different points in time based on where the individual is in the transformational process. Such a scale would provide a unique way of investigating self-efficacy development and the properties that influence this development.

This study has suggested that there may be a chronological element in experiencing some 'aha' moments and in particular some teaching specific thresholds. The reformulation of meaning schemes and meaning structures explains this. If this is true,

certain meaning schemes must be in place before reformulation to accommodate higher-level knowledge. This aspect of threshold concept research is still developing (Cove et al., 2008). It is also possible that self-efficacy development is subject to chronological events. As such, this area would warrant further research.

Conducting this research within Aotearoa New Zealand had the potential to bring to light any cultural differences in the teachers' perception of their teacher self-efficacy because of the indigenous *Māori* peoples' collectivist cultural tradition. The teacher who indicated that he was of *Māori* ethnicity and that he had a very close connection with his *marae* and culture included aspects of collectivism in his understanding of teacher effectiveness. While interesting, this finding is not transferable. However, it would make a worthwhile study if a comparison were to be made between teachers' self-efficacy of those working in other institutional settings for example a private training establishment and/or a *wānanga*.¹⁴

7.6 Limitations

As with any qualitative study conducted within a certain context there are a number of limitations. The main limitations are:

- The use of case study methodology meant that the findings are associated with 11 teachers working in two higher education institutions in Aotearoa New Zealand. This limits the transferability of findings to other institutions and other cultural contexts.
- Eleven teachers participated in this study. This is a small sample size and as such, this limits the transferability of the findings to other higher education teachers and to other teachers more generally.

¹⁴ A *wānanga* is a higher education institution that provides education in a *Māori* cultural context.

- The teachers in this study were asked to recall their 'aha' related teaching moments. It is possible that their memories were not accurate or that in the retelling of the events the teachers were prone to social desirability bias, whereby respondents answer questions in a manner that they hope will be viewed favourably (Ashton et al., 1984).
- The research design of this study elected not to measure change in teacher self-efficacy using a scale. This was because the focus of the study was on understanding the process of self-efficacy transformation from the perspectives of the teachers. The teachers themselves articulated, identified and interpreted the degree of change. This is a limitation of this study because the degree of influence of the 'aha' moments is not quantified.

7.7 Personal response to the research

Throughout this study, there have been numerous moments of clarity experienced by the teachers and equally by the researcher. My personal aim in doing this research was to explore the complex phenomenon of higher education teachers' self-efficacy development. Through this study, I have gained a strong appreciation for what the teachers in the current study experienced and I feel humbled and privileged to have been trusted with their stories. The teachers have very much been a part of my own professional learning journey.

When I first started out on this doctoral journey, I wrote an article that attempted to highlight the importance of the development of teacher self-efficacy (Percy, 2012). In a rudimentary way, I suggested that a teacher's perceptions of their teacher self-efficacy could be constructed through an understanding of the threshold concepts that inform effective teaching. Now that I have come to the end of this research, I am aware that I

was just beginning to peel the first layer of skin off the onion when I wrote that article. Since that time there have been many layers of uncovering and I suspect that there are many more to go.

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APPENDICES

Appendix 1: Letter requesting access to an institution



Institute of Education | Cnr Collinson Rd and
Albany Dr | Turitea Campus | Palmerston North
4474 | New Zealand

Dear Sir/Madam

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES

I would like to request permission to conduct a study, **Moments of clarity: A study of lecturer's professional learning experiences** at [REDACTED] campus and to invite second and third year of service lecturers to take part in the study. This qualitative study aims to gain a better understanding of the development of lecturer self-efficacy and the study is being conducted by me, Bridget Percy, for the requirements of an Education Doctorate Degree.

This request includes access to a staff database list of second and third year of service lecturers at the [REDACTED] and permission to contact the lecturers to invite them to participate in the study. I would also like to request permission to use a private meeting room at the Institute of Education for the purpose of the interviews.

Project Procedures

Qualitative data will be collected through face-to-face interviews, reflective journals, and visual mapping activities over one academic year beginning May 2014. Individual interviews will be conducted approximately every two months in an interview room within the university grounds and will take about 45 minutes each. The transcripts of each interview will be emailed to the participants two weeks after the interview for checking and participants will be asked to sign a transcript release form for the checked transcript before the next interview. Participants will be asked to keep a reflective journal to record actions, thoughts, feelings and perceptions and to draw visual representations depicting insightful moments that resulted in changed self-efficacy. It is expected that this activity will take approximately 15 minutes each time. Before each

interview I will telephone the participants to arrange interview times and to answer any questions they may have. The total time commitment for the study will be 9 ¼ hours per participant spread over one academic year (6 x 45 min interviews, 6 x 5 min transcript checking, 6 x 10 min phone calls, and 5 x 15 min reflective journal entries).

Participation in this study is not anonymous, but it will be confidential. The institution will not be identified, however given the small number of universities within New Zealand, anonymity cannot be guaranteed.

Project Contacts

If you have any comments or questions about this study, please feel free to contact me on bridgetmpercy@gmail.com (06 3768220) or to speak with my supervisor(s) Associate Professor Nick Zepke 3569099 ext 84458 or Dr. Maggie Hartnett 3569099 ext 84409.

Yours sincerely

Bridget Percy

Massey University Doctoral Candidate

“This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 14/06. If you have any concerns about the conduct of the research, please contact Prof John O’Neill, Acting Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5799 x 81090, email humanethicsouthb@massey.ac.nz.”

Appendix 2: Advertisement email & Information sheet



Institute of Education | Cnr Collinson Rd and
Albany Dr | Turitea Campus | Palmerston North
4474 | New Zealand

Dear lecturer

I would like to invite you to take part in this study **Moments of clarity: A study of lecturers' professional learning experiences.**

This qualitative study is being conducted by me for the requirements of an Education Doctorate Degree. The study aims to gain a better understanding of the development and changes in lecturer self-efficacy (which is similar to self-confidence but more specifically related to your teaching). I am interested in hearing from second and third year lecturers who have experienced moments that have resulted in changed (positive and negative) self-efficacy in teaching and working with students.

Sample

The study will involve ten participants. If a group larger than ten respond then a purposeful selection will take place so that the sample contains a balance of gender and participants across disciplinary areas of Business, Humanities, Health, and Science. If too many volunteer, I will select those who responded to this invitation first.

What is involved?

Qualitative data will be collected through face-to-face interviews, reflective journals, and visual representation activities over one academic year beginning in May 2014. Individual interviews will be conducted every two months in an interview room at the Institute of Education and will take 45 minutes each time. These will be audio recorded and the recordings will be transcribed. The transcripts of each interview will be emailed to you two weeks after the interview for checking and you will be asked to sign a transcript release form for the checked transcript before the next interview.

You will also be asked to keep a reflective journal (written, audio or video) to record thoughts, feelings and perceptions of events that resulted in a change in your self-efficacy regarding teaching and working with students. As part of the reflective journal you will be asked to draw a visual representation depicting the events and properties you experienced in those moments. The reflective journal and visual representation will be the focus of the follow-up interviews.

Your total time commitment for this the study will be 9 ¼ hours spread over the academic year (6 x 45 min interviews, 6 x 5 min transcript checking, 6 x 10 min phone calls, and 5 x 15 min reflective journal entries).

Data Management

Participation in this study is not anonymous, but it is confidential. Names will be removed and numbers will be used to identify each participant, and the university will not be identified. Data, including any interview content and responses will be stored securely and will not be discussed with anyone.

At the completion of the study raw data will be destroyed in a secure and confidential manner. Research output will be in the form of a thesis chapter outlining the findings and it may inform a journal article or conference presentation after the thesis has been submitted and accepted.

Your Rights

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

- *decline to answer any particular question;*
- *withdraw from the study at any time;*
- *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;*
- *ask for the recorder to be turned off at any time during the interview.*

Project Contacts

If you have any comments or questions about this study, please feel free to contact me on bridgetmpercy@gmail.com (06 3768220) or to speak with my supervisor(s) Associate Professor Nick Zepke 3569099 ext 84458 or Dr. Maggie Hartnett 3569099 ext 84409.

Bridget Percy

Massey University Doctoral Candidate

“This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 14/06. If you have any concerns about the conduct of the research, please contact Prof John O’Neill, Acting Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5799 x 81090, email humanethicsouthb@massey.ac.nz.”

Appendix 3: Email to Study Participants 1

Hello

Thank you for agreeing to be part of my study.

I am very keen to meet with you and to begin our first interview. When would be a good time for you, during working hours or after work/in the weekend?

I have attached the participant information letter for you to read, although I think this has already been sent to you by [name removed] in HR and a participant consent form.

I look forward to hearing from you soon and to meeting you.

Kind regards

Bridget Percy

Appendix 4: Participant Consent Form



Institute of Education | Cnr Collinson Rd and
Albany Dr | Turitea Campus | Palmerston North
4474 | New Zealand

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES.

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/do not agree to the interview being sound recorded.

I wish/do not wish to use video recordings for my reflective journal entries.

I wish/do not wish to have my recordings returned to me.

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

Signature:

Date:

Full Name - printed

“This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 14/06. If you have any concerns about the conduct of the research, please contact Prof John O’Neill, Acting Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5799 x 81090, email humanethicsouthb@massey.ac.nz.”

Appendix 5: Interview guide 1

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES.

The study aims to gain a better understanding of the change and development of lecturer self-efficacy. I am particularly interested in hearing about those moments that gave you some special insight or understanding about the practice of teaching and working with students and how those moments have changed your self-efficacy.

1. Background information

- When did you begin teaching at this university/institution?
- What experiences related to teaching did you have prior to teaching at this university/institution?
- How many papers are you currently teaching this semester?
 - What discipline are they in and how many students do you usually have in each class?

2. I would now like to ask you to think about your teaching self-efficacy. Teaching self-efficacy is your belief in yourself as a teacher to bring about change or learning for your students. Thinking about your classes this semester, if I asked you to rate your level of self-efficacy on a scale of 0-10 with 10 being the highest, what score would you give yourself?

- Can you please tell me why you rated yourself that number?

3. Through this study I am investigating self-efficacy and how are moments of clarity are related to self-efficacy change. As teachers we all experience a moment either good or bad that will result in a change to how we teach, what we think about ourselves as teachers and how we interact with students.

I am interested in hearing about your moments, what you experienced, your feelings, your thoughts etc before, during and after those moments. Thinking back over the first year(s) of

teaching which aha moments or moments of clarity have had the most influence(s) (good or bad) on your belief in yourself as a teacher?

- Can you please tell me about the experience?
 - (If necessary) Can you please describe the setting, how long ago it happened and who was involved?
 - Can you tell me about the feelings that you were experiencing at the time, before the event, during and after?
 - What were you thinking at the time, before, during and after the moment?
 - When you think about the event now how do you feel and what are your thoughts?
 - How has this moment influenced the teaching self-efficacy you feel today or your beliefs and values about teaching?
4. Are there other moments that come to mind that you would like to share?
5. Visual representation is a technique that allows us to describe a significant moment or a moment of clarity and the properties of this through pictures and symbols.
- I would like you to think about the specific moment you described and visually depict this and any feelings, thoughts, beliefs or values in a cartoon or drawing. You can use any form of visual depiction you like including pictures, colours, words and symbols. Your depiction can include what was happening just before the critical event and what happened after.
 - Let's discuss what you have drawn. Can you please tell me about the drawing? What does this symbol mean? Why did you use this colour?
6. As part of this research I would like you to keep a reflective journal to record insightful moments as they occur; what you were doing (before, during and after), your thoughts, feelings, and any changes to beliefs or values. To help you we will use two prompt questions:

- What moments have you experienced in the last few weeks that gave some insight or understanding about the practice of teaching and working with students?
 - In what ways has this moment changed your self-efficacy as a teacher if at all including your beliefs and values about teaching/learning?
7. Before we end today I have one last question. Thinking broadly about your teaching what would you say was the one thing that has positively influenced your teaching self-efficacy the most?
8. Do you have anything else you would like to add about your teaching self-efficacy?
- Do you have any questions pertaining to today's interview and/or the research project?

Thank you very much for your time today.

Appendix 6: Interview guide 2

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES.

Warm up questions.

Did you get time to read through the transcript of our last interview?

Do you feel that the transcript is an accurate record of our last interview?

Did the transcript raise any issues or concerns when you were reading it?

Was there anything in the transcript that you would like to discuss?

Before we begin can I please ask a couple of questions I missed asking in our initial interview?

Can I please ask how old you are?

Have you completed any adult teaching qualifications such as CATA (Certificate in Adult Teaching Advanced) or NCALNE (National Certificate in Adult Literacy & Numeracy Education)?

Let's begin by discussing your reflective journal and the visual representation activity.

1. What insightful moment(s) have you experienced in the last two months?
 - Can you please tell me about the experience(s)?
 - Can you please describe the setting and who was involved?
 - Can you tell me about the feelings that you were experiencing at the time, before the event, during and after?
 - What thoughts did you have at the time, before, during and after?

- When you think about the event now how do you feel and what are your thoughts?
 - How has this moment influenced or changed your beliefs and values about teaching?
 - Has this moment affected your motivation, task choice, effort, or persistence?
 - Do you feel that you would be successful if faced with a similar situation in the future?
2. Let's look at your drawing. Please tell me about the pictures/symbols/ etc that you have used.
 3. Last time you gave yourself a self-efficacy score of XXX. Would you still give yourself the same score or has that score changed?
 4. How much has this moment influenced what you do now in your role as a teacher?
 5. Do you have anything else you would like to add?
 6. Do you have any questions pertaining to today's interview and what we have been talking about?

Thank you very much for your time today.

Appendix 7: Interview guide 3

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES.

Warm up questions.

Did you get time to read through the transcript of our last interview?

Do you feel that the transcript is an accurate record of our last interview?

Did the transcript raise any issues or concerns when you were reading it?

Was there anything in the transcript that you would like to discuss?

Let's begin by discussing your reflective journal and the visual representation activity.

1. What insightful moment(s) have you experienced in the last two months?
 - Can you please tell me about the experience(s)?
 - How has this moment influenced or changed your belief in yourself to bring about change or learning for your students, your self-efficacy?
 - Has this moment affected your motivation, task choice, effort, or persistence?
2. I have some aspects of teaching self-efficacy that I have taken from another study by Velu that investigated lecturer self-efficacy. (*Place the cards out on the table and allow the participant to read through them*).
3. On this piece of paper I would like you to draw a continuum line. One end of the line will represent aspects of your teaching self-efficacy that you feel are stable or do not easily change and the other end is represent aspects that are open to movement or are less fixed. (*Try not to provide words or terms that the participant is not comfortable with. Use one of the item cards as an example as ask the participant if they feel that their self-efficacy is fixed/stable/unchangeable etc until the participant decides a phrase*

or definition that they are happy with that suits the purpose of the activity). Let's work through each of these items. Some may not apply to your teaching context. *Work through each item asking the participant to place the cards along their continuum line. Some participants may also indicate stable and fixed items that they feel negatively or positively about.*

4. What other aspects of teaching self-efficacy would you like to add?
5. Looking at these aspects, and thinking about your belief in yourself to do these tasks, which have changed since you began teaching? Which of these aspects have changed as a result or because of an 'aha' moment?
6. Do you have anything else you would like to add?
7. Do you have any questions pertaining to today's interview and what we have been talking about?

Thank you very much for your time today.

Activity cards

Delivering lectures
Keeping up to date and revising lecture materials
Preparing tutorials
Delivering tutorials
Using information technologies (ICT)
Selecting reading materials
Preparing hand-outs
Revising teaching strategies

Facilitating student discussion in class
Consulting with students
Designing subject assessment
Setting exams
Preparing assignments
Marking assignments
Assessing students' skills
Providing feedback on assessment items
Providing feedback on students' performance
Assigning grades
Responding to students' feedback
Consulting with colleagues about coursework

Adapted from Velu and Nordin (2011)Velu and Nordin (2011)Velu and Nordin (2011).

Appendix 8: Interview guide 4

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES.

Warm up questions.

Did you get time to read through the transcript of our last interview?

Do you feel that the transcript is an accurate record of our last interview?

Did the transcript raise any issues or concerns when you were reading it?

Was there anything in the transcript that you would like to discuss?

Let's begin by discussing your reflective journal and the visual representation activity.

1. What insightful moment(s) have you experienced in the last two months?
 - Can you please tell me about the experience(s)?
 - How has this moment influenced or changed your self-efficacy?
2. I'm going to ask you draw yourself or symbol that represents yourself in the centre of the paper. (*Ask the participant to explain the drawing/symbol is there appears to be significance in what they have drawn*). Around this I would like you to draw three or four circles going outwards as spheres of influence. The items on the closest circle have the greatest influence and items on the outer circles have less of an influence. If we put a line down the middle we can indicate that one side of the circles has positive influence and the other side has negative influences of your self-efficacy.
3. Thinking of the external things that have an influence on your self-efficacy what items do you think are currently having a large impact on your self-efficacy and why. (*Work through asking the participant to complete the spheres of influence. Ask probing*

questions to establish values, beliefs, changes to self-efficacy etc). Are these influences positive or negative? Have these items always had that influence?

4. Do you have anything else you would like to add?
5. Is there anything else that is currently happening that is affecting your self-efficacy?
6. Do you have any questions pertaining to today's interview and what we have been talking about?

Thank you very much for your time today.

Appendix 9: Interview guide 5

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES.

Warm up questions.

Did you get time to read through the transcript of our last interview?

Do you feel that the transcript is an accurate record of our last interview?

Did the transcript raise any issues or concerns when you were reading it?

Was there anything in the transcript that you would like to discuss?

Let's begin by discussing your reflective journal and the visual representation activity.

1. What insightful moment(s) have you experienced in the last two months?
 - Can you please tell me about the experience(s)?
 - How has this moment influenced or changed your self-efficacy?
2. Persistence:
 - Thinking back to a time in your teaching when you encountered a difficult or unfamiliar situation what did you do?
 - What about if you had to deal with a difficult student?
 - If you are struggling with a difficult teaching situation or student, would you seek help?
 - Who or where would you go for help?
 - If a student comes to you after a class and says that they don't understand the content that you have just taught (or how to do something), what would you do?
3. Academic efficacy:
 - How confident do you feel teaching your current course content?

- Has your confidence in teaching course content changed since you first began teaching?
 - Have you done anything in particular to increase your confidence in teaching course content?
4. Motivation/goal setting:
- Do you set goals around your teaching? Why? Why not?
 - What are your thoughts on setting teaching goals? Do you see them as adding value or as something you have to do to satisfy your employer?
 - What teaching professional development have you been involved in since you began teaching?
 - How do you evaluate your teaching progress/development?
 - Have you changed the way you teach or what you do in the classroom as a result of a teaching goal or teaching professional development?
5. Self-regulation:
- How likely are you to reflect on your teaching?
 - If you encounter a problem in your teaching that you can't easily overcome (i.e. a student who just can't understand the content), how likely are you to persist?
6. Do you have anything else you would like to add?
7. Do you have any questions pertaining to today's interview and what we have been talking about?

Thank you very much for your time today.

Appendix 10: Interview guide 6

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES.

Warm up questions.

Did you get time to read through the transcript of our last interview?

Do you feel that the transcript is an accurate record of our last interview?

Did the transcript raise any issues or concerns when you were reading it?

Was there anything in the transcript that you would like to discuss?

1. Let's begin by discussing how your teaching has been going since we last met.
2. What do you feel you have achieved in your teaching over the time we have been meeting?
3. How do you feel about your teaching (optimistic or pessimistic) and why?
4. What do you want to achieve in the future around your teaching?
5. How successful do you expect to be in the future (outcome expectations)?
6. Do you think your teaching self-efficacy has changed over the time we have been meeting? In what way?
7. What do you think happens to your teaching self-efficacy when you are experience challenges and break throughs?
8. Thinking about your teaching self-efficacy over the 12 months of the study, can you please visually represent what has happened or what you think your teaching self-efficacy looks like?
9. Do you have anything else you would like to add?
10. Do you have any questions pertaining to today's interview or the study and what we have been talking about?

Thank you very much for your time today.

Appendix 11: Reflective Journal Prompts

- What moments have you experienced in the last few weeks that gave some insight or understanding about the practice of teaching and working with students?
- In what ways has this moment changed your self-efficacy as a teacher if at all including your beliefs and values about teaching/learning?

Appendix 12: Transcriber’s Confidentiality Agreement



Institute of Education | Cnr Collinson Rd and
Albany Dr | Turitea Campus | Palmerston North
4474 | New Zealand

Moments of clarity:

A STUDY OF LECTURERS’ PROFESSIONAL LEARNING EXPERIENCES.

TRANSCRIBER’S CONFIDENTIALITY AGREEMENT

I (Full Name - printed) agree to
transcribe the recordings provided to me.

I agree to keep confidential all the information provided to me.

I will not make any copies of the transcripts or keep any record of them, other than those
required for the project.

Signature:

Date:

.....

“This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 14/06. If you have any concerns about the conduct of the research, please contact Prof John O’Neill, Acting Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5799 x 81090, email humanethicsouthb@massey.ac.nz.”

Appendix 13: Participant email

Subject: Moments of Clarity Study transcript and Interview 2

Hi [insert name]

Please find attached a copy of the transcript of our initial interview. I hope you have been going well and that you have been able to capture some moments of clarity into your reflective journey.

Can I please ask that you check the transcript for accuracy and indicate any information that you wish to have removed from this.

I was hoping that we could make a time for our second interview sometime next week. What day and time would be convenient?

I look forward to hearing from you soon.

Kind regards

Bridget Percy

**Appendix 14: Authority for the Release of Transcripts, Reflective Journal Entries
and Visual Representations**



Institute of Education | Cnr Collinson Rd and
Albany Dr | Turitea Campus | Palmerston North
4474 | New Zealand

Moments of clarity:

A STUDY OF LECTURERS' PROFESSIONAL LEARNING EXPERIENCES.

I confirm that I have had the opportunity to read and amend the transcript of the interview(s),
reflective journal entry(s), and visual representation activity(s) conducted with me.

I agree that the transcript, reflective journal entry(s), and visual representation activity(s) and
extracts from these may be used in reports and publications arising from the research.

Signature:

Date:

Full Name - printed

“This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 14/06. If you have any concerns about the conduct of the research, please contact Prof John O’Neill, Acting Chair, Massey University Human Ethics Committee: Southern B, telephone 06 350 5799 x 81090, email humanethicsouthb@massey.ac.nz.”

Appendix 15: Interview Notes

Interview:	Location:
Date:	
Participant details:	
What were the main issues encountered?	
What was the objective of this interview?	
Summary of what was actually being conveyed during the interview.	
Anything else that struck researcher as salient, interesting, illuminating or important in this contact?	
What new (or remaining) questions during the next contact with this participant?	
Concerns?	

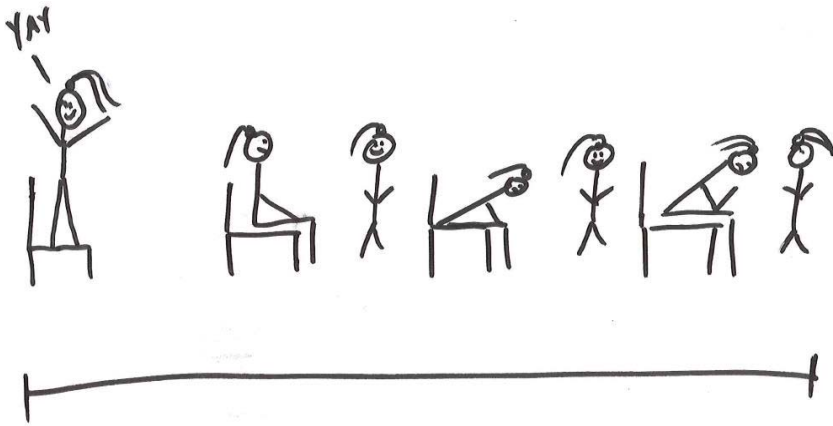
(Adapted from Miles & Huberman, 1994).

Appendix 16: Example of NVivo coding nodes

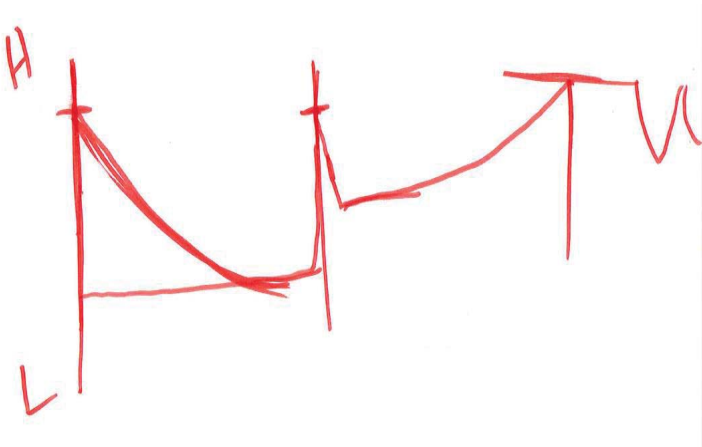
The screenshot displays the NVivo 'Nodes' window, which is a hierarchical tree structure of coding nodes. The nodes are organized as follows:

- Change to teacher pedagogy
- Changes to teacher knowledge
- Demographic Information
- Identification of 'aha' moments
 - Feelings at the time of the event
 - First teaching experience
 - Thoughtst at the time of the event
 - What are the properties of 'aha' moments
 - After
 - Before
 - belief
 - during
 - emotions
 - Physical reactions
 - Triggers of 'aha' moments
 - Feedback
 - PD
 - Reflection or thinking before the 'aha'
 - Student behaviour
 - Trying something different
 - Unexpectedly
- Interview Questions
- Other
- QUOTES

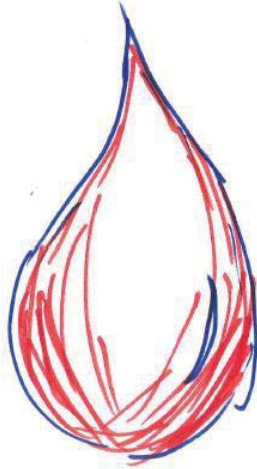
Appendix 17: Cate Visual Representation 6



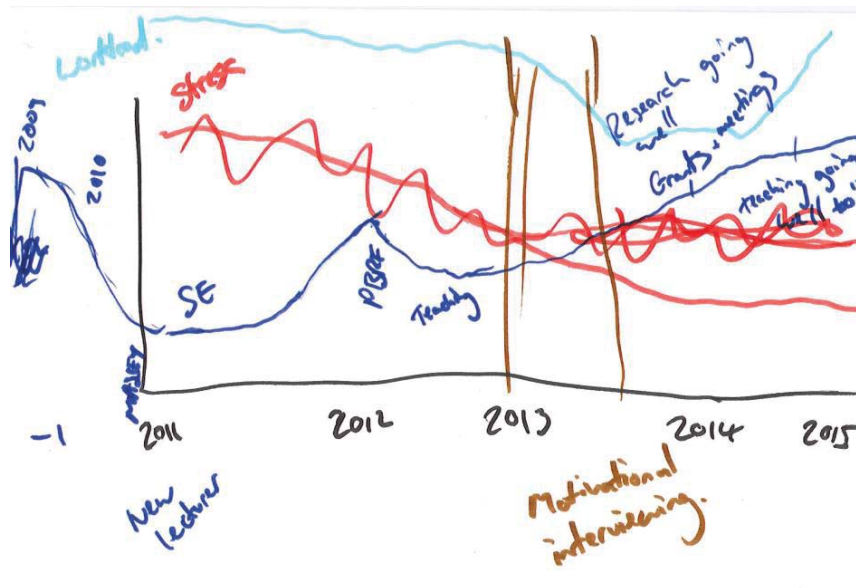
Appendix 18: Eddy Visual Representation 6



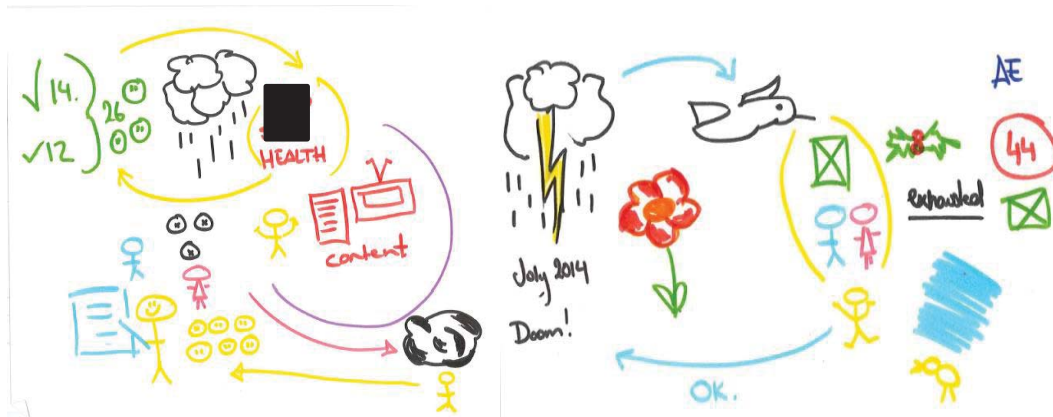
Appendix 19: Eddy Visual Representation 2



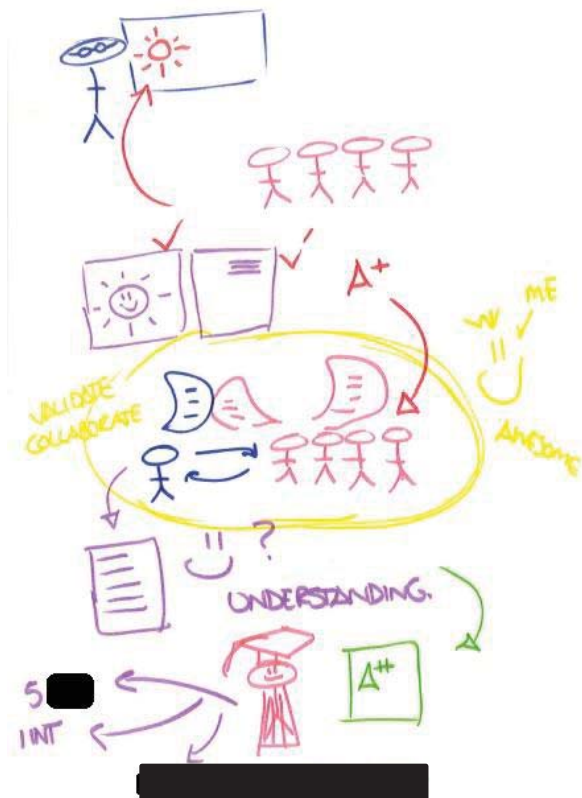
Appendix 20: Jon Visual Representation 6



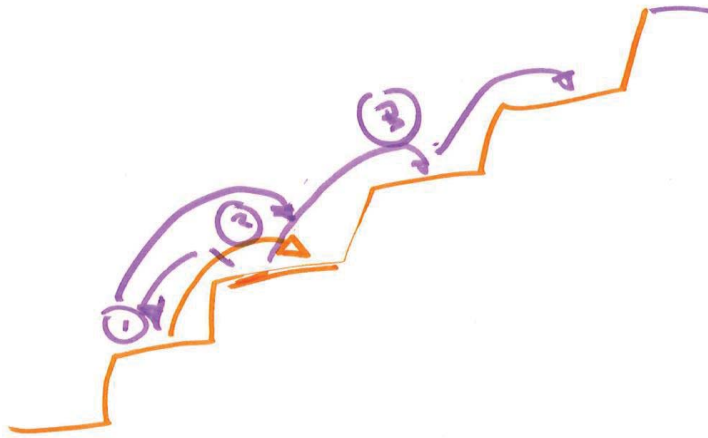
Appendix 21: Grace Visual Representation 6



Appendix 22: Grace Visual Representation 1



Appendix 23: Tame Visual Representation 6



Appendix 24: Aroha Visual Representation 6

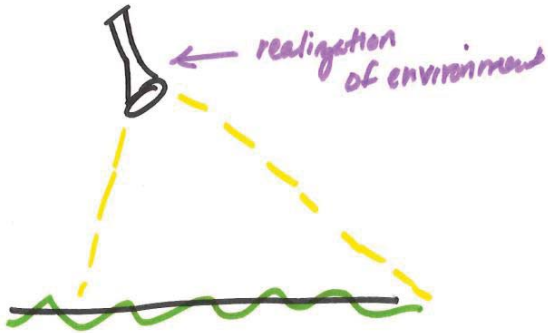


Appendix 25: Aroha Reflective Journal

Had a bad week last week. Lost confidence in myself - [redacted] surveys back-end of a hard semester, knew where I'd gone wrong but still felt upset at some of the student feedback. Wish they would see how busy it gets sometimes!

Having a break (annual leave) this week - feeling refreshed, although usually get quite demanding emails when I'm away...

Appendix 26: Liz Visual Representation 6

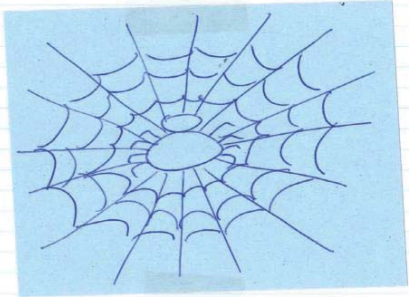


Appendix 27: Anne Reflective Journal

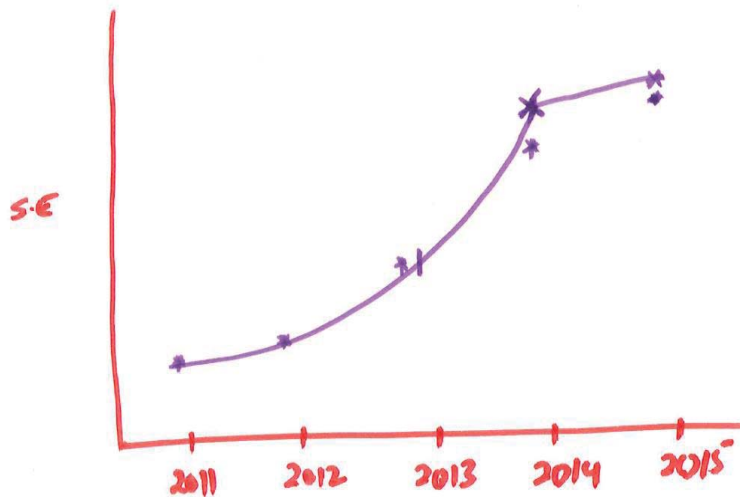
30th Oct.

Spent the whole day today running around trying to build bridges of communication between students, teachers. ~~and~~ more networking than teaching.

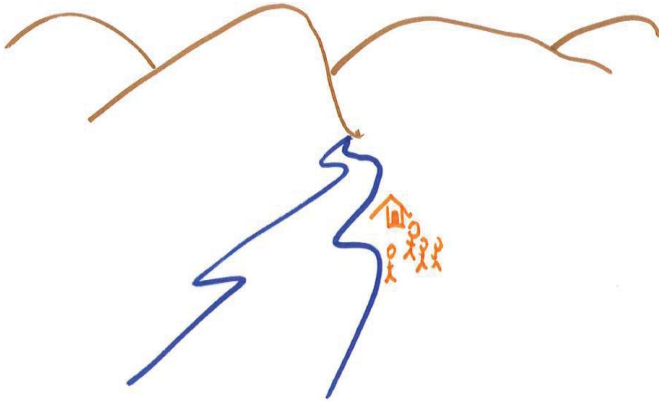
I was like a spider maintaining my web. Students need help seeking out support - they won't go themselves.



Appendix 28: Matt Visual Representation 6



Appendix 29: Tame Visual Representation 1



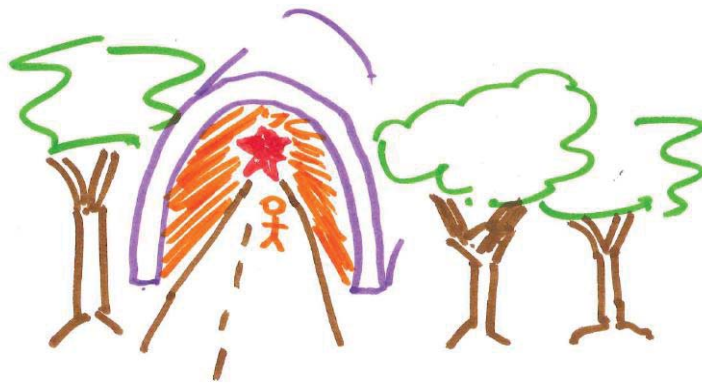
Appendix 30: Eddy Reflective Journal 3

- 'Respected'
- between the student having a 'word' to hear, and it being the end of the term, I'm not actually sure if I have helped or the student has lost respect for me.
 - I just want them all to like and listen to me, but there is always dark in the light.

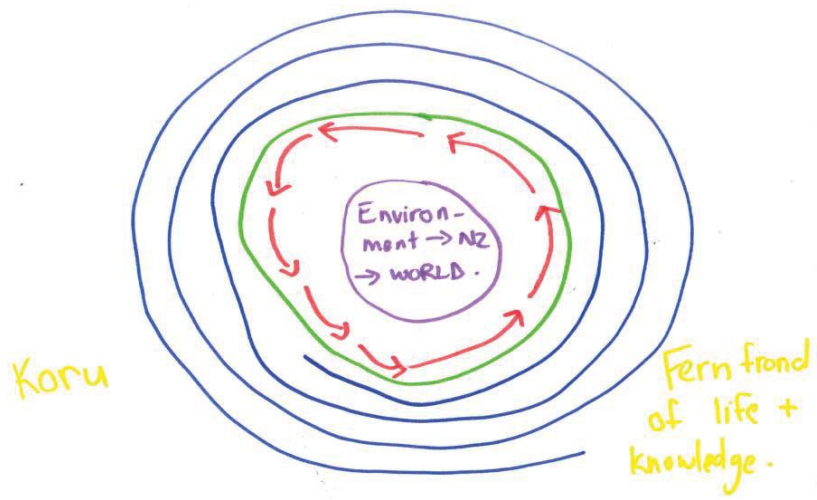
Appendix 31: Grace Reflective Journal 3



Appendix 32: Tame Visual Representation 2



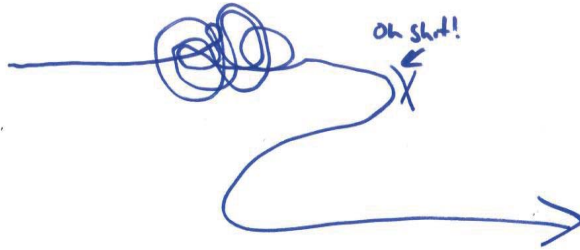
Appendix 33: Sarah Visual Representation 2



Appendix 34: Cate Visual Representation 2



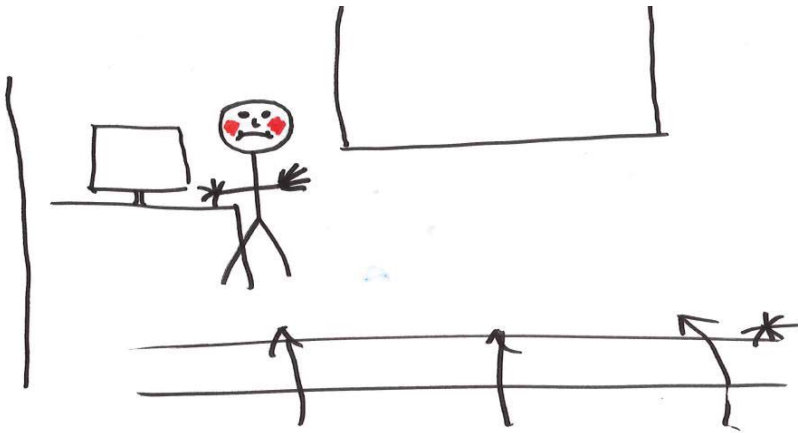
Appendix 35: Aaron Visual Representation 2



Appendix 36: Aaron Reflective Journal 1

I don't think "Moments of Clarity" is accurate. It's more peering through the fog of hindsight.

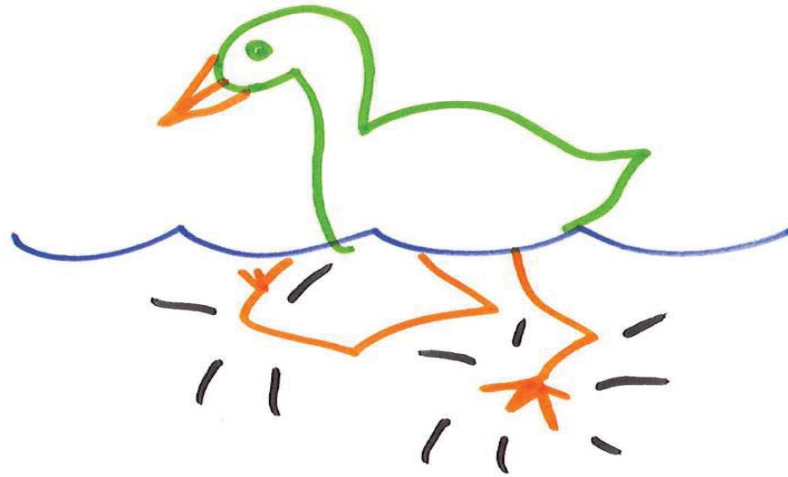
Appendix 37: Aroha Visual Representation 1



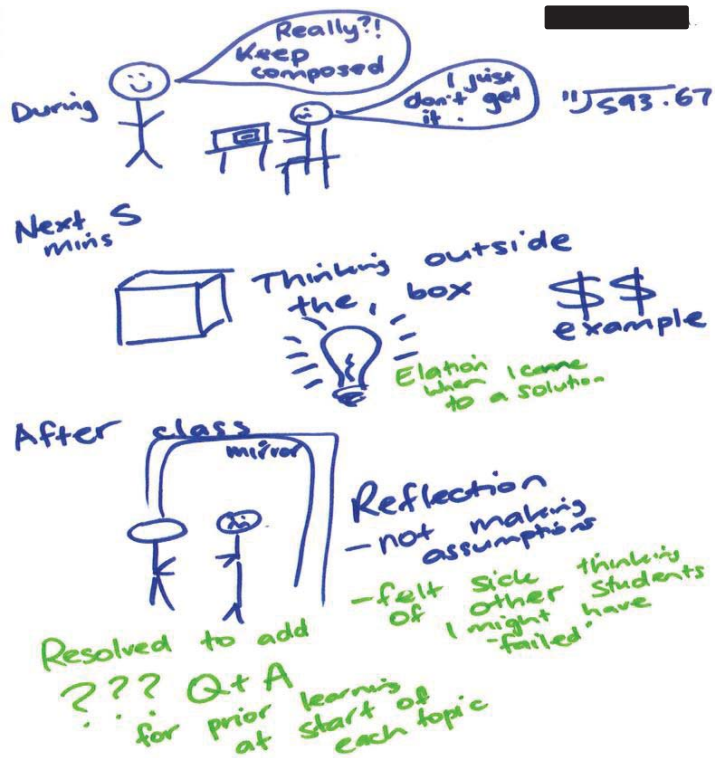
Appendix 38: Liz Visual Representation 1



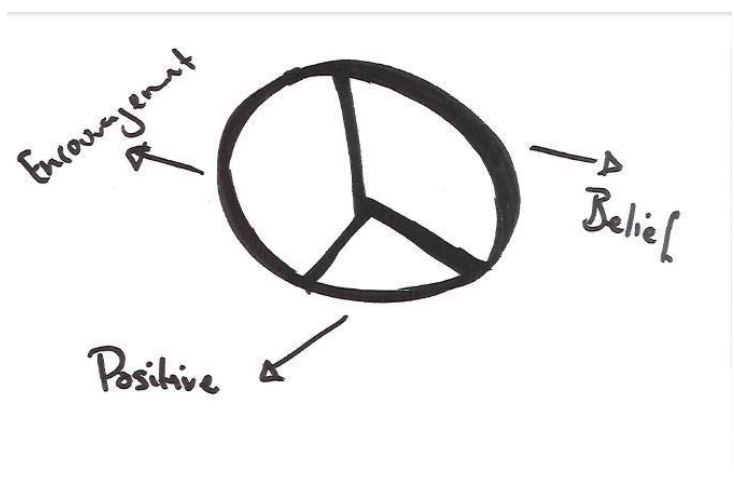
Appendix 39: Anne Visual Representation 6



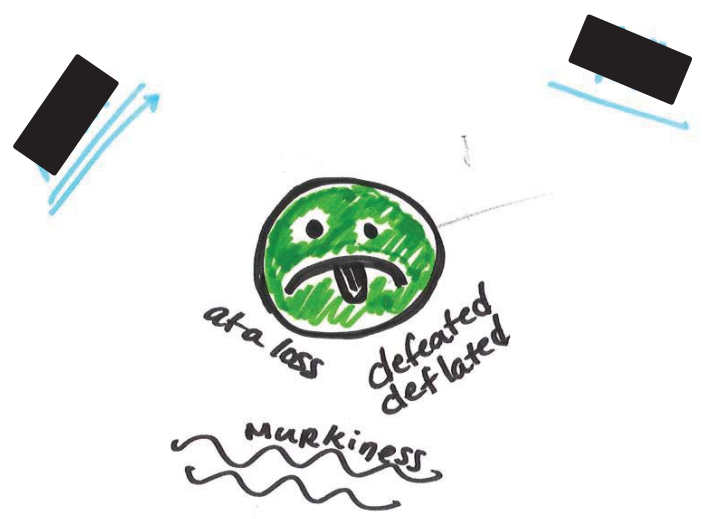
Appendix 40: Anne Visual Representation 1



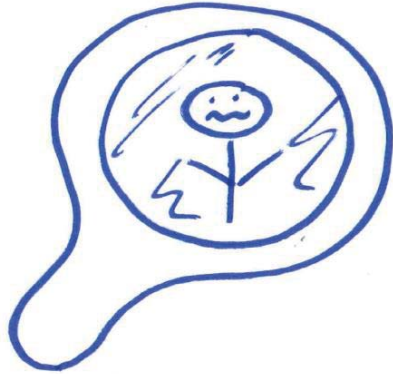
Appendix 41: Grace Visual Representation 2



Appendix 42: Liz Visual Representation 2



Appendix 43: Anne Visual Representation 2



Appendix 44: Aroha Visual Representation 2

