BUILDING PRESERVICE TEACHER CAPACITY AND PROFESSIONAL IDENTITY USING METAPHOR AND CRITICAL REFLECTION AS TOOLS TO ILLUMINATE BELIEFS, IDENTITY AND PRACTICE

A Thesis submitted by

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For the Award of

Doctor of Philosophy

2017

Abstract

Recent national and international reports have expressed concern about the quality of initial teacher education programs. A key concern is the disconnect between theory and practice highlighting the need for authentic tertiary assessment to deepen preservice teachers' understanding of the complexity of teaching and learning.

This doctoral research is focused on the development of an effective teacher professional identity and how this impacts on practice. Metaphor and critical reflection were used as tools to illuminate connections between preservice teacher beliefs, their professional identity and their practice. In response to the literature, the researcher developed a tertiary course to facilitate a self-study inquiry for preservice teachers situated in a five-week professional experience. The self-study inquiry was designed to build their capacity to determine the effectiveness or ineffectiveness of their practice by coming to know themselves better.

Design-based research sought to capture the effectiveness of the self-study inquiry in making explicit to preservice teachers their beliefs about teaching and learning, their image of self as teacher as revealed through metaphor and their pedagogy used in practice. Iterative cycles of design were used in a systematic and flexible way to determine impact on the formation of preservice teachers' professional identity. Multiple forms of data, including surveys, written metaphors and principles of pedagogy and artefacts of authentic practice were gathered to inform how the elements of the self-study inquiry process contributed to the shaping and reshaping of preservice teachers' professional identity through understandings about their beliefs, professional identity and practices.

The results indicate that all preservice early childhood teachers envisaged themselves as social constructivists and were able to analyse evidence of their practice to determine its effectiveness to varying degrees of proficiency, ranging from a minimal understanding (Level 2) to an advanced understanding (Level 5). The findings from this study afford the following contributions to knowledge: the *North Philosophy of Education Metaphor Taxonomy* and the *North 5Is model of inquiry,* which is an effective five-step process (Interrogate, Illuminate, Innovate, Investigate and Iterate) designed to guide the self-study inquiry. In addition, three models were developed to contribute to the formation of an effective preservice teacher identity. First, is a new envisioning model to scaffold the imagining of self as teacher; second, is a new model to guide a holistic approach to critical reflection; and third, is a model to guide the formation of an effective teacher professional

identity in initial teacher education expanded from an existing published model of factors which influence teacher identity.

   The self-study inquiry is a powerful pedagogical tool in initial teacher education for shifting surface learning to deep learning by creating an authentic context for professional growth as evidenced by the findings of this study.

Certification of Thesis

This thesis is entirely the work of <u>Deborah North</u> except where otherwise acknowledged. The work is original and has not previously been submitted for any other award, except where acknowledged.

Student and supervisors signatures of endorsement are held at USQ.

<u>Associate Professor Karen Trimmer</u>
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Acknowledgements

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Chapter 1   Introduction and genesis of the research

International testing has revealed the declining performance of Australian students which has fueled the community debate about the quality of teaching. Results of the Program for International Student Assessment (PISA) 2012 show that, although Australian students perform significantly above the Organisation of Economic Cooperation and Development (OECD) average in all three core domains (reading, mathematics, and scientific literacy), our performance has declined in both absolute terms and relative to other countries since PISA began in 2000. Between 2009 and 2012, Australia slipped from 15th to 19th in mathematical literacy, 9th to 14th in reading literacy and 10th to 16th in scientific literacy. The proportion of Australian students performing at the highest levels of proficiency in PISA has also declined over time, particularly in mathematical and reading literacy. At the same time, the proportion of Australian students failing to meet minimum proficiency standards has increased, particularly in mathematical literacy. Enhancing the proficiency of the Australian teaching profession is critical to accomplishing discernible improvements in the achievement of over 3.5 million students.

There is strong evidence that high-quality teaching is fundamental to student learning, and is the biggest in-school factor determining student outcomes (Hattie, 2009). Consequently, improving the effectiveness of teachers is the key to improving schools, but most initial teacher education programs and education systems internationally have only recently focused reform efforts on transforming initial teacher education (Teacher Education Ministerial Advisory Group [TEMAG], 2015). To this end, it has been noted that the design of initial teacher education programs impacts on the quality and effectiveness of their practice, and in turn, on their students' achievements (Learning First, 2015).

Another recent major report on quality teaching entitled, *Action Now: Classroom-Ready Teachers*, also expressed concern about the quality of initial teacher education programs both within Australia and internationally. In fact, this report highlighted that teacher employers are dissatisfied with the classroom readiness of initial teacher education graduates (TEMAG, 2015). Moreover, evaluations of a number of initial teacher education programs globally have identified the following key issues that need to be addressed in contemporary initial teacher education programs:

- Strengthened assessment of preservice teachers to ensure classroom readiness is improved.

- Integration of theory and practice through effective partnerships between on campus and workplace learning.

- Increasing innovative models of assessment of preservice teachers' classroom readiness.

- Insufficient focus on data collection as evidence of practice.

- Development of analysis skills for clinical teaching practice.

- Consistent and transparent assessment compared to an agreed benchmark as a key feature of professional entry requirements.

- Professional standards must be reviewed regularly to ensure that these standards are meet the contemporary needs of the classroom (TEMAG, 2015).

1.1 Factors that impact on these issues

Current reports on initial teacher education noted that authentic links between theory and practice seem to be missing from the design of initial teacher education courses, in particular, the professional experience (Russell, 2005). This issue is also illustrated in the statement from reports that suggest preservice teachers do not grasp the complexity of the daily decision-making processes encountered by teachers (Lortie, 1975). Furthermore, there is widespread evidence that the focus on theory in teacher education courses has little impact on the development of preservice teachers' ability during practicum experiences (Cochran-Smith & Zeichner, 2005; Zeichner & Tabachnik, 1981). In fact, during professional experiences, preservice teachers seem to be socialised into the status quo of school practice or, at worst, simply reproduce what they experienced about teaching when they were students in school (Tigchelaar & Korthagen, 2004; Tillema, 1997). The lack of truly transformative learning by preservice teachers during professional experiences is perhaps most succinctly summarised in the title of Britzman's (2003) book about preservice teaching, *Practice makes practice*, rather than 'practice makes perfect.' Her analysis of the research surrounding this situation has identified that many preservice teachers have been caught in the dilemma between the expectations of the cooperating teacher in the school and

the university's expectations and their desire to develop a personal teaching style which contributes to the ineffective nature of some professional experiences. This *struggle for voice* has been documented in a number of studies (Britzman, 2003; Loughran, 2006). This struggle is illuminated by preservice teachers who reported that sometimes they had to adopt the teaching approach of their mentor during the professional experience which was in conflict with the university's requirements for the professional experience. This situation resulted in a *tactical compliance* (Jephcote & Salisbury, 2009) for preservice teachers rather than creating a professional space for transformative learning.

Research indicates that preservice teachers who participate in professional experiences linked to course work are better able to understand the theory and to apply these concepts in practice to support student learning. This avoids the theory and practice disconnect prevalent in current initial teacher education programs. Internationally, better-performing systems have integrated the professional experience with the course work of their teacher education programs. This approach is illustrated in a study of seven exemplary teacher education programs in the United States that identified a common feature of these programs was the provision of teaching opportunities (professional experience) carefully interwoven with course work (Queensland College of Teachers, 2012). Additionally, TEMAG (2015), noted examples of Australian initial teacher education programs working in partnership with schools to ensure the integration or praxis of theory, knowledge, and practice. To achieve this goal, the inclusion of authentic assessment in teacher education programs design plays a pivotal role in developing preservice teachers with a deep knowledge and understanding of classroom contexts, as well as diverse learners. This approach to assessment in course design requires the adoption of an evidence-based approach to practice.

A factor that illuminates the issues related to the ineffectiveness of professional experience within an initial teacher education program is the lack of examination of preservice teachers' prior assumptions and beliefs. Brookfield (1995) states that initial teacher education programs should focus attention on preservice teachers' assumptions and beliefs which are often complex and challenging to identify. These assumptions and beliefs are defined as the taken-for-granted beliefs about the world and our place within that, and they appear obvious and are therefore not usually explored or explained explicitly. However, assumptions and beliefs give meaning and purpose to our teacher professional identity which

subsequently impacts on the effectiveness of pedagogies adopted in our teaching practices.

Becoming aware of the implicit beliefs that frame how we think and act is one of the very challenging roles of initial teacher education program design. Furthermore, Segall (2002), also supports this view that prospective teachers are not invited to examine critically their underlying assumptions and beliefs about how they conceptualise teaching and learning. The focus for preservice teachers is on learning how to perform expected actions rather than analysing those actions or the expectations (Segall, 2002).

Another factor that impacts on the success of initial teacher education programs is the adoption of an explicit approach to the formation of *teacher identity*. This concept is hard to articulate as well as being easily misunderstood and open to interpretation (Olsen, 2008). Since the shaping and reshaping of teacher professional identity is not an individual process but involves other collectives, as well as the discourses associated with them, initial teacher educators must envision and structure courses that are designed to promote social interaction and activities to engage preservice teachers in the exploration of their developing professional selves. Professional contexts create an authentic space for the shaping and reshaping of professional teacher identities (Feiman-Nemser, 2001), resulting in an emerging vision of whom the preservice teacher wants to become (Beauchamp and Thomas, 2009). As preservice teachers develop visions of their classroom practice, professional identities continue to develop and can be instrumental in guiding their practice (Hammerness, 2006). The pedagogical goal of an initial teacher education program should be to provide preservice teachers with an inquiry-based learning environment that is designed to offer opportunities for productive dialogue and engagement in transformative learning contributing to the formation of an effective teacher identity (Danielewicz, 2001).

As stated in the Learning First report *A new approach: Reforming teacher education* (2015), most systems around the world are focused on addressing the issues identified in the report, such as, reversing the pattern of under-prepared teachers graduating from Universities in a bid to reform initial teacher education. Thus, several reports including a report requested by the Queensland College of Teachers [QCT] (2012) have synthesised best tertiary practice that enables graduate teachers to meet these challenging professional standards. For example, Darling-Hammond (2006) presented a set of principles as a guide for well-designed initial teacher education programs to ensure coherence based on a common, clear vision of good teaching grounded in an understanding of learning:

1. *A strong core curriculum* taught in the context of practice, grounded in knowledge of child and adolescent development, learning in social and cultural contexts, curriculum, assessment and subject matter pedagogy.

2. *Extensive, connected clinical experiences* that are carefully developed to support the ideas and practices presented in simultaneous, closely interwoven course work.

3. *Well-defined standards* of practice and performance that are used to guide and evaluate course work and clinical work.

4. *Explicit strategies* that help students to (1) confront their deep-seated beliefs and assumptions about learning and students, and (2) learn about the experiences of people different from themselves.

5. *An inquiry approach that connects theory and practice*, including regular use of case methods, analyses of teaching and learning, and teacher research applying learning to real problems of practice and developing teachers as reflective practitioners.

6. *Strong school-university partnerships* that develop common knowledge and shared beliefs among school- and university-based faculty and allow candidates to learn to teach in professional communities modelling state-of-the-art practice for diverse learners and collegial learning for adults.

7. *Assessment based on professional standards* that evaluate teaching through demonstration of critical skills and abilities using performance assessments and portfolios that support the development of adaptive expertise (Darling-Hammond, 2006, p. 276).

1.2 Positioning of researcher's beliefs

In light of the issues illuminated in the literature about principles which guide the effective design of initial teacher education programs, it is important for the researcher to consider her beliefs as a teacher and how these beliefs about teaching and learning impact on tertiary course design. In my career as a teacher, I have worked in a number of roles such as early years of a school teacher, reading recovery teacher, special education teacher and Assistant Principal in a variety of contexts including private and public schools within

Australia and the United States. I adopted a social constructivist approach to teaching and learning when working with young children as it framed how I interacted with children as a co-constructor of knowledge, from the very beginning of my career. This paradigm draws heavily on the work of Vygotsky (1962) who believed that knowledge was constructed through inquiry and collaboration in social contexts.

It is challenging to adopt a social constructivist approach in tertiary contexts due to time constraints within a semester as well as teaching in an online mode. Darling–Hammond (2006) suggests that authentic assessment is a significant feature of effective and impactful initial teacher education program that enables preservice teachers to make meaningful links between theory and practice as well as their image of self as teacher. Chapter 3 and Chapter 4 explore the relationship between the researcher's philosophical perspective and her beliefs as an initial teacher educator about teaching and learning as illustrated in the course assessment featured in this research study.

1.3 The conceptual framework

Recent reports that highlight issues related to the quality of graduates entering the teaching profession identify design principles that should be addressed in the development of initial teacher education programs. In response to the concerns identified thus far and the related theoretical concepts, a conceptual framework has been developed to guide the research design drawing upon the following as shown in Figure 1-1. This framework is used as a basis to develop the deep arguments that support its structure in the literature review and ultimately provide a basis for its contribution to knowledge. Throughout this thesis, small graphics will highlight the section under discussion.
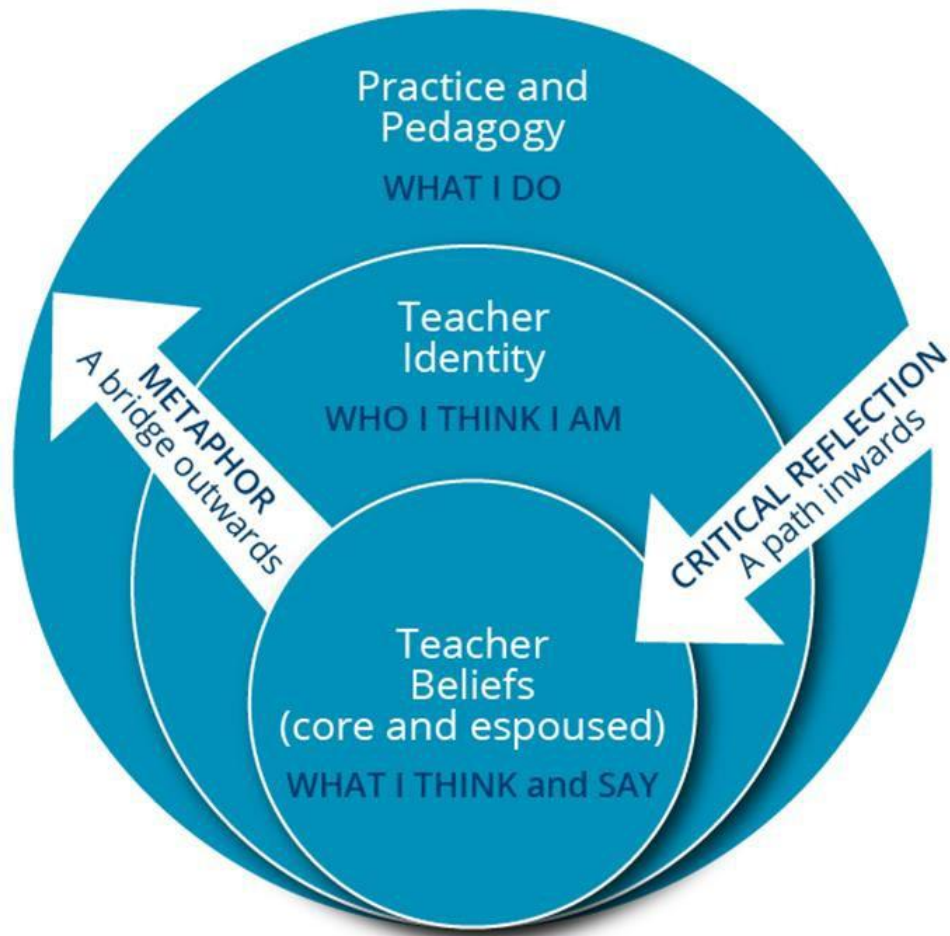
Figure 1-1 **The conceptual framework shows relationships between concepts, and tools used to shed light on these relationships**

The inner circle – teacher beliefs. The inner circle includes both the core beliefs and the beliefs that preservice teachers espouse about teaching and learning. Core beliefs can be thought of as their innermost thoughts (what I think), whereas espoused beliefs (what I say) may be modified versions of those core beliefs due to a sense of *political correctness* (what I think I should say)

(Larrivee, 2000). Initially, an attempt was made to separate core beliefs from espoused beliefs, but this was difficult to justify from the literature. Much of the literature simply speaks of *beliefs* (Fives & Buehl, 2012) or is inconsistent with the use of these terms

Nonetheless, teacher beliefs are core to the conceptual framework because initial teacher educators have become increasingly aware that on entry to teacher education programs, preservice teachers bring with them a myriad of experiences, assumptions, and beliefs about teaching and learning (Feiman-Nemser & Remillard, 1996). Therefore, teacher beliefs are a form of personal knowledge that is generally defined as pre- or in-service teachers' implicit assumptions about teaching and learning (Herrmann & Duffy, 1989). Teachers' beliefs appear to be relatively stable and resistant to change (Kagan, 1992). The literature on teacher belief systems also indicates that short-term interventions, such as teacher education programs, may not change preservice teacher beliefs (Kagan, 1992; Widen, Mayer-Smith & Moon, 1998; Tanase & Wang, 2010). This may be because preservice teachers' body of experience begins to accrue during his or her time as a school student, acting as a preliminary training phase or an *apprenticeship of observation* (Lortie, 1975). These prior school experiences may serve as the filters used in the evaluation of information entering the cognitive system, influencing what information preservice teachers' pay attention to, how they interpret information, and how that information is (or is not) incorporated into a teacher's explicit beliefs, knowledge, or practice (Lee, Baik, and Charlesworth (2006) et al., 2006; Yerrick, Parke, and Nugent, 1997).

If this research on preservice teacher beliefs is valued then it poses a challenge for initial teacher educators in knowing which strategies need to be incorporated into the design of initial teacher education programs to improve the quality of preservice teachers and to better prepare graduate teachers for the reality of teaching in today's high-stakes environment (Levin, He & Allen, 2013). As Leavy (2007, p. 3) stated: "While changes in beliefs have been found to occur and often as a result of education programs, preservice teachers are not seen to develop new perspectives during teacher education courses unless they are confronted with their held beliefs." Therefore, it is important that initial teacher education programs include the explicit study of teacher beliefs, in addition to other factors that influence teacher quality and teacher retention into their initial teacher education programs (Fairbanks et al., 2010).

The second circle – teacher identity. The second circle of the conceptual framework encompasses the notion of becoming a teacher (who I think I am); that is, the individual adopts an identity that incorporates beliefs, images, and constructs about people, learning, and knowledge. Danielewiez (2001) defined identity thus, "… identity refers to how individuals know and name themselves and how they are recognised and regarded by others" (p. 3).

It has been suggested in a report by Flores and Day (2006), based on a study of new teachers in their first two years of teaching, that "preservice teacher education seemed to have had a relatively weak impact on the way in which new teachers approached teaching and viewed themselves as teachers" (p. 224). The Flores and Day (2006) study explored how assumptions and values about teaching and being a teacher were challenged in school settings, including the ways the professional and cultural environment affected their teacher professional identities. It highlighted the key role that context played in (re) shaping teachers' conceptualisation of teaching and learning which in turn either facilitated or hindered their professional learning and development. "Despite the strong connections between personal biography and a robust sense of identity, it is clear that in most if not all cases, history was mediated by context" (Flores & Day, p. 230).

Beauchamp and Thomas (2009) also believe that the development of teacher professional identity does not automatically come with experience; indeed, some form of deliberate action is necessary to ensure that new teachers begin their careers with the appropriate tools to negotiate the challenges of the first few years of teaching. Moreover, few studies examine the process by which preservice teachers develop their teacher identity during initial teacher education (Thomas & Beauchamp, 2011). Therefore, understanding preservice teacher identity could contribute significantly to the research on effective initial teacher education pedagogy.

One of the most complicated aspects of understanding professional identity is grappling with the notion of how identity shifts and reshapes (Flores &Day, 2006). Developing a strong sense of teacher identity may be crucial to the well-being of new members of the profession (Thomas & Beauchamp, 2011). Therefore, the more initial teacher educators understand about the process of developing teacher identity as well as how to facilitate this development in initial teacher education, the greater the opportunity for preservice teachers to be more resilient and classroom ready when entering the profession.

The outer circle – teacher practice and pedagogy. Preservice teachers' practice, particularly pedagogy, is the focus of the third circle in the conceptual framework. Sociocultural theories have provided a conceptual tool for understanding effective practice adopted in early childhood contexts, that of the preservice teachers I teach. These theories draw heavily on the work of Vygotsky (1962), and more recently Rogoff (1990). Vygotsky (1962) saw the social environment as being instrumental to a child's learning, with Rogoff extending this view to include "the development of children in the context of their own communities" (Rogoff, Mosier, Mistry, & Göncü, 1998, p. 228).

Preservice teachers who adhere to sociocultural beliefs about teaching and learning adopt a social constructivist paradigm. This means these preservice teachers believe in creating a student-centred environment where the control of the power is shared between the teacher and students. This shared control is often revealed by the quality of classroom interactions and talk. Thus, the constructivist teacher is responsible for creating
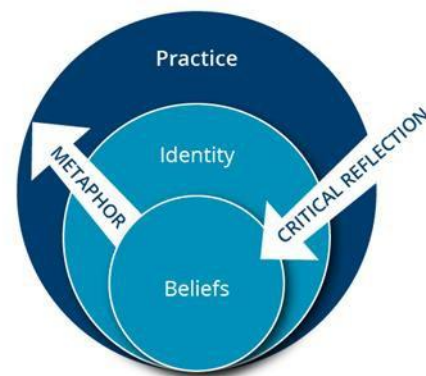
a learning environment in which students interact with peers and the teacher, providing students with opportunities to use previous knowledge to construct new knowledge (Brady, 2004).

However, preservice teachers with more traditional beliefs about teaching and learning use a transmission approach that is teacher-focused and content-driven (Slavin, 2006). Traditional teachers teach in a didactic manner seeking correct answers to determine students' knowledge (Brooks & Brooks, 1999). The power in the teacher-student relationship rests with the teacher who is the dominant figure in the classroom environment as evidenced in the limitations of the classroom interactions and the quality of the classroom talk.

Linking the circles. Some research has made attempts to link the circles in the framework, particularly beliefs with actions. For example, Argyris and Schön (1974) differentiated between two kinds of personal theory: (a) the espoused theory which is the theory that teachers plan to use in practice and (b) the theory-in- action that is what teachers do in classroom practice. As with all mental models, there is an inconsistency between the beliefs we espouse to be true and our beliefs in action (Senge, 1994). As Larrivee (2010) notes, preservice teachers may stay in a reflexive loop where their unexamined beliefs affect what data they select.
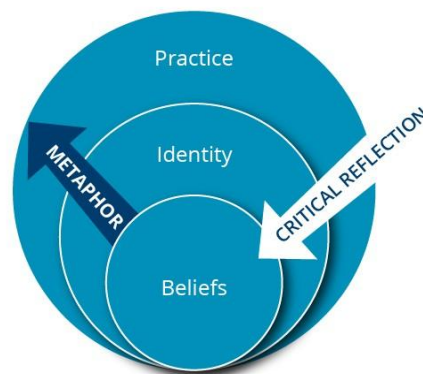
Various tools have been used to attempt to help teachers make connections between these conceptual circles. For example, Taylor and Dirkx (2002) used photo-elicitation to tap into teachers' unconscious beliefs and their actions in the classroom. Narrative inquiry was employed by (Clandinin & Connelly, 2000) to reveal teacher's stories as a lens to reveal their intrinsic beliefs about teaching and learning. As shown on the conceptual framework, in this doctoral study metaphor was chosen as a bridge to explore preservice teachers' beliefs about their teacher professional identity. By definition, "metaphors constitute linguistic analogic devices that compare a new/unknown concept to a known concept to illuminate a quality of the former" (Stylianou, Hodges-Kulinna, Cothran & Kwon, 2013, p. 23). Wan and Low (2015) support this choice in their statement that metaphors have emerged as a powerful tool for investigating teachers' thinking and professional knowledge in the field of education.

Metaphors are closely linked with teachers' views of teaching and learning and are grounded in teachers' personal histories as learners and educators (Mahlios, Massengill-Shaw & Barry, 2010). Thus, preservice teachers' metaphors provide a backdrop for an in-depth understanding of how they conceptualise teaching and learning in practice. Metaphors could be viewed as "a bridge enabling passage from one world to another" (Shiff, 1979, p. 106). As shown in this conceptual framework, metaphor is seen as a bridge outwards, from their beliefs through their identity to their practices and pedagogy.

Images and metaphors of teaching also have the potential to provide a common language of practice for preservice teachers and initial teacher educators to engage in discourse to achieve these insights (Beauchamp and Thomas, 2011; Saban, 2010). This approach may enable initial teacher education programs to move beyond designs solely concerned with imparting knowledge about teaching and learning, to providing avenues for preservice teachers to understand their values, attitudes and beliefs that impact on their teacher professional identity. Engagement in systematic and cohesive interrogation of existing values and beliefs is an important part of building an awareness of their teacher professional identity. Thus, creating a metaphor to encapsulate one's beliefs about teaching and learning is a significant conscious-raising exercise, so that preservice teachers realise the impact of their professional decision-making processes on their teacher professional identity which in turn drives practice (TEMAG, 2015).

Critical reflection has also been included in the conceptual framework as a process for preservice teachers to determine the quality and effectiveness of their teaching using an evidence of practice approach. Reflection has a core process that leads to an understanding of self and oneself when situated within a professional context (Beauchamp, 2015). Therefore, reflection is a key factor in the shaping and reshaping of teacher identity and helps teachers

to find a path from the outside (practice) inwards through their identity to their beliefs (Cooper & Olson, 1996; Kerby, 1991). Moreover, reflection is an essential ingredient of effective teaching and teacher development (Zeichner, 2008). So if we consider teacher identity development, the notion of reflection must be included as part of the process in the formation of an effective professional identity.
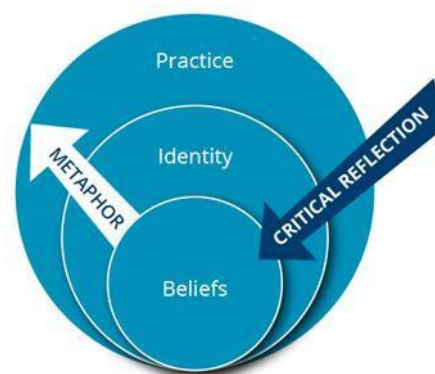
However, Atkinson (2012), in her article: *Silence, "Faking it," and Confession in Teacher Reflection*, suggests that the reflective practitioner idealised in the literature may be closer to "reflective fiction" (p. 84) that is developed in initial teacher education curriculum and pedagogy courses and academic scholarship rather than through the reality of preservice teacher practice. Although reflective practice has been adopted widely as an essential component of initial teacher education, there are still questions raised to challenge its benefits in initial teacher education. For example, does reflective practice scaffold and deepen preservice teacher learning? Does it impact on improved preservice teacher outcomes? Does critical reflection in practice lead to a transformation in practice? These questions highlight the grave concerns related to the impact of reflection on preservice teacher learning as a major component in course design. Akbari (2007, p. 192) clearly states that there is "no evidence to show improved teacher or student performance resulting from reflective techniques". It is striking to note that relatively little is known about the difficulties, practicalities and methods of critical reflection (Beauchamp, 2015; Hsiung, 2008) or the issues of teaching the theory and practice of critical reflection in academic contexts (Brockbank & McGill, 1998; Larrivee, 2008). This situation is surprising given that in education contexts, reflective practice has been perceived as a way of improving professional practice rather than simply recreating professional knowledge (Barnett 2004; Smith, 2011).

This attack on the effectiveness of critical reflection in initial teacher education relates to the perceived links between critical reflection and transformative learning, whereas, in this study, the key focus is on the relationship between critical reflection, teacher identity and teacher beliefs. Reflection is an important part of teacher identity development including future orientated reflection that encourages preservice teachers to shape and reshape their professional teacher identity to which they may aspire (Urzúa & Vásquez, 2008). Overall, it is clear that there is a growing focus on the importance of teacher identity formation as an aspect of critical reflection developed using authentic tertiary pedagogy within the context of professional experiences. By adopting critically reflective practices, challenging our unexamined beliefs and assumptions also deepens our insights into practices with the goal of refining or revisioning our actions.

1.4 Summary

This conceptual framework highlighted the key issues and related theoretical concepts relevant to the investigation presented in this thesis. A critical part of the development of an effective teacher professional identity is the careful interrogation by preservice teachers of the beliefs which drive their practice. Without preservice teachers carefully examining their beliefs about teaching and learning, the taken-for-granted and unhelpful practices may persist, impacting on the quality of their teaching and learning. Preservice teacher espoused beliefs, featured in the inner circle of the conceptual framework, which drives their practice may differ from those beliefs in action. Metaphor is a tool that may enable teachers to move from their beliefs through their identity to their actions. Critical reflection becomes a key process that stimulates learning by challenging preservice teachers to investigate the link between their practice (beliefs in action) and their conceptualisation of teaching and learning expressed as espoused beliefs. Similarly, teacher identity is shaped and reshaped by experiences; therefore, the quality of those experiences in initial teacher education is imperative for the effective formation of a teacher professional identity.

1.5 Structure of the thesis

Chapter 1 has provided an introduction to establish the significance of the study as well as introducing the research problem and the conceptual framework in response to this problem which will guide the methodology and inform the findings of this thesis.

Chapter 2 reviews the literature using the conceptual framework to guide and structure the literature review to support the research and ultimately provide a basis for its contribution to knowledge.

Chapter 3 describes the curriculum and pedagogy course designed in response to the literature evaluating the effectiveness of initial teacher education programs and their impact on teacher identity formation in preservice teachers.

Chapter 4 presents the Methodology, design-based research for this study; the ontological and epistemological considerations provide a rationale for the selection of the research design. Methods used to gather and analyse data related to the three stages of the study also have been deliberated in this chapter.

Chapter 5 presents the results to the research questions derived from the analysis of data. Preservice teachers' artefacts were also included as exemplars to highlight

elements of the self-study inquiry.

Chapter 6 presents the findings as well as summarising the study's conclusions based on comparisons with research addressed in the review of the literature. It discusses the relationship between research findings and the conceptual framework applied to the study. Finally, this chapter discusses the significance of the study, the limitations of the study as well as the future implications of the research.

Chapter 2   The review of the literature

2.1 Introduction

Chapter 1 provided a background description to the main problem i.e. preservice teachers not achieving the desired classroom readiness by graduation. TEMAG (2015) raised several issues for initial teacher education, including providing opportunities for the integration of theory and practice, a stronger focus on data collection as evidence of practice; more efficient partnerships between on campus and workplace learning in which teacher qualities are valued in initial teacher education and development of analysis skills for clinical teaching practice.

Darling-Hammond (2006) had already provided seven principles for effective initial teacher education which appeared to address many of the issues later raised by TEMAG (2015). Preliminary reading indicated that some of these issues were due to the apparent inability of initial teacher education programs to assist preservice teachers in examining their beliefs and identity and how this influences their practice, which impacts their classroom readiness. Chapter one presented the literature describing these constructs and speculated on links between them. This information was summarised visually by the development of the conceptual framework as presented in Chapter one. This framework then became the guide for a comprehensive review of the literature to establish the relationships between the constructs of beliefs, identity and practice, and the potential use of two tools, metaphor and critical reflection, to assist in exploring these relationships. Putting the issues, principles and possible causes together, my response was to design an improved curriculum and pedagogy course adopting these principles to address these issues (to be described in Chapter 3) and then to use appropriate methods to research its effectiveness (to be described in Chapter 4). To achieve this, I first needed a clearer view of the conceptual constructs of beliefs, identity, practice, metaphor and critical reflection.

The purpose of this literature review then is to explore, in turn, each of these constructs in the literature in more depth, especially any known links between them. The robustness of the conceptual framework as devised will thus be tested in the literature. This process will also acknowledge and analyse the literature that focuses on improving the quality and impact of initial teacher education programs, strengthening the quality of preservice teacher candidates entering the profession. To achieve this end, it is critical that

preservice teachers develop the capabilities to build their capacity to improve their practice and in turn, affect a positive impact on student achievement. This review will therefore also attempt to identify key issues in tertiary pedagogy that needs to be addressed in the initial teacher education program and course design to ensure *classroom-ready teachers*.

This review aims to represent the breadth and depth of the available literature, to include seminal works, and to show the persistence over time of some issues. Therefore, this review deliberately incorporates literature from a wide span of years from the twentieth and twenty-first centuries instead of focusing exclusively on more recent works.

2.2 Preservice teacher beliefs

This section will explore difficulties with defining beliefs, various ideas about the significance of beliefs, the origin of beliefs, the influence of prior beliefs on teacher identity and practice, and appropriate responses in initial teacher education.

Defining beliefs. Research in the domain of teacher beliefs has spanned many decades (Oliver & Butcher, 1962), and seemingly the goal was to identify a clear psychological construct to explain how preservice, and in-service teachers make decisions related to their practice which in turn have a significant impact on the learner (Tang, Lee, & Chun, 2012). After reviewing more than 650 published empirical research articles about teachers' beliefs, Fives and Buehl (2012) reported that there was a lack of cohesion and precise definition of beliefs. This lack of clear definitions to describe beliefs has limited the explanatory and predictive potential of teachers' belief systems and their impact on preservice teachers' practice. Furthermore, the manifestations of beliefs in teacher practice are complicated, and the understanding of what is meant by teacher beliefs in the research literature is sometimes unclear. Nevertheless, the meta-analysis provided by Fives and Buehl (2012) highlights the critical importance of teacher beliefs as an area for further research and consideration in initial teacher education.

Significance of beliefs. Over time, many different ideas have been proposed concerning the significance of teacher beliefs. For example, in 1987, Nespor attempted to clarify the significance of beliefs by defining and explaining six properties that frame teachers' belief systems:

- they sometimes contain assumptions about the existence of entities beyond the teacher's control or influence,

- they can include conceptualisations of ideal situations that differ from reality,

- they rely heavily on affective and evaluative components,

- they derive much of their power from memories of specific events,

- they are not open to critical examination or outside evaluation, and

- the domains in which specific beliefs may apply are undefined.

Nespor (1987) concluded that these pre-existing beliefs were significant and must be challenged effectively before new beliefs can exist and be translated into practice.

In 1989, Quackenbush noted that beliefs are considered to include the notion of self-concept that serves to organise other beliefs, which are closely related to a sense of self. In 1992, Novak and Knowles, and Powell and Birrell, demonstrated that beliefs are reliant on past experiences and present experiences, findings later confirmed by Burn, Hagger, Mutton & Everton (2003). Also in 1992, Pajares suggested belief systems may serve an "adaptive function in helping individuals define and understand the world and themselves" (Pajares, 1992, p. 325). Quackenbush (1989) and Pajares (1992) both provide a link between beliefs and identity or sense of self, two of the constructs in the conceptual framework.

Students entering initial teacher education programs are also believed to bring a host of beliefs and assumptions regarding teaching and learning to bear on their emerging professional practice (Ball & Cohen, 1999; Cole & Knowles, 1993). More recently, this has been expressed as beliefs about teaching and learning acting as filters and frame perspectives that are valued or not valued related to professional knowledge (Lee, Baik, & Chalresworth, 2006; Yerrick et al., 1997). These writers make a direct link between beliefs and practice, substantiating the placement of beliefs in the framework as non-

concentric, i.e. not always having to operate through teacher identity.

Origin of beliefs. A seminal work in the search for how beliefs might arise is that published by Lortie in 1975. In this work entitled *Schoolteacher: A sociological study*, Lortie (1975) coined the term *apprenticeship of observation*. Preservice teachers have spent many years as students, and this apprenticeship causes them to form beliefs about teaching, learning and images of teachers through the lens of their experiences as school students. To this end Lortie (1975) has identified four ways that this lens of having been students shapes preservice teachers' beliefs and their understanding of teaching and learning:

- Students do not link teaching strategies used by teachers to the effects those strategies have on their learning.

- Students imitate teachers: through observation, learning about teaching in ways that are "intuitive and imitative rather than explicit and analytical" (Lortie, 1975, p. 62).

- Students believe teaching decisions are whimsical and subjective: "Students have no reliable basis for assessing the difficulty of demands of various teaching acts and thus may attribute teachers' actions to differences in personality or mood" (Lortie, 1975, p. 63).

- Students do not understand the complex decision-making processes that teachers engage in every day. Thus, students do not "perceive the teacher as someone making choices among teaching strategies" nor are students "likely to make useful linkages between teaching objectives and teaching actions" (Lortie, 1975, p. 63).

Influence of beliefs. Many researchers have drawn on Lortie's research due to its importance in understanding why teachers believe what they do, to comprehend how teachers make decisions in planning, teaching, managing, and assessing children (McMullen, 1997). Kagan (1992) argued that teacher beliefs function as a *filter* that influences how teachers make instructional judgments and decisions in their classroom practices. The literature also stresses the important role of teachers' theories and beliefs in understanding teachers' thought processes, classroom practice, and learning to teach (Pajares, 1992; Richardson, 1996).

There has been considerable confirmation that the attitudes (expressions of beliefs) held on entry to preservice programs greatly influence what prospective teachers learn as well as reducing their receptiveness to adopting learning theories and approaches promoted in education programs in practice (Hollingsworth, 1989; Holt-Reynolds, 1992; Korthagen, 1988; MacKinnon, & Erickson, 1992). Donna Kagan (1992), from her review of the research on the professional growth of preservice and beginning teachers, concluded that the personal beliefs and images of preservice teachers often remain inflexible. Thus, preservice teachers tend to use the information provided in coursework to confirm rather than confront and correct pre- existing beliefs. Consequently, preservice teachers' personal beliefs and images determine how much knowledge they acquire from an initial teacher education program and how it is interpreted in practice.

As well as acting as filters to incoming knowledge, pre-existing beliefs are also thought to *frame* a problem or task (Fives & Buehl, 2012). This issue was conceptualised in a research project conducted in a literacy course where participants were asked to review videotaped case studies of exemplary reading lessons. Two preservice teachers with different beliefs about knowledge and learning selected different video clips to discuss regarding effective pedagogy. The preservice teacher with more traditional beliefs about knowledge focused on the teacher in the video clip pointing out mistakes and student errors without explanation. In contrast, the second preservice teacher with a more integrated view of knowledge focused on how the teacher discussed the student's work thus placing significance on the learning process. These findings illustrate how beliefs frame the nature of a problem, that is, one teacher simply focusing on mistakes while a second teacher focuses on processes and pedagogy which is a deeper and more meaningful approach to building student capabilities and capacity (Yadav & Koehler, 2007).

Responses in initial teacher education. Research has also shown that traditional initial teacher education programs have concentrated on imparting pedagogical knowledge, with little consideration given to challenging teachers' beliefs that exert a strong influence on knowledge acquisition (Segall, 2002; Tillema, 1997). Preservice teachers' beliefs have been widely ignored with the prevailing perception of preservice teachers as blank slates even when the preservice teachers hold alternative views about teaching and learning to those presented in their initial teacher education programs (Kasoutas & Malamitsa, 2009). The upshot of all of these findings is that initial teacher education courses have been found to have a weak effect on preservice teachers unless

their held beliefs are challenged. Otherwise, novice teachers often revert to adopting the practices used when they were at school (Borg, 2004; Leavy et al, 2007).

If this is the case, then initial teacher education programs must recognise the need to find ways to enable preservice teachers to firstly identify and then challenge their pre-existing beliefs successfully. There has been a slowly-growing recognition of the importance of beliefs in initial teacher education. Research on teaching in schools and initial teacher education programs has transferred noticeably from an emphasis on behaviours to a concentration on cognition (Richardson, 1996) with the acknowledgment that teachers' ways of thinking and understanding are fundamental components of their practice (Clark & Peterson, 1986; Nespor, 1987). This view is based on the assumption that beliefs are the best indicators of the decisions individuals make throughout their lives or more specifically acknowledging that teacher beliefs affect their planning, decision-making, and subsequent classroom practice (Nussbaum 2008). It is what teachers think, what teachers believe, and what teachers do at the level of the classroom that ultimately shapes the kind of learning that young people receive (Fullan, 2002 & Hargreaves, 2003).

An effective way to help preservice teachers to construct essential knowledge and understanding of teaching and learning is by first identifying these preconceptions and beliefs and then examining the sources and validity of these beliefs (Bullough & Gitlin, 1995). This might be achieved by finding ways to raise self-awareness, which may help preservice teachers understand the alignment between teacher beliefs and practices. If teachers are not self-aware, they may enact practices not aligned with their beliefs, and not understand the tension that they experience. However, when preservice teachers discuss these tensions between beliefs and practices (which may be termed *practice incongruity*), this often leads to an adjustment of practice as well as professional growth (Fairbanks et al., 2010).

Critical reflection is another essential component of this process of aligning beliefs with practice (Larrivee, 2000). That this process can be successful is demonstrated in the work of Feiman-Nemser, McDiarmid, Melnick, and Parker (1989). They examined an introductory course in an initial teacher education program which was designed to challenge the preservice teachers' prior beliefs and assumptions about teaching. This challenge was successfully accomplished by the use of personal reflections, analysis of case studies and videotapes of classroom teaching, discussions and field assignments,

leading to a transformation of the preservice teachers' prior images of teaching.

2.2.1 Summary

The literature reviewed on beliefs indicated that an unwillingness in preservice teachers to change their practice can be attributed to their beliefs that act as a filter through which they interpret their education and experiences (Stipek, Givven, Salmon, & MacGyvers, 2001) and as a frame through which they approach problems that arise in classrooms (Fives & Buehl, 2012). According to Nespor (1987), change is not possible without first disposing of current beliefs. Additionally, Pajares (1992) predicted that the study of teacher beliefs could be the single most important construct in educational research. Fives and Buehl (2014) conclude from their research exploring differences amongst inservice teachers that only by acknowledging and working with teachers' existing beliefs can initial teacher educators hope to bring about the intended changes in teachers' beliefs, knowledge, and practices. Consequently, providing preservice teachers with the opportunity to interrogate their beliefs as a consciousness-raising inquiry should be a critical component of initial teacher education courses and programs.

The cited research related to teacher beliefs poses a challenge for initial teacher educators who seek to improve the quality of preservice teachers and to better prepare graduates who are classroom ready as required. It is well documented that teacher quality is a major factor influencing student academic achievement (Cochran-Smith, 2004; Darling-Hammond, 2010). Therefore, it is important that initial teacher education programs include the study of teacher beliefs in addition to other factors that influence teacher quality and teacher retention (Fairbanks et al., 2010).

The preceding discussion shows that existing research has largely linked beliefs with practices, with links to teacher identity (e.g. reference to sense of self, and images of teachers and teaching) being implicit rather than explicit. This supports why the framework is shown as nested circles rather than concentric circles, allowing for the possibility of beliefs directly affecting practice. The next section will examine the literature concerning teacher identity, and will seek to establish its place as the middle circle in the conceptual framework.

2.3 Teacher professional identity

The literature concerning teacher identity is replete with reviews, yet clear definitions are elusive. This section will provide an overview of the various definitions and models of teacher identity. This section will also critically examine the location of teacher identity in the conceptual framework, and suggest strategies for exploring identity.
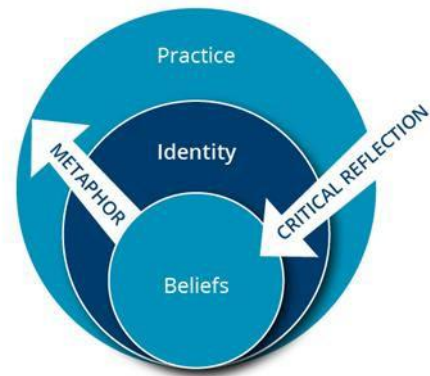
Definitions. Many definitions of teacher identity exist in the literature. There is general agreement that professional identity is an ongoing, dynamic process in which individuals negotiate external and internal expectations as they strive to make sense of themselves and their work as educators (Beijaard, Meijer, & Verloop, 2004). Moreover, teacher professional identity can be described as a self-attributed notion that is constructed through teaching experiences, in various professional contexts, that affirm what it means to be a teacher (Korthagen, 2004; Lasky, 2005; Wenger, 1998). In simple terms, teacher identity can be described as how teachers see themselves and their work i.e. concepts or images of self (Knowles, 1992; Nias, 1989).

The means for arriving at such definitions vary. Some studies placed emphasis on the teachers' roles (Goodson & Cole, 1994; Volkmann & Anderson, 1998), yet others consider the complex relationships between the personal self and the professional self (Lipka & Brinthaupt, 1999). Introspective questions commonly asked to include:

- *Who am I?*

- *Who am I as a teacher?*

Answering these questions may create a tight connection, perhaps even an inseparable one between intricate and complex dimensions of teacher identity development, making it difficult to articulate and explore (Olsen, 2008). Some studies included teacher identity development in relationship with other concepts; for example, reflection or self-evaluation as these concepts also contribute to the development of a teacher professional identity (Cooper & Olson, 1996; Kerby, 1991).

Thus far, the definitions relate only to how the teacher sees him or herself as a teacher. Gee's review (2000) defined identity "as being recognised as a particular kind of person, in a given context" (Gee, 2000, p. 99). He further argued that there are four aspects, or perspectives to identity: nature (the identity people are born with that they cannot control), institutional (identity imposed by being part of an institution such as a school), discursive or social (identity induced by the ways in which others interact with a person), and affinity (identity acquired from belonging to a chosen group). Gee's work, therefore, introduces added dimensions to the definition i.e. that being recognised (or recognisable) as a teacher by others may contribute to a teacher's professional identity, as may simply choosing to be a teacher. Critical reflection, if focused on the visioning of self as teacher may encourage preservice teachers to deeply explore key features inherent to the formation of an effective teacher identity as outlined by Gee (2000). This process facilitates the shaping and reshaping of teacher identity throughout their initial teacher education program (Flores & Day, 2006).

Beijaard et al., (2004) recognised that although teacher professional identity had emerged as a distinct and significant area of research, there were some inconsistencies in how research terms were defined; in particular, the concept of teacher professional identity. They conducted a detailed review of the literature, categorising the studies into three groups:

1. 9 studies in which the focus is on the *formation* of teacher professional identity.

2. 11 studies focused on the *characteristics* of teacher professional identity.

3. 2 studies in which professional identity was represented by *teacher stories*.

Only 13 (6/9+5/11+2/2) of the studies reviewed by Beijard et al., (2004) provided an explicit definition of teacher identity. There was little consistency in these definitions; in fact, most definitions focused on the personal aspects of the professional self and overlooked the influence that contexts played in identity formation (Volkmann & Anderson, 1998). A complete definition was: "we consider teachers as persons and professionals whose lives and work are influenced and made meaningful by factors and conditions inside and outside the classroom" (Goodson & Cole, 1994, p. 88). Some definitions appeared tangential to the key issues, such as Moore and Hoffman (1988)

suggesting that professional identity is similar to the extent to which someone thinks of his or her role as relevant, attractive and in harmony with other roles.

Beijaard et al., (2004) concluded that there was a clear need for a more consistent concept of what is meant by identity, professional identity, and teacher identity in future research. However, one point of consensus noted was that the construct of teacher identity was an integration of the personal and professional sides of becoming and being a teacher. Beijaard et al., (2004) also maintained that "professional identity is not something teachers have, but something they use to make sense of themselves" (p. 123).

Examining a model of teacher identity. Flores and Day (2006) investigated 14 novice teachers in their early career to explore how their professional identities were shaped and reshaped in various school settings by their personal and professional interactions as well as contextual factors. Also, this study explored how assumptions and values about teaching and being a teacher were challenged in the school settings, including the ways the professional and cultural environment affected early career teachers' professional identities. Flores and Day utilised multiple data sources, creating a rich data set from just 14 teachers. This enabled them to devise a model featuring three main influences that impacted on the construction, deconstruction, and reconstruction of their professional identities. This model is presented in Figure 2-1 below.
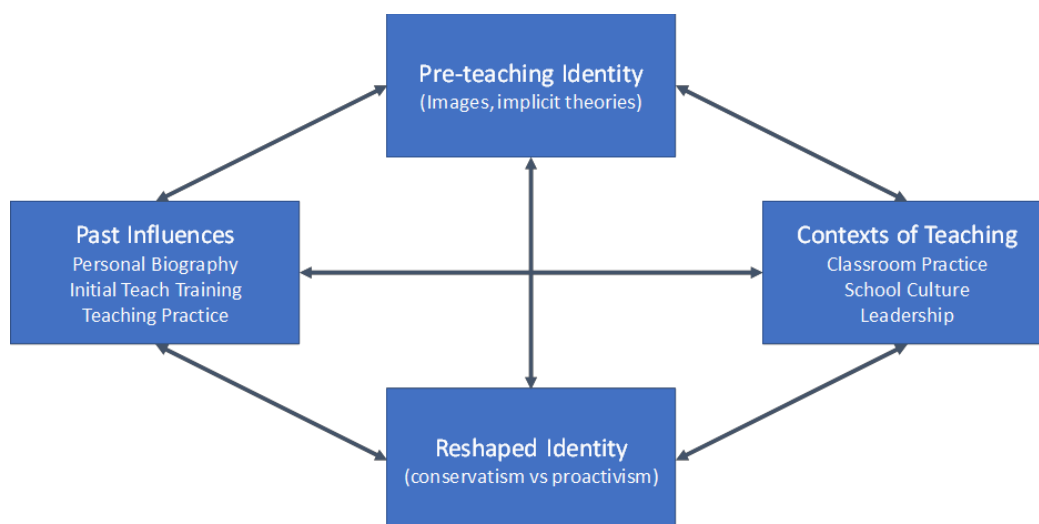
Figure 2-1   Model of factors influencing teacher identity

Reprinted from "Contexts which shape and reshape new teachers' identities: A multi-perspective study," by M. A. Flores and C. Day, 2006, *Teaching and Teacher Education, 22*, p. 230. Copyright (2006) by Elsevier.

This model clearly links the work of Lortie (1975) on the origins of beliefs to teacher identity, in that prior experiences as students were found to influence their teacher identity. It also links personal biographies and other ways of identifying beliefs used in initial teacher education programs to the shaping of teacher identity. However, in this model, it was found that context (that could be related to institutional and affinity perspectives of identity as described by Gee, 2000) played the major role in shaping and reshaping teachers' professional identities.

Further, the findings of this study by Flores and Day (2006) suggest a limited impact on the development of effective teacher identities in initial teacher education programs. The design of these programs may be improved with a stronger focus on personal biography and cultural contexts of schools so that the tensions between them might be better understood. Early career teachers' values, images, and ideas of what it means to be a teacher on their entrance to the profession were challenged by professional contexts, and for many teachers, their practice became more routine, aligning with their context (Flores & Day, 2006).

Beauchamp and Thomas (2009) also undertook a review of recent literature about the formation and development of teacher professional identity to ascertain critical issues that may impact on the development of an effective teacher identity as well as uncover the implications for initial teacher education programs. They did not devise a new model, but rather situated their findings with those of others, including a fit with the frameworks proposed by Gee (2000) and Beijaard et al., (2004) and with the model proposed by Flores and Day (2006). Beauchamp and Thomas further concurred with Beijaard et al., (2004) concerning the limitations of the findings on teacher identity being induced by the inconsistent use of terminology and lack of clear definitions. Their findings also underscored the critical importance of recognising the connectedness of the self and the professional self as found by Lipka and Brinthaupt (1999). Newly clarified in the findings of their review were links between emotions and identity (mentioned previously by Flores and Day, 2006) and agency and identity. The role of reflection in exploring and shaping teacher identity was also noted as being an essential component of the development of an effective teacher professional identity.

More recently, Morrison (2013) conducted a similar study to that of Flores & Day (2006), also recruiting 14 early career teachers. His findings also did not contradict

their model of mediating factors as was presented in Figure 2-1, in that context was important. However, he labelled teacher identities as being on emergent, distressed or tenuous (oscillating between emergent and distressed) trajectories, reflecting the emphasis in his findings on the social and emotional components of identity. New teachers working in rural schools, isolated from others, struggled, and sometimes failed to establish effective teacher identities. His conclusion was that greater emphasis needed to be placed on teacher identity formation, and while his study focused on the induction stage, at the onset of their teaching career, this clearly also has implications for initial teacher education. From the findings of Beauchamp and Thomas (2009) and Morrison (2013), it appears that the model proposed by Flores and Day is robust in describing the main mediating factors on identity.

Locating teacher identity in the conceptual framework. Despite the limitations of inconsistent use of terminology as noted by many researchers, collectively the research presented in this section affirms the location of identity as the middle circle in the conceptual framework. Identity is seen as something dynamic, constructed and reconstructed (Beijaard et al., 2004; Flores & Day, 2006; Morrison, 2013), yet part of who a teacher is becoming and becomes (e.g. Gee, 2000), therefore located within. Identity is less stable than beliefs (Kagan, 1992), more likely to be impacted by external factors such as roles (e.g. Volkmann & Anderson, 1998), context and the views of others (e.g. Flores & Day, 2006; Gee, 2000), yet beliefs have also been shown to influence teacher identity (Flores & Day, 2006). Links were also made with practice, with teachers' whose identity was heavily influenced and could be considered to be constricted by their context, resorting to routine practices (Flores & Day, 2006) consistent with their apprenticeship of observation as students (Lortie, 1975).

This location of identity as a potential mediator between beliefs and practice holds implications for initial teacher education. Although there is no control over the ultimate context in which graduate teachers will find themselves, there is some control over the contexts in which preservice teachers practice their art, i.e. professional experience placements. Similarly, this placement and highlighting of the importance of teacher identity has implications for strategies adopted within course work in initial teacher education.

Strategies for examining identity. Over time, Flores and Day (2006), Beauchamp and Thomas (2011) and Morrison (2013) all found that developing a strong sense of teacher identity may be crucial to the well-being of new members of the teaching profession. Morrison describes the sad case of a promising graduate teacher (Emily) whose long-held sense of identity as a teacher crumbled during a year of personal and professional isolation, resulting in her leaving the profession after just one year. Therefore, the more initial teacher educators understand about the process of developing teacher identity as well as how to facilitate this development in initial teacher education programs, the greater the opportunity for them to create pedagogies that contribute to the formation and ongoing development of an effective teacher identity in preservice teachers.

The literature presented in this section has implicitly provided some direction as to appropriate strategies. Although the details of all studies have not been presented here, many of these details provide useful hints and tips that skillful educators can use to devise strategies by which teacher identity may be examined and discussed during initial teacher education. These potential strategies are summarised below. Note that the reference provided is the source of the background information from which the strategy was derived; the strategy itself was not necessarily mentioned in the reference. Potential strategies include:

- Raising their awareness of the factors reported in the literature that may mediate the development of effective teacher identities and the importance of this in terms of their ultimate success as a teacher (Flores & Day, 2006; Morrison, 2013). To achieve this, case studies (Feiman-Nemser, McDiarmid, Melnick, & Parker, 1989) of other teachers (such as those in Morrison, 2013) could be studied and discussed as a class, initiating desirable social interactions and discourse about identities (Danielewicz, 2001; Gee, 2000).

- Assisting preservice teachers to realise that teacher identity is an ongoing and dynamic construction by having them examine their own identities at several junctures in the overall program (Beijaard et al., 2004).

- Encouraging them to answer introspective questions that examine their constructions of their personal and professional selves (Lipka &

Brinthaupt, 1999) thus conducting their inquiry into their identity (Danielewicz, 2001).

- Using tools for reflection or self-evaluation as these concepts also contribute to the development of a teacher professional identity (Beauchamp and Thomas, 2009; Cooper & Olson, 1996; Kerby, 1991).

- Examining the four perspectives of identity as proposed by Gee (2000) and subjectively weighting them regarding perceptions of their current influence on their teacher identity.

- Writing teacher biographies or other forms of teacher stories (Beijaard et al., 2004; Feiman-Nemser, McDiarmid, Melnick, and Parker, 1989; Flores & Day, 2006; Lortie, 1975) that help them connect the origins and influence of their beliefs to the development of their teacher identity.

- Drawing, describing or finding images that represent their current teacher identity (Flores & Day, 2006).

- Discussing cultural contexts of schools as encountered during the professional experience and mapping the impact these contexts had on their teacher identity (Feiman-Nemser, 2001; Flores & Day, 2006).

- Brainstorming emotions experienced during episodes of teaching and considering how these impacted on their sense of teacher identity at the time and subsequently (Beauchamp and Thomas, 2009; Flores & Day, 2006). Sharing these with other preservice teachers may help eliminate the sense of 'aloneness' and being unique in their struggles that may later prevent early career teachers from asking for help (Morrison, 2013).

Such strategies satisfy principles 2 (extensive, connected clinical experiences), 4 (helping students to confront their deep-seated beliefs and assumptions, and learning about the experiences of people different from themselves) and 5 (practising an inquiry approach that connects theory and practice) from the list of seven principles for well-designed initial teacher education programs provided by Darling-Hammond (2006).

The findings of Morrison (2013) also echoed work done by Beltman, Mansfield, and Price (2011) in raising issues faced by early career teachers. Subsequently, this group suggested that developing a strong, coherent teacher identity in beginning teachers is

related to teacher retention, teacher resilience and teacher effectiveness, particularly in the early years of the profession (Mansfield, Beltman, & Price, 2014). Using strategies such as those suggested to better understand how preservice teacher professional identity develops over the duration of an initial teacher education program will assist teacher educators to prepare preservice teachers better for the rigours of teaching. It may also shed light on how teachers may engage in "a productive process of constructing their professional identities" (Izadinia, 2013, p. 695), and finally, may assist mentors in schools to better support early career teachers to establish and maintain an effective identity in the face of the challenges of the first year of teaching. This will improve their actual and perceived classroom readiness.

Linking identity with practice. Iterative links exist between identity and practice. Formation of teacher identity occurs through developing understandings of the professional practices of teaching, alongside the necessary values, skills, and knowledge deemed imperative to the teaching profession (Chong, Ling, & Chuan, 2011; Chong, Low, & Goh, 2011; Olsen, 2008). Active participation and reflection on the roles and responsibilities of teaching coupled with an appreciation of the implicit *codes of practice* (Wenger, 1998) embedded in teaching, support the development of a thorough knowledge of what it means to be a teacher. This approach, in turn, seems to enable the strengthening of a teacher professional identity (Korthagen, 2004). Morrison (2013), Olsen (2008) and Wenger (1998) maintain that it is through interactions with others in the school context that teacher identity is formed, influenced and reshaped and will thus have an impact on teacher practices.

2.4 Teacher practices and pedagogy

Teacher practices and pedagogy appear to be more easily defined than beliefs and identity. Indeed, it seems that the meaning is so self-evident that in papers specifically about practice, the term *practice* may not be defined at all (e.g. Richardson, 1990; Wenglinsky, 2001). However, other than dictionary definitions, it is difficult to find concise definitions of these two terms. This section will move from definitions to factors influencing practice, but the main focus will
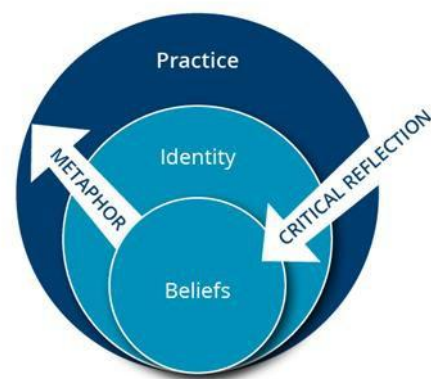
be the examination of various approaches to studying one's practice.

Definitions. Beyond definitions that equate teacher practice with professional experience or practicum, practice is essentially what teachers do in the classroom (OECD-Teaching and Learning International Survey [TALIS], 2013). It may be defined in terms of subcategories such as instructional, management and administrative practices (OECD-TALIS, 2013). Instructional practices themselves may be further subdivided into teacher directed or constructivist (OECD-TALIS, 2013; Soto Calvo, Isac, Araújo, Costa, & Albergaria-Almeida, 2015) dependent upon the relative prominence of the teacher or the student in classroom decision-making, although it is acknowledged that a combination of these two approaches may be optimal (Creemers, Kyriakides, & Antoniou, 2013; Purdie & Ellis, 2005). However, in Australia, the *Classroom Practice Continuum* (AITSL, 2014) indicates a progression across six proficiency levels from graduate to lead teacher from teacher- directed to student-directed learning. This implies a path towards a perceived *best practice* of constructivism, yet in the OECD report on TALIS (2013) based on 200 schools from each of 34 countries, it is stated that it is clear that there is no one best way to teach. Rather, teaching practice is specific to the domain (learning areas), goals, professional traditions and the prevailing cultural contexts (OECD-TALIS, 2013), to which list age and/or educational level of the students is added by Soto Calvo, Isac, Araújo, Costa, & Albergaria-Almeida (2015).

Pedagogy may be seen as a synonym for practice (e.g. dictionary definitions such as Merriam-Webster, 2017), but can also be seen as a broader term encompassing more than instruction (MacNeill & Silcox, 2003). It may refer to the study of teaching or teaching as an academic concept (e.g. Cambridge Dictionary, 2017; Oxford Dictionary, 2017). Both meanings are utilised here – pedagogy may refer to what the preservice teachers in the study did in classrooms i.e. their practice, but it may also refer to approaches adopted by initial teacher educators to impart an academic concept of teaching to preservice teachers.

In terms of pedagogy as a discipline, there appears to be a disconnect between the theory of teaching, as evidenced by research, and the practice of teaching in classrooms (Cabaroglu, 2014; Ketter & Stoffel, 2008; Richardson, 1990). This may occur because teachers are seen as resistant to change (Richardson, 1990; Hempenstall, 2006) especially when control over change is external to the teacher e.g. mandated in a top-down approach

(Ellis, Armstrong, & Groundwater-Smith, 2010; Richardson, 1990). Other possible causes include that theory does not appear to be realistic or practicable to classroom teachers (Ketter & Stoffel, 2008; Korthagen & Vasalos, 2010; Sim, 2011), or that theory presents too much of a clash with the prevailing cultures in schools (Cabaroglu, 2014) described by Hempenstall (2006) as being "science-aversive" (p. 83). So if theory is not the prevailing factor to influence practice, it is important to ascertain factors that are perceived to have such influence.

Paulo Friere (1970) introduced the term '*praxis*' to describe the space where theory and practice intersect in a professional context, creating a space for deep learning. He considered praxis a process of taking action in practice informed by a set of beliefs which leads to transformative thinking. Therefore, to build preservice teacher capacity during a professional experience frequent opportunities to engage in pedagogical discussions linked to preservice teacher practice will also contribute to the formation of an effective teacher identity.

Factors influencing practice. As has been established, beliefs (e.g. Nespor, 1987) and identity (Chong, Ling, & Chuan, 2011; Chong, Low, & Goh, 2011; Olsen, 2008) both influence practice. Conversely, practice, particularly practices perceived as working especially well or badly, can influence identity (Chong, Ling & Chuan, 2011; Chong, Low & Goh, 2011; Wenger, 1998) and beliefs (Cabaroglu, 2014). This confirms practice as the outer circle of the conceptual framework, and it is also the outer aspect of the teacher, being readily observable by others. People may not be able to see what a teacher believes, nor whom they perceive themselves to be, but they can see (and judge) what a teacher says and does. This also positions practice as the first target for the influence of others.

Wenger, a noted theorist in the areas of both social learning theory and communities of practice, acknowledged this influence by developing the idea of a *community of practice*. Wenger (1998) identified four components that characterised his community of practice model: meaning, practice, community, and identity, which he considers to be closely and mutually connected:

1. Meaning refers to learning as experience: that is, the ability to experience one's life and the surrounding world as meaningful.

2. Practice refers to learning as doing: relying on shared historical and

social resources, background systems, and viewpoints that can sustain mutual engagement in action.

3. Community refers to learning as belonging: belonging to a social community in which our activities are recognised as valuable and competent.

4. Identity relates to learning as becoming: an understanding of how learning in the context of the community affects and moulds us (p. 27).

This model shows the links between practice and identity and connections between the teacher and the professional context i.e. the community in which they are working.

Wenger (1998) acknowledges the influence of the community in shaping a teacher through their experience and interactions within a professional community of practice. A supportive professional community can do much to assist the development of beginning teachers. Similarly, an unsupportive community, or the feeling of not belonging to the community, can make it very difficult for a teacher to thrive (Morrison, 2013). As preservice teachers enter their professional experience, thus becoming part of a range of teaching communities, they experience varied learning opportunities. In the absence of a framework for evaluating the influences on their perceived successes and failures, preservice teachers may be inclined to take all the credit for success or all the blame for failure (Morrison, 2013). This simplistic approach ignores the influences of context. Wenger's (1998) concept of learning as becoming situated within a community of practice is a helpful framework to explore the complex process of becoming a teacher, in particular, developing the quality of their practice.

Teachers and preservice teachers are not able to assimilate all the knowledge and complexities of teaching unless they know how to learn and thus make meaning from their professional contexts. This approach to learning from practice requires being able to stand back and analyse their teaching by asking and being able to answer questions, for example, *what is effective pedagogy*? Moreover, *how can I improve the quality of my teaching*? Therefore, quality teaching cannot be developed by only focusing on substantive knowledge about teaching and learning, that is, preparing for practice, without also recognising the critical importance of learning during and from their practice (Cabaroglu, 2014). Moreover, an inquiry stance that investigates and evaluates the quality of teaching and subsequently its impact on student learning is critical for developing

effective teaching and learning practices (Ball & Cohen, 1999). Thus, becoming a teacher is more than being experienced but rather requires equipping preservice teachers and teachers with the capabilities to learn from their practice.

Strategies for learning from practice. Research indicates that graduates who have a deep knowledge of content, as well as a sound understanding of teaching practices, impact positively on student learning (Ingvarson et al., 2014; Robert- Hull; Jensen & Cooper on Teaching, 2014; TEMAG, 2015). Consequently, it is deemed important that initial teacher education programs produce such graduates, yet there is concern that some programs are using practices not supported by research (TEMAG, 2015). Therefore, there is a strong urge towards exposing preservice teachers to the value of utilising evidence-based approaches to learning from their practice. However, there is debate as to what constitutes sufficient evidence. Initially, the emphasis was on objective, valid, scientific studies with large, rigorously-defined samples, that test competing theories, and are peer reviewed (Hempenstall, 2006). Yet this is also the type of research that is ignored by politicians and teachers alike (Hempenstall, 2006), as it seems too remote from the classroom. Teachers are also perceived as being ill-equipped to evaluate research and to interpret the findings to decide appropriate action (Hempenstall, 2006). Clearly, what is required is a way to breach this gulf, to bring researchers and teachers together on the same side. As a consequence, new forms of collaborative, evidence-based research have gained popularity.

Inquiry is the underpinning stance for many of these newer forms of research. Inquiry is defined by Cochran-Smith and Lytle (2009) as: "we offer the term inquiry as a stance to describe the positions teachers and others who work together in inquiry communities take toward knowledge, its relationships to practice, and the purposes of schooling" (p. 48). This definition points to teachers and others working together, creating a collaborative approach to research. Two forms of inquiry are distinguishable by their focus.

1.   Practitioner inquiry – was defined by Cochran-Smith and Lytle (1999) as a systematic and intentional inquiry by teachers about their school and classroom work. However, by 2009, in response to the perceived need to bring teachers and researchers together, these same authors broadened the range of people who might be involved in practitioner inquiry to include

administrators, leaders, teacher educators, University researchers, community-based educators, parents and others. Practitioner inquiry is often considered to be synonymous with action research (Groundwater-Smith & Mockler, 2005; Kemmis, 2006), though some consider action research to be relevant only to the researched situation, with practitioner research having a broader, more altruistic and transformative purpose (Cochran-Smith & Lytle, 2009). Nevertheless, defining features include the dual role as practitioner and researcher, the ethical considerations this raises, the placement of the study setting and participants at the heart of the study, and inclusion and valuing of collective knowledge, all of which increase the likelihood that results will be applied (Marion, 2007). Thus its purpose, to improve practice through examining practice, is likely to be realised (Cochran-Smith & Lytle, 2009).

2. Self-study inquiry - by the late 1980s, university researchers began to use biographical forms of inquiry as well as personal histories, life history approach, and narrative inquiry to better understand teacher practices (Bullough & Gitlin, 1995; Connelly & Clandinin, 1999). The self-study was defined by Hamilton and Pinnegar (1988), as "the study of one's self, one's actions, one's ideas as well as the not-self (p. 238). Thus, self-study aims to move beyond reflection by generating questions about the very nature of teaching and learning to contribute to the ongoing process of 'becoming.' Self-study allows preservice teachers to reflect systematically upon their practice to identify tensions or challenges (Loughran, 2002). Being an inquiring professional is not only learning about research methods and techniques but rather developing dispositions, knowledge, and understanding to become a professional who asks questions and is challenged to learn more deeply about their practice and its impact on student learning.

Fieldman, Paugh, and Mills (2004) suggest that a critical way of differentiating action research and self-study genres is to focus on the relationship between action and research and self and study. When the emphasis is on the *action*, the main purpose of the research is to transform one's practice or situation. However, when the emphasis is on the word self, then the *self* becomes the focus of the study and "this is a distinguishing

characteristic of self-study as a variety of teacher research" (p. 953). Both may lead to improved practice but through different mechanisms.

A tool useful for either type of inquiry is an e-portfolio. This is the collection of artefacts into digital storage with appropriate commentary to provide evidence of practice and growth over time (Lorenzo & Ittelson, 2005). According to these authors, such collections by individual teachers can be used to:

- Document knowledge, skills, abilities and learning.
- Track development within a program.
- Find a job. In Australia, this latter point refers to demonstrating how the teacher has met the national standards for registration as well as to impress a prospective employer.
- This tool can also be used at a corporate level to:
  - evaluate a course;
  - monitor and evaluate performance; and
  - provide evidence of having met accreditation standards.

It has frequently been suggested that using e-portfolios to link the theory and the practice of preservice teachers will assist in improving their understanding and knowledge of their practice (Buckley et al., 2009; Butler, 2002; Strudler & Wetzel, 2005). The processes of reflecting on their selection of artefacts and on crafting the accompanying commentary is thought likely to improve the quality of preservice teacher practice in professional contexts (Buckley et al., 2009; Rees, Shepherd, & Chamberlain, 2005).

2.4.1 Summary

This discussion of practice and pedagogy has examined the influences on practice, and the need for preservice teachers to be equipped to critically examine their practice. This may be achieved in two different ways for two different purposes – if the emphasis is purely on practice, then practitioner inquiry/action research is appropriate. However, if the teacher needs to come to know themselves better in order to improve their practice, then a self-study inquiry may be a more appropriate technique. Initial teacher education programs need to expose preservice teachers to ways of conducting such inquiries to equip them to use these techniques at multiple stages in their careers.

From the foregoing discussion of the three circles of the conceptual framework,

the iterative inter-relationships between them have become apparent. Mechanisms by which individuals may bring these inter-relationships to light in themselves and their own practices are needed. In the remainder of this literature review, two such mechanisms are discussed – metaphor is presented as a bridge from beliefs outwards to practice, and critical reflection is presented as a path inwards from practice to beliefs.

2.5 Metaphor – A bridge outwards

This section will examine arguments justifying the use of metaphor in this study as a tool that assists preservice teachers to get in touch with their beliefs and forms a bridge outwards towards their practice.

Definition. Lakoff and Johnson, in their classic work on metaphor (1980) entitled *Metaphors we live by*, contended that "The essence of metaphor is understanding and experiencing one kind of a thing in terms of another" (Lakoff & Johnson, 1980, p. 5). They pointed out that although many people view metaphor as a poetic, linguistic device used rarely, on the contrary, metaphor is pervasive in language, thoughts and action. By linking thoughts (or beliefs) with actions (practice), they demonstrated a link between the inner and outer circles of the conceptual framework. For example, they explained that the concept of 'argument' is grounded in the metaphor of 'war', and this is reflected in all the language we use about argument e.g. we say we *win* an argument, and he *attacked* every weak point in my argument. If we were to meet people for whom the concept of argument was grounded in the metaphor of 'dance', it would be hard for us to even recognise what they were doing as an argument. In this way, our metaphors very much control our thinking and understanding of concepts and this is reflected in our language. Consequently, examining the language of metaphors can put us in touch with our thoughts and examine how these metaphorical concepts are related to our actions.

Value of metaphor in education. Research confirms that metaphors may be a useful bridge that assists preservice teachers to understand themselves as professionals and for relating this understanding to their professional growth and development (Armstrong et al, 2011). As evidenced in the literature the use of metaphor may assist in
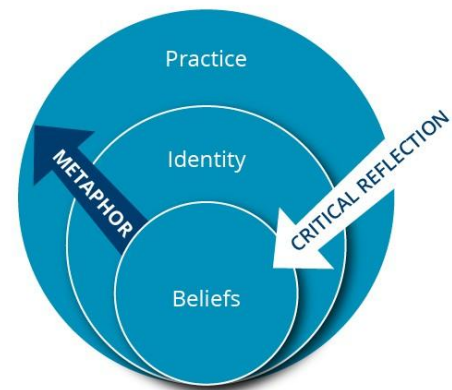
raising preservice teachers' awareness of tacit, unconscious beliefs they hold, thus supporting preservice teachers to:

a) Examine their beliefs and relate them to classroom

action (Fenstermacher, 1994).

b) Understand the influence of their beliefs as they teach (Richardson, 1996)

and as they are exposed to new material and teaching strategies.

c) Appreciate how their beliefs change throughout their

careers (Richardson, 1996).

Metaphors are also considered to contribute to the formation, development, and exploration of teacher professional identity and could contribute to an understanding of how teachers describe themselves and of how teachers describe others i.e. their students (Stokes, 1994).

Wan and Low (2015) argued that metaphors have emerged as a powerful tool for investigating teachers' thinking and professional knowledge in the field of education. Unexamined, implicit beliefs and tacit knowledge may remain undeveloped and serve to reinforce and support classroom practices that may not be informed by current theories and authentic practices. Engaging preservice teachers in an elicitation process that leads them to create metaphors that encapsulate their beliefs about teaching and learning serves to make implicit knowledge explicit (Moser, 2000). Engagement in a systematic and cohesive interrogation of existing values and beliefs is an important part of building an awareness of teacher professional identity. Images and metaphors of teaching have the potential to provide the language of practice for preservice teachers and initial teacher educators to engage in collaborative dialogue to achieve these insights (Thomas & Beauchamp, 2011; Saban, 2010).

Metaphor as a research tool has been adopted in a number of studies that investigated preservice and inservice teachers' beliefs to reveal how they conceptualise teaching and learning and teacher identity formation. Many of these studies focused on the preservice and inservice teachers' attitudes towards classroom practices, teacher-student interaction, and the evolution of teacher beliefs about teaching and learning (Bullough, Knowles, & Crow, 1991; Leavy et al., 2007). However, specific methods and procedures

adopted for the analysing of data and how findings were triangulated or confirmed are not always explicitly described in these research studies (Ritchie, 2003; Todd & Harrison, 2008). The next section will explore some ways in which metaphors have been studied.

Studying metaphor. Various researchers have used qualitative and quantitative methodologies to explore ways of gathering and interpreting preservice teacher and teacher metaphors. Seung, Park and Jung selected and reviewed 32 studies in which metaphors were used as a methodological tool for research. A summary of Seung, Park and Jung findings is presented in Table 2-1. It is clear that qualitative methods are preferred, particularly constant comparative analysis (11 studies) and thematic analysis (10 studies).

Seung, Park and Jung's analysis and synthesis also yielded three groups of studies, according to their purpose, their methods of eliciting metaphors and their methods of analysing metaphors. About purpose, they found subgroups representing four main purposes. These four purposes are all relevant to finding solutions to the problem outlined in Chapter 1. Table 2-1 illustrates that uncovering beliefs was the dominant purpose (in 14 out of 32 studies). This subgroup focused on teacher–generated metaphors which were elicited, classified and conceptualised to uncover the implicit beliefs of participants about teaching and learning. This included the role of the teacher which is reflective of their teacher professional identity. These studies are based on the assumption that beliefs impact on practice (Pajares, 1992; Richardson, 1996), and thus this would be a worthwhile exercise for preservice teachers. The second subgroup of 10 studies focused on understanding changes in teacher beliefs and conceptions, typically by eliciting teacher metaphors at different points. This indicates it would be beneficial for preservice teachers to encounter this process more than once in their initial teacher education program.

Table 2-1   *The summarised findings of the meta-analysis by Seung, Park and Jung (2015) of studies using metaphor in education.*

Purpose of using metaphors		Method of eliciting metaphors			Method of analysing metaphor		
To uncover implicit teacher beliefs/conceptions	14	Single method	Written prompt	5	Qualitative	Constant comparative methods	11
			Written records of group discussion	1		Inductive categorisation using analytic framework	2
			Essay	3		Thematic categorisation	10
To understand change in teacher beliefs/conceptions	10		Survey	3		Pre-determined categorisation	3
			Drawing prompt	1	Mixed	Qualitative + Quantitative analysis	3
			Interview	7			
To understand teachers' professional knowledge	5	Multiple methods	Written prompt + metaphor essay	3			
			Metaphor statements + interview	1			
			Journals + interview	1	Quantitative	Frequency control, statistical analysis	3
			Written prompt + survey	1			
To understand relationship between metaphoric beliefs and practice	3		More than three methods: e.g. Metaphor statements + essay + interview + survey + reflective document	6			
Total no. of studies	32	Total no. of studies		32	Total no. of studies		32

Note. Reprinted from "Elicited metaphor analysis in educational discourse" by Seung, Park and Jung cited in W. Wan and G. Low, 2015, p. 48. Copyright (2015) by Benjamins.

The third subgroup of five studies was designed to understand teachers' professional knowledge, and the final subgroup sought to uncover the relationship between belief and practice using metaphor elicitation as a methodology (Tobin, 1999). The findings indicate that metaphors impact on the concept of the teacher, so helping teachers develop new metaphors for desirable teaching roles could mean supporting them in improving their practice. Developing such awareness is important because as Knezedivc (2001) has pointed out, such is the beginning of a "process of reducing the discrepancy between what we do and what we think we do" (p. 10), or the tensions between beliefs and practices.

As seen in Table 2-1, metaphor analysis is predominantly a qualitative research process that allows researchers to examine the intent of conceptual metaphors using a range of procedures for gathering and analysing metaphoric data (Armstrong et al., 2011; Kochis & Gillespie, 2006). Armstrong et al. (2011) further note that metaphor analysis is most effective when an intentional plan for triangulation is built into the design. This methodological approach contributes to the trustworthiness of the data. The predominant methodologies of constant comparative analysis and thematic categorisation as evidenced in Table 2-1 rely on the creation of robust taxonomies for metaphors. The next section will explore the development of some such taxonomies.

Taxonomies for teachers' metaphors. Four examples will be considered in a comparative chronological presentation. These examples are studies by Oxford et al., (1998); Martinez, Sauleda, and Huber (2001); de Guerrero and Villamil (2002); and Saban, Kocbeker, and Saban (2007). General features of the studies generating these taxonomies will be summarised then the key findings of each study will be presented in Table 2.2.

Table 2-2   *General features of four studies that generated taxonomies for metaphors*

Feature	Oxford et al. (1998)	Martinez et al., (2001)	de Guerrero and Villamil (2002)	Saban et al., (2007)
Location of study	North and South America, Greece	Europe	Puerto Rico	Turkey
Number of participants	Many (more than 250) from different sources	50 experienced teachers, 38 preservice teachers	6 male, 16 female teachers from 1 to 15+ years of experience	1122, comprising 455 males and 687 females
Type of participants	Many voices including teachers and students	Teachers and preservice teachers	Teachers of English as a second language (ESL)	Preservice teachers
Methodology	Gleaned data from many sources, mainly personal narratives	Group elicitation task	Eliciting metaphorical images	Individual elicitation task
Levels of generated model	14 categories aligned with 4 philosophies	3 dimensions based on theories of learning	28 metaphors organised into 9 themes	111 metaphors collapsed into 10 themes

Three of the four studies introduced in Table 2-2 are empirical research based on a discrete sample of teachers, whereas the study by Oxford et al., (1998) relied on a more distributed sample of teachers and students. Some metaphors were extracted from personal narratives, but others were extracted from case studies reported by other researchers and from over 20 books in general and language education. This breadth of sampling yielded both explicit metaphors (such as sowing seeds) and implicit metaphors (such as a push for efficiency referring to the factory model of teaching and learning).

The taxonomy of metaphors resulting from the distributed sample study by Oxford et al., (1998) will be presented first in Table 2-3, it being the oldest of the four studies to be compared.

Table 2-3   *The taxonomy of metaphors developed by Oxford et al., (1998)*

Key Aspects	Social Order	Cultural Transmission	Leaner-Centered Growth	Social Reform
Exemplar metaphors	Teacher as manufacturer, competitor, hanging judge, doctor, mind and behaviour controller	Teacher as conduit, repeater	Teacher as nurturer, lover or spouse, scaffolder, entertainer, delegator	Teacher as acceptor, learning partner
Archetypal metaphor	Molding	Gatekeeping	Gardening	Democratising
Control	Teacher control	Teacher control	Shared teacher-and-student control	Shared teacher-and-student control
Focus	Shaping learners through external reinforcement	Unidirectional information-giving	Facilitating development of innate potential	Encouraging multiple viewpoints in community of learners
Relative prevalence	High prevalence	Low prevalence	High prevalence	Least prevalent

Note 1. Adapted from "Clashing metaphors about classroom teachers: Toward a systematic typology for the language teaching field," by R. L. Oxford et al., 1998, *System, 26*, p. 7. Copyright (1998) by Pergamon.

Note 2. In separate sections of their paper, Oxford et al. (1998) claim that social order is most prevalent (p. 13) and that learner-centred growth have more adherents than social order and cultural transmission (p. 40). This contradiction has been represented here by indicating High prevalence for both of these categories.

Oxford et al., (1998) attribute the prevalence of social order metaphors and hence a *factory model of education* as being due to the industrialisation of the 19th and 20th centuries demanding a compliant and skilled workforce. Student metaphors expressed dissatisfaction with this model, particularly the imposition of time limits for covering the work. However, students appreciated teachers who operated within the philosophy of learner-centred growth because the students were treated as important, their interests were considered, and they recognised the compassion and the passion of their teachers.

Table 2-4 presents a new summarisation of the findings from Martinez et al., (2001). In this case, the metaphor taxonomy is based on three learning theories:

1. behaviourist/empiricist reflecting the belief that the learner is passive and knowledge is fixed (Skinner, 1954);

2. cognitive/constructivist reflecting the belief that the teacher is a facilitator of learning (Piaget, 1960), and

3. socio-historical perspective is reflecting the belief that learning is a social construct that is situated in the context in which it was constructed (Vygotsky, 1978).

Table 2-4

Table 2-4 *The taxonomy generated from classifying metaphors by learning theory (Martinez et al., 2001)*

Learning theory	Behaviourist/empiricist	Cognitive/constructivist	Socio-historical
Exemplar teacher metaphors	Teacher as transmitter, writer, horse-tamer, instrument tuner, player of billiards	Teacher as facilitator, creator of intellect, site foreman, optician, parental guide	Teacher as collaborator, tourist guide, negotiator
Metaphors about learning/learners	Receiving, observing and recording (video camera), magic pen and paper, wild horse, instrument, ball being given direction	Metamorphosis (silkworm), detective, builder and process of building, learning to see, learning to walk	Ants working together, tourists and tour guide working out an itinerary together
Interpretation	Teacher as owner and transmitter of knowledge, learning as experiences creating new connections between sense and response	Teacher as parent and guide, learning as active and individual construction and reconstruction of schemata of knowledge	Teacher as community member, learning as a social construct inextricably related to context, a product of authentic participation in community
Prevalence Preservice teachers In-service teachers	22% 57%	56% 38%	22% 5%

Not obvious in Table 2-4 is the fact that in-service teachers generated 3 times as many metaphors than the preservice teachers. Martinez et al., (2001) suggested this could be attributed to different learning contexts of the two samples, as well as to the different levels of experience of the two groups of participants. Notwithstanding the difference in numbers of metaphors generated, the difference shown in Table 2-4 between the two groups in the prevalence of *types* of metaphor is striking and implies changes in beliefs over time. Unfortunately, the trend of the change is away from highly regarded teacher roles such as facilitator and collaborator, towards the teacher being a transmitter of information, shifting the learner from an active participant to a passive receiver. This could indicate the acculturation of teachers into "routinized craft knowledge" (Martinez et al., 2001, p. 973) as they gain experience in the school classroom context.

The third study to be presented is the smallest of the four, with the fewest participants. Nonetheless, Table 2-5 indicates a wide range of metaphors was still generated from this small sample from Puerto Rico. The researcher, de Guerrero and Villamil (2002) noted that these metaphors reflect what teachers *say* and not necessarily what they *do*, as no attempt was made to examine teachers' practices. The authors also recognised the range of levels of control, active engagement and participation of teachers and learners reflected in these metaphors. However, there was some degree of overlap between categories in that some metaphors had elements of more than one category. For example, in the gym instructor metaphor, the teacher can be viewed as the person directing the activity but also as the coach as they are seen to do a lot of the 'sweaty work' themselves. Similes produced were original and yet could readily be classified into conventional metaphors of teaching and learning in the ESL field of education.

Table 2-5   *The taxonomy of metaphors developed by de Guerrello and Villamil (2002)*

Theme	Exemplar teacher metaphors	Metaphors about learning/ learners	Interpretation	Prevalence (*n*=28)
Co-operative leader	Coach, trail guide, movie director, instrument of God, symphony director	Active participant in the game or artistic production	Helping learners achieve goals in a positive, productive	6
Provider of knowledge	Moon, wire, television set, sun, missile, tree full of apples	Recipient of light (knowledge), appliance plugged in, viewer, eater (who may choose not to eat)	Doling out knowledge to learners (teacher in control), though some learners may choose not to receive	6
Agent of change	Snag in the river, window to the world, bullfighter, lion tamer, gateway to future, shooting star	Sometimes reluctant object of change	Creating challenge and opportunities for learning to occur	6
Nurturer	Busy bee, Mother Nature, gardener	Developing organism on its own growth timetable	Providing support to foster potential capabilities of learner	4
Innovator	Explorer, convertible car	Reluctant travel companion, rocks in the road	Teacher tries new things, learner resists change	2
Provider of tools	Tool carrier	Constructor	Teacher provides tools so learner can construct - collaboration	1
Artist	Potter moulding clay	Raw material like clay	Learner is able to be moulded into shape	1
Repairer	Mechanic of the mind	Needs to be shown the right way	Learner is defective and needs repairing	1
Gym instructor	Instructor and trainer	Gymnast practising	Training bodies and minds	1

Table 2-6   *A new compilation of the taxonomy of metaphors developed by Saban et al., (2007)*

Theme	Teacher metaphors	Role of teacher	Role of learner	Prevalence
Knowledge provider	Sun, candle, tree, light, flower	Teacher is both the source and giver of endless knowledge	Passive recipient e.g. jug, rain	23.4%
Molder or Craftsperson	Sculptor, painter, constructor, baker, potter	Master craftsperson who skillfully produces a quality product	Raw material e.g. clay that can be molded into shape	26.5%
Curer or repairer	Doctor, mechanic	Diagnoses and cures educational ills	Defective individual who accepts cure	4.7%
Superior authority	Shepherd, ship captain, brain	Teacher is in absolute control of the classroom and students	Compliant recipient	6.3%
Agent of change	Scriptwriter, fashion designer	Teacher brings about change for the good of student and	Object of change	3.1%
Entertainer	Actor/actress, stand-up comedian	Breaks down barriers between teacher and students to encourage students to perform	Conscious observer, audience	3.1%
Counselor	Parent, friend	Teacher is concerned for students' wellbeing	Significant other	6.3%
Nurturer or cultivator	Gardener, farmer	Caring and nourishing students for maximum growth	Developing organism	6.3%
Facilitator or scaffolder	Compass, lighthouse, North Star, flashlight, traffic signs	Teacher provides scaffolding when needed and removes it when it is no longer needed	Constructor of knowledge	15.6%
Democratic leader	Tour guide, coach, conductor	Teacher conducts activities in which all participate	Active participant in community of practice	4.7%

The large sample size of the study by Saban et al., (2007) necessitated some culling of the metaphors generated by the elicitation task. Any that were judged incomplete articulations of a metaphor (only the simile but no rationale), or writings that contained no metaphor at all, were set aside. Writings that mixed a number of metaphors were also culled. Remaining metaphors were analysed for duplication, culminating in a total of 111 metaphors for further analysis. That degree of culling does raise concerns of 'cherry-picking the data' but Saban et al., (2007) state that "all the views and ideas of the

participants whose metaphors were excluded were in essence represented in the conceptual categories that were finally adopted" (p. 127). The authors note that the metaphors shown in Table 2-6 represent divergent views of teaching and thus there is no one metaphor that captures all the complexities of teaching or being a teacher. For these authors, "alternative metaphors may provide fresh lenses through which we become capable of seeing a phenomenon from different theoretical perspectives" (Saban et al., 2007, p. 134). It follows that exposing teachers to these metaphors (their own and those of others) may assist them to see the phenomenon of teaching from different perspectives.

The findings of these four studies have been presented in some detail to highlight a particular phenomenon. These four studies cross international and cultural barriers as well as a decade of time, yet the similarity of the findings is remarkable. Some categories are the same though may be couched in different language – teacher as knowledge provider/transmitter, teachers as agents of change, teachers as collaborative partners/democratic leaders are ubiquitous and others are found in three of the four studies. There is also a broad representation of many individual metaphors e.g. teacher as a gardener, a type of artists such as sculptor or potter, and teachers as a source of light (sun, moon, candle), although these may be placed in the same or different categories by some researchers. This phenomenon illuminates the universality of the concept of 'teacher' and the power of metaphor as a tool for investigating beliefs (Saban et al., 2007).

Saban et al., (2007) suggested that findings presented in Tables 2.3, 2.5 and 2.6 could be viewed through the lens of four major philosophical viewpoints that have shaped educational thought through the centuries, i.e. they are all consistent with the taxonomy developed by Oxford et al., (1998). These three studies are by Oxford et al., (1998), de Guerrero and Villamil (2002) and by Saban et al., (2007). Table 2-7 presents a new summation of these philosophies, with representative metaphors and interpretation from these studies.

Table 2-7   *Teacher metaphors aligned with educational philosophies*

Philosophy	Social order	Cultural transmission	Learner-centred growth	Social reform
Representative metaphors	Teacher as manufacturer, mechanic of the mind, sculptor	Teacher as conduit, shopkeeper	Teacher as nurturer, scaffolder, counselor	Teacher as learning partner, cooperative leader, coach
Interpretation	Teacher as a social engineer who molds students for the needs of society	Teacher as a gatekeeper who transmits to the students the cultural heritage of the society	Teacher as a facilitator of personal growth and emotional development	Teacher as a social reformer whose main role is to facilitate the creation of an autonomous individual in a democratic community

The taxonomy developed by Oxford et al., (1998) has also been cited as one of the most theoretically sound taxonomies for metaphor analysis in the field of education (Nikitina & Furuoka, 2008). Consequently, in the light of the similarities between taxonomies, and the regard placed on the Oxford taxonomy by research peers, this taxonomy will be the starting point for the analysis of metaphor in this doctoral thesis.

Limitations of metaphor. It is also important to appreciate that the use of metaphors may not always be advantageous. If Lakoff and Johnson's (1980) view of metaphors as being our conceptual constructs holds true, then Phillips (1996) rightly cautions that the metaphors we hold can influence, and at times constrain, our conceptual frameworks. Our assumptions and predispositions, as reflected by our metaphors, can affect the phenomena we choose to study and the means by which we examine these phenomena. Phillips (1996) suggests that by being cognisant of our metaphors and being aware that "metaphors are not all-encompassing and that they can be criticised or assessed" (p. 101) will prevent us being sucked into a "self- sustaining whirlpool" (p. 101). Morgan (1986), drawing from his analysis of complex organisations, also highlights the limitation of metaphors in that they can create insight but can also distort. Therefore, metaphors cannot represent a single theory that gives an all-purpose point of view. Staying mindful of these limitations of metaphor remains a critical task for teachers and initial teacher educators.

2.5.1 Summary

The research effort into metaphors for teaching and learning is considerable; only a representative sample has been presented here. The universality of metaphors across cultures and time affirms the value of examining metaphors as a means of accessing inner beliefs about teaching and learning. This research confirms the use of metaphor in this study as a bridge outwards.

Given the limitations of metaphor described above, it would seem wise to use a second tool to illuminate pathways between beliefs, identity and practices. Critical reflection is such a tool which operates in the reverse direction to metaphor – it provides a pathway inwards from practices to beliefs. The final section of this literature review will explore pertinent aspects of critical reflection.

2.6 Critical reflection – a path inwards

This section will define terms such as critical reflection and reflective practice, provide a historical overview of the practice of reflection, explore levels, frameworks and a selection of the many models of reflection, and critiques of these models. It will conclude by examining strategies that may be used in initial teacher education to promote appropriate critical reflection.
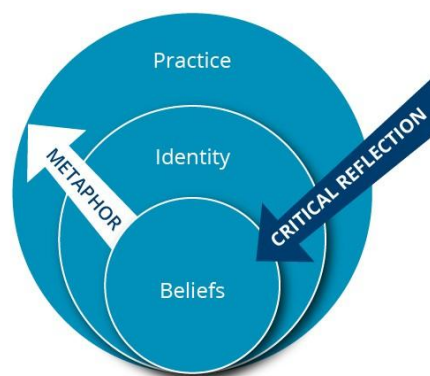
2.6.1 Definitions

Mezirow (1990) provides this definition, "Critical reflection involves a critique of the presuppositions on which our beliefs have been built" (p. 1). This definition emphasises that critical reflection involve analysing and challenging the validity of the assumptions that underpin our thoughts i.e. is a process that directly looks at what is within, the inner circle in the conceptual framework. Another definition of critical reflection from Boud, Keogh, and Walker (1985, p. 3) refers to reflection as "a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciation". This definition refers to exploring experiences i.e. looking at what we do, or practice, the outer circle in the conceptual framework. In this thesis, these two definitions are combined so that

reflective practice involves examining practice in order to shed light on underpinning beliefs and assumptions (Cooper & Olson, 1996; Kerby, 1991). It is a path inwards from practice to belief.

For Dewey, reflection was both a meaning-making process and a disciplined way of thinking (Rodgers, 2002; Davis, 2006). His philosophical pragmatism was evidenced in his highly progressive educational reforms that valued interaction, reflection, experience, interest in the community and democracy. Dewey's most basic assumption was that learning improves to the degree that it arises out of the process of reflection (Dewey, 1933). Reflective thinking addresses practical problems, allowing for doubt and puzzlement before possible solutions are reached (Hatton & Smith, 1995). Dewey indicated that reflection should be informed by evidence to enlighten future actions (1933).

A notable progression of understanding of reflection was when Argyris and Schön (1974) differentiated between two kinds of personal theory: (a) the espoused theory - the theory that people plan to use in practice and (b) the theory-in-action - what people do in practice. As with all mental models, there is an inconsistency between the beliefs we 'espouse' to be genuine and our beliefs in action (Senge et al., 1994). Argyris and Schön (1974) also coined the terms *single loop learning* and *double loop learning*. In simple terms, when something goes wrong, and solutions are sought within the existing variables and strategies, then that is single loop learning. If, however, attention is turned to the underpinning beliefs and assumptions that determine those variables and possible strategies, this is double loop learning. Larrivee (2000, p. 295) notes that "We stay in a reflexive loop where our unexamined beliefs affect what data we select."

From this early development of the concept and practice of reflection, the 1970s, 1980s and 1990s heralded the development of frameworks and models of reflection, and these will be explored next.

Levels, frameworks and models of reflection. In 1977, van Manen proposed a three-level framework to assist as a scaffold for monitoring the progression and the development of reflection. These three levels of reflectivity are:

1. technical (application of principles to achieve an outcome) – the teacher looks only at prevailing educational knowledge and curriculum to achieve an outcome;

2. practical (to clarify assumptions used to reach a goal) – the teacher analyses their own behaviour and that of the students to clarify underlying assumptions to see if and how goals may be met; and

3. critical reflection (focuses on the moral, ethical and equity aspects of the process) – the teacher looks beyond personal bias to delve into the worth of the knowledge and any moral or ethical dilemmas raised by the teaching.

However, reflection in teaching became prominent in both teaching and initial teacher education literature with the publication in 1983 of Schön's seminal work, *The Reflective Practitioner*. His conceptualisation of reflection examined ways in which educators could reflect on and deepen their understanding of their practice. Schön's most significant and lasting contribution was to identify two types of reflection: reflection *in* action, or simultaneously with action, and reflection *on* action, looking back on and learning from experience or action.

Also in the 1980s, another model of reflective thought often used by practitioners is *The Learning Cycle*, developed by David Kolb. This was based on the belief that deep learning comes from a sequence of experience, reflection, abstraction, and active testing. Kolb's (1984) well-known model of the learning process posits reflection as a step-wise process within a cycle of learning that also includes planning, action, and evaluation. However, this model later came under critique. In the context of teachers' professional development, Day (1999, p. 69) concluded that Kolb's model "fails to take account of the need for developmental links between cognitive, emotional, social and personal development in the journey towards expertise in teaching." In the everyday work of teachers, their behaviour is not only guided by cognitive thinking but may be influenced as much by their emotions (Damasio & Sutherland, 1994; Hargreaves, 1998, 2003; van Veen, Sleegers, & van de Ven, 2005), and their personal needs (Ryan & Deci, 2000). If the practitioner is the central instrument through which practice takes form, then the personal frames of reference, emotions, and needs that determine teacher responses in practice must also be considered.

In the next decade, and building on this body of work, particularly van Manen's reflectivity levels, Zeichner and Liston (1996, p. 82) postulated a framework of five levels at which reflection can take place during teaching:

1. Rapid reflection - immediate, ongoing and automatic action by the teacher.

2. Repair – in which a wise teacher makes decisions to alter their behaviour in response to students' cues.

3. Review – when a teacher thinks about, discusses or writes about some element of their teaching.

4. Research – when a teacher engages in more systematic and sustained thinking over time, perhaps by collecting data or reading the research.

5. Re-theorising and reformulating – the process by which a teacher critically examine their practice and theories in the light of academic theories.

These five levels encourage teachers to reflect at different levels at different times. It affirms the value of the lower levels of reflection which teachers may be readily able to do but also promotes digging deeper to levels 4 and 5.

Brookfield (2000) has a reflection model with four lenses – the autobiographical (teacher's self-reflection), the students' eyes (which may be examined through student feedback), colleague's experiences (through peer feedback) and theoretical literature (which requires engagement with the professional literature). Brookfield's focus is on quality teaching and learning and suggests that while good teachers may engage with the first two lenses, excellent teachers will deeply engage in all four processes and may also look to peers for mentoring, advice and feedback to improve the impact of their practice on student outcomes.

In summary, reflection aims to
- discover and research some of the assumptions behind choices of practice;
- provides opportunities to hear the stories of others, and in so doing, come to understand that we are not unique and isolated in our experiences; and
- realise the value of our experiences.

The models examined so far attempt to address those aims. However, Loughran (2002) contends that what is missing from these is a focus on 'a problem' i.e. what is it that is being reflected upon. Being told a problem exists is ineffective; each must come to the realisation of a problem for themselves. Loughran (2002) describes an example of a teacher with a class perceived to be disinterested in learning. This perception may lead to further problems with practice being attributed to the students, rather than to the practice. Consequently, any reflection may be misdirected and there will be little incentive for the practitioner to alter their practice. Loughran also highlights the value of experience, of actually trying out practice, rather than just hearing about it. Writing an anecdote about how that experience felt can be an effective form of reflective practice. He points out that a common post- practicum practice of teacher educators of filtering preservice teachers' experiences for them is probably not helpful. It is more important that preservice teachers be able to conduct this filtering or reflection for themselves. Thus a debriefing experience should extend to documenting assertions about a practice that may be more transforming for the individual preservice teachers.

Critiques of reflective practice. In 2005, Russell commented that reflection in initial teacher education is talked about more than it is practiced. Yet it is not always clear what is being talked about. The discussion just presented on the development of the concepts of reflection illustrated that a simple notion of examining practice to illuminate assumptions has blossomed into complex frameworks and models. From as early as 1990, researchers such as Grimmet, Erickson, McKinnon, and Riecken (1990) commented that the body of literature on reflective practice had no clear connection between the terms and the meanings attached to the range of terms used to describe the reflective process.

Beauchamp (2015) performed an in-depth analysis of no less than 55 definitions of reflective practice, finding many and varied definitions of the following terms: self-reflective, reflection, critical reflection, reflexive thinking, reflective practice and reflective inquiry used in the literature to describe the process of reflection. Beauchamp does not present a definitive definition of this concept. However, she did identify types of reflective processes, objects and rationales (Collin, Karsenti, and Komis, 2012).

Collin et al., (2012) critically examined the models that generate a hierarchy of levels of reflection such as those from Van Manen (1977), and Zeichner and Liston (1996). Collin et al. (2012), considers that hierarchies risk categorising different levels as

'good' or 'bad' with the concomitant classification of practitioners who engage in those levels as being 'good' or 'bad'. Pragmatically, it would appear that all types (rather than levels) of reflection are useful for teachers, who need to select what is practicable for each circumstance. This is in line with the intent of Zeichner and Liston (1996) as their five levels were not intended to be imbued with notions of better or worse, all are considered useful at different times and in different circumstances.

Collin et al., (2012) recognise the contributions of Dewey and Schön to the field of reflection in education, but note that their ideas are somewhat at odds, thus contributing to the difficulties in defining terms. The authors note that there are other domains of thought that have also engaged in reflective practice such as philosophy and sociology, and it is disappointing that insights from those fields have not been brought in to enrich the discussions of these constructs in education. However, in this article at least, Collin et al., (2012) make no attempt to redress this perceived gap.

Collin et al., also point to two other levels of critique, practical and methodological. Practical critique points to the divergences of the many models that range from being limited to teaching strategies to encompassing the entire profession including history and ethics. This raises the question of exactly what preservice teachers should be taught about reflection and how to accomplish it. In practical terms, there is also debate about the role of the practicum and the timing of critical reflection. Some theorists (e.g. Schön, 1987) hold that the practicum provides the ideal opportunity for critical reflection, yet others (e.g. Calderhead, 1989) are concerned that the practicum will serve to acculturate preservice teachers to the routinised instructive practices of experienced teachers, so critical reflection should be developed before the practicum. A final practical concern is that as we are not yet clear on definitions and models of reflection, there is no clear advice on the best way to teach reflection in initial teacher education (Collin et al., 2012).

These issues combine to create methodological weaknesses (Collin et al, 2012). One such weakness is the divergence of methods in empirical research which do not allow for strong comparability between studies, as found by O'Connell and Dyment (2004) in their review of 11 research articles. As evaluating reflective statements involves interpretation, the problem of inter-rater reliability also arises (O'Connell & Dyment, 2004). Several studies applying Bloom's taxonomy to assess reflective statements indicate

the majority of entries are at the lowest three levels (Jensen & Christina Joy, 2005; Minott, 2008; Richardson & Maltby, 1995; Wessel & Larin, 2006). However, the questions arise of whether this is an actual finding of significance or an artefact of the methodology used to elicit the reflection and/or to evaluate it. Methodological weakness also involves the difficulty of actually observing reflective practice happening, and thus assessing reflective practice is extremely problematic. Ghaye (2007) also expressed concern about the ethical issues of autonomy, privacy, and confidentiality involved in preservice teachers submitting their reflections in a portfolio as an assessment for the purpose of evaluation.

In the light of these critiques of reflection, it is unsurprising that despite the abundance of models of critical reflection providing a framework for moving thinking from surface level to a deeper level of thinking, research indicates that much of preservice teachers' reflective writing is deemed unproductive. Unproductive reflection is mainly reported as descriptive, with little or no analysis, judgmental rather than evaluative, involves listing ideas rather than connecting them in a logical way, and avoids questioning their assumptions (Abell, Bryan, & Anderson, 1998; Harrington & Hathaway, 1994; Zembal-Saul, Blumenfeld, & Krajcik, 2000). These are all important considerations raised by Dewey (1933). Also, preservice and beginning teachers tend initially to place primary importance on themselves as teachers, as opposed to having a clear focus on children as learners (Fuller, 1969; Fuller & Bown, 1975; LaBoskey, 1994), though it is acknowledged that preservice teachers do not do this exclusively (Conway & Clark, 2003; Harrington, Quinn-Leering, & Hodson 1996; Hoover, 1994). Although few findings can be clearly linked from one study to another, a common conclusion is that there is little evidence of productive critical reflection on the part of preservice teachers.

Strategies to teach reflection in initial teacher education programs. The foregoing discussion of critiques paints a challenging picture for initial teacher educators. Two questions can be raised: Is reflection a viable tool or not? If it is, how can reflection be appropriately taught? Beyond the difficulties already discussed, additional barriers have been identified. These barriers include existing preconceptions about teaching as a profession, the essential pre-conditions that allow preservice teachers to develop reflective capacities, their possible responses to being required to undertake reflection, and the structural and ideological program design within which various kinds of reflecting are

being encouraged (Hatton & Smith, 1995). Critically reflective practice is often constructed as a superficial process in which preservice teachers evaluate tacit understandings about teaching. Subjective investments are not emphasised in this arrangement because the focus of reflection is centered on technical aspects of practice in isolation from explorations of a range of theories, one's beliefs, and entrenched understandings (Erlandson, 2006; Schön, 1995). The focus on technique can work to maintain existing understandings, to the point that recursive processes of reflection can only reveal what is already known (Fendler, 2003). Preservice teachers thus become stuck in a reflexive loop, maintaining but not challenging the status quo. This raises the third question, *Can these barriers be overcome, and if so, how?*

Synthesising all that has been read and presented here; the following strategies have been devised as potentially addressing some of the major issues:

1. Select a term (e.g. critical reflection or reflective practice), select a practical definition of that term and then apply it consistently throughout the initial teacher education program.

2. Select a model for reflection that suits the context. If choosing a circular model, explain and elaborate the dangers of reflexive loops. If choosing an apparently hierarchical model of levels, be sure not to imply that there are 'good' and 'bad' levels of reflection. Instead, encourage preservice teachers to select the appropriate level of reflection for the time and circumstance, moreover, encourage them to experiment with all levels at different times and occasions.

3. Decide whether reflection should occur before, during or after practicum (or a combination of these options). Explicitly teach about reflection and the skills required for reflection before preservice teachers are expected to use these skills in a high-stakes environment such as practicum. Providing incidental opportunities to teach and encouraging reflection on these may afford preservice teachers the practice time they need to acquire the skills and habits of reflection.

4. Consider adding strategies such as writing anecdotes and assertions about one's practice and sharing these to the practicum debriefing as these

strategies may be effective in helping teachers make deeper meaning (Loughran, 2002).

5. Do not teach about reflection in isolation, but demonstrate its many links with theories, beliefs and identity. Discussing the conceptual framework that underpins this literature review and doctoral research with preservice teachers may enable them to perceive these links and situate reflection as one tool that may help them connect their practices to their identity and beliefs.

6. Within a consistent definition and model, engage in a variety of approaches to reflection to better appeal to a variety of preservice teachers.

7. Foster evidence-based approaches to reflection by teaching preservice teachers how to gather, analyse and interpret data as an ongoing record of student learning and their impact as a teacher on that learning. Such information will be useful into the future and provide a basis for ongoing critical reflection and change. Building preservice teacher capacity enables them to determine what is effective or not effective in the quality of their teaching.

In summary, adopting a holistic approach to the development of reflective practice embedded in professional contexts should be viewed as an essential ingredient of the course design in initial teacher education programs (TEMAG, 2015). This approach should have a greater impact on improving the effectiveness and quality of preservice teachers' practice (Blaik Hourani, 2013). However, perhaps the most difficult challenge for preservice teachers is the intellectual demands of simultaneously teaching and reflecting on their practice and the theory which informs that practice, and this remains a challenge for initial teacher education.

2.7 Conclusion

This chapter has presented a review of the literature in response to the conceptual framework that underpins this research. The chapter discussed the key issues illustrated in the conceptual framework which highlights the connectedness between beliefs, teacher identity and practice as well as metaphor and critical reflection as powerful tools to explore this relationship. This research study will investigate how using an inquiry model

applied to course design may assist preservice teachers in developing capabilities to build their capacity to determine the quality of their teaching. This process aims to contribute to the formation of an effective teacher identity.

The overarching research question for this study considers how an initial teacher education program equips preservice teachers to examine their practice critically?

Can metaphor and critical reflection be used in a self-study inquiry as tools for preservice teachers to examine their beliefs, professional identity and practices?

Other research questions that will be addressed in this study are:

1. What are preservice teachers' espoused beliefs about teaching and learning?

2. To what extent are preservice teachers able to articulate their professional identity?

3. To what extent are preservice teachers able to enact their espoused beliefs in practice?

4. To what extent are preservice teachers able to examine the quality of their teaching?

5. Is metaphor an effective strategy to bridge preservice teachers' beliefs, identity and practice?

6. What were preservice teachers' perceptions of the value of critical reflection?

7. How did the self-study inquiry assist preservice teachers in conceptualising their teacher professional identity?

In response to some of the critical issues revealed in the review of the literature, a fourth-year early childhood curriculum and pedagogy course was designed to create a space for preservice teachers to learn deeply about themselves and their practice.

Authentic tertiary pedagogy and other key issues related to initial teacher education as well as the early course design will be discussed in Chapter 3.

Chapter 3   Course design

3.1 Introduction

Chapter 1 outlined the research problem, the perceived lack of quality in initial teacher education and the possibility that influencing factors are a lack of understanding of the connections between teachers' beliefs, identity and practices presented in the conceptual framework. Chapter 2 presented a review of the literature focused on the links between beliefs, teacher identity and practice along with justifications for using metaphor and critical reflection as tools to illuminate the connections between these constructs. This chapter will present the researcher's response to these perceived issues.

Research related to teacher quality (World Bank 2012; Hattie, 2009) has recognised that quality teaching is the single most important factor, in a school, in influencing classroom practices that impact on student engagement and student achievement. That is why teacher quality is one of the four key pillars of the Australian Government's 'students-first' approach to school education (Australian Government, Department of Education and Training, 2016). The first step to achieving a quality education, which is so critical for the future of young Australians and our nation, is to lift the quality, professionalism and status of the teaching profession (TEMAG, 2015). The Teacher Education Ministerial Advisory Group (2014) has provided advice on how initial teacher education programs could be improved so that graduates have the right mix of academic and practical skills needed for the classroom. To this end, this researcher responded to the critical issues revealed in the literature by developing a fourth-year early childhood course in curriculum and pedagogy that creates a space for deep learning by integrating theory and practice situated within the context of a professional experience.

3.2 Authentic tertiary pedagogy

The Advisory Group (TEMAG, 2015) has made a number of recommendations to improve the quality of tertiary assessment with a key focus on integrating theory and practice. To date, assessment of initial teacher education programs is exemplified by various models that are representative of perceived relationships between theory, knowledge, and practice. Currently, the favoured model of assessment characterises a division where theory and knowledge, assessed in the University context, are separated from practice, which is assessed in the school context. This approach to assessment in initial teacher education has been challenged as inadequate (Darling–Hammond, 2006;

TEMAG, 2015; QCT, 2012), therefore, alternative forms of assessment that integrate theory and practice should be adopted to maximise the learning opportunities for preservice teachers. These alternate methods of tertiary assessment are explicitly based on notions of praxis and evidence-informed approaches to practice (Hammerness, 2006). To accomplish praxis, assessment needs to align with the development and ongoing integration of theory and knowledge of classroom practices thus providing robust evidence to demonstrate classroom readiness of graduates (TEMAG, 2015).

In Australia, there has been an increasing recognition of the limitations of conventional methods of tertiary assessment (Roberts-Hull, Jensen, & Cooper, 2015). In response to this critique, more diverse and authentic assessment strategies have been adopted, including peer and self-assessment, portfolios, electronic media and collaborative assessment tasks. Program content must be evidence-based (Gore & Bowe, 2016) and must prepare preservice teachers to address diverse student learning needs effectively, understand how to use research and assessment to inform practice and lift student outcomes, and communicate effectively (TEMAG, 2015). Professional experience is essential to the development of graduate teachers when it provides strong opportunities to integrate theory and practice. Critically reflecting on the professional practice is a vital part of this experience, enabling preservice teachers to improve and adjust their own practice, in the process also shaping and reshaping their professional identity.

Recent reviews of initial teacher education and assessment in Europe, Asia, and the USA (QCT, 2012) have highlighted some examples of quality assessment that are designed to build preservice teacher capacity. In an approach evident in high-performing countries such as Finland, initial teacher education emphasises the importance of the teacher as a researcher and as such preservice teachers are required to critically reflect and analyse their work as a way of shaping and reshaping their practice. Authentic approaches to the tertiary assessment test the rigour of evidence-based decision-making and teaching strategies of the preservice teacher.

Various principles for authentic tertiary assessment have been advanced. Table 3-1 compares similar principles abstracted from two sources – the Queensland College of Teachers (QCT, 2012) and Darling-Hammond (2006). Both sets of principles in full act as a guide for well-designed initial teacher education programs to ensure coherence based on a common, clear vision of good teaching grounded in an understanding of learning. Both sets of principles highlight the importance of evidence of preservice teacher practice to

stimulate their learning about students and themselves as professionals. Also highlighted is the importance of assessment tasks directly linked to preservice teachers' professional experience to scaffold a deeper understanding of the complexities of teaching. It is interesting to note the emphasis placed on confronting preservice teacher beliefs and adopting an inquiry approach to an assessment presented by Darling-Hammond (2006). These two sets of principles are aligned and, if adopted, should yield best practice in initial teacher education programs. Principles related to authentic assessment practices were therefore used to guide the assessment task designed for the curriculum pedagogy course presented in this chapter.

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Table 3-1 *Alignment of principles from QCT (2012) and Darling-Hammond (2006)*

Principle Title	QCT (2012)	Darling-Hammond (2006)
Authentic Assessment	A tertiary assessment system is based on principles of authentic assessment. This means, "that assessment requires the integration of multiple kinds of knowledge, skills and dispositions required of teachers as they are used in practice" (QCT, 2012, p. 26). This includes knowledge of curriculum content and assessment, the research underpinning pedagogical practices, a demonstration of capabilities in the collection and analysis of data, as well as its interpretation and implications for practice and critical reflection on the process and practices adopted in the assessment tasks.	Well-defined standards of practice and performance that are used to guide and evaluate course work and clinical work.
Capacity building	"It is a system that enhances the capacity of preservice teachers for self-assessment and reflection on their levels of developing knowledge and practice" (QCT, 2012, p. 27). Authentic assessment in initial teacher education is focused on developing preservice teachers who are able to build their capacity to improve the quality of their teaching through self-assessment and monitoring learning reflectively from their practice in professional contexts	Explicit strategies that help students to confront their deep-seated beliefs and assumptions about learning and students.
Assessment design	It captures the complexity of teaching (QCT, 2012, p. 27).	An inquiry approach that connects theory and practice, including regular use of case methods, analyses of teaching and learning, and teacher research applying learning to real problems of practice and developing teachers as reflective practitioners.
Aligns with standards	It aligns with current national (AITSL) professional standards (AIRSL, 2014).	Assessment based on professional standards that evaluate teaching through demonstration of critical skills and abilities using performance assessments and portfolios that support the development of adaptive expertise.
Partnerships and communities		Strong school-university partnerships that develop common knowledge and shared beliefs among school and university-based faculty and allow candidates to learn to teach in professional communities modelling state-of-the-art practice for diverse learners and collegial learning for adults.

A pedagogical goal of initial teacher education programs should be to provide preservice teachers with an inquiry-based learning environment that is designed to offer opportunities for productive dialogue and engagement in the process of becoming a teacher (Danielewicz, 2001). Moreover, this inquiry process creates a context where preservice teachers develop capabilities to build their capacity as a teacher to recognise what is effective and not effective in their practice and their impact on student learning. These proficiencies will contribute to maintaining up-to-date, evidence-based teaching practices throughout their careers (TEMAG, 2015).

3.3 Positioning of the researcher in the study

I was assigned the role of course examiner for an early childhood curriculum and pedagogy course situated in the fourth and final year of an early childhood education degree. To meet the needs of early childhood preservice teachers and in response to the literature on high performing initial teacher education programs, I wrote this course to provide preservice teachers with an opportunity to explore their teacher professional identity and to build their capacity to determine the effectiveness of their practice. Course participants were not aware during the course that data gathered from their assessment tasks would be collected from a volunteer sample for the course examiners' research. Once all course participants' results were released by the University, then all course participants received an email inviting them to participate in the research study. There was a very positive response to this invitation from 50 participants (out of the 78 enrolled in the course) who agreed to participate as they hoped to assist future preservice students in their professional development. It was an important ethical consideration to wait until the release of course results before introducing students to the opportunity to participate in this research study. It was imperative that students did not feel pressured or coerced to participate in the research project. This also allowed me to separate my roles as course examiner and researcher.

3.4 Rationale for the course design

The fourth year early childhood curriculum and pedagogy course was designed to integrate theory and practice by connecting three course assessment tasks, two assessed by the University and one assessed by a school. Having considered the principles and issues as outlined, my focus for these tasks was to allow preservice teachers to examine their beliefs, their professional identities and their practices to see how these were connected. I selected a self-study inquiry as a means to achieve this focus. This inquiry process affords preservice teachers with an opportunity to build preservice teacher capacity by using multiple-sources of data to enable them to analyse their practice to determine what is effective or not effective. Thus, the guided self-study inquiry process is designed to actively engage preservice teachers in the complexities of teaching, capturing the range and integrity of preservice teachers' professional identity reflected in the pedagogical design of the course assessment.

Teacher identity development cannot be left to chance. This development does not happen automatically; it must be actively built by raising awareness of preservice teachers' beliefs that drive their practice (Beauchamp, 2015). An explicit focus on the formation of an effective teacher identity was, therefore, a crucial part of this course design.

The guided self-study inquiry process is a powerful pedagogical tool in initial teacher education, for shifting surface learning to deep learning. Imperative to this process, which provides a space for critical reflection, is connecting preservice teachers with their profession; that is, providing an authentic context for learning. Consequently, this course included an embedded professional experience of five weeks situated in foundation level to grade 3 classrooms. The teaching accomplished by the preservice teachers during this professional experience became an integral component of their course assessment. The inquiry process also places emphasis on preservice teachers seeing themselves as effective learners or researchers into their practice for the purpose of building their capacity as teachers.

Education systems internationally have developed goals or professional standards for teachers as a way of shaping teacher expectations and teacher professional identity (AITSL, 2014). Initial teacher education programs across Australia are currently undergoing a process of evaluation and renewal. The Australian Institute for Teaching and School Leadership (AITSL) published a set of Professional Teaching Standards (AITSL, 2014) which describe the knowledge and skills that teachers require at different stages of their careers. Among the Graduate Teaching Standards is recognition that new teachers improve their classroom practice by engaging in professional learning with colleagues and by developing their capacity for self-reflection (AITSL, 2014). Graduates must have the capabilities of critical, analytical and integrative thinking and commitment to continuous learning. The professional standards addressed in this course are outlined below:

1. Know students and how they learn

    1.1 Physical, social and intellectual development and characteristics of students. Demonstrate knowledge and understanding of research into how students learn and the implications for teaching.

    1.2 Understand how students learn. Demonstrate knowledge of teaching strategies that are responsive to the learning strengths and needs of students from diverse linguistics, cultural, religious and socioeconomic backgrounds

2. Know the content and how to teach it.

    2.1 Content selection and organisation: organise content into effective learning and teaching sequence.

3. Plan for and implement effective teaching and learning.

    3.1 Evaluate and improve teaching programs: demonstrate a broad knowledge of strategies that can be used to evaluate teaching programs to improve student learning.

4. Assess, provide feedback and report on student learning.

This initial teacher education course is part of an undergraduate education degree at an Australian regional university that envisages developing early childhood teachers who are highly competent in diverse and specialised domains. It would be expected that by the end of four years of study and professional experience early childhood preservice teachers would have developed substantial confidence and capabilities to begin their careers. Consequently, these graduate standards are expected to be achievable in this course.

3.5 Overview of the course design

The self-study inquiry involved two phases – phase 1 before their professional experience and phase 2 after their experience. Three assessment tasks were used to guide the preservice teachers through the self-study process, of which one was the school-based assessment of the professional experience. Collectively these tasks were designed to:

- Provide preservice teachers with the skills to interrogate their beliefs and establish their *perceived* professional identity prior to their professional experience.

- Facilitate their collection of evidence of their teaching practices during their professional experience.

- Encourage and facilitate their evaluation of the evidence they collected to examine their practices in the light of their beliefs and any reshaping of their professional identity that occurred during their professional experience.

Firstly, an overview of the assessment tasks will be provided in Table 3-2. Then each element of the tasks will be explained and justified.

Table 3-2   The authentic University-assessed tasks design for this course

Phase 1 Assessment 1	Complete the survey entitled: *Philosophy of Education Inventory*, (Katzenmeyer & Moller, 2009, p. 185). This survey identifies your philosophy of education.
	Create a metaphor for teaching to encapsulate your beliefs about how children engage in the learning process within the school context. The metaphor should start with the words: *Teaching is...*
	Then create and use five principles of pedagogy to frame your explanation of your metaphor and how it reflects your philosophy of education.
	Finally, visually represent your metaphor for teaching in any mode that captures your image of learning and teaching. Ensure that the visual representations of your metaphor also capture the intent of your principles of pedagogy.
Phase 2 Assessment 2	Begin your e-portfolio with an introduction. Include your metaphor for teaching and an overview of your professional experience context.
	Next, insert your set of five principles of pedagogy. These statements will be the reference points used to frame your critical reflection demonstrating how your practice aligns with the professional standards for teachers.
	Then, provide evidence to support your claims of competence with regard to knowledge, skills, dispositions and accomplishments so that the reader has a clear understanding of you as a professional. Include at least four artefacts per principle as data that demonstrates your exemplary practice. Include also an annotation for each artefact to justify its inclusion as evidence of practice as it relates to each principle of pedagogy. Present a transformative moment (a short narrative) for each principle of pedagogy that captures your principles in practice.
	Prepare an analysis of your classroom discourse to demonstrate how your pedagogy is enacted in your classroom. Record a video or audio file of yourself teaching, using an explicit model of instruction in a literacy lesson (20-30 minutes).
	This can be a whole class or small group explicit literacy session. Write a transcript of the lesson from the audio or visual file. Then use at least the three tools listed below to analyse the transcript of your classroom discourse:
	• Explicit model of instruction. (Edwards-Groves, 2002).
	• Scaffolding Interactional Cycle (Rose, 2005)
	• Pedagogical styles (Anstey & Bull, 1996).
	Write at least an 800 word analysis of your lesson which should report on your perceived strengths and limitations in your teaching practice which will be informed by the tools for analysis of teacher talk and your lesson transcript.
	Thirdly, include implications for future practice which would improve classroom interaction and literacy pedagogy including examples of alternative and more effective pedagogical talk. Please include: Audio or visual file; Transcript of the lesson; A grid with the completed analysis of the transcript; and Signed confirmation form for the classroom discourse.
	Reflect on your professional growth highlighting three ways the creation of your metaphor provided an opportunity for you to reflect critically on your values and beliefs.

3.6 Task elements of the assessments

3.6.1 Philosophy of education inventory

The *Philosophy of Education Inventory* (PEI) was first devised by Zinn (1983); however, the version used was from Katzenmeyer & Moller (2009, p. 185). The first task of completion of the PEI by the preservice teachers served as both: (1) a consciousness-raising strategy to uncover their beliefs about teaching and learning, and (2) an opportunity to interrogate their beliefs as revealed by their inventory scores with one of five theories of education: social order; comprehensive; progressivist; humanistic and social change. After the completion of the PEI, tutorial discussions teased out the implications of each of the participants' dominant philosophical perspectives as a scaffold for the next step in the guided self-study inquiry process conditioning the way we come to think of ourselves and others. As indicated in the literature review Flores (2014) states that without an intentional strategy to raise awareness of preservice teachers' prior beliefs which in turn impact on their practice, the effects of initial teacher education programs on developing teacher quality may be superficial.

3.6.2 Elicitation of metaphor

The second task in the first phase of the self-study inquiry aimed to further illuminate the preservice teachers' beliefs about teaching and learning through the *creation of a metaphor* using the prompt *Teaching is ...*. These metaphors provided a window into preservice teacher beliefs about teaching and learning and acted as a scaffold to articulate their teacher professional identity. Elicitation of a metaphor is a critical component of the first phase of the self-study inquiry process as it ensures that preservice teachers fully understand the concept of metaphor as well as providing time for preservice teachers to create meaningful metaphors that capture their teacher professional identity. This process is also important as beliefs are a central construct in every discipline that deals with human behaviour and learning (Fishbein & Ajzen, 1975; Ajzen, 1988). Research into teachers' thinking shows that preservice teachers' practice is guided by cognitive processes that construct theories, beliefs, metaphors and mental models (Bullough et al., 1991). Also, prior beliefs of preservice teachers are a theoretical construct that cannot be observed directly and as Johnson states: "are not usually consciously articulated without some assistance" (Johnson, 1992, p. 125). Metaphors are also effective as a bridge to make implicit knowledge explicit as well as provide the language that enables preservice

teachers to bridge the gap between theory and practice (Tobin 1995). Thus, the powerful forces of metaphor (Berliner, 1990) once adopted, will assist in uncovering a response to the dual questions: *Who Am I?* and *Who Am I as Teacher?*

3.6.3 Framing of the principles

The third task in the guided self-study inquiry involved preservice teachers in the creation of five principles of pedagogy that conceptualised their philosophy of teaching and learning as well as providing a framework for the explanation of their metaphor. These principles were a set of statements that captured their beliefs and were intended to guide their practice. The process of preservice teachers explaining their principles of pedagogy and how these principles are connected to their metaphor and philosophy is a continuation of the process of awareness raising of their teacher professional identity and thus making explicit the question of *Who Am I as Teacher?* This explanation of preservice teachers' perceived identity is presented in a recorded oral presentation supported by a PowerPoint presentation as part of the first assessment task in the fourth-year early childhood curriculum and pedagogy course. To facilitate this presentation, preservice teachers were asked to find or create a visual image that encapsulated their metaphor and the intent of their principles.

This task concluded the first phase of the guided self-study inquiry, in which the preservice teachers have uncovered and articulated their perceived professional teacher identity. These first three steps of my 8-step elicitation and trustworthiness plan capture Phase 1 of the self-study inquiry. These steps are summarised in Table 3-3.

Table 3-3   *North's application of the Eight Step Elicitation and Trustworthiness Model*

Steps	Activity
Step 1	An awareness-raising exercise was conducted to involve participants' in responding to the *Philosophy of Education Inventory*. The results of the survey uncovered their philosophical perspectives aligned with an educational theory of learning.
Step 2	Prepare preservice teachers to create a metaphor, *Teaching is*, during tutorials ensuring that: • The concept of metaphor is understood. • The rationale for creating conceptual metaphor is discussed linking its purpose with the literature. Exemplars of the metaphor task are viewed and considered to consolidate understanding.
Step 3	Elicited principles of pedagogy were used to frame and facilitate participants' explanation of their metaphor for teaching. These principles provide a snapshot of preservice teachers' values translated into practice.

3.6.4 Professional experience and collection of evidence

Phase 2 of the self-study inquiry is represented as the tasks building to form Assessment 2 in Table 3-2. Collectively these tasks explore the enactment of preservice teachers' perceived identity as a teacher in practice to answer *Who Am I as a Teacher in the context of a professional experience?* Phase 2 began as the preservice teachers undertook five weeks of professional experience, assessed by their placement schools.

During this time, they were required to collect diverse evidence of their teaching for further analysis and presentation in the conclusion of the course. Consequently, the theoretical components of the course were intimately linked to the practical components. Specifically, each preservice teacher was required to gather three groups of artefacts:

- A set of four artefacts to exemplify each principle as evidence of their practice that is, 20 artefacts in total.

- A "transformative moment," that is, an incident that captured the intent of each pedagogical principle in practice. A one or two paragraph statement was recorded by each preservice teacher for each of the five principles of pedagogy.

- A video or audio file of 20-30 minutes of their teaching of a literacy lesson using an explicit model of instruction. This could be the whole class or a small group.

3.6.5 Analysis of artefacts

Upon their return from their professional experience, the preservice teachers were required to analyse these three groups of artefacts:

- Each of their 20 artefacts collected as evidence of their principles required a description of the artefact and an annotation which articulates the rationale for selection of the artefact to demonstrate the principle of pedagogy in practice.

- The transformative moments were presented as short narratives that captured the principle being put into practice.

- The video or audio file was to be transcribed and their classroom discourse analysed using the following three tools at a minimum: (1) Explicit model of instruction (Edwards-Groves, 2002); (2) Scaffolding Interactional Cycle (Rose, 2005); and (3) Pedagogical styles (Anstey & Bull, 1996). Use of additional analytical tools was encouraged.

The analysis culminated in a critically reflective report of 800 words on the effectiveness of their literacy lesson. They were required to use evidence of their practice from the analysis of the lesson transcript to support claims of strengths and limitations in their practice as well as identifying implications for future practice. This final source of evidence was a challenging task and a very illuminating one providing further evidence of the enactment of their principles of pedagogy in action.

3.6.6 Reflecting on growth

During the final phase of the self-study inquiry, preservice teachers were asked to reflect on their guided self-study inquiry to highlight critical areas of professional growth by responding to the following question:

Consider and list three ways the creation of your metaphor provided an opportunity for you to reflect critically on your beliefs enacted as pedagogy?

This final step enabled preservice teachers to critically reflect on their guided self-study inquiry to make visible their learning and professional growth.

3.6.7 Presentation in an e-portfolio

All task elements were collated into an e-portfolio for presentation for assessment. Preservice teachers will continue to have access to this e-portfolio after they have graduated and left the University. Consequently, it will be an important repository of their beliefs, identity and practices at this time, a snapshot that they can look back on in future. This affords a baseline by which they can judge future professional growth and learning.

3.6.8 North's 5Is Model of Self-Study Inquiry

I developed the 5Is model of self-study inquiry to summarise Phases 1 and 2:

INTERROGATE

Completion of the Philosophy of Education Inventory allowed preservice teachers to interrogate their beliefs.

ILLUMINATE

Elicitation of their metaphor for teaching and learning allowed preservice teachers to further illuminate their beliefs and begin to see how these related to their current perceived teacher identity.

INNOVATE

Preservice teachers were asked to frame their principles of pedagogy in the light of their beliefs (dominant philosophy of education) and their metaphors about teaching and learning.

INVESTIGATE

Preservice teachers conducted an investigation into their practice by the collection and analysis of three groups of artefacts during their professional experience.

ITERATE

Preservice teachers' reflection on their professional growth and reshaping of their teacher identity throughout this course, the tools they have learned to use and the skills they have developed will allow them to repeat this cycle of inquiry in future.

This model scaffolds the process of self-study inquiry for the preservice teachers.

3.7 Self-study inquiry as a model of authentic tertiary assessment

A growing body of research has examined the link between the understanding of teachers' belief systems that construct their teacher professional identity and the manner in which preservice teachers' practice is actioned in the classroom. The *Philosophy of Education Inventory* (Katzenmeyer & Moller, 2009) was used in this investigation to raise awareness of preservice teacher beliefs that ultimately determine their practice. Uncovering preservice teachers' dominant philosophy of education also acted as a scaffold for eliciting preservice teachers' metaphors that encapsulate their understanding of teaching and learning (Beauchamp & Thomas, 2009).

The course assessment explores preservice teachers' beliefs about their perceived teacher identity through the lens of metaphor. Massengill & Mahlios (2008) explain metaphor as a "means of framing and defining experiences to achieve meaning about ones' life" (p. 35). Through an examination of the literature, it is confirmed that metaphors are a powerful lens with which to reflect teachers' beliefs about teaching and the teacher's role, i.e. they illustrate teachers' professional identity (Saban et al., 2007). As preservice teachers develop visions of their classroom practice, professional identities continue to develop and can be instrumental in guiding their work (Hammerness, 2006).

The investigate step in the inquiry process was designed to challenge preservice teachers' espoused beliefs about teaching and learning as expressed in their metaphor and principles of pedagogy through an investigation that required preservice teachers to use evidence of practice to evaluate their beliefs in practice. This inquiry process challenges, create tensions and requires preservice teachers to provide evidence of their practice to demonstrate how effectively they are able to enact their espoused beliefs into practice. A multi-dimensional data-driven approach to critical reflection is also designed to scaffold the meaning-making process for preservice teachers, thus providing an opportunity to engage in profound and transformative learning that challenges held beliefs while strengthening teacher professional identity.

Also, the investigate step of the inquiry process mirrored the Reggio Emilia approach to teaching and learning (Rinaldi, 2006) where observation is valued as an important skill for early childhood teachers. Observation, for these preservice teachers, is the first step in collecting data as evidence of their practice. Documentation becomes a tool for teacher research, reflection, collaboration, and decision-making. The role of the teacher

as an observer is extended in this inquiry to documenter and researcher. Furthermore, the documenting of children's learning processes then analysing the documentation, revisiting, and creating documentation of their practice enhances' critical reflection for preservice teachers (Moran, 2002). This investigation phase of the self-study inquiry makes both children's learning and preservice teachers' learning visible.

Part of the focus of the analysis of transcripts by preservice teachers was to identify dialogic teaching (Alexander, 2008). An explicit literacy lesson was selected for this part of the self-study inquiry as the analysis of the style of lesson would be less complex than using other early contexts for learning as a focus for this task. It was designed to build preservice teachers' capacity by analysing their lesson transcripts to determine effective strategies and non-effective strategies in their teaching. Dialogic pedagogy has been the subject of increasing discussion in the last decade, and a number of writers have suggested it holds the greatest cognitive potential for pupils, while at the same time demanding the most of the teachers (Alexander, 2004, 2010; Nystrand, 1997). Dialogic pedagogy was the focus of a large-scale international research study entitled, '*The Five Nations Study*' (Alexander, 2000) which demonstrated the impact of skillfully used dialogic teaching on student achievement in five primary contexts across five countries. Classroom interactions scaffold children's thinking and learning as a pedagogy to improve student engagement and outcomes (Scott, 2009).

Scaffolded dialogue, or dialogic teaching, is very different from practices commonly seen in many classrooms where teachers construct question and answer sessions during which they ask questions, frequently closed questions, and students bid competitively for the opportunity to give brief answers (Alexander, 2008). The monologic teacher is concerned with transmitting knowledge while maintaining the control of talk (Bakhtin & Holquist, 1981), whereas the dialogic teacher is focused on authentic interactions between teacher and student or groups of students in a context of collaboration and mutual support. These interactions can occur in the context of whole class, group or one-on-one learning activities and are designed to help the child to build understanding, explore ideas and practice thinking through and expressing concepts. During these interactions teachers deliberately model and explicitly teach strategies for reasoning, inquiry, and negotiation, among others.

The guided self-study inquiry was designed to progress and deepen preservice teachers understanding of themselves as a professional through the cycles of inquiry. The

critical reflective process enabled preservice teachers to interrogate, illuminate, innovate, investigate and iterate their professional teacher identity as well as making meaning about themselves as learners and as practitioners. This approach to preservice teacher learning empowers them to continue to build their capacity to determine effective practice. Moreover, this process was strengthened by the interrogating and illuminate step of the inquiry which facilitated and scaffolded preservice teachers' interrogation of their beliefs about teaching and learning and in turn raising preservice teachers' awareness of their perceived teacher identity. Explicit knowledge of beliefs which inform pedagogy ensures a more focused and deeper space for learning and meaning-making through this holistic approach to critical reflection informed and enriched by preservice teachers' evidence of practice.

Throughout the guided self-study inquiry, preservice teachers acquired a new and extended metalanguage that contributes to their capacity to engage in pedagogical conversations with other professionals, in particular, their mentor teachers during the professional experience. The knowledge needed to analyse and improve practice cannot be produced outside of educational contexts. Therefore, this systematic and intentionally guided self-study inquiry, situated within a five-week professional experience is responsive to the initial teacher education reports outlining assessment practices that result in improved capabilities of preservice teachers subsequently ensuring that they are classroom ready. The International Alliance of Leading Educational Institutes [IALEI] published a report (2008) that conveyed the following important perspective on teacher professionalism. The report indicated there is an urgent need to recognise teachers' work as complex and demanding. Thus, improvement in teacher quality requires a reconceptualisation of how we prepare a new generation of teachers. It is manifested in qualities that require teachers to value and sustain the intellect, to work collaboratively with other stakeholders in education, to be responsible and accountable and to be committed to lifelong learning and reflexivity (IALEI, 2008, p. 3). Authentic assessment plays a key and pivotal role in achieving significant goals in initial teacher education.

Chapter 4   Methodology

4.1 Introduction

Chapter four describes the methodological approaches used in the study: the research design, including paradigm, methodology and methods, participants and ethical considerations, data collection, data analysis and data integrity. Furthermore, this chapter will outline and justify the research design by making explicit the links between the philosophical assumptions and theoretical perspective of the research and the position of the researcher together with the strategy of inquiry selected to address the research questions.

4.2 Research Design

4.2.1 Paradigm

One of the first tasks a researcher needs to undertake is to position themselves paradigmatically. According to Neuman (2006, p. 81), a paradigm is "a general organising framework for theory and research that includes basic assumptions, key issues, models of quality research, and methods for seeking answers". There are many definitions of a paradigm: Creswell, Plano Clark, Gutmann, and Hanson (2003) suggest that it is a '*worldview*' while Kuhn (1962) describes a paradigm as shared beliefs about how to engage in solving research problems. Finally, Denzin and Lincoln (2008, p. 22) describe paradigm as, "The net that contains the researcher's epistemological, ontological, and methodological premises". Denzin and Lincoln (2008), also consider all research as interpretive, guided by the researcher's beliefs and feelings about the world and how it can be investigated.

The paradigm captures the researcher's research philosophy which is an over-arching term to describe the development of knowledge and the nature of that knowledge. The research philosophy contains important assumptions about the way in which the researcher views the world. There are three major ways of thinking about the research philosophy: ontology, epistemology, and axiology. Each contains important differences which will influence the way in which you think about the research process. Ontology is concerned with nature of reality. This perspective raises questions of the assumptions researchers have about the way the world operates and the commitment held to particular views. The second is epistemology which focuses on what constitutes acceptable knowledge in a field of study. The third is axiology which is a branch of philosophy that

studies judgments about values; this includes ethics. Understanding the role that your values play in all stages of the research process is of critical importance to ensure that your research results are to be considered credible

   After presenting arguments for and against the importance of considering paradigms, Mertens (2005) concludes that "a researcher's philosophical orientation has implications for every decision made in the research process" (p. 7). Her work and that of Creswell (2014) have provided researchers with guidance towards the consideration of which paradigm to adopt by providing insight into the basic beliefs that underpin alternate inquiry paradigms through the lenses of ontology and epistemology and the position that each paradigm adopts on issues such as the nature of knowledge, values, and ethics. The differences and distinctions between paradigms can be illuminated through the consideration of the ontology and epistemology associated with each paradigm (please refer to Table 4.1).

Table 4-1   Summarised Comparison of Research Viewpoints

	Interpretative	Positive	Pragmatism	Realism
Ontology	Things are socially constructed leading to subjective reasoning which may change with multiple realities.	Emphasises that researcher be external, objective and independent of that study	Researcher is external, multiple, and the view is that chosen to best answer the research questions	Researcher is objective and exists independently of human mind but interpreted out of social situation
Epistemology	Toward subjective meanings of social phenomena, looking at details and realities behind it with motivating actions.	Things are observed to prove credibility to facts, focusing on causality and law generalisations thereby reducing phenomena to simplest elements	Either subjective or objective meaning can provide facts to a research question; focus on practical application to issues by merging views to help interpret data.	Belief that observing an event proves credibility of facts; scarce data, facts creates imprecision and misinterpretations; focus only within context or contexts for explanations
Axiology	The research is value bound; such that the researcher is part of what is being studied, not isolated from the studied and will be subjective	The research is value free, hence independent of the data and objective in the analysis of the data	Values play a vital role to interpret results using subjective and objective reasoning	The research is value-laden; hence, the researcher is biased by world views, culture, values, experiences and will affect the results/research
Approach	Qualitative	Quantitative but can still be qualitative	Use both qualitative and quantitative	Approach adopted depends on the research matter
Method	Mixed or multiple methods	Mono- method but can be mixed in some cases	Mixed or multiple methods	Method to use is based on the research problem or situation

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In Creswell's model, each approach is characterised not only by the stance taken on a paradigm, which he terms knowledge position but by the strategies used to apply the design and the methods of data collection (Creswell, 2014). The quantitative approach tends to be associated with a positivistic paradigm that employs strategies of inquiry such as experimentation and survey and methods of data collection that are pre-determined measures resulting in numeric data (Tashakkori & Teddlie, 2003). By contrast, the qualitative approach tends to be associated with constructivist or the transformative-emancipatory paradigms, which employ strategies such as the case study or narrative and use methods of data collection such as the interview resulting in open-ended data textual data. In addition, there is the mixed methods approach that is often associated with the pragmatic paradigm and strategies that involve collecting data in a simultaneous or sequential manner.

Initially, an interpretivism research paradigm was considered for this study as reality would be socially constructed between the interpretations supplied by the participants and myself as both course examiner and researcher (Mertens, 2005). However, the research problem and research questions also needed to be considered as they form the foundation of the study. This study is the challenge for initial teacher educators in knowing which strategies need to be incorporated into the design of initial teacher education programs to improve the quality of preservice teachers and to better prepare graduate teachers for the reality of teaching in today's high-stakes environment (Levin, He, & Allen, 2013). This is a practical problem. hence pragmatism was chosen as the paradigm for this study as it is orientated towards solving practical problems in real world contexts rather than being focused on assumptions about the nature of knowledge. This paradigm evolved from the research of Charles Sanders Peirce (1839–1914), William James (1842–1910), and John Dewey (1859–1952), (Ormerod, 2006). Pragmatism emphasises "outcomes rather than ideas or ideals" (Mouton, 1996, p. 8) and affords the researcher several options in terms of research design and data collection. For that reason, pragmatism is often adopted in mixed method studies, but can also be the basis for design-based research as in this thesis.

Pragmatism has a set of characteristics that distinguish it from other research paradigms; Creswell (2014, p.11) summarises these features in the following way:

- Pragmatism is not committed to any one system of philosophy and reality.

- Individual researchers have a freedom of choice in terms of methods, techniques, and procedures of research that best meet their needs and purposes.

- Pragmatists do not see the world as an absolute unity, rather, truth is what works at the time; it is not based in a dualism between reality independent of the mind or within the mind.

Pragmatists agree that research always occurs in social, historical, political, and other contexts. Therefore, in this paradigm, the researcher is free to consider the research problem and subsequent research questions to determine which research data collection and analysis methods (qualitative/quantitative or some of each of these) will 'work' for their study.

4.2.2 Research methodology

The distinction between methodology and methods is not always clearly made. Wahyuni (2012) makes an attempt to open up the research maze by describing methodology as a map and a theoretical model within which research is conducted. Methods are specific tools used to traverse the map a researcher has chosen. However, these tools could just as easily be used to traverse other maps; methods are not tied to specific methodologies, although the ways in which they are applied may be so tied. Some methodologies are more restrictive than others, and this study, and its paradigm of pragmatism demands a flexible methodology in which varied tools can be used.

Quantitative research is often used to test hypotheses whereas qualitative methodologies aim to deeply understand a particular current situation. However, the aim of this research is to study the effectiveness of an intervention, specifically, the design of a course. Findings of the research should allow the course to be improved in future iterations. This is the remit of design-based research. The first question to be answered was whether this methodology suits the paradigm, and the literature indicates that pragmatism is an appropriate paradigm for underpinning design-based research (Barab &

Squire, 2004; Juuti & Lavonen, 2012). The next question to be answered was whether design-based research was congruent with collecting a variety of data as anticipated in this study. Wang and Hannafin (2005) consider that design- based researchers can integrate a variety of research methods, both qualitative and quantitative, depending on the needs of the research. Consequently, design-based research does not restrict the freedom that pragmatism offers; rather, it supports that freedom.

Design-based research is a relatively new way of conducting research, and arguments exist as to whether it is an approach (Herrington, McKenney, Reeves, & Oliver, 2007) or even an emerging paradigm (Design-Based Research Collective [DBRC], 2003). However, there are several arguments that place it as a methodology (Bell, 2004; DBRC, 2003; Wang & Hannafin, 2005) that focuses on the value and importance of studying phenomena related to learning in context through the systematic design of instructional design and tools. Given that this research focuses on the value and importance of preservice teachers learning about their identity in the context of professional experience, and whether the tertiary course design facilitated this learning, there is an obvious fit for this study with design- based research.

There is a complex relationship between theory and practice in educational research (Moore, 1982). Anderson and Shattuck (2012) emphasised that design-based research should contribute to building up the theory to increase the impact and translation of educational research into practice. Theories provide different lenses for researchers to view complex and practical problems (Reeves, Albert, Kuper, Hodges, 2008).

Design-based research has emerged as a reaction against the failure of some traditional research approaches to link theory and practice within educational research, and as a means of generating useful knowledge to guide educational practice (DBRC, 2003; Dix, 2007; Lai, Calandra, & Ma, 2009; Ma & Harmon, 2009). Therefore, design-based research "combines research, design, and practice into one process, resulting in usable products that are supported by a theoretical framework" (Bowler & Large, 2008, p. 39). It is being adopted more often in educational research (Herrington; McKenney, Reeves & Oliver, 2007).

Educational research has been criticised for often being disconnected from educational issues (Juuti & Lavonen, 2012; Sari & Lim, 2012). A possible reason is that much educational research concentrates on "research about education" (Juuti & Lavonen,

2012, p. 54) that aims to understand educational problems. Juuti and Lavonen (2006) advocate instead for "research for education" (p. 54) that aims to bridge the gaps between the theoretical aspect and the practical aspect of research within the educational environment.

Wang and Hannafin (2005) defined design-based research as "a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually- sensitive design principles and theories" (pp. 6–7). This comprehensive definition confirmed that design-based research precisely suited the aims of this study.

Drawing on the literature, Wang and Hannafin (2005, pp. 7-11) proposed five basic characteristics of design-based research:

1) **Pragmatic**: Design-based research is pragmatic because its goals are to solve real-world problems by designing and enacting interventions as well as extending theories and refining design principles (see also DBRC, 2003; van den Akker, 1999).

2) **Grounded:** Design-based research is grounded in both theory and the real-world context.

3) **Interactive, iterative and flexible**: Design-based research involves collaboration and a continuous cycle of design, enactment, analysis and redesign. It is responsive to local settings (see also DBRC, 2003).

4) **Integrative**: Design-based research draws upon a range of quantitative and qualitative methodologies including inquiry methods.

5) **Contextual**: Design-based research is contextualised because research results are related to the design process and the research setting. By presenting information about the context and the multiple forms of data, and showing how the design process worked, readers can connect the findings with their own settings as appropriate.

The iterative nature of design-based research means that it is usually sustained over time so that several iterations can lead to improvements in the design. This makes it apparently problematic to use in a doctorate situation. However, Abdallah and Wegerif

(2014) have argued for the viability of adopting Design-Based Research [DBR] methodology in a PhD study due to its applicability to educational research (Herrington et al., 2007). There are some constraints in the version of DBR used in a PhD study due to the limitations posed by the timeframe of a PhD which restricts the opportunity to conduct a longitudinal study. DBR typically involves collaboration with the practitioners under study. Given the ethical need to not involve the preservice teachers in this study until after they had completed the course, this made it impossible to incorporate this aspect of DBR into this investigation. However, it was still possible to address complex problems in real and authentic contexts. Although this thesis can only report chiefly on the first iteration of the intervention, the findings of this study have revealed a number of refinements to a redeveloped conceptual framework as well as to the intervention. These results and outcomes of the first iteration of the intervention will be discussed in Chapter 6 as well as presenting a number of artefacts developed as a result of the design-based study.

Beyond the five principles outlined by Wang and Hannafin (2005), Reeves (2006) describes four phases to the design-based research process: analysis of the practical problem; development of the solutions; iterative cycle and refinements; reflection and solution enhancement. These phases applied to this research study as follows:

Phase one: the focus of this phase is the identification of a significant problem by the researcher. The research problem was identified through a review of education reports criticising assessment design in initial teacher education programs, for failing to produce classroom-ready teachers. Next, an exploration and analysis were undertaken of the literature as described and presented in Chapter 2. The review of literature focused on the following themes, authentic tertiary assessment, beliefs, teacher identity, teaching practice in context, metaphor and critical reflection to gain insights into the problem and identify what is known about strategies for improving initial teacher education outcomes. In particular, there was exploration of possible ways to integrate theory and practice to promote an increased focus by preservice teachers on data collection as evidence of practice. Research questions were also developed to respond to the research problem guided by the review of the literature. Therefore, by the end of this phase, the education problem and its context was identified, and the literature related to this problem was reviewed and preliminary research questions developed for the study.

Phase two introduced the theoretical framework for the study**.** In response to the identified problem in the literature, the researcher developed a fourth-year early childhood curriculum and pedagogy course that situated the intersection of theory and practice within the context of a five-week professional experience designed as a self-study inquiry. Preservice teachers were engaged in the self-study inquiry to examine their beliefs about teaching and learning as a process to uncover their teacher professional identity using metaphor as a bridge between their beliefs and how these are enacted in practice. Critical reflection was used in this self-study inquiry process to build preservice teacher capacity to determine what is effective or not effective in their practice using multiple sources of data as evidence of the quality of their practice. This process and the resultant course were fully described in Chapter 3.

Phase three focused on the implementation of the intervention. The researcher recruited participants then undertook the data collection and selected analysis methods including timelines for both the implementation of the intervention (first iteration) and for the evaluation of the intervention (Reeves, 2006). In this phase, the researcher gathers data about the impact of the innovation as it is implemented through iterative cycles of the design. In this study, the researcher who is also the course examiner identified the different phases to enact the self-study inquiry as tertiary assessment in a fourth-year course. The evaluation cycle began with the initial planning of the design solution and carried through with each phase of the implementation. Multiple forms of data, including surveys, metaphors and principles of pedagogy, as well as artefacts of authentic preservice teacher practice, were gathered by preservice teachers and used as data by the researcher to evaluate the impact of the intervention.

Phase four focuses on reflection and enhancement of the solutions and planned implementation of the final iteration of the intervention. In this final phase, design principles are generated that will inform future development and implementation decisions. There are potentially at least three outcomes of design–based research:

- design principles;

- design artefacts; and

- learning opportunities.

The researcher's reflection on the findings from this study will be used to inform

further iterations of the course. These iterations will include ongoing modifications and improvements to the design of authentic assessment practices planned to contribute to the shaping and reshaping of preservice teachers' professional identity. In addition, design principles and artefacts will be developed as another outcome of the design-based research study. A strength of this phase of the DBR framework is that practical solutions are provided for real world problems, as a result of the research study.

The foregoing discussion clearly demonstrates that this study is best accomplished by design-based research methodology operating within a pragmatic paradigm. The next step was to outline precisely what would be studied, the research questions so that optimal methods could be selected to obtain the required data to answer these questions.

4.2.3 Research questions

Determining the research questions is an extremely important step in the research process because these questions narrow the research objective and research purpose to specific questions that researchers attempt to address in their studies (Creswell, 2005; Johnson & Christensen, 2004). However, research questions are significantly more important when using a pragmatic paradigm as researchers make use of the methodology as a system of philosophy. As such, pragmatic studies are driven by the research questions used to investigate the problem (Newman & Benz, 1998; Tashakkori & Teddlie, 1998). Examination of the research problem, the literature review and the process of designing a new fourth-year curriculum and pedagogy course, led to the development of the following overarching research question:

Can metaphor and critical reflection be used in a self-study inquiry as tools for preservice teachers to examine their beliefs, professional identity and practices?

This in turn was broken down into the following specific research questions:

1. What are preservice teachers' espoused beliefs about teaching and learning?
2. To what extent are preservice teachers able to articulate their professional identity?
3. To what extent are preservice teachers able to enact their espoused beliefs in practice?

4. To what extent are preservice teachers able to examine the quality of their teaching?

5. Is metaphor an effective strategy to bridge between preservice teacher beliefs and identity and practice?

6. What were preservice teachers' perceptions of the value of critical reflection?

7. How did the self-study inquiry assist preservice teachers in conceptualising their teacher professional identity?

These questions arise from the conceptual framework that was established in the literature review in Chapter 2 as they address all five sections of that framework: beliefs, identity, practice, metaphor and critical reflection. They are also derived from the design of the course as described in Chapter 3 as they consider connections between beliefs and practice, beliefs and identity and the value of metaphor and critical reflection. As is appropriate in pragmatism and design-based research methodology, the specific research questions drive the selection of specific methods to collect available data from the course and the ways in which it is used to answer these questions and generate an overall picture of the findings to be presented in Chapter 5. Both quantitative and qualitative tools were used, to be described shortly, but first is a description of the research participants and the ethical considerations related to their selection.

4.2.4 Research participants and ethical considerations

Design-based research is predicated upon designing for a specific context which clearly includes a specific cohort of participants. This is the only group that can be invited to participate in this research (Herrington et al., 2007). Consequently, a sampling of this cohort does not fit with usual sampling methods beyond being a form of convenience sampling. Convenience sampling involves drawing samples that are both easily accessible and willing to participate in a study. Two types of convenience samples are captive samples and volunteer samples (Teddlie & Yu, 2007). In this investigation, volunteer convenience sampling was used to gather participants for this investigation. From a total of 78 in the course, 50 preservice teachers volunteered to participate in the study so this convenience sample represents 64% of the total population of the course.

Ethics is important in any research, but there are particular considerations in methodologies such as design-based research where the sample is fixed by the nature of the study. There are also particular concerns when an educator is using their own student

cohort for the purposes of their research. A key concern is that students may feel obliged to participate to please the course examiner or to avoid any potential negative bias towards them that might be reflected in their marks. For this reason, no mention of the upcoming research was made during the teaching of the course. As far as the preservice teachers were concerned, their assessment was merely what was required to pass the course. Only after course evaluations were complete and all the results were released, thus avoiding issues of obligation was the cohort of the course sent a personal email by the course examiner/researcher. This email outlined the research and its long-term goals and sought voluntary participation in the research.

Informed consent was thus obtained, with all consenting participants completing a formal consent form. This form acknowledged the protection of participants' rights during the collection of data and distribution of results. Care was taken to maintain confidentiality and anonymity of participants and their responses. Individual identities were not revealed, and pseudonyms will be used in the presentation of the information and participant quotes to come in Chapter 5. The researcher was also contactable to discuss any aspect of the project with the study participants.

Prior to this, ethics approval for research involving humans was sought and gained from the University Human Ethics Committee. As part of the ethics application, approval was requested and granted by the Dean of the Faculty of Education to gain access to the study participants.

4.3 Research methods and analysis

Chapter 3 described the tasks that preservice teachers undertook during the designed course and provided a rationale for their inclusion in the course. In this section, the focus will be on their purpose in the research study and how the data obtained from these tasks and instruments were analysed. Table 4.1 lists the tasks and instruments, indicates how many of each data source were available for analysis, describes their function in the research study, indicates the tools used to analyse the data from each task and the outcomes of that analysis in terms of data presentation.

Table 4-2   Overview of research methods and analysis

Task/instrument	Total number of data source from participants (*n*=50)	Function of task/instrument in this research	Tool(s) [T] used to analyse data from task/instrument	Outputs of analysis/Data display
Philosophy of Education Inventory [PEI] (Katzenmeyer & Moller, 2009, p. 185)	50	To identify preservice teacher beliefs	Scoring provided with PEI , rating scale 1-7	Frequency distribution
Metaphor elicitation *Teaching is …*	50	To identify preservice teacher metaphors	T1 - Oxford Metaphor Taxonomy (Oxford et al., 1998). T2 - North's Taxonomy. T3 – Thematic analysis	Frequency distributions
Creation of 5 principles of pedagogy by each participant to connect metaphor and philosophy of education	250	Used in combination with the metaphors to identify connections between beliefs and practice	T4 - Australian Professional Standards (AITSL, 2011).	Thematic coding of metaphors Map
Visual representation of metaphor	50	Supported analysis of metaphor		Sample images
Set of 4 artefacts for each of 5 principles of pedagogy – 20 in total from each participant	1000	To identify whether preservice teachers enacted their beliefs in their practice	T5 – A rating scale 1-5 on the basis of a rubric	Frequency distribution Excerpts for qualitative representation
Annotations for each artefact to justify its inclusion – 20 in total from each participant	1000	Supported analysis of artefacts		
Transformative moment for each principle – 5 in total from each participant	250	To identify the capacity of preservice teachers to critically reflect	T6 - Sterling levels of critical reflection (Sterling, 2001) rating 1-4	Mean scores Excerpts Frequency distribution
Video/audio file of explicit literacy teaching episode	50	These activities combined to enable preservice teachers to write their analytical report		
Transcript of audio of teaching episode	50			

Task/instrument	Total number of data source from participants (*n*=50)	Function of task/instrument in this research	Tool(s) [T] used to analyse data from task/instrument	Outputs of analysis/Data display
Analysis of discourse from teaching episode using 3 nominated tools	50			Frequency distributions Frequency scores
Written analysis of teaching based on transcript and tools used	50	To identify the capacity of preservice teachers to critically reflect	T6 - Sterling levels of critical reflection (Sterling, 2001) rating 1-4	Frequency distributions Excerpts
Implications for future practice derived from analysis of teaching episode	50			Excerpts
Reflection on professional growth in terms of 3 ways per participant in which metaphor assisted identification of beliefs and values	126	To identify how preservice teachers reflected on ways in which metaphor had assisted their identification of their beliefs and values	T3 - Thematic analysis	Thematic coding Excerpts
Reflection on the value and impact of critical reflection on their practice.	126	Reflective question	T3 Thematic analysis	Thematic coding excerpts

Table 4.1 provides a succinct overview of the multiple methods used and sources of data generated by this design-based research study. A more detailed description of these follows.

Philosophy of Education Inventory [PEI]. This inventory (Katzenmeyer & Moller, 2009) is comprised of fifteen sections with five questions per section. Each question requires a response on a seven-point scale from strongly disagree,one, to strongly agree, seven. Results in each of the five philosophies of education (Behavioural, Comprehensive, Progressive, Humanistic, and Social Change) were calculated to identify the participants' scores in each philosophy. Table 4.2 summarises the definition of each philosophy.

Table 4-3 *An overview of the five philosophies of education used to align PEI*

Philosophy of Education Inventory (PEI) Katzenmeyer & Moller, 2009)	Definition of terms
Behavioural	To promote skill development and behavioral change.
Comprehensive	To emphasise the transmission of knowledge
Progressive	To develop practical knowledge and problem-solving skills
Humanistic	To enhance personal growth and development
Social Change	To bring about through education: social, political and economic change

The highest score in the inventory reflects the philosophy of education closest to the participants' beliefs about teaching and learning while the lowest score represents the least likely philosophy of education to reflect their beliefs. This quantitative data enables the researcher to position participants' dominant philosophy of education which reflects their beliefs about teaching and learning.

Metaphors and their analysis. Metaphor elicitation was achieved by the use of a prompt *Teaching is …* for example, *Teaching is a Broadway play*. Providing the prompt ensured consistency in the manner in which preservice teachers framed their metaphor, facilitating analysis. The elicitation of metaphors allows the researcher to enter the inner world of early childhood preservice teachers' perceptions, understandings, and experiences. Metaphors provide insight into the mental models used to conceptualise themselves as professionals (Akinoglu, Tatik, & Baykin, 2015; Cameron, 2010). Analysis of metaphors was ultimately achieved by the use of three tools (T1, T2 and T3).

T1 – Oxford metaphor taxonomy (Oxford et al., 1998). As described in Chapter 2, this taxonomy classifies metaphor in terms of four philosophical perspectives on education (Social Order, Cultural Transmission, Learner-centred Growth, and Social Reform). Table 2.3 showed how the locus of control shifts from teacher (in Social Order and Cultural Transmission) to shared control between teacher and students (in Learner-centred Growth and Social Reform). This aspect, as well as the examples of metaphors provided by the taxonomy, was critical in classifying each participant's metaphor using this taxonomy. If the metaphor statement alone was not sufficiently clear for this classification, their principles of pedagogy that were used to frame the explanation of their metaphor were of assistance in making taxonomic decisions.

One issue with using the PEI and the Oxford Taxonomy is that one refers to five philosophies of education and the other only four. This led to the development of my own taxonomy which brought together these clashing perspectives.

T2 - North Philosophy of Education Taxonomy for Metaphors. In developing this taxonomy, consideration was also given to other published taxonomies such as those by Martinez et al., (2001); de Guerrero and Villamil (2002) and Saban et al., (2007), already described in Chapter 2. These were represented in the examples of metaphors selected for my first presentation of this new taxonomy in Table 2.7. The re-presentation of this taxonomy [T2] in Table 4.3 focuses instead on showing how the philosophies in the PEI and Oxford Taxonomies have been brought together in the new North Philosophy of Education Taxonomy for Metaphors.

Table 4-4   *T2 - North's Philosophy of Education Taxonomy for Metaphors*

PEI (Katzenmeyer & Moller, 2009)	Definition of terms	Oxford Taxonomy (Oxford et al., 1998)	Definition of terms	Representative Metaphors
Behavioural	To promote skill development and behavioural change.	Social Order	Schooling is a production line Teacher control	Teacher as manufacturer, mechanic of the mind, sculptor
Comprehensive	To emphasise the transmission of knowledge	Cultural Transmission	Transmission model of instruction Teacher control	Teacher as conduit, shopkeeper
Progressive Humanistic	Develop practical knowledge and problem-solving skills To enhance personal growth and development	Learner – Centred Growth	Facilitating development of innate potential Shared interaction and control	Teacher as nurturer, scaffolder, counselor
Social Change	To bring about through education: social, political and economic change	Social Reform	Encouraging multiple viewpoints in a democratic community Shared control	Teacher as learning partner, cooperative leader, coach

T3 – Thematic analysis by coding. The principles of pedagogy that preservice teachers devised to frame their explanations of their metaphors were subjected to analysis by thematic coding [T3]. Thematic analysis is a method of identifying, analysing, and reporting patterns (themes) within the data. This process organises and describes the researcher's data set in rich detail. Miles and Huberman (1994) suggested that qualitative data analysis consists of three procedures:

- data reduction (a process of reducing and organising data through the adoption of a coding process),
- data coding (the organisation of raw data into conceptual categories), and
- data display (a variety of forms such as tables, charts and networks to facilitate interpretation and drawing conclusions).

Initial conclusions can be further verified and validated through comparing with other collected data, which occurred in this research. Codes are labels assigning meaning to chunks of information. Charmaz (1983) notes:

Codes serve to summarise, synthesise, and sort many observations made of the data coding becomes the fundamental means of developing the analysis. .Researchers use codes to pull together and categorise a series of otherwise discrete events, statements, and observations which they identify in the data. (p. 112)

Miles and Huberman (1994, p. 56) set out rules for coding. Codes:

- can be assigned to chunks of varying size (from a word to a paragraph);
- should be valid, accurately reflecting what is being researched;
- should be distinct with no overlap, that is, mutually exclusive; and
- should be exhaustive; that is all relevant data should fit into code.

For these rules to be obeyed, it follows that coding is a time-consuming, thought-provoking, challenging and iterative process. To achieve the analysis, the researcher followed six steps suggested by Braun and Clarke (2006).

1. Familiarisation with the data: This step involves reading and re-reading the data, to become immersed and intimately familiar with its content.

2. Coding: This step involves generating succinct labels (codes) that identify important features of the data that might be relevant to answering the research question. It involves coding the entire dataset, and after that, collating all the codes and all relevant data extracts together for later stages of analysis.

3. Searching for themes: This step involves examining the codes and collated data to identify significant broader patterns of meaning (potential themes). It then involves collating data relevant to each candidate theme, so that the researcher can work with the data and review the viability of each candidate theme.

4. Reviewing themes: This step involves checking the candidate themes against the dataset, to determine that they tell a convincing story of the data and one that answers the research question. In this step, themes are typically refined, which sometimes involves them being split, combined, or discarded.

5. Defining and naming themes: This step involves developing a detailed analysis of each theme, working out the scope and focus of each theme, determining the 'story' of each. It also involves deciding on an informative name for each theme.

6.   Writing up: This final step involves weaving together the analytic narrative and data extracts and contextualising the analysis about existing literature.

Although these steps are sequential, each building on the previous, analysis is typically a recursive process, with movement back and forth between different steps. So it is not rigid, and with more experience (and smaller datasets), some of these steps may blur together.

T4 – Mapping against professional standards. As a further triangulation of the data sets, the principle themes derived from the thematic coding of the preservice teachers' self-developed principles of pedagogy were also mapped using T4, the Australian Professional Standards for Teachers (AITSL, 2011). The seven professional standards are shown:

1.   Know students and how they learn.

2.   Know the content and how to teach it.

3.   Plan for and implement effective teaching and learning.

4.   Create and maintain supportive and safe learning environments.

5.   Assess, provide feedback and report on student learning.

6.   Engage in professional learning.

7.   Engage professionally with colleagues, parents/carers, and the community.

The analysis as described will reveal how preservice fourth year early childhood teachers envision their professional identity, in particular, how participants conceptualise teaching and learning through their metaphors and principles of pedagogy.

T5 - Analysis of artefacts using a rubric. During the progress of their professional experience, preservice teachers collected four artefacts to illustrate each of their self-developed principles of pedagogy. An artefact was defined as an item able to illustrate authentic evidence of practice. Analysis of preservice teachers' collections of artefacts was achieved by T5 – an holistic rubric based on a scale with ratings 1-5 as shown. The complete rubric based on this scale is shown in Table 4.4. The instruction to myself as researcher was:

> **Rate the evidence presented regarding the participant's ability to enact principles of teaching in practice by a rating of each artefact on the 5-point scale provided**.

An iterative process was adopted, which included sorting artefacts into groups until the researcher was satisfied that her judgments were consistent and credible. Additional notes were added to the rating scale to inform judgment and ensure consistency of ratings. As shown in Table 4.4, preservice teachers provided annotations explaining the rationale for selecting the artefact as evidence of each principle of pedagogy in practice. The annotations further informed the researcher's judgment and subsequent rating of preservice teachers' ability to translate the theory as expressed in preservice teacher metaphors and principles of pedagogy into effective classroom practice.

Table 4-5 *Rubric for analysing preservice teachers' artefacts as evidence of practice*

Criterion	No evidence of understanding of a principle in practice	Minimal understanding of the principle in practice.	Progressing in their understanding.	Proficient understanding.	Advanced understanding.
Authenticity	Artefact provided is not authentic	Artefact provided is not authentic	Artefact authenticity identified.	Artefact authenticity identified.	Artefact authenticity identified.
Context description	No information provided about the context.	Minimal information provided about the context.	Provided adequate information about the context to situate the artefact: what, when and why.	Provided satisfactory information about the context to situate the artefact: what when and why.	Provided detailed information about the context to situate the artefact: what, when and why.
Quality of annotation	No annotation included with the artefact	No evident link between artefact and principle. No clear link between the principle of teaching and evidence of practice.	Identified briefly a limited link between evidence using language demonstrating understanding of the principle and how the artefact demonstrates this principle in practice.	Identified accurately a satisfactory link between evidence using language demonstrating understanding of the principle and how the artefact demonstrates this principle in practice.	Identified explicitly a clear link between evidence and principle using language demonstrating understanding of the principle and how the artefact demonstrates this principle in practice.
Evidence of professional growth				The artefact illustrates some professional growth. Evidence of re-visioning.	The artefact illustrates explicit professional growth. Transformative thinking.
Artefact ID Number					
Tick Rating	1	2	3	4	5

The rubric was read vertically to arrive at an overall rating on the 5-point scale, the description for which forms the headers of the columns. With 1000 artefacts to rate and the application of an iterative process which involved comparing as part of the development and application of the rating scale and rubric, this part of the process of analysis took considerable time. Furthermore, through the iterative process, the researcher acquired significant practice and skill at rating artefacts of preservice teachers' practice thus becoming very proficient in this process. Once each artefact was rated using the five-point scale, a mean score was calculated for the collection of twenty artefacts supplied by each participant. Individual scores for each artefact as well as the mean score for each collection were recorded in the research database. A frequency distribution was calculated to represent the overall rating of artefact scores for the group of the fifty participants.

T6 – Analysis of transformative moments. Transformative moments were also described by the preservice teachers. These were captured in the form of narratives of incidents that captured the intent of their principles of pedagogy in practice. This critically reflective task situated as part of the self-study inquiry provided another opportunity for preservice teachers to evaluate their theories of learning in practice. A transformative teacher is constantly committed to refining and/or re-visioning their practice to engage students in improving outcomes. Thus, a transformative moment captures the "ah ha" moments that deepens preservice teachers' knowledge and understanding of the learner and the learning context.

To analyse the transformative moments, the Sterling rating scale [T6], as shown in Table 4.5 was applied to categorise the level of critical thought demonstrated by preservice teachers' transformative moments. This involved four levels with the following interpretation: Score of 1 = no change, Score 2 = accommodation, Score 3 = reformation, and Score 4 = transformation, so each transformative moment received a score on the four-point scale. The analysis involved the calculation of the mean score for the collection of five transformative moments for each participant preservice teacher. This approach provided insights and explanation into how each preservice teacher's five teaching principles were perceived in their implementation of practice during the five-week professional experience. The analysis was designed to highlight to what extent each participant's transformative moments reflected a thorough understanding of the

associated principle.

Table 4-6 *T6 – Sterling scale of levels of critical thinking*

Levels of Learning	Order	Aspects
1 – No change	No learning.	Ignorance, denial, tokenism
2 – Accommodation	1st order learning.	Adaptation and maintenance
3 – Reformation	2nd order learning.	Critically reflective adaptation
4 – Transformation	3rd order learning.	Creative re-visioning

Note. Adapted from 'Sustainable Education – Revisioning learning and change' (p. 78) by S. Sterling, 2001. Dartington, Green Books. Copyright 2001 by Green Books.

Analysis of teaching episode. Preservice teachers were required to record a teaching episode involving explicit teaching of literacy. The video or audio file was to be transcribed, and the transcript analysed using at least three tools nominated by the course examiner/researcher. These three tools were:

1. Pedagogical styles (Anstey & Bull, 1996)

2. Scaffolding interaction cycle (Rose, 2005)

3. Explicit model of instruction (Edwards-Groves, 2002)

Once the detailed analysis of classroom interactions had been completed, then preservice teachers wrote a report about their perceived strengths as evidenced in the analysis of transcript as well as their limitations again revealed in the analysis of classroom discourse. The report was a further artefact used as evidence of practice as part of the self-study inquiry.

The Sterling scale [T6] was again used to analyse the levels of thought or learning applied to preservice teachers' explicit literacy lesson reports. The researcher used the Sterling four-level scale to judge each participant's ability to reflect critically on their classroom interactions based on their evidence of talk from their lesson transcripts. This analysis involved fifty explicit literacy lesson reports to rate the preservice early childhood teachers' capabilities as critically reflective practitioners. Furthermore, each participant's strengths were coded into themes using the coding procedures outlined earlier in the chapter. Next, the limitations of each lesson were coded, then organised into themes. Frequency distributions were calculated for each group of themes (strengths and limitations) and the results for each group of themes were represented in two frequency scores. This visual representation of data clearly contributed to illuminating the key areas

of lesson focus of preservice early childhood teachers as well as highlighting significant areas of limitation in explicit literacy instruction and quality interactions between teacher and students, as evidenced in participants' lessons.

Analysis of critical reflections. Finally, the preservice teachers were asked to reflect on their professional journey and highlight key areas of growth and then appraise their professional growth and identity. The preservice teachers were challenged as professionals to explain how the creation of their metaphor had assisted in (a) developing their identity as a teacher and (b) deepened their understanding of the learner. The preservice teachers were required to list three ways the creation of their metaphor provided an opportunity for them to reflect critically on their values and beliefs about teaching and learning. Responses were coded using a thematic coding system (as previously described) to identify categories of responses.

4.4 Compilation and collation of data

Three databases were constructed to record all the data. Data in the three databases were linked to specific participants using a sequential Participant Identification Number (PIN). The translation between names and PINs was recorded in the first database, along with records of their metaphor category code, *Philosophy of Education Inventory* (PEI) code, their overall rating of evidence for their understanding of their transformative moments and their ratings for artefacts as evidence of principles in practice.

The second database recorded each preservice teacher's principles, (five per participant) and the category of metaphor to which the principles belonged. It provided a master list of principles where each principle included a code that also identified the emergent theme to which it belonged. The record of the PIN with the particular principle number allowed back-tracking to the particular preservice teacher's materials and self-appraisal. Also recorded in the second database were codes for the metaphor category and then the researcher's rating of evidence for the preservice teacher's understanding of transformative moments and artefact collection, including their lesson report.

The third database recorded the three ways in which each participant believed their metaphor had provided them with an opportunity to reflect critically on their teaching, as well as their values and beliefs. These ways were coded for common themes

and the related metaphor category.

4.5 Trustworthiness and integrity of the data

This section of the chapter discusses how the researcher is concerned with the accuracy of the research findings such that the research findings provide evidence to justify conclusions. Design-based research does not fit either the validity framework of quantitative methodologies or the many criteria by which qualitative methodologies are evaluated. The DBRC (2003) suggest objectivity is generated through triangulation. Wang and Hannafin (2005) write about credibility and adaptability. Bell (2004) considers rigour and utility arise from a coordination of different theoretical views, and that a study may fall on a continuum between being generalisable outside of its context and being particular to its context. Bell (2004) recommends openness about the context and the research process so that readers may make their own assessments of the study's relevance to their own situation. Thus, there is no one recommended framework by which to assess the truthfulness of design-based research. However, the descriptors just listed relate more to the descriptors for the evaluation of qualitative research than the validity framework of quantitative research. Given that much of the data collected in this research was qualitative in nature, a decision was made to establish the *trustworthiness* of claims, ensuring that the collection, interpretation and evaluation of the collected data is accomplished in a reliable, dependable and consistent way.

In this thesis, the issue of trustworthiness has been addressed in a number of ways. First, systematic and transparent documentation of the data as just documented is one way to ensure the trustworthiness of the data, that is, openness, as recommended by Bell (2004). The use of multiple sources to enable triangulation of the data (DBRC, 2003) also ensured trustworthiness. As previously mentioned in this chapter, these multiple data sources included in an inventory, metaphor, artefacts of practice and documentation of reflection. These multiple sources of data were chosen to provide multiple perspectives of preservice teachers' conceptualisation of their teacher professional identity in the final year of their initial teacher education program.

Where rubrics were developed and rating scales applied, the repetitive and iterative comparative process contributed to the trustworthiness of these ratings. Although other markers had been involved in assignment marking, I re-assessed all the metaphors and artefacts for the 50 participants to maintain consistency. However, with

only one researcher to analyse the data, inter-rater reliability was not applicable. Instead, check-coding (Miles & Huberman, 1994) was implemented to strengthen the accuracy of the results. The researcher check-coded the initial thematic coding of the principles, metaphors, artefacts, transformative moments, and lesson report six months after the initial coding was completed and inserted into the database. The agreement between these two coding processes was high, 80% agreement. The few coding differences were easily reconciled by reference to my notes about the codes that I had made during the first process.

I also developed an eight-step trustworthiness plan to ensure data collection and analysis was purposeful and efficient. This is shown in Table 4.6. This plan documents the deliberate decisions made by the researcher to ensure that preservice teachers were appropriately prepared for each stage of the self-inquiry so that their efforts would be authentic and represent their beliefs, identity and principles of pedagogy as accurately as possible. For example, it is of little value to ask preservice teachers to write their metaphor for teaching if they are not clear in their minds what a metaphor is. Thus, the preservice teachers received instruction and opportunity to discuss what metaphors are in tutorials, prior to completing the elicitation task.

Table 4-7   *North's Eight-Step Trustworthiness Plan*

Steps	Activity
Step 1	An awareness-raising exercise was conducted to involve participants' in responding to the Philosophy of Education Inventory. The results of this established survey uncovered their philosophical perspectives aligned with an educational theory of learning.
Step 2	During tutorials, preservice teachers were prepared to create a metaphor, *Teaching is*, by ensuring that: • The concept of metaphor is understood. • The rationale for creating conceptual metaphor is discussed linking its purpose with the literature. • Exemplars of the metaphor task are viewed and considered to consolidate understanding.
Step 3	Elicited principles of pedagogy were used to frame and facilitate participants' explanation of their metaphor for teaching and learning. These principles provide a snapshot of preservice teachers' values translated into practice.
Step 4	Iterative thematic coding of principles during which coding decisions were recorded in notes revealed core beliefs of the participants.
Step 5	Firstly, a qualitative method of metaphor analysis was adopted using the "Oxford Taxonomy'' to align metaphors with an educational perspective. Use of the taxonomy was also informed by participants' principles of teaching and learning. This process also determined the participants' perception of their role as a teacher as it relates to their students. These data were compared and confirmed with the quantitative data (PEI scores), using the North taxonomy of metaphor. This comparison of indirect data sources with direct data from the same study contributes to the trustworthiness of data.
Step 6	Principles of pedagogy were mapped against the Australian Professional Standards for Teachers. This data offered further verification of trustworthiness when positioning participants and their beliefs about teaching and learning.
Step 7	Preservice teachers' ability to enact metaphor as framed by their principles of pedagogy in practice was evaluated. This analysis will be informed by their evidence of practice. This also affords the researcher an opportunity to evaluate the alignment of participant metaphors with the data.
Step 8	An opportunity for preservice teachers to reveal in a short narrative if the process of metaphor elicitation and application impacted on their learning as well as having a positive impact on their teacher professional identity. This final data source provides a cross-check on all the previous data, confirming predominant themes.

The dependability of the research design can assure another measure of trustworthiness. In this study, design-based research principles have been applied including systematic data collection, analysis, compilation and recording. As well as quantitative summations of aspects of the data (frequency distributions and scores as detailed in Table 4.1), the collection, retention and presentation of qualitative excerpts were a reliable way to generate and present a body of rich, thick data that related to the participants' perceptions of themselves as learners and teachers during a semester in the fourth year of their education program.

Triangulation is deemed as a process of "using multiple perceptions to clarify meaning, verifying the repeatability of an observation or interpretation" (Stake, 2005, p. 454). This process was particularly useful as a consistency check of the researcher's judgment of metaphor categories and preservice teachers' conceptualisation of teaching and learning as well as their teacher professional identity. Although the findings in this thesis will not be generalisable, another indication of the trustworthiness of the findings is when other researchers make their own conclusions about the applicability of my findings applied to similar contexts.

In terms of my co-positioning as course examiner and researcher, conflict of interest was avoided by delaying recruitment into the research study until after all marks for the course had been released. Also, a volunteer sample, rather than a captive sample, was used, with participants signing informed consent forms. With all of these measures, the trustworthiness of the data, processes of analysis and subsequent findings has been maximised.

4.6 Limitations of the research

The study was dependent upon voluntary participation following completion of the fourth-year early childhood curriculum and pedagogy coursework and assessment tasks. The 50 participants represent 64% of the total cohort of students enrolled in the course. A limitation was whether the selected participants' work reflected the full range of achievement levels or not and whether they worked to their full potential or not. However, the data collected from the 50 participants provides an excellent representation of levels of performance. Limitations of being a sole researcher are acknowledged, but as documented, measures were taken to minimise the impact of this upon the findings.

4.7 Summary

This chapter has presented the research design, including the pragmatic paradigm, and the design-based research methodology. It has provided a detailed rationale and description of the many methods of data collection and analysis. Ethical considerations relating to the recruitment of participants and the positioning of the researcher have been discussed and limitations of the research acknowledged.

Educational researchers suggest that metaphor analysis is a unique heuristic tool for bringing implicit beliefs and tacit knowledge to awareness (Patchen & Crawford,

2011). This process is important because without a trustworthy knowledge base initial teacher educators cannot intervene effectively to promote a transformation of unproductive teaching beliefs and futile classroom practices. However, there is a clear-cut trade off as on the one hand the empirical findings will be of only explorative value, and they are therefore not replicable. On the other hand, a first "thick description" may stimulate future quantitative and qualitative research about authentic tertiary pedagogy and its contribution to the effective formation of preservice teacher identity.

Chapter 5   Findings

5.1 Introduction

Chapter 4 discussed the rationale for using design- based research in this investigation and detailed the methods, tools and analysis. The purpose of this chapter is to report on the analysis of the data. The chapter has four sections: the first section provides an overview of the investigation; the second section reports on the results of *Philosophy of Education Inventory* as well as how participant metaphors conceptualised preservice teachers' professional identity; the third section reports on participants' ability to provide multi-dimensional evidence to demonstrate the enactment of their espoused beliefs into practice; and the fourth section reports on preservice teachers' responses to the qualitative question: In what ways did the metaphor provide an opportunity to critically reflect in the self-study assessment on beliefs enacted in practice.

5.1.1 The aim of the research

The aim of this study is to examine the impact of authentic tertiary pedagogy, presented as a self-study inquiry, on the formation of preservice teachers' professional identity. Specifically, exploring the links between beliefs, identity and practice through exploring and explaining how the use of a holistic approach to critical reflection can develop preservice teachers' capacity to enable them to determine the quality of their teaching. The newly-designed course was planned to create an intersection between thinking and action – theory and practice to generate a dynamic learning context for preservice teachers. In addition, this study also investigated the importance of envisioning the self as a professional at this crucial stage of their final year of their initial teacher education program as a significant contribution to the development of an effective teacher identity. Metaphor was used as a lens to facilitate this process of envisioning self as teacher as an integral part of the holistic approach to reflective practice situated within a self–study inquiry.

5.1.2 Research questions

This study focused on answering the following overarching question:

Can metaphor and critical reflection be used in a self-study inquiry as tools for preservice teachers to examine their beliefs, professional identity and practices?

The overarching question was broken down into these subquestions:

1. What are preservice teachers' espoused beliefs about teaching and learning?

2. To what extent are preservice teachers able to articulate their professional identity?

3. To what extent are preservice teachers able to enact their espoused beliefs in practice?

4. To what extent are preservice teachers able to examine the quality of their teaching?

5. Is metaphor an effective strategy to bridge between preservice teacher beliefs and identity and practice?

6. What were preservice teachers' perceptions of the value of critical reflection?

7. How did the self-study inquiry assist preservice teachers in conceptualising their teacher professional identity?

5.2 Findings Part 1

5.2.1 Results of the philosophy of education (PEI)

These findings form the answer to Research Question 1. *What were preservice teachers' espoused beliefs about teaching and learning?*

The *Philosophy of Education Inventory* (Katzenmeyer & Moller, 2009) was completed by the fifty participants as the first step in the self-study inquiry. These fifty participants were all female spanning a wide age range. The largest number of participants
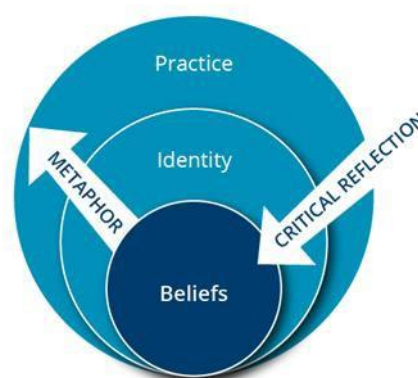
(N=28) were in the age group from 20- 30 years. The next largest group of participants (N=16) was aged 31-40 years. There were five participants aged 41-50 years and one participant was in the age group 50-60 years.

The inventory represents a set of beliefs associated with five philosophies of education. The rationale for the inclusion of the inventory as part of the data collection was to utilise an instrument that would prompt preservice teachers to interrogate their educational assumptions to explore their beliefs about teaching and learning. Moreover, the process of enabling preservice teachers to identify their personal philosophy of education scaffolds the nexus between espoused beliefs and practice. The inventory scores align with the five philosophies of education defined in Table 5-1.

Table 5-1   *Definition of the philosophies of education*

Number	Philosophy of Education	Definition of Terms
1	Behavioural	To promote skill development and behavioural change
2	Comprehensive	The transmission of knowledge
3	Progressive	Develop practical knowledge and problem-solving skills
4	Humanistic	To enhance personal growth and development
5	Social Change	To bring about through education: social, political and economic change

The participants' philosophy of education inventory scores were situated in one or more philosophies of education that served to profile their values and beliefs about teaching and learning. Determining the participants' dominant philosophy was the focus of this data collection. These data are important as they afford insights into preservice teachers' espoused beliefs about teaching and learning.

Figure 5-1 presents the results of the participating early childhood preservice teachers' *Philosophy of Education Inventory*, (*N*=50).
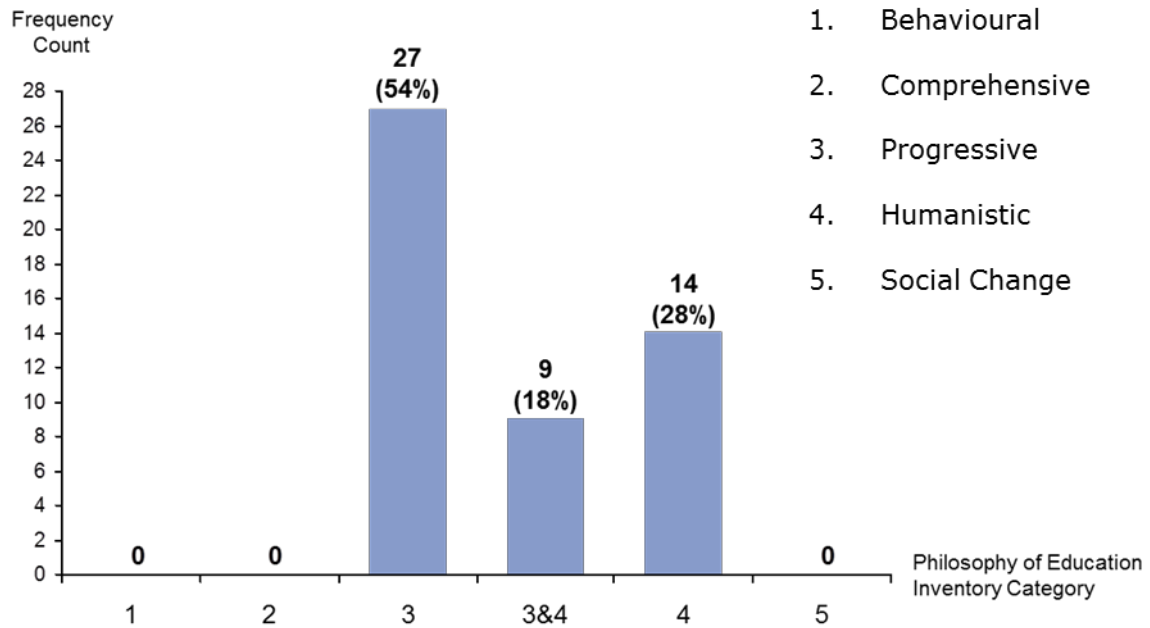
Figure 5-1   Proportion of students by philosophy of education (N=50).

The results show over half (54%) of the preservice teachers categorised their philosophy of education as Progressive (Category 3). This category suggests a philosophy of education that values development of the whole child. John Dewey (1933) was an advocate for progressive education that emphasised active learning and a shared approach to decision making between teacher and student. In addition, it can be seen that 28% of respondents (14) were aligned to a Humanistic philosophy of education (category 4). This paradigm embraces the notion that the learner should become a fully autonomous person who is allowed choice while remaining responsible for their learning.

Humanism was developed as an educational philosophy in the 18th century by Rousseau and Pestalozzi who emphasised nature and the basic goodness of humans, understanding through the senses, and education as a gradual and unhurried process in which the development of human character follows the unfolding of nature. (Huitt, 2009).

The results of the *Philosophy of Education Inventory* also indicated that 18% of respondents (9) had scores that were evenly spread between Progressive and Humanistic philosophies (Categories 3 and 4). This group of respondents drew on key aspects of each philosophy to develop and engage with the whole child. It is of interest also to note that none of the respondents' results aligned their dominant educational philosophy to Behaviourist or Comprehensive philosophies (Categories 1 and 2). This is not surprising as both of these philosophies reflect the teacher in control of the context in which students are

expected to adopt a passive role and be observant. Early childhood initial teacher education programs typically adopt a social constructivist paradigm in which the students have a voice in their learning and control over the learning process is shared between teacher and students. It is also of interest, however, that none of the respondents' dominant philosophy of education results aligned with Social change (Category 5).

In summary, the inventory results are not surprising in their outcome, as early childhood preservice teachers are encouraged to adopt a social constructivist paradigm to teaching and learning in their initial teacher education program. This paradigm is consistent with the two philosophical perspectives of Humanistic, Progressive (or a combination of both) used in the *Philosophy of Education Inventory*. These results, therefore, confirm a goal of the early childhood initial teacher education program, that is, preservice teachers are able to espouse a philosophy of education that is student focused and therefore learner-centered. Although one might expect in the increasingly challenging context of education where student diversity, disadvantage and the need for improvement in literacy levels, particularly in the early years, that some preservice teachers would show some propensity towards a philosophy of Social change (Category 5).

5.3 Findings Part 2

5.3.1 Results of the metaphor elicitation

These findings form the answer to Research Question 2. *To what extent are preservice teachers able to articulate their professional identity?*

Metaphor was used as a tool in the self-study inquiry to uncover each preservice teacher's perceptions of their teacher professional identity. Each of the fifty participants created a metaphor for teaching and learning to capture their teacher professional identity. Participants were also required to create a visual representation of their metaphor to further illustrate their understanding of teaching and learning in action. As a result, the participants' metaphors were grouped into thematic categories according to the metaphor title to provide an overview of the range of topics selected by fourth-year early childhood preservice teachers. These themes illuminate preservice teachers' metaphorical conceptualisation of their teacher professional identity as shown in Table 5-2.
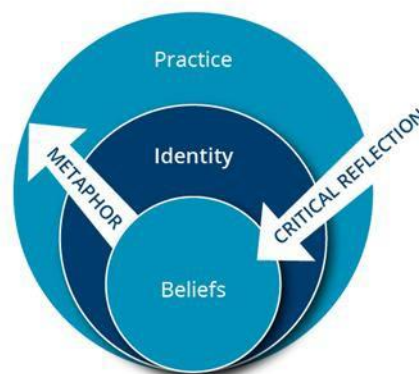
Table 5-2 *Preservice teachers' pedagogical metaphors grouped by theme*

Theme	Metaphor
Arts	• Teaching is like a patchwork quilt. • Teaching is being a painter. • Teaching is painting • Teaching is being a movie director. • Teaching is like dancing. • To teach is to choreograph a dance for life. • Teaching is like the conductor of an orchestra. • Learning and teaching is like a piece of woven cloth where each yarn represents individual threads of knowledge. • Teaching and learning is like playing jazz. • Teaching is working with a unique piece of clay, guiding it to learn something inspirational. • Teaching is painting a canvas, each individual brushstroke adds to the masterpiece of knowledge
Cooking	• Teaching is a recipe. • Teaching is like making a cake. • Teaching is being a chef within a team of chefs.
Gardening	• Teaching is a garden where flowers bloom and grow. • Teaching is tending a garden each seed needs to be cared for some in different ways . • Teaching is a *Sunflower Garden* (poem). • Teaching is a garden. • Teaching is to create a flourishing garden • Teaching is nurturing a garden. • Teaching is the gift given by many that sows and grows the seeds of learning from within, changing with the ways every special flower blooms. • Teaching is having the faith to take the time to nurture the seeds and trusting to see it become its own tree. • Teaching is a garden. • Teaching is like an open field full of wild flowers. • Teaching is growing in a garden of knowledge. • Teaching is a secret garden • Teaching is a maze.
Learning	• Learning is to grow. • Teaching is using the environment • Education is a lens of learning. • Teaching is a window of opportunity. • Teaching is growing • Teaching is inspiring. • Teaching is a virtual bag • Teaching is inspiring the mind
Theme	Metaphor
Game	• Teaching is playing a board game. • Teaching is understanding that life is not a level playing field. • Teaching is making sure all the pieces fit neatly into a puzzle to complete the educational picture • Teaching is a decagon dice.

	• Teaching is understanding that life is a level playing field. • Teaching is navigating your own way through a maze.
Water	• Teaching is driving a ski boat, and learning is water skiing. • Teaching is a picture of the captain of a yacht, navigating through the vast ocean with her crew. • Teaching is like a wave/poem.
Journey	• Teaching is a roadmap. • Teaching is a journey through a duck park. • Teaching is flying in a plane to multiple destinations.
Miscellaneous	• Teaching is social networking. • Teaching is midwifery. • Teaching is a rainbow.

Table 5.2 shows 50 individual metaphors, most of which used the *Teaching is ...* prompt. A total of seven categories emerged from the analysis of metaphors. These relate to the (1) Arts, (2) Cooking, (3) Gardening, (4) Learning, (5) Games, (6) Water, (7) the notion of a Journey and a group deemed Miscellaneous (8). The results of analysing these metaphors with different tools will now be presented.

5.3.2 Tool 1 [T1] – Oxford taxonomy of metaphor

In keeping with the research design, the Oxford Taxonomy of metaphor (Oxford et al., 1998) was selected as a tool to analyse and classify preservice teachers' metaphors to discover their teacher professional identity. The Oxford taxonomy is comprised of four philosophies of education that form a framework or taxonomy to illuminate preservice teachers' professional identity. Oxford et al. (1998) contend that all metaphors generated by preservice teachers can be encompassed within their taxonomy: Social Order, Cultural Transmission, Learner-Centered Growth and Social Reform.

Social Order and Cultural Transmission are both perspectives that promote a transmission model of instruction. Accordingly, the teacher is in control while the students adopt a passive role in the learning process. The other two categories identified in the Oxford taxonomy are Learner-centered and Social Reform. Both of these perspectives promote a social constructivist paradigm which means that the teacher and the student share control in the learning process.

The Oxford Taxonomy has three key aspects. The first aspect used to align metaphors with a philosophical perspective is *Control,* this refers to the teacher's role in the learning process. The language used in the participant's explanation of their metaphor to describe the role of teacher was analysed to reveal the control aspect of their metaphor. Moreover, identifying the teacher's role reveals preservice teachers' espoused pedagogy

thus aligning the envisioning of self as teacher with a philosophical perspective in the taxonomy. The second aspect is *Focus*, this refers to the pedagogical paradigm described in the metaphor explanation, and finally the third aspect is *Archetype,* this denotes the 'action' word in the participant's metaphor. This word e.g. molding is indicative of a preservice teachers' conceptualisation of their role as teacher revealing how they perceive children as learners and the pedagogical practices they would adopt in a classroom context.

The results of the classification of preservice teachers' metaphors using the Oxford Taxonomy of Metaphor were interesting – all 50 participants had metaphors that were classified under the Learner-centred Growth category. This classification focuses on a child- centered approach to teaching and learning. The role of the teacher in this learner-centred category is one of facilitator; learning in this context has a focus on an experiential paradigm centred upon the learners' interest and their active engagement in the learning process.

The results also indicate that none of the participant metaphors were categorised into the Social Change category. Metaphors in this category need to highlight the teachers' role as an advocate for social, political and economic change in education. No participants' metaphors suggested this philosophy where children are viewed as having a voice in determining what and how they learn within a democratic community.

Furthermore, the results show that none of the metaphors reflected the first category of Social Order. This result suggested that these preservice teachers' philosophical perspective did not focus on the notion of the teacher as molding the child into a socially useful product. Similarly, the fact that none of the metaphors in this data collection were categorised into the second philosophical perspective of Cultural Transmission suggested that the participants did not see their role of the teacher as a gatekeeper who controls the learners. However, the lack of mapping of preservice teacher metaphors to the first two categories is not a surprising outcome as early childhood pedagogy adopts a socio-cultural perspective that promotes a constructivist paradigm which reveals how preservice teachers envisage themselves as teachers. Consequently, Social Order and Cultural Transmission perspectives are in stark contrast to the philosophical perspectives of Learner-centred and Social Change.

5.3.3 Tool 2 [T2] - North philosophy of education taxonomy for metaphors

The researcher has generated a new taxonomy for categorising metaphors for teaching and learning that aligns preservice teachers' *Philosophy of Education Inventory* (PEI) categories with the Oxford Taxonomy (OT) for metaphor. Thus, behaviourism (PEI) aligns with social order (OT), and comprehensive (PEI) aligns with the cultural transmission (OT), the next two categories, progressive and humanism (PEI) both align with a learner–centred approach (OT). Finally, social change (PEI) aligned with social reform (OT). This newly developed taxonomy triangulates the data to reveal how the participants conceptualised their understanding of their teacher identity. The quantitative data gathered from the PEI confirms the qualitative analysis of the participant metaphors using the Oxford Taxonomy. The results from the North Philosophy of Education Taxonomy are important, as quantitative data have been aligned with qualitative data to confirm the researcher's judgments regarding the classification of preservice teachers' metaphors. Table 5-3 clarifies the alignment of the philosophy of education inventory with the metaphor category that suggests a preferred philosophical perspective.

Table 5-3   *North Philosophy of Education Taxonomy for Metaphor Findings*

Oxford Taxonomy	Number of participant metaphors	Number of participants in each PEI philosophy	PEI philosophy
Social order	0		Behaviourism
Cultural transmission	0		Comprehensive
Learner-centred approach	50	27 14 9 in both of these	Progressi ve Humanis
Social reform	0		Social change

The results of the alignment indicate that metaphors analysed as Learner– centred align with the results of the PEI. The PEI showed that all participants fell in one of three categories, Progressive, Humanistic or a combination of Progressive and Humanistic which are all learner-centred in their focus, thus confirming the qualitative judgments of the researcher. These data illuminate participants' teacher professional identity as embracing a social constructivist paradigm, as this is consistent with their espoused beliefs about how children learn and how the role of the teacher should be constructed and the learners' role viewed in a classroom context.

5.3.4 Tool 3 [T3] – Thematic analysis of principles of pedagogy

Preservice teachers' principles of pedagogy also contributed to the articulation of their teacher professional identity. Preservice teachers' five principles of pedagogy used to explain and expand their metaphors for teaching and learning were used as data to analyse their perceptions of their teacher identity. Additionally, this process of articulating their principles of pedagogy was an important step in the self-study inquiry to ensure that tacit knowledge becomes explicit. This served to raise preservice teachers' consciousness of how their beliefs inform their practice which in turn shapes and reshapes their professional identity. The five principles of pedagogy developed by each of the fifty participants in this investigation totaled 250. Thematic analysis and coding of the principles of pedagogy gave rise to twenty- six themes as listed in Table 5-4.

Table 5-4   *Principles of pedagogy themes*

No of theme	Principles of Pedagogy Themes
1	Teacher and student relationships require trust.
2	Educators need to encourage and support the emotional and social development of children.
3	Cater for all students and individual learning.
4	Supportive and happy learning environments.
5	Knowledge is built upon and added to over time.
6	Challenge students to achieve their individual goals.
7	Children learn through active exploration.
8	Diversity should be recognised.
9	Education should provide foundations for learning.
10	Assessment is a vital part of the decision-making process.
11	Children are capable and competent learners.
12	Children learn best through authentic and engaging and challenging experience.
13	Learning is a social and collaborative experience.
14	Given student feedback and time to reflect are part of the learning process.
15	Teaching is a dynamic profession enhanced by continual engagement in self-reflection.
16	Professional development.
17	The child has many teachers (parents, extend family, peers, teachers, the community, the environment).
18	Relationship plays an important part in the life of a teacher (S−T).
19	Lifelong learning.
20	Higher order thinking through active learning.
21	Develop positive dispositions to inquiry learning.
22	Right to learn.
23	ICT should be incorporated into teaching.
24	Partnerships.
25	Effective planning.
26	Scaffolding.

A percentage distribution of these 26 principles of pedagogy was calculated to simplify and organise these data. Figure 5-2 reveals the scope and depth of participants' conceptualisation of their teacher professional identity.
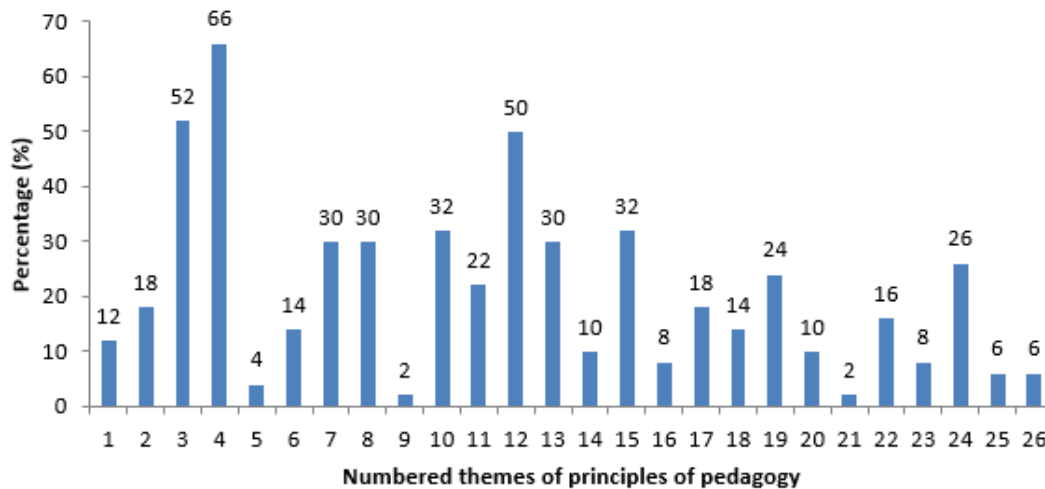
Figure 5-2   **Percentage distribution of preservice teachers' principles of pedagogy**

Figure 5-2 reveals that 66% of participants identified theme No. 4, a safe and supportive learning environment, as a key principle of their pedagogy. The second highest score identified that 52% of participants included principle theme No. 3, cater for all students and individual learning, in their group of five principles of pedagogy; while 50% of participants highlighted principle theme No. 12, children learn best through authentic, engaging and challenging experience. This group of participant responses is noteworthy as these three principle themes are essential components of a learner-centered approach to teaching and learning. The data suggests that a significant number of preservice early childhood teachers view themselves as nurturers given a large number of preservice teachers who selected safe and supportive learning environment as a valued principle of pedagogy.

A cluster of five principles featured in approximately 30% of the responses. These five principles were: 7, 8, 10, 13, and 15. Reference to Table 5-4 shows that two of these principles are specifically about teaching (assessment and decision-making, and the need for self-reflection in a dynamic profession), two are about learning (social and collaborative, active exploration) and one acknowledges the diversity of learners. This cluster of principles also reflects an emphasis on learner-centred pedagogy in that diverse children are seen as active participators in their learning (as collaborators and explorers),

and teachers are seen to be thoughtful about what they do to facilitate learning.

Similarly, the next cluster of three principles valued by more than 20% of preservice teachers (themes 11, 19, and 24) are also focused on the learner, valuing partnerships and seeing them as capable and confident lifelong learners. However, what is also of interest is the cluster of principle themes that scored at the lowest end of the distribution. Five principles were rated by 6% or less of the participants. These were principles 5, 9, 21, 25 and 26. In descending order of occurrence, these are 25 - Effective planning, and 26 - Scaffolding learning, 5 - Knowledge is built upon and added to over time, 9 - Education should be the foundation for learning, and 21 - Develop positive dispositions to inquiry learning. Principles 5 and 9 are important pedagogical processes for preservice teachers who perceive their teacher identity as being a social constructivist. However, key pedagogical practices, e.g., scaffolding learning and inquiry learning should score at a higher frequency within this cohort.

5.3.5 Tool 4 [T4] – Mapping against the professional standards

Table 5-5 presents the principles of pedagogy mapped against the Australian Professional Standards for Teachers (AITSL, 2011). This mapping process provides a deeper understanding of the interpretation of the preservice teachers' responses related to the Australian professional standards.

Table 5-5   *Preservice teachers' principles of pedagogy aligned with professional standards*

Domains of teaching	Standards	Focus areas	Principles of Pedagogy
Professional Knowledge	1 Know students and how they learn	1.1 Physical, social and intellectual development and characteristics of students 1.2 Understand how students learn 1.3 Students with diverse linguistic, cultural, religious and socioeconomic backgrounds 1.4 Strategies for teaching Aboriginal and Torres Strait Islander students 1.5 Differentiate teaching to meet the specific learning needs of students across the full range of abilities 1.6 Strategies to support full participation of students with disability	1 2 3 8 9 11 18 19 22

Domains of teaching	Standards		Focus areas		Principles of Pedagogy
	2	Know the content and how to teach it	2.1	Content and teaching strategies of the teaching area	
			2.2	Content selection and organisation	
			2.3	Curriculum, assessment, and reporting	
			2.4	Understand and respect Aboriginal and Torres Strait Islander people to promote reconciliation between Indigenous and now- Indigenous Australians	
			2.5	Literacy and numeracy strategies	
			2.6	Information and Communication Technology (ICT)	
Professional Practice	3	Plan for and implement effective teaching and learning	3.1	Establish challenging learning goals	5
			3.2	Plan, structure and sequence learning programs	7
			3.3	Use teaching strategies	12
			3.4	Select and use resources	
			3.5	Use effective classroom communication	13
			3.6	Evaluate and improve teaching programs	20
			3.7	Engage parents/carers in the educative process	21
					23
					25
					26
	4	Create and maintain supportive and safe learning environments	4.1	Support student participation	
			4.2	Manage classroom activities	
			4.3	Manage challenging behaviour	
			4.4	Maintain student safety	4
			4.5	Use ICT safely, responsibly and ethically	6
	5	Assess, provide feedback and report on student learning	5.1	Assess student learning	10
			5.2	Provide feedback to students on their learning	14
			5.3	Make consistent and comparable judgments	
			5.4	Interpret student data	
			5.5	Report on student achievement	
Professional Engagement	6	Engage in professional learning	6.1	Identify and plan professional learning needs	15
			6.2	Engage in professional learning and improve practice	16
			6.3	Engage with colleagues and improve practice	
			6.4	Apply professional learning and improve student learning	
	7	Engage professionally with colleagues, parents/carers and the community	7.1	Meet professional ethics and responsibilities	17
			7.2	Comply with legislative, administrative and organisational requirements	24
			7.3	Engage with parents/carers	
			7.4	Engage with professional teaching networks and broader communities	

The principles of pedagogy themes align with six of the Australian Professional Standards for Teachers (AITSL, 2011). There are large clusters of principles themes aligned with two standards, in particular, S1. *Know students and how they learn* and S3, *Plan for and implement effective teaching and learning*. The mapping of principles of pedagogy themes against the standards further illustrates preservice teachers' perceptions of themselves as being learner-centered. However, it is also of note that there were no principle of pedagogy themes that placed any emphasis on teacher knowledge as a key ingredient of these participants' teacher identity. Additionally, there were only a few principles of pedagogy focused on assessment, therefore standard 5, given its significant focus on teachers gathering and analysing student data to inform their planning, failed to draw preservice teachers' attention. This mapping highlights some areas that may need more attention in their University studies.

In summary, all the principles of pedagogy themes selected by participants to conceptualise their understanding of teaching and learning reflect a social constructivist paradigm. This perspective was revealed by the principle themes when aligned with the results of the analysis of participant metaphors with 100% of participants being learner-centred in their preferred pedagogical approach to teaching and learning. It is also interesting to note the results of the PEI where 60% of participants favoured a progressive perspective as their dominant educational philosophy while 28% aligned with a humanistic perspective in education, and 12% scored equally between progressive and humanistic perspectives. Again, these findings further support the perspective that fourth-year early childhood preservice teachers' professional identities are being conceptualised as social constructivists.

Some important areas for further attention are also highlighted, in terms of lack of emphasis on scaffolding, inquiry, the importance of teacher knowledge and assessment.

5.3.6 Two exemplars of preservice teachers' metaphors and principles of pedagogy

Examples of two participant metaphors have been selected to illustrate how preservice teachers' metaphors, principles of pedagogy and subsequent explanations were analysed to align with one of the philosophical perspectives elucidated in the Oxford Taxonomy. Also, how preservice teachers' philosophy of education as scored by the *Philosophy of Education Inventory*, aligns with the Oxford categorisation of participant metaphors. Thus, the analysis of the metaphor confirms and reveals the theoretical

underpinnings of participant metaphors and principles of pedagogy.

Exemplar 1. Humanistic Philosophy. Participant 32 (who will be referred to as Sarah) was selected as representative of a humanistic philosophical perspective as per her results of the philosophy of education inventory. Sarah's metaphor, "Teaching is being a painter" when categorised using the Oxford Taxonomy is reflective of a *learner-centered* pedagogy. This result was determined by the researcher by using information from the participant's explanation of her metaphor that described the role of the teacher and the role of the student in the classroom context. Sarah's visualisation of her metaphor is presented in Figure 5-3.

Figure 5-3   Visual representation of Sarah's metaphor, "Teaching is being a painter"

Sarah said: 'A painter is unique, observant, sensitive to their surroundings and creative. Before painting, a painter considers the many possibilities of compositions. A painter considers different styles and prior experiences to develop a meaningful, creative and individual masterpiece. A painter makes choices about colour, line, and form. These choices may originate from a feeling, from something observed or something taught. A painter's choices may also be spontaneous, based on a reaction to a piece of music, an emotion or a scene. A painter exudes creativity, developing new and fresh ideas, in the hope that this can be projected onto their painting'.

Sarah continues her description of her metaphor: 'both during and after painting, a painter may stop to reflect on their artwork. They may revise, alter and start again, or they may be happy with what they have created and endeavour to remember and repeat the good choices they have made. A painter has an open mind, always aware of what they have learned, and open to what they are yet to learn'. The learner-centred approach favoured by Sarah encourages giving children a voice in the co-construction of their learning while Sarah as the teacher acts as a guide or facilitator in the learning process. The participant in her explanation of her metaphor values children are unique (as is every painting), and this belief was illustrated by Sarah's focus considering student's learning styles as a pedagogy that promotes a learner-centered approach to teaching and learning in her practice. The subject of Sarah's painting as shown in the visual representation of her metaphor is flowers, showing parallels with a gardening metaphor that the Oxford Taxonomy considers archetypal for learner-centred growth. Table 5-6 summarises the participant's pedagogical approach to teaching and learning.

Table 5-6 *Metaphor Classification of PST 32*

Student Number 32	
Key	Learner-centered growth
Control	Shared teacher-and-student control
Focus	Individual learning styles
Archetype	Guiding

The *humanistic* philosophy of education, Sarah's preferred education philosophy as seen in her results of the philosophy of education inventory, has a clear focus on personal growth and development and values the child at the centre of the curriculum and also focuses on and values children's interests. Sarah's five principles of pedagogy are in alignment with her philosophical stance:

A.   Provide a supportive, caring, inclusive and stimulating learning environment.

B.   Value and respect all students' needs, interests, talents, backgrounds and learning styles.

C.   Provide opportunities for students to participate in active learning experiences through exploratory, play-based, and hands-on learning.

D.   Promote and encourage students to become creative, independent and life-long learners.

E.   A commitment to ongoing reflective practice and professional renewal to consistently improve my teaching practice.

These principles of pedagogy which guide Sarah's practice were further elucidated in Sarah's explanations of each principle. The first excerpt begins to explain Principle A.

> Just as a painter considers the many possibilities of compositions when creating artwork, a teacher considers the physical and emotional environment they wish to create. The learning environment is an important aspect of teaching because the arrangement of the classroom environment affects children's level of involvement, as well as the quality of interaction between teachers and students (Rodriguez, 1998).
>
> PST 32 Excerpt 1

This detailed explanation of Sarah's first principle, highlighted key issues for consideration when enacting Principle A in practice. As stated in the above quote the participant places vital importance on the learning environment. Providing a safe, supportive and stimulating environment is considered essential for all students, in the early years of the school context. Preservice teachers' course work includes a major focus on the Reggio Emilia philosophy of education. This approach adopts the view that: "There are three teachers of children: adults, other children, and their physical environment" (Malagazzzi, 1990, p. 58). The environment is referred to as the "third teacher." because it "speaks to children about what they can do, how and where they can do it and how they can work together" (Paiman & Terrani, 1998, p. 1 as cited in Ludlow, 2012). Educators who adopt this philosophy see space as an "aquarium that mirrors the ideas, values, attitudes and cultures of the people who live in it" (Gandini, 1994, p. 149). In her explanation of Principle A, Sarah highlighted key descriptors to elucidate her pedagogy that also confirms the value placed on the environment, that is, promoting a supportive and inclusive learning environment.

In consideration of the classroom environment, Sarah made three key points that sum up her view of its importance. These are shown in Excerpt 2.

> A supportive and caring environment is achieved through effective communication; providing positive reinforcement, and collaboration with children, parents, staff and community. Inclusivity is achieved in an environment that values diversity, and where differences are celebrated thus becoming a key component of the planning and decision-making process. Furthermore, to achieve a stimulating environment, students would be offered many choices, allowing them to have input into their learning by providing a variety of open-ended materials and resources to explore including the use of a variety of media to represent ideas (Fraser, 2006).
>
> PST 32 Excerpt 2

Sarah believes a learning environment should be supportive and caring, inclusive and stimulating. She expands on inclusivity in Excerpt 3:

> I value diversity, and to achieve an inclusive environment, I aim to acknowledge individual differences and learning styles by incorporating inclusive practices. Inclusivity can be achieved through celebrating differences (e.g. learning about different cultures, languages, etc.), and ensuring that differentiation is an integral part of in my planning (Ashman & Elkins, 2009)."
>
> PST 32 Excerpt 3

Sarah explained Principle B in Excerpt 4:

> Before painting, a painter will consider different styles and prior experiences to develop a meaningful and individual masterpiece. In the same way, when planning the curriculum, a teacher needs to consider their students' different needs, interests, talents, learning styles, learning rates, prior experiences, and backgrounds. This knowledge helps teachers to build on student's understanding in the same way as a painter would build on the background of their painting. Valuing and respecting the needs, interests and capabilities of each and every student helps to provide an inclusive environment for all.
>
> PST 32 Excerpt 4

Sarah unpacks the focused strategies adopted to cater for individual differences. One effective strategy for achieving this goal is using a multi-sensory approach to planning and teaching. Also, using children's interests is another way to ensure authentic, engaging and inclusive learning experiences for young children.

This participant also emphasised a differentiated approach to teaching and learning that is informed by authentic assessment strategies that profile students' interests and abilities. Sarah used the following quotation to capture her understanding of this principle and related strategies: "Students will be offered a range of learning experiences and alternative assessments through differentiation of the curriculum. In this way, individual needs are addressed, and all students can achieve success" (Ashman & Elkins, 2009, p. 49).

Sarah's Principle C acknowledged the value of active learning that includes play-based pedagogy as an important strategy to achieve the translation of espoused beliefs of into practice. Other strategies used to adopt this principle in a classroom context included inquiry learning, learning-centres, role play, as well as a range of concrete materials to stimulate and support learning.

Principle D focused on the importance of creative and critical thinking to be included in early years' curriculum planning and pedagogy. The participant wrote: I would encourage

creativity in the classroom through the provision of open-ended learning experiences. These require students to make individual responses to a task or challenge within a set criterion, where the 'process' is considered as important as the 'product' (Dinham, 2011).

Additionally, there was a focus on higher order thinking revealed in the participant's comments:

> The development of deep knowledge and understanding requires the provision of detailed and specific information so that students can make connections to significant concepts. Students use their deep knowledge to solve problems, present arguments and make clear distinctions.
>
> PST 32 Excerpt 5

Finally, in Principle E, Sarah demonstrated a commitment to ongoing reflective practice and professional renewal in order to consistently improve her teaching practice. This is explained in the following excerpt:

> Both during and after painting, a painter may stop to reflect on their artwork. They may revise, alter and start again, or they may be happy with what they have created and endeavour to remember and repeat the good choices they have made.
>
> PST 32 Excerpt 6

It can be seen that the importance of critical reflection as a strategy to improve practice as well as student outcomes has been highlighted in Principle E. The overall significance of this position is also captured in the following quotation that Sarah selected to support her principle:

> Through regular reflection, I endeavour to consistently improve my teaching philosophy and practice, and seek out relevant professional development opportunities. These strategies for self-renewal will help me to maintain resilience, retain currency and best practice (Queensland College of Teachers, 2006).
>
> PST 32 Excerpt 7

Exemplar 2. Progressive and Humanistic Philosophy. Participant 12 (Anne) was selected to represent the group of participants who received equal scores for *progressive and humanistic* philosophical perspectives as profiled in the *Philosophy of Education Inventory*. Anne's metaphor, '*Teaching is working with a unique piece of clay, guiding it to become something inspirational*', was categorised using the Oxford Taxonomy as reflecting *a learner-*

centred pedagogy. On face value, the metaphor seems to be one of '*moulding*', the archetype of Oxford Taxonomy category, *Social Order*, however as will be seen in her explanations and visual representation Anne states: 'the clay metaphor will guide something unique and inspirational, rather than stamping out identical pots'.

Anne explained her metaphor as shown in Excerpt 1 and her visual representation appears in Figure 5-4. In this first excerpt, Anne emphasises the uniqueness of each piece of clay and how the potter is not in control of what the clay will become, despite having a vision of what it might become. Allowing the clay (children) to be free is important to her.

Teaching is working with a unique piece of clay, guiding it to become something inspirational. A ball of clay can differ from one piece to the next, with its natural and individual textures that you need to work with through using a range of techniques. You may have a vision in mind of what this ball of clay is going to metamorphous into, but sometimes things don't go to plan; you get an air bubble in your clay and you have to stop and work out the bubble before moving on. When being open minded and creative with your raw piece of clay, you allow it to take on shapes and curves you may never have imagined. It is free to become the inspiring masterpiece that your hands have helped it to be.

PST 12 Excerpt 1

Figure 5-4   Teaching is working with a unique piece of clay

In this second excerpt, Anne expands on how the metaphor captures her philosophy of education. Though lengthy, it is very revealing of which philosophy she espouses.

> This metaphor captures my beliefs about teaching and learning as pottery is a passion of mine, so too is teaching and learning. Learning the many techniques and styles of turning a raw piece of clay into a unique, tall vase, for example, takes a lot of patience, practice, and dedication. These traits being ones that I feel are imperative to becoming a successful teacher. There are numerous types of clay that you can work with; just like there are many types of children you will teach, and they are all unique in many ways. They come from a variety of backgrounds and bring to your classroom an array of life experiences that will influence the way they learn and hence the way you teach. As a teacher, you will need a number of teaching models and strategies to draw on in order to "work out the bubble" meaning to work through any learning hurdles you may come across within each child. I've been careful not to use the word 'mould' in my metaphor as I feel it would be misinterpreted as having too much control over the direction of learning the child is inclined to take. At the end of the day I want the children I teach to be inspired to learn, as I draw inspiration from each and every one of them to aspire to be their own, unique and individual self that can acknowledge their gifts and talents.
>
> PST 12 Excerpt 2

It is clear in this excerpt that Anne does not align with the '*moulding*' metaphor typical of Oxford's *Social Order*. Thus her metaphor is clearly classified as one belonging to *learner-centred* growth. Table 5-7 provides an overview of the analysis of Anne's metaphor.

Table 5-7   *Classification of Anne's metaphor (participant 12)*

Anne (Participant Number 12	
Key	Learner-centered growth
Control	Shared teacher-and-student control
Focus	Individual learning styles
Archetype	Guiding

As discussed, Table 5-7 confirms that Anne's metaphor is *learner-centred* as revealed by the analysis of her metaphor using the Oxford Taxonomy. This approach to teaching and learning is aligned with a social constructivist paradigm. The principles and subsequent explanation of her principles focuses on a shared teacher and student control of the learning in the classroom. Moreover, this claim is supported by the participant's results in the PEI, in which she scored equally in two educational perspectives: thus, humanism and progressivism as her dominant philosophy of education.

Anne explained the theoretical background of her metaphor through the following quotation: "a key figure in Progressive Education is John Dewey, who moved towards a more democratic and child-centered approach to education where children learn from doing and that education should involve real-life material and experiences and should encourage experimentation and independent thinking" (Mooney, 2000, p. 4). She explained how her approach would be enacted in practice in the following excerpt:

> A child's culture, family, and community is very important and needs to be incorporated into authentic learning activities where a correlation between what is known and what is about to be learned is the starting point for any new learning,
>
> PST 12 Excerpt 3

The final aspect considered in the categorisation of the metaphor is the representation of the teacher's role in the title of the metaphor or the participant's explanation. Anne was careful to emphasise a shared role in the teaching and learning process, and guidance from the teacher, rather than teacher control.

The following principles of pedagogy captured Anne's beliefs about how children learn effectively in a classroom context. They are also reflective of this participant's pedagogical approaches used to engage learners and to improve student outcomes.

A. Children have an equal role in deciding the direction of their learning.
B. The incorporation of higher order thinking in my teaching and learning plan would be accomplished by using Bloom's Taxonomy.
C. Using the Project Approach or Negotiated Learning model of teaching and learning to ensure authentic learning opportunities in an early years context.
D. When relating the project approach to real-life experiences, it allows the child to make a correlation between home and school and hence build their interest in learning as well as developing a positive self-esteem (Mooney, 2000).
E. Incorporating Howard Gardner's Levels of Intelligence to cater for individual learning styles.

Anne's pedagogical intent as investigated through her accompanying explanation of each principle of pedagogy could be enacted in practice.

Principle A is reflective of a social constructivist approach to learning where the child is an equal partner in the learning process. Strategies that would facilitate this pedagogy include a focus on authentic learning experiences, the opportunity for choice and following student's interests in the learning process.

Anne's explanation of Principle B concerning higher order thinking suggests that she values are challenging students to engage in thought-provoking tasks to ensure opportunities for deep and meaningful learning. It suggests that Anne will use versions of Bloom's Taxonomy to guide the planning of tasks to make sure that her students have many opportunities to engage in the highest levels of thinking. She confirms this perspective in the

following statement:

> The incorporation of higher order thinking is another principle I am very passionate about, and I would accomplish this through using Bloom's Taxonomy. I have found using Bloom's key verbs in my learning objectives in lesson and unit plans resulted in students' engagement in challenging and exciting learning direction.
>
> PST 12 Excerpt 4

Higher order thinking is an essential component of effective pedagogy as it affords students the opportunity to engage in metacognitive dialogue that leads to improved student outcomes.

Principles C and D are related, both concerning aspects of using a project approach or a negotiated learning model of teaching and learning. This is an effective approach in a learner-centred classroom using a social constructivist paradigm. The project approach to learning provides an opportunity for students to share in the direction of their learning as well as engaging in an inquiry approach to learning that fosters higher order thinking. Thus Anne's principles are uniting to build a clear picture of her intended practice. Her recognition the importance of the home-school connection so that new learning is built upon prior knowledge and experiences will enable the learning to be contextualised thus meaningful to learners in the early years of school.

The fifth and final principle, "Incorporating Howard Gardner's levels of intelligence to cater for individual learning styles" again focuses on a learner–centered approach, recognising that children are unique and learn in a variety of ways. This principle indicates a participant who values individual differences in her students hence adopting a multiple-intelligence approach to ensure the highest level of engagement of her students in the learning process and subsequent outcomes. The participant further supports this position in the following excerpt.

> I believe that by working from student's strengths, you can reach a child's full potential through implementing activities that will nurture these skills to understand a range of learning concepts and achieve learning objectives.
>
> PST 12 Excerpt 5

Conclusion from the exemplars. To conclude, it is clear that the process of creating a metaphor for teaching and learning provides a powerful opportunity for preservice teachers to reflect critically on their values and beliefs and their impact on their pedagogical practices. The self-study inquiry process provides a space for students to identify their personal metaphor and continuously examine, refine and re-vision their beliefs about teaching and learning. This affords them the opportunity to move their ideas and stance forward and transform their thinking, which maximises the opportunity to build their capacity as teachers. Therefore this contributes to professional growth, effective teacher identity, and hopefully being better prepared for the classroom.

5.4 Findings Part 3

5.4.1 Results of the analysis of teachers' artefacts

These findings form the answer to Research Question 3. *To what extent are preservice teachers able to enact their espoused beliefs in practice?*

This section presents the results of the analysis of twenty artefacts selected by each teacher to illustrate their principles of pedagogy as they were enacted during their professional experience.
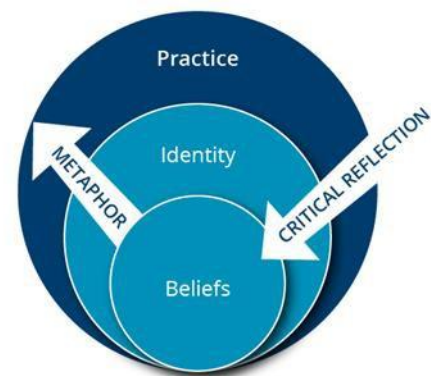
5.4.2 Tool 5 [T5] - Rating of self-selected artefacts

The guided self-study inquiry was designed for preservice teachers to investigate their teacher professional identity by documenting their evidence of practice to demonstrate their ability to enact their espoused beliefs. These data were gathered into an e-portfolio during their final supervised 5-week professional experience, a rich data source for analysis. Each preservice teacher selected four artefacts for each principle of pedagogy illustrative of their professional practice during their five-week professional experience to demonstrate how their pedagogical beliefs were enacted in practice. The researcher ranked each artefact according to a 5-point scale that drew upon a rubric (see Chapter 4, Methodology) to determine to what extent participants demonstrated their espoused beliefs in practice. To arrive at an overall rating or score for each participant, each artefact and accompanying annotation for that artefact was rated against the same 5-point scale, shown here as the legend for Figure 5-5 which shows the distribution of these scores.
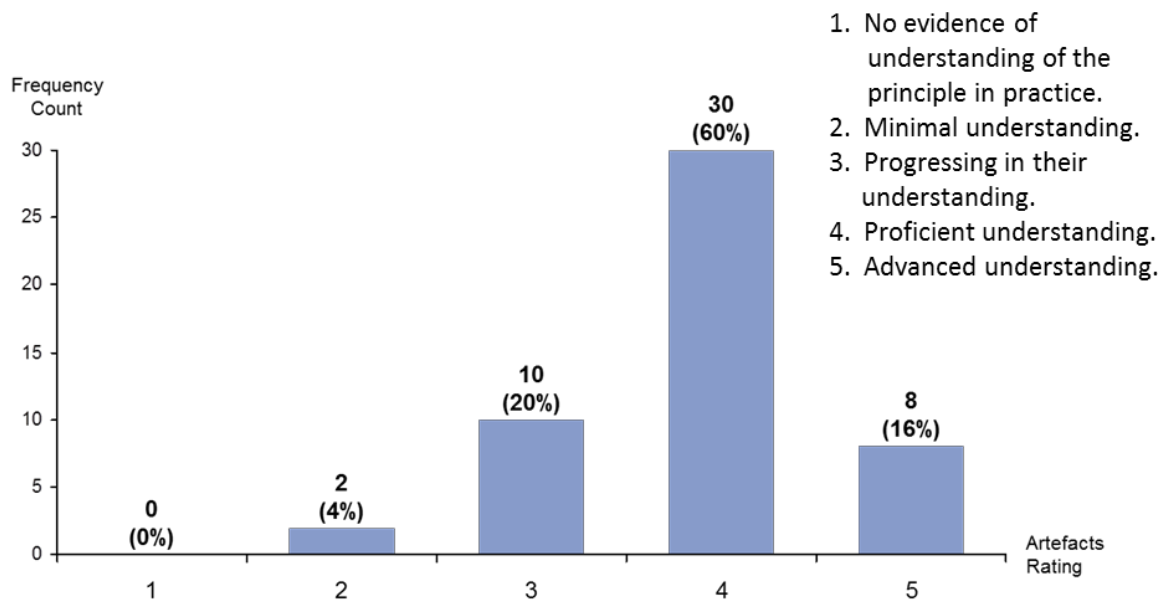
Figure 5-5   Distribution of the ratings of the artefacts selected by preservice teachers

The annotations that accompanied each artefact were considered when rating each artefact to help gauge the overall consistency of preservice teacher judgment. For instance, where the artefact needed some clarification to determine its rating, the combination of artefact and annotation provided substantial data to clarify the rating level along with continuous, iterative comparisons of the whole group.

Once all twenty artefacts per participant were rated individually, a mean score was calculated for each participant's collection. Thus, the frequency count in Figure 5-5 is representative of each participant's overall rating using Tool 5 [T5], the 5-point scale for artefacts and taking into account preservice teachers' annotations.

The results of the frequency count illustrated in Figure 5-5 show that 16% (8) of the preservice teachers demonstrated an "advanced understanding" of enacting their pedagogical principles in practice while more than half (60% of participants; 30) scored a level four rating for critical reflection, so judged as having a "proficient understanding". A further 20% of the group (10) were rated as achieving a "progressing understanding" while two (4%) of PSTs were judged by their artefacts and annotations as showing "minimal understanding". This implies a weakness in their ability to enact their espoused beliefs about teaching and learning in their practice compared with their peers. However, it was noteworthy that none of the preservice teachers were rated at the level of showing "no evidence of understanding" of their principles in practice. This result indicates that all students were able to gather at least some authentic representation of their practice.

5.4.3 Tool 6 [T6] - Analysis of transformative moments

Another style of the artefact, transformative moments, was used as evidence of preservice teachers' practice to demonstrate their ability to reflect critically on their principles in practice. Preservice teachers wrote a paragraph to describe each of the five transformative moments selected to illustrate the essence of each of their five principles of pedagogy enacted during the five-week professional experience. A transformative teacher is constantly committed to refining and or re-visioning their practice to engage students and improve student outcomes. A transformative moment captures the "ah ha" moments that deepen knowledge and understanding of the learner and the learning context as it relates to the selected principle of pedagogy.

The Sterling 4-point scale was used to evaluate the transformative quality of preservice teachers' descriptions of these moments. The analysis of the transformative moments added to the data collection to determine how successfully preservice teachers could enact their principles of pedagogy in practice. Figure 5-6 provides an overview of results from the analysis of preservice teachers' transformative moments using the Sterling rating scale (Sterling, 2001) to determine evidence of transformative thinking. After rating each transformative moment on a scale from level one meaning no change to a level 4, meaning transformation has been achieved. Next, a mean score was attributed to each participant for their collective transformative moments. Finally, a mean score was calculated for the group of fifty participants' transformative moments. Figure 5-6 presents the overall results of this group of participants indicating their overall capacity to enact these principles of pedagogy in practice in the context of the early years of school.
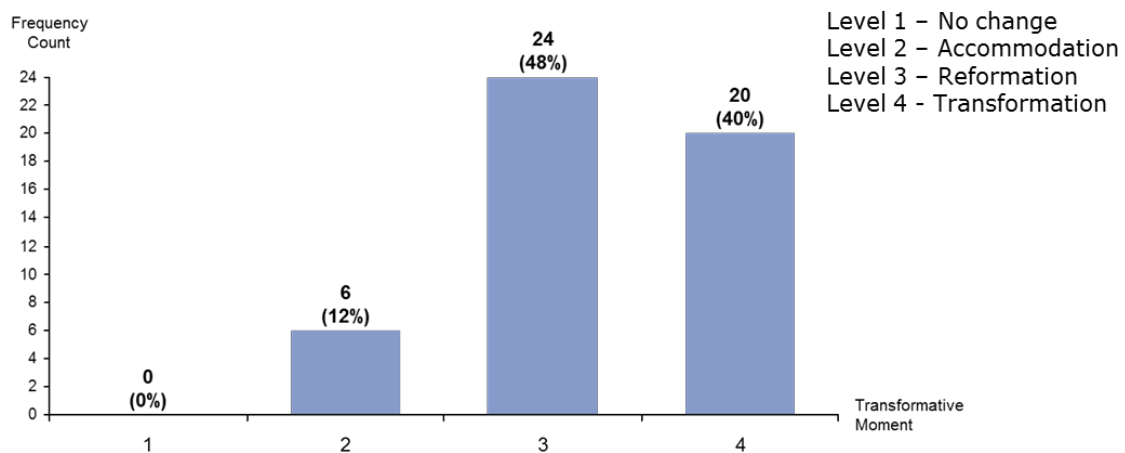
Figure 5-6   **Mean Sterling scale scores for all of the collected transformative moments**

The results illustrated in Figure 5-6 show that the most common result was level 3, reformation on the Sterling scale, with 48% (24) of participants positioned in this category. A level 3 rating indicates that participants enacted their principles of pedagogy in practice by providing evidence of their principles. Also, preservice teachers were able to demonstrate their ability to reflect critically on the selected principles in practice.

The second most common rating presented in Figure 5-6 was level 4, with 40% (20) of participants positioned in this group. Level 4 indicates that evidence of transformative thinking was evident in the critically reflective statements presented as artefacts (transformative moments) of each principle of pedagogy. At this rating, preservice teachers had provided exemplary examples of their transformation and showed advanced levels of critical reflection on their principles in practice.

Additionally, level 2 thinking (accommodation) was attributed to 12% (6) of participants' transformative moments. This group of participants did not indicate any plans to review or re-vision practice but rather described the practice with no recommendations to refine the pedagogy. As an educator, it was pleasing for the researcher to note that no participants were rated at level 1, that is, no change. This result suggests that all participants are at least noticing their practice and engaging in some level of reflection and or critical reflective thought.

5.5 Findings Part 4

5.5.1 Tool 6 [T6] – Analysis of explicit literacy lesson

These findings form the answer to Research Question 4. *To what extent are preservice teachers able to examine the quality of their teaching?*

The final artefact used as evidence of preservice teacher practice was an analysis of their lesson transcripts by preservice teachers to determine the quality of their teaching. This analysis was presented in a report of strengths and limitation

in their practice during an explicit literacy lesson. A frequency distribution was calculated as an indication of the preservice teachers' levels of critical reflection as evidenced in preservice teacher reports on their lesson. In these reports, preservice teachers discussed
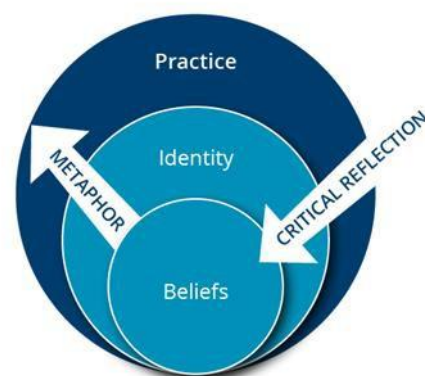
their lessons' strengths, limitations, and implications for future practice. On this basis, each preservice teacher was allocated to a level of learning as described by the Sterling scale 1-4.

These results are illustrated in Figure *5-7*
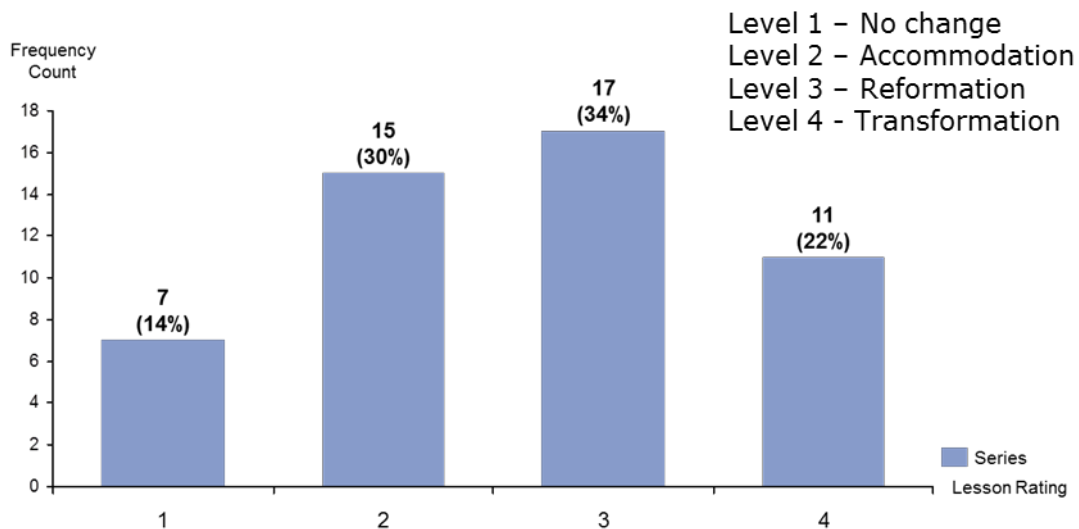
Figure 5-7   Mean Sterling scale scores for analyses of literacy lessons

The results presented in Figure 5-7 show that over half of the preservice teachers achieved the Transformative or Reformation levels with the majority (34%; 17) being at the level of Reformation and 22% (11) at the highest level of Transformation. Thus, it may be argued that the majority of preservice teachers be able to demonstrate either critically reflective adaptation (2nd order learning) or creative re-visioning (3rd order learning). These results also provide evidence that is crucial to arguing their depth of reflection on practice, thus confirming this subgroup's ability to enact their espoused beliefs in practice. Similarly, the evidence of those preservice teachers at Level Three indicates that they were able to think critically and adapt future practice to improve student outcomes.

Figure 5-7 also shows that those preservice teachers, whose evidence placed them at Level Two (representing 30%; 15), were unable to articulate a refining or a re-visioning of their practice in the "future implications" section of the report, although they were able to recognise some limitations in their practice. The Level Two rating suggests that critical thinking did not occur as a result of their analysis of the lesson transcript. Nevertheless, these preservice teachers were able to reflect or notice strengths and limitations but failed to provide evidence to support their claims as well as being unable to suggest changes to practice that would improve the quality of their instruction in the future.

Lastly, 14% of preservice teachers (7) scored a level one, which places them in the category of no change and no learning according to the Sterling levels. According to Sterling (2001), this level also represents *ignorance, denial, and tokenism*. This rating suggests that this subgroup of preservice teachers was unable to apply the tools for analysis of the transcript effectively. Thus, they were unable to provide any evidence to support their claims of strengths and limitations in their practice. Implications for future practice were not addressed by this subgroup, but rather generalised statements (e.g. improve behaviour) were written without supporting evidence of dialogue or an explicit explanation of how identified improvements to practice would be actioned in the future. Thus, it can be concluded that on this basis there was no evidence of these preservice teachers being able to think critically about their practice.

In summary, the task of analysing transcripts of lesson dialogue appears to be a new and challenging concept for these preservice teachers although the concept and process were taught as part of the coursework in this fourth-year curriculum and pedagogy course. This process of astute analysis of classroom discourse requires considerable time and thought to delve deeply into one's practice in order to build teacher capacity and ultimately increase student engagement, learning, and outcomes. Secondly, it is not an easy concept to grasp for novice teachers and preservice teachers. Also, preservice teachers while engaged in professional experience no doubt had their attention compromised by needing to demonstrate the management of students' behaviour and therefore may have less time to concentrate on listening to themselves and analysing how they were scaffolding learning in a classroom context.

The preservice teacher reports on the quality of their explicit literacy lesson were also analysed by the researcher to determine the overall strengths, weaknesses, and limitations identified by this group of participants. The researcher coded the issues identified as strengths and weaknesses/ limitations in the participant reports on the analysis of the explicit literacy lesson transcripts into themes. Twenty-seven themes emerged from the researcher's analysis of preservice teachers' reports on the selected lessons in all. The nature of the issues and the frequency with which they arose is shown in Table 5-8.

Table 5-8 *Themes arising from the analysis of strengths and weaknesses/limitations*

No.	Lesson Analysis Theme	No.	Lesson Analysis Theme
1	Lesson preparation	15	Pedagogy of literacy lesson
2	Improved use of SIC in lesson discourse	16	Interactive
3	Questioning	17	Behaviour management
4	Student reflection	18	Differentiated instruction
5	Lesson pacing	19	Critical reflection
6	Explicit introduction	20	Activate prior learning
7	Focused learning	21	Positive reinforcement
8	Explicit model of literacy instruction	22	Reflection
9	Engagement	23	ICT
10	Authentic pedagogy	24	Active memory
11	Higher order thinking	25	Scaffolding
12	Learning Styles	26	Learning goals for students
13	Time constraints	27	Content knowledge
14	Assessment		

Figure 5-8 and Figure 5-9 provide a further breakdown of these data; being percentage distributions firstly of the themes identified as strengths, and secondly, of the themes identified as limitations.
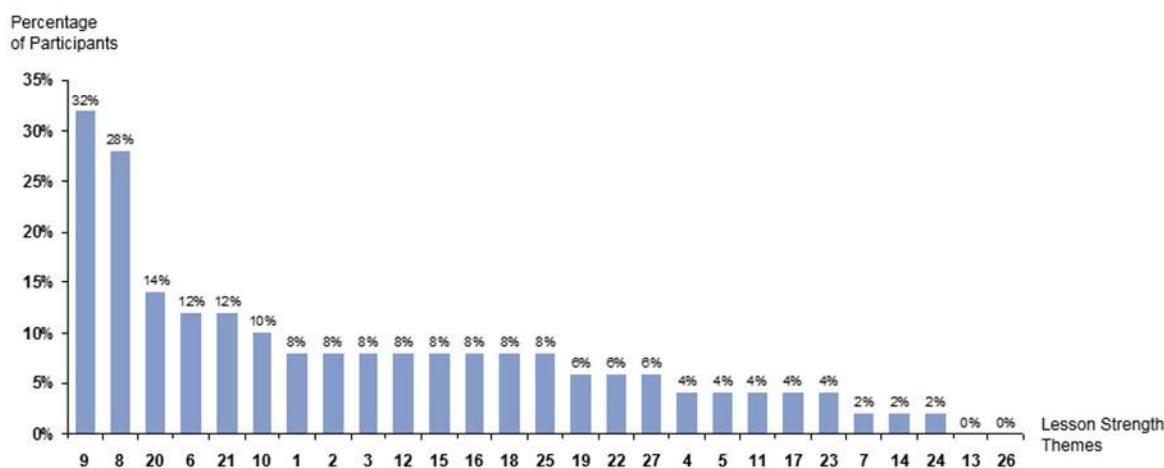
Figure 5-8 **Preservice teachers' perceived lesson strengths grouped by theme**

The results presented in Figure 5-8 show that 32% of participants identified the theme of *Engagement* (Theme 9), as a strength in their critically reflective report on the explicit literacy lesson. Theme 8, the *Explicit model of instruction,* was noted by 28% of participants as a strength in the report on their lesson. Both of these strategies are important pedagogical considerations when focusing on improving student outcomes.

Figure 5-8 also shows that 14% of preservice teachers recognised Theme 20, *Activating prior knowledge* as a strength in their report on the explicit literacy lesson. Additionally, 12% of participants reported that Theme 6, *Explicit lesson Introduction* and Theme 21 *Positive reinforcement* were both strengths in the analysis of their lesson transcript. Themes 20 and 6 are clearly related, in that activating prior knowledge is usually part of an effective explicit introduction.

However, only 10% of participants noted the theme, *Authentic pedagogy* (Theme 10) as a strength in their report, while 8% of participants recorded one or more of the following themes as strengths in their report on the analysis of their lesson transcript: *Lesson preparation, Improved use of SIC in lesson dialogue, Learning styles, Pedagogy of literacy lesson, Interactive, Differentiated instruction* and *Scaffolding.* Higher results might have been expected for at least some of these themes such as *Interactive, Differentiated instruction* and *Scaffolding* given that these preservice teachers were in their fourth year of the education program. Only 6% of participants stated that the following themes were strengths in their lesson report: *Reflection, Critical reflection* and *Content knowledge* yet a greater number of participants have been demonstrated to be capable of critical reflection in the data presented in this chapter. Similarly, it was surprising that only 4% of participants recognised the importance of *Student reflection, Lesson pacing, Higher order thinking, Behaviour management* and *ICT* as strengths in their explicit literacy lesson, particularly Theme 17, *Behaviour management*. *Assessment, Active memory,* and *Focused learning* were strengths identified by only one student (2%) and the themes of *Learning goals* and *Time constraints* were not referred to as strengths by preservice teachers in their lesson reports.

In summary, Figure 5-8 illustrated lesson strengths thus providing a comprehensive overview of teaching strategies confidently adopted by preservice teachers in their final supervised professional experience in the fourth year of the Bachelor of Education Early Childhood degree. The scope of the lesson strengths illustrates the significance of various strategies as well those perceived to be important by preservice teachers when planning and enacting an explicit literacy lesson.

Figure 5-9 presents those themes identified by the preservice teachers as limitations.

Percentage of Participants

55% 54%
50%
45% 46% 46%
40%
35%
30%
28%
25% 24% 24%
20%
15% 16% 16%
10% 10%
8% 8% 8%
5% 6% 6% 6%
4% 4% 4% 4% 4%
2% 2% 2% 2% 2%
0% 0% 0%

8 3 16 15 2 5 17 25 1 4 13 18 6 9 11 10 14 19 21 22 7 23 24 26 27 12 20

Lesson limitation themes
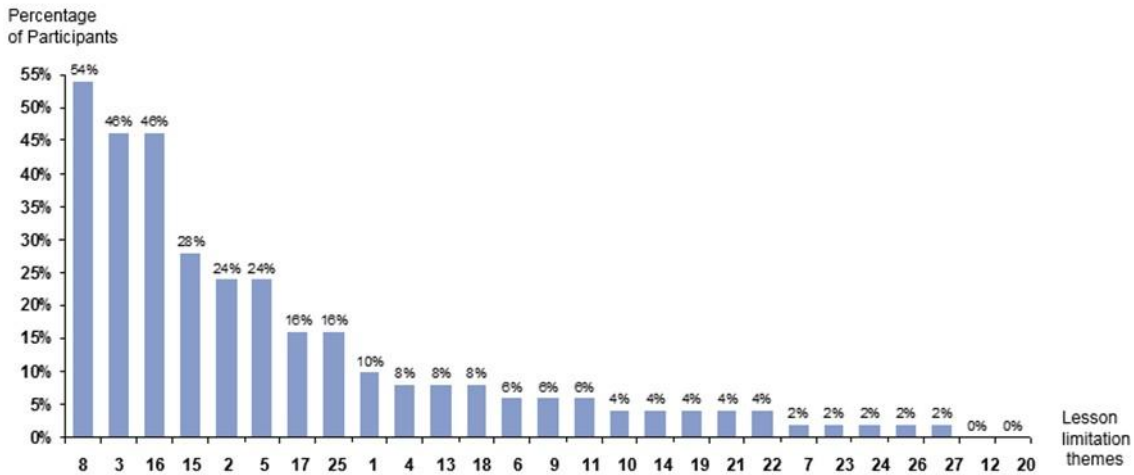
Figure 5-9   **Percentage distribution of themes identified as limitations**

The results of the percentage distribution illustrated in Figure 5-9 show that 54% of participants nominated Theme 8, *Explicit model of instruction* as a limitation in their literacy lesson. Rather than the whole model being problematic, participants often nominated a particular phase of the four-phase lesson plan as a weak area in their lesson, e.g., the fourth phase of the lesson framework "reflection" which was often overlooked due to time constraints. The next highest result in Figure 5-9 shows 46% of participants nominated Theme 3, *Questioning* and Theme 16, *Interactive* as limitations in their analysis of their literacy lesson. These two themes are closely intertwined as question types act as scaffolds to facilitate level and depth of classroom interactions. For example, a factual question or closed question will only afford students a limited opportunity to respond, that is, with a one-word answer such as yes/no. This form of question does not afford students the opportunity to provide an extended response enabling their engagement in higher order thinking as well as opportunities to use the metalanguage of the lesson. This monologic approach to teaching typically confines the teacher's interaction to just one student if the first student answers correctly. Additionally, 28% of participants cited Theme 15, the *Pedagogy of the literacy lesson style,* the ineffective style, as another limitation in their lesson design. This information is also revealing as this style, identified by Anstey and Bull (1996), focuses on processes involved in literacy tasks such as teaching reading comprehension.

Twenty-six percent of preservice teachers referred to Theme 2, S*caffolding Interactional Cycle* and Theme 5*, Lesson pacing* as the limitations of their lesson in their reports, realising that their dialogue might have better scaffolded their teaching. The scaffolding interactional cycle which is a series of teacher moves designed to support and scaffold the learning for all students is linked with other key areas identified as limitations that are, *Interactive*, *Questioning* and *Literacy lesson* style. The analysis of teacher and student interactions demonstrates the way teachers scaffold and support learning. It appears that these preservice teachers were able to identify the shortcomings of their lessons through the application of the various lenses provided for dialogic analysis.

Also, 16% of participants nominated Theme 17, *Behaviour management* and Theme 25, *Scaffolding* as areas of limitation in their literacy lesson and 10% acknowledged *Lesson preparation* as a limitation in their lesson report. *Preparation* is a limitation relatively easily overcome and in itself, would assist teachers in overcoming *Behaviour management* and *Scaffolding* problems by more thoughtful planning. Furthermore, 8% of participants identified Theme 13, *Time constraints*, Theme 4, *Self - reflection* and Theme 18, *Differentiated instruction* as limitations in their explicit literacy lesson. Themes 13 and four are often linked regarding the lack of time for self-reflection.

Finally, Figure 5-9 shows that a small number of preservice teachers (6%; 3) cited Theme 6, *Explicit Introduction* and Theme 11, *Higher order thinking* as limitations in their lessons and additionally, 4% of participants identified Theme 9, *Engagement*; Theme 10, *Authentic pedagogy*; Theme 14, *Assessment*; Theme 19, *Critical reflection* and Theme 22 *Reflection* as limitations in their lessons. Only one preservice teacher in each case nominated Theme 7, *Focused learning*; Theme 21, *Positive reinforcement*; Theme 23, *ICT*; Theme 26, *Learning goals for students* and Theme 27, *Content knowledge* as limitations as an outcome of their analysis of transcripts. Some of these were clearly identified as strengths instead, particularly *Engagement*, but some themes do not appear often as either strengths or limitations, notably Theme 7, *Focused learning*, Theme 24, *Active Memory,* and Theme 26, *Learning goals for students*. This may mean that these themes are not recognised as important by the participants.

In summary, the themes identified as strengths in participant lessons were only identified by a small cohort of preservice teachers as limitations, and the themes attracting the highest recognition in the limitations graph are all related to the pedagogies required to scaffold learning. These strategies are essential to achieving effective interactions between teacher and students, as well as between students.

These interactions are the key to optimising the learning opportunities for all students. It is clear that the process of analysing pedagogical dialogue used in this self-study inquiry provides a valuable and revealing lens for preservice teachers into the detail and evidence of the quality of their practice. At this level of analysis, it becomes very apparent which preservice teachers can apply their espoused theories of learning in action and critically reflect on their pedagogical practice as a process of building their teacher capacity to determine the effectiveness of their practice.

Their pedagogical strengths and limitations are reflective of their philosophical perspectives on how children learn. When preservice teachers hold a socio-cultural perspective, the analysis of transcripts reveals a strong emphasis on effective questioning, scaffolding, and meaningful interactions that encourage higher order thinking and provide opportunities for students to use the metalanguage of the lesson pedagogy. There should also be evidence of meaningful opportunities for students to reflect on their own learning as a scaffold to the process of self- assessment. Rather than using "question-answer-listen-tell routines" or "guess what's in my head questions", in this tertiary pedagogy the preservice teachers are encouraged to recognise and use the cognitive moves that extend and deepen the dialogue such as those modelled in the scaffolding interaction cycle.

The Sterling ratings achieved from the analysis of transcript reports showed a spread of results with some students very accomplished in their critical thinking and analysis of their teaching while others are not engaged at the level of critical thought required to analyse the effectiveness of their teaching practice. The results confirm how imperative it is to engage in evidence- informed approach to critical reflection to ensure the development of an effective professional identity that simultaneously builds preservice teacher capacity to analyse data enabling them to evaluate effectiveness and ineffectiveness of their practice. Developing capacity-building capabilities of preservice teachers should ensure that teaching and learning will positively impact on student achievement.

The principles of pedagogy theme frequency score highlighted the most valued principles of pedagogy espoused by this cohort of preservice teachers. The highest rating principle was *Caring and supportive learning environment*, which aligns with the features that are needed to create an optimal learning environment for young children. These include a classroom environment that fosters a dialogic pedagogical approach to teaching and learning.

5.5.2 Four exemplars of preservice teachers' evidence of practice

Three collections of artefacts (artefacts of practice; transformative moments; and reports on explicit literacy lesson) and their ratings on the 5-point scale underpinning the rubric will be illustrated in the following exemplars of preservice teachers' as evidence of their practice. These exemplars illustrate how the artefact rating scales were applied to the collections of artefacts used as evidence of practice.

Exemplar 1 - Participant 25, alias Lyn The context of Lyn's professional practice was a Foundation class in a multicultural urban school. The selected principle is: Provide a safe, supportive and positive learning environment. The participant provided an explanation of the intent of this principle in practice as follows:

> The learning environment is one that shelters and supports its students, just like the tree in my visual metaphor. I strongly believe that as teachers we need to ensure that we provide a safe, supportive and positive learning environment for our students. We need to be aware "the physical environment we create has implications on children's interactions and behaviours" (Arthur, Beecher, Death, Dockett, & Farmer, 2005, p. 288). It is also important that as teachers we plan learning experiences that are safe and do not put students at risk of any danger.
>
> PST 25 Excerpt 1

Lyn received a level three rating "progressing in their understanding" for the collection of artefacts presented as evidence of practice for this principle. Although the information about her re-visioned future actions to improve the current limitations in practice was not included in the annotation, also, Lyn specified:

> As a teacher, I need to ensure that I am providing the best possible learning environment for my students, and being in a positive environment not only helps me as a teacher but also supports students intellectual and emotional growth.
>
> PST 25 Excerpt 2

Exemplar 2 – Participant 42, alias Mary Mary is working in a Year 1 classroom and states: The classroom is the learning environment, it should be inviting, exciting and make students feel safe. Figure 5-10 is a photo that was supplied of the Year 1 classroom.
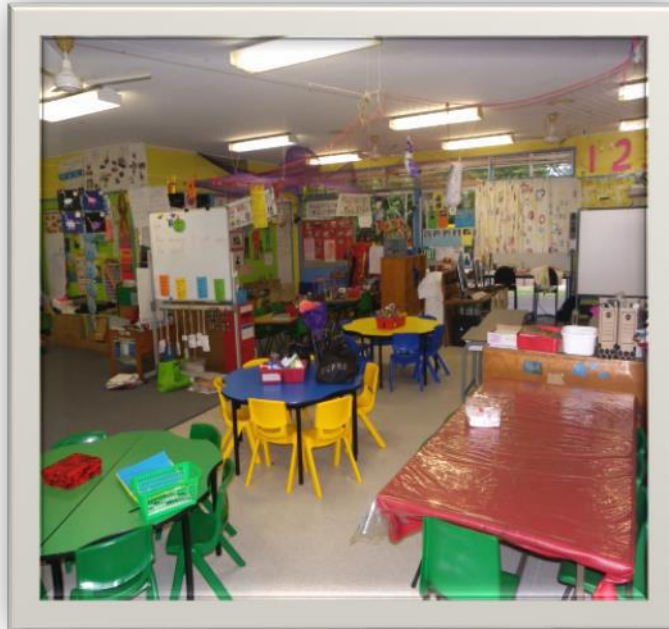
Figure 5-10   The Year 1 classroom in which Mary was teaching

Mary considers a Home Corner is a 'must-have' in an early year's classroom setting. The home corner was equipped with numerous uniforms of "People who help us". Free play in the home corner creates great learning opportunities between students and also generates a positive atmosphere. Figure 5-11 shows the Home Corner and a safety sign activity, 'Copy a safety sign'. To tie in with the unit "People who help us' students had to copy a safety sign of their choice. This was directly related to the unit work and it also promoted safety awareness amongst students.

Figure 5-11   Home Corner and the safety sign activity in Mary's classroom

Figure 5-12 shows the safety sign activity in more detail.

Figure 5-12   The safety sign activity in more detail

Table 5.9 summarises the results of the application of the rubric to the artefacts collection submitted by Mary.

Table 5-9 *Artefact Rating Level 3 PST42*

Artefact rating level 3	Justification of level 3 rating using criteria
Selected an authentic artefact	Artefacts represent authentic learning
Authentic artefact/s represented an adequate link between evidence and principle	While the photographs illustrate a colourful environment, there wasn't any explicit identification of key features of a supportive environment.
Provide information about the context to situate the artefact such as what, why and when.	Some information was provided to contextualise the artefacts.
The artefact illustrates professional growth	No growth evident

A Level 3 was achieved as Mary selected authentic artefacts with links between the evidence and the principles but was not able to explicitly identify features that exemplified the principle. Clear links needed to have been drawn from what is visible in the photographs to the principle.

Exemplar 3 – Participant 47, alias Alana In this exemplar of evidence of practice rated at a level 4, the context was a Year two class in an urban location. This is the work of Alana, participant 47, and the principle of pedagogy is: *Teaching and learning opportunities should be made through individual, group and parent involvement*. Alana explains the intent of this principle as follows:

A variety of experiences presented during the weekly program involved individual, group (small and large) as well as parent involvement as a way of promoting high-quality teaching and learning opportunities for all students. These activities are authentic in style and encourage the children to take the initiative to extend their learning according to their needs and interests. It is valuable to develop learning opportunities that connect with home, as well as encouraging communication between children and their families as a way to extend their learning and promote further investigation of what the students found interesting.

PST 47 Excerpt 1

One of the authentic activities that linked between home and school was cooking:

To follow on from the Australian animal unit of work, as a whole group we read the story Wombat Stew and then made a" veggie stew". This session developed into a lesson on healthy eating in addition to talking about the shapes of the vegetables; 3D shapes such as potatoes (sphere) carrots (cone). Sequence cards for the recipe for making the Veggie Stew were used as an individual activity for students to learn the steps in making the stew.

PST47 Excerpt 2
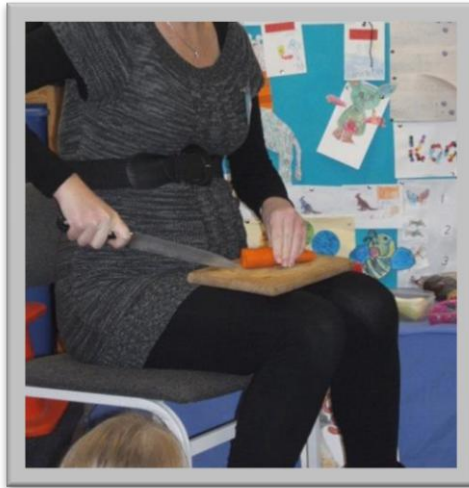
Figure 5-13   Alana is concerned about safety and so uses the knife for the cooking activity

Figure 5-14   An authentic cooking activity with links to literacy activities

Figure 5-13 and Figure 5-14 show how Alana made an authentic link between the class literacy activity – reading the book *Wombat Stew*, and making a stew. Alana also took the opportunity to extend the activity into a discussion of healthy eating and integrated mathematics (geometry) by talking about the shapes of the foods. This indicates Alana is operating at a high level in terms of this principle about teaching and learning opportunities as she clearly maximised the opportunity she had. Figure 5-15 shows the Sequence cards that Alana refers to in her Excerpt 2.

Figure 5-15   Alana included a picture of the Sequence Cards she made for this activity

To extend the learning activities associated with the story, *Wombat Stew*, children shared the experience of making and eating the wombat stew with their parents. The children attempted to write stories about what they liked about the stew as well as a picture. This activity unexpectedly led to one of the children making soup with their mother on the weekend. Then the procedure of making the soup was shared by mother and daughter with the class. The session developed measurement concepts with the children and teachers. Table 5-9 summarises the results of the application of the rubric as applied to Alana's artefacts at level 4.

Table 5-10   *Artefact Rating Level 4 from Alana, Participant 47*

Artefact level 4 rating	Justification for rating as level 4
Authentic artefact/s.	The collection is authentic gathered within the context of a professional experience.
Identified link between evidence and principle	The participants' explanation illustrates this link.
Provide information about the context to situate the artefact such as what, why and when.	This information was evident in the annotation.
The artefact illustrates professional growth.	Determined within the context of the whole collection of the artefacts presented in the e-portfolio.

Alana demonstrates an ability to gather a collection of artefacts that illustrated the principle of pedagogy in practice. She also provided information about the learning experience and children's involvement in the activities in her annotation to accompany the artefact (Excerpt 2, PST 47) and made a clear link between the selected learning experiences represented in the artefacts and the principle of pedagogy in practice. However, she did not consider how to develop these activities in the future with a view to extend student learning or to improve her practice. This final criterion is considered when assessing the four artefacts or the four artefact collections aligned against each principle at a level 4 (*proficient understanding*) rather than a level 5 (*advanced understanding or transformative thinking*).

Exemplar 4 – Participant 33, alias Jemma Jemma's artefacts received a level 5 rating on the rubric. Jemma is working in a Year one classroom, mid-year in an urban context in Australia. Jemma links the selected principle of pedagogy; *Knowledge is built upon and added to over a lifetime*, to her metaphor for teaching as well as explaining the intent of this principle for teaching and learning. Her metaphor was: *Teaching is painting a canvas, each brushstroke adds to the masterpiece of knowledge*. She notes:

Like the stages of painting a canvas, knowledge is also built upon stroke by stroke, stage by stage. Students come into each classroom with existing knowledge that teachers build upon and use as a base to develop more in-depth understanding. Like the canvas gradually gets fuller with each brushstroke, so does a child gain knowledge over time, but there is always room to add yet another brushstroke to the canvas of knowledge. I think that we all learn not just throughout our years of formal education, but throughout our whole lives and it is through this continuous learning that we are each able to create our masterpiece of knowledge.

PST 33 Excerpt 1

The teaching and learning context is related to planning and building a playground and its equipment. Figure 5-16 and Figure 5-17 illustrate this context.
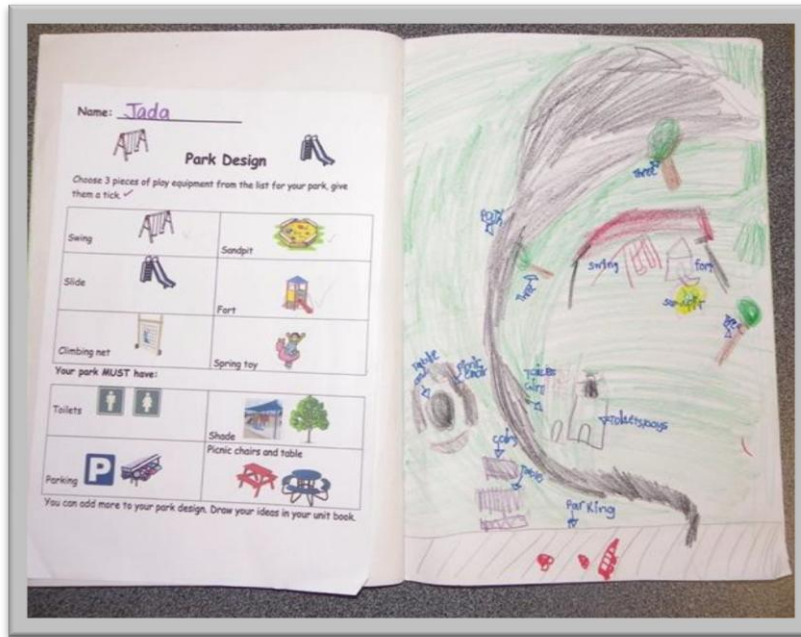
Figure 5-16   Park design activity and playground map

Figure 5-17   Model of completed park design

Jemma's annotation for this principle of pedagogy included the following two excerpts in which she clearly explicates her principle in action:

> To complete this inquiry about constructing an interesting playground for young children, students were given some guidelines to design their park as well as using their knowledge about parks and playgrounds. Next, students had to use their existing knowledge about playground equipment to construct equipment for their parks. The finished parks looked fantastic, and the students were very impressed with their achievements. This project required students to use existing knowledge and combine it with new knowledge to create their parks. This collection of artefacts represents principle five in practice.
>
> PST 33 Excerpt 1

> I will aim to provide experiences for students that will allow them to use their existing knowledge to develop new understandings. This was achieved by linking new learning with prior knowledge, not just prior content knowledge but also prior experiences as a scaffold into new learning. Doing this is another way of ensuring that you are setting the students and yourself up for success.
>
> PST33 Excerpt 2

Table 5.11 summarises the results of the application of the rubric as applied to Jemma's artefacts at level 5.

Table 5-11   *Artefact rating Level 4 from Jemma, Participant 33*

Artefact rating criteria level 5	The justification for level 5 rating.
Authentic artefacts. Identified link between evidence and principle.	Artefact collection was collected during a five-week professional experience linked to course work.
Provide information about the context to situate the artefact such as what, why and when.	The information about the context was provided as part of the introductory section of the e-portfolio (assignment two).
The artefact illustrates professional growth.	This criterion is determined within the context of the whole assignment.
Explicitly identified how artefact shows achievement of the principle of teaching and learning.	Explanation and collection provide explicit explanation of the rationale for the artefacts' selection as evidence of principles.
Transformative thinking	Annotation included an action plan for future practice.

Table 5-11 clearly shows that Jemma was working at an advanced level throughout her collection of artefacts, only part of which has been presented here.

5.5.3 Three exemplars of the rating of transformative moments

Attention will now be given as to how the Sterling four-point rating scale (Sterling, 2001) was applied to the transformative moments. The rating of each transformative moment was situated within the context of the participants' principles of pedagogy illustrated through the presentation of multiple sources and dimensions of evidence. This data provided background information so that the "moment" was viewed holistically within the self-study inquiry. Three exemplars will be presented to clarify the

distinction between levels 3 and 4 on this scale.

Exemplar 1 - Participant 1, alias Chris The principle for this transformative moment was *Children are given the opportunity to participate actively and construct knowledge through hands-on learning experiences*. Following is the transformative moment experienced by Chris. This was rated at Sterling Level 3. Figure 5-18 illustrates the hands-on activity described.

Prior to undertaking this professional experience, I have written numerous assignments about students needing to be active learners in the learning environment for them to be able to learn the required content. In saying this I have not been afforded the opportunity to put this into practice during my professional experiences, I did not think that this was possible. However, there was one lesson that stood out for me. I was undertaking a lesson on patterning, and I had to leave the room (under the supervision of my mentor teacher) to get a book and when I returned I was surprised by how engaged the students were in the learning process. I approached a group and questioned how they were getting on. To my surprise, this group (that I thought would struggle) was able to identify the pattern and then repeat it several times. At this point, I thought, yeah this is what students need to enable them to progress in their learning journey, active and concrete learning experiences.

PST 1 Excerpt 1

This hands-on learning experience saw students using concrete materials (2 pieces of blue string – one big and one small) to enable them to construct the required knowledge of time.

Figure 5-18   The hands-on learning activity which yielded Chris's transformative moment

This transformative moment is illustrative of the principle of pedagogy and was rated as a level 3 on Sterling's scale, that is, "reformation, critically reflective adaptation". Although Chris described the context adequately and generally acknowledged that students were engaged and confident while completing the learning experience, Chris did not state explicitly her "new learning" or understanding about children's varying learning styles and

how important it is to match students with appropriate pedagogies to ensure equity of learning opportunities. To be transformative (Level 4), Chris should have outlined an action plan e.g. some children need to be taught a skill or concept explicitly, using a model of explicit instruction to facilitate this process.

The second exemplar was also rated at Level 3 but for different reasons.

Exemplar 2 – Participant 13, alias Tina For Tina's principle: *Teaching and learning opportunities should be made through individual, group and parent involvement,* she submitted the following transformative moment complete with embedded picture, which was rated at Level 3.

A transformative moment linked to principle 2 came from a small and whole group experience on the possum. Together we brainstormed what a possum looks like by drawing a possum together, then from a book we discovered more information about the possum; where it lives, what it eats, etc. My teacher then got everyone to come and have a look at the possum scratching on a tree outside, and I talked about how I have possums in my back yard that often jumps on my roof and makes my dog bark. The next day a parent spoke to me and my mentor teacher about how interested her child was about possums now and how he said they make scratch marks on trees and jump from roof to roof. He looked for evidence of possums at his house. This made me realise that even the teacher's personal stories and excitement builds on the children's excitement for further learning and that things we say, stick in their minds.

PST 13 Excerpt 1

This transformative moment was rated as a Level 3 using the Sterling levels of learning scale; that is "reformation, critically reflective adaptation". Although there is evidence of transformative thinking in this example of the impact of the hidden curriculum on student learning and development, the link between the transformative moment and the principle of teaching and learning has not been explained explicitly. A more in-depth exploration around the role of parents as partners in their children's learning and development would have raised the rating of this transformative moment to a level four.

Exemplar 3 – Participant 34, alias Denise Denise submitted the following transformative moment for the principle: *Quality relationships should occur interchangeably between students, teachers, parents/caregivers and community members alike*. This transformative moment was rated at Sterling level 4.

Each year Sunshine State School students participate in their annual Emus and Kookies Sports Carnival. I was fortunate enough to be on professional experience when this event occurred, and there was one moment that day that changed my mind about inclusion, diversity and the kind-hearted nature of country kids. In the upper primary school there is a young boy who has Down syndrome, and although the students acknowledge that he is different, they still treat him the same as they would anybody else.

Lining up for the 800m race were all the 11-year-old boys including *KC. On your marks, get set, (BANG!). As the race progressed the boys were running faster and by this stage finished their race. *KC was still running his race but was determined to finish and not give up. At that moment when it looked like *KC was about to give up on the race the whole school (all 42 children) stopped cheering on the sideline and ran over to finish the race with *KC. At this moment my eyes welled up I just couldn't believe that here was this young boy finishing off his race with all of his friends alongside cheering him on. They did not care if he came last, or if he has special needs, or was different from everybody else. All that mattered was that he completed the race and the most touching moment was when he crossed the line with both arms up in the air surrounded by a sea of red (Kookies) and green (emus). This was a moment that I will never forget and that has allowed me to witness an extraordinary act of accepting diversity and inclusion from a whole school.

PST 34 Excerpt 1

This participant's transformative moment was significant as it illustrated the identified principle of pedagogy as a lived experience during the school's annual sports' carnival. Furthermore, the transformative moment was rated as a level 4, on the Sterling scale, described as "creative revisioning". The principle does indeed capture the principle of pedagogy in action. The description of the moment is clearly reflective of the impact that this incident had on Denise as illustrated in the statement: *this was a moment that I will never forget and that has allowed me to witness an extraordinary act of accepting diversity and inclusion from a whole school.*

Therefore, this moment as described is considered "transformative" (Level 4), as the meaning and intent of this principle, *Quality relationships should occur interchangeably between students, teachers, parents/caregivers and community members alike*, as voiced by this participant, "will last a lifetime".

5.5.4 Exemplars of analysis of literacy lesson reports using the Sterling scale

The following exemplars taken from a selection of preservice teachers' reports on their explicit literacy lessons provides representatives of levels 2, 3 and 4 on the Sterling scale. These excerpts are from different participants, but as they are being considered collectively to elucidate the scale, the participants have not been separately identified by number or alias.

The first two excerpts were rated at Sterling level 2. There was no evidence provided from the transcripts to support claims of success or limitations, which impacted on the overall rating. However, suggestions for improvements to practice were included in the discussion of lesson strengths.

During the lesson, I scaffolded students by explicitly demonstrating and modelling the use of the skill and knowledge, such as in lines 2, 8 and 37. However other than in line 2, I did not explain this so that students could identify it as an example, I just did it. This is something I will endeavour to focus on and implement in future lessons. After analysing the transcript, there were also opportunities to acknowledge the variety in thinking and responses amongst the students. This would have emphasised the value of communicating thinking strategies verbally, but from different ways of thinking about it, and in turn enhancing discussion and further thinking. When concluding the lesson, I ensured time was available to review and reflect on learning that enabled students to make connections with the purpose of this learning, while reflecting on their achievement. There were no concrete forms of reflection for students or specific references made in conclusion. This may be something to consider in the planning process and integrate into connecting lessons.

Excerpt 1

Feedback was given to students effectively linking achievement of learning objectives with their responses and performance throughout the lesson, such as lines 19, 20, 28, 37, 44, 47, 49, 52 and 53. I did allow opportunities for students to demonstrate learning independently such as in lines 16, 21, 39 and 50. However, this expectation was mostly too high for this stage of learning, and further scaffolding was needed. Assessment for future planning requires participation in a sequence of lessons that enable further practice before reducing the amount of teacher support.

Excerpt 2

The next excerpt is rated at Sterling level 3. This is because the report identified evidence from the lesson transcript to support her claims of success as well as using a reference from an authoritative source to further substantiate her claims of strength in the lesson delivery. She also considers the implications for future practice.

The talk within the lesson explained explicitly what was expected of the students throughout the experience and mostly provided effective scaffolding for them to achieve goals successfully, although not always independently. The literacy focus was maintained throughout the lesson. However, the more explicit instruction may have improved the results rather than scaffolding students through repeated questioning using the word 'why.' Reducing the number of questions/scenario's would provide more time to deepen the thinking process and in turn increase discussions. The teacher talk genuinely supported students' needs to encourage thinking and to talk, however, my choice to avoid confronting students to the front on was a strategy I stand by. As a consequence of this, all contributions to a discussion should be valued, and judged only on the extent to which they help the class achieve the desired outcomes of the discussion (Killen, 2009, p.148). This in turn supported the objective to extend students learning in applying deeper thinking and communicating this verbally.

Excerpt 3

The final excerpt in this group is illustrative of Sterling level 4.

Throughout this lesson, there were a variety of strengths that I believe allowed students to understand and grasp this concept of writing. Allowing students the opportunity to make predictions of what they believe the story may be about by looking at the front cover of this book, enables students to start making connections between print and text (Line 7). Wing Jan (2009) found that for students to be able to make meaning from text they need to be able to look at the pictures and think about what they believe the text may be about. Coinciding with principle 5, higher order thinking was regularly seen throughout my transcript (Lines 9, 50, 54). Encouraging students to think deeply can allow them to think critically about the question and then reflect upon this at a later date.

Excerpt 4

Excerpt 4 is commenting on perceived strengths in the lesson and makes clear links between the principle, the transcript of the lesson and the practice. Expert use of an appropriate authoritative reference also supports the claims of strengths. These features led to this excerpt being rated at Sterling level 4.

5.5.5 Exemplars of reporting strengths and weaknesses in the literacy lesson analysis

Two exemplars show evidence supporting claims of strengths, and the third shows evidence supporting the claim of a weakness. This first report shows an ability to analyse the lesson transcript and refer to the evidence of dialogue by line to identify the students' opportunities to apply cognitive processes and to build in reflection on the learning. The preservice teacher identifies the importance of providing feedback to the students.

After analysing the transcript, there were also opportunities to acknowledge the variety in thinking and responses amongst the students as in lines 23, 34, 35. When concluding the lesson I ensured time was available to review and reflect on learning that enabled students to make connections with the purpose of this learning, while reflecting on their achievement. Feedback was given to students effectively linking achievement of learning objectives with their responses and performance throughout the lesson, such as lines 19, 20, 28, 37, 44, 47, 49, 52 and 53. I did allow opportunities for students to demonstrate learning independently such as in lines 16, 21, 39 and 50.

Excerpt 1

This second report considers the importance of affirmation and confirmation and the preservice teacher claims that having done this effectively is a strength.

During the telling of the story, the children join in and can identify the way the story evolves through using the felt visual prompts to assist at the end of the telling of the story Brown Bear. I affirm the students through feedback by saying 'well done.' According to the Scaffolding Interactional Cycle [SIC] (Culican, 2007), during the identifying stage, the teacher asks learners to identify the wording in the text, learners respond and this is followed by the teacher's confirmation and praise. This is shown throughout the analysis of the transcript (refer to Appendix – analysing transcript lines 6 – 16) as the children can tell the story of Brown Bear and I confirmed and affirmed their input and praised the students for telling the story to me.

Excerpt 2

In this third report, the preservice teacher realises that using all moves of the Scaffolding Interactional Cycle would have been beneficial.

When analysing my explicit lesson it becomes apparent that I am using teacher talk that reflects the pedagogy of literacy learning style most. However, looking further into my teacher talk it becomes clear that I am not modelling my thinking processes to the best of my ability. For example instead of saying (see number 38) 'I want you to tell me something. What do you think about the porpoise? I could have used the Scaffolding Interactional Cycle whereby teacher talk is structured around the text in the classroom in an alternative way (Rose, 2005). This approach would have been beneficial for student's especially the students that struggle with literacy. The cycle is made up out of 3 moves, prepare, identify and elaborate, these moves to facilitate extended interactions. Unfortunately, when analysing my teacher talk it becomes clear that I hardly ever use all three moves, this means children often miss the opportunity to use higher order thinking (Culican, 2007).

Excerpt 3

5.5.6 Exemplars of reporting limitations in the literacy lesson analysis

The next two exemplars illustrate how preservice teachers were able to identify and articulate limitations observed in the teaching episode that they had recorded. It indicates that asking them to use different tools as lenses for analysis of such episodes is useful. The first report recognises two limitations, one she could have prevented by stating the lesson objectives, and one she could not remediate as the children were not allowed to use the book as a resource as the activity was an assessment.

Looking back it becomes obvious that I did not clearly state the lesson objectives at the beginning of the lesson (Venn diagram of characters) (Edwards-Groves, 2002). Not only that, to use the pedagogy of literacy learning correctly I should have made the book available for students to use as a scaffolding resource. I was unable to offer this as the Venn diagram was an assessment task, however I know some children would have benefitted if they were able to use the book as a resource.

Excerpt 1

This second report reflects on both a strength (the one-to-one interview allowing children to use higher order thinking) and a limitation (not all children had chance to articulate their learning during the lesson). There is however, no mention of how this might be avoided in future.

The children were able to reflect on their work via a one-to-one interview. I believe they were given an excellent opportunity to review their Venn diagram with me and verbalise why they placed particular descriptive words in certain areas of the Venn diagram. They were, therefore, able to use higher order thinking skills. On the other hand, I do realise not every child had the chance to reformulate and articulate what they have learned during the lesson (Edwards-Groves, 2002).

Excerpt 2

5.5.7 Exemplars of reporting future improvement in the literacy lesson analysis

These two excerpts demonstrate how preservice teachers were able to be future-orientated in terms of suggesting improvements that they aimed to implement when next teaching explicit literacy lessons.

The first report clearly suggests what needs to be done in terms of improving teacher talk but acknowledges the difficulty of 'reprogramming' as talk patterns are ingrained.

> To teach effectively, I need to use explicit teacher talk constantly and give clear task requirements (Campbell & Green, 2006). Students can then create connections between the new and known knowledge (Edwards-Groves, 2002). This means I should stop using the common routines of talk, such as the IRE pattern as it has been proven that by using these routines the students that struggle are unable to participate successfully in this discourse (Culican, 2007). This creates a barrier since oral language is the central element within my explicit lesson (Culican, 2007). To eliminate this interactive trouble, I can use the scaffolding interactional cycle pattern that focuses on explicit statements. This way all students can offer a response and all students can use higher order thinking (Culican, 2007). It is however challenging to rewrite these patterns as they are, according to research, habitual and intuitive (Culican, 2007).
>
> Excerpt 1

The second report indicates that the preservice teacher wants to be more explicit about learning paths so children can develop metacognitive strategies. The teacher acknowledges that keeping children focused on building their understandings; she will be able to manage student contributions consistently.

> In addition, I aim to inform children explicitly during the introduction what learning path will be taken as well as give them the opportunity to reflect on their learning during the review phase of the lesson. This is vital as I will then give them the opportunity to develop metacognitive strategies for knowing and learning (Edwards-Groves, 2002). By ensuring to manage student contributions consistently, I will keep the children focused. By acknowledging the individual student and build upon their fund of knowledge and experience, I will be able to manage student contribution consistently and become a learner together with the students (Campbell & Green, 2006).
>
> Excerpt 2

To sum up, the excerpts from the preservice teachers' reports on their analysis of the transcripts of the explicit literacy lesson illuminates the impact of quality interactions on student outcomes. The preservice teachers have come to realise that quality teacher talk creates quality interactions with students which encourage them to think, and to think in different ways. Preservice teachers now realise the importance of selecting questions that invite higher order thinking rather than simple recall. They understand that the flow of teacher moves which encourages students to provide justification for their responses will, in turn, move the dialogue forward rather than just providing confirmation of a correct or incorrect answer. In addition, participants understand that providing feedback to students informs and encourages deeper thinking and greater self-confidence.

Overall, the preservice participants in this study showed appropriate levels of analysis as fourth years in the early childhood curriculum and pedagogy course. Relatively few showed little ability to analyse their lesson, most were at least satisfactory, and some were well advanced. This analysis was a challenging task, but the results presented here substantiate its usefulness as an assessment in this newly-designed course.

5.6 Findings Part 5

5.6.1 Results of the analysis of teachers' perceptions of metaphor

These findings form the answer to Research Question 5.

Is metaphor an effective strategy to bridge between preservice teacher beliefs and identity and practice?

The final section of the self-study inquiry required preservice teachers to list three ways the creation of their metaphor provided an opportunity for them to reflect critically on their beliefs about teaching and learning and illuminated their teacher identity. Participant responses were coded into 18 themes that emerged and reflected the range and intent of the qualitative data.
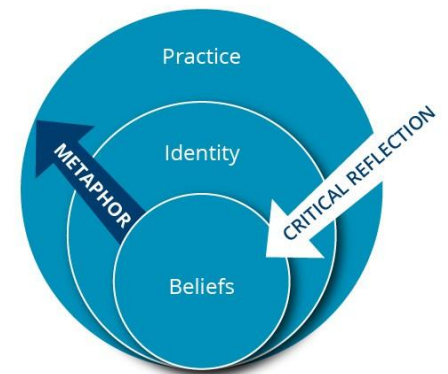
Figure 5-19 illustrates preservice teachers' perceptions of the ways metaphor assisted them to reflect critically on their practice.

1. • Empower
2. • Self-Exploration
3. • Rewarding to reflect
4. • Reflect against principles
5. • Professional discussion with metaphor as a lense
6. • Challenging
7. • Create standards to foster student learning
8. • Reflect not only on approach to teaching and learning but connecting with the school and wider commmunity
9. • Reflect on my own beliefs and values in a creative way
10. • The metaphor allowed me to dream
11. • Develop confidence as a teacher
12. • Deepened understanding of teaching and learning
13. • An inquiry process of the mind
14. • Theories that inform practice
15. • Metaphor provides a vision
16. • Visual metaphor, is a reflective tool
17. • How I view teaching - my perception of teaching
18. • Teacher Identity

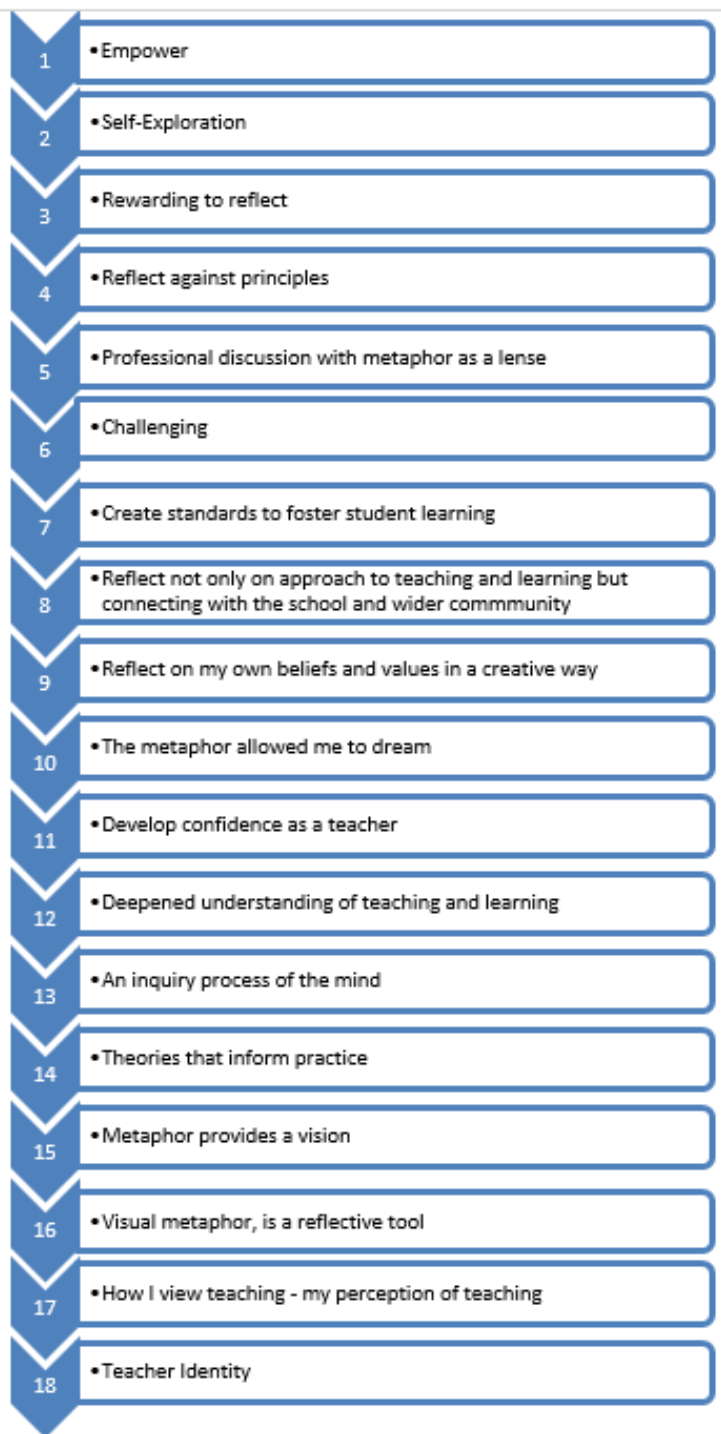**Figure 5-19   Preservice teachers' perceptions of the ways metaphor assisted their reflection**

Figure 5-20 presents a percentage distribution of the themes for the way metaphors were perceived by preservice teachers to assist them in understanding their beliefs about teaching and learning enacted in practice, as well as critically reflecting on their growth and formation of their teacher identity.
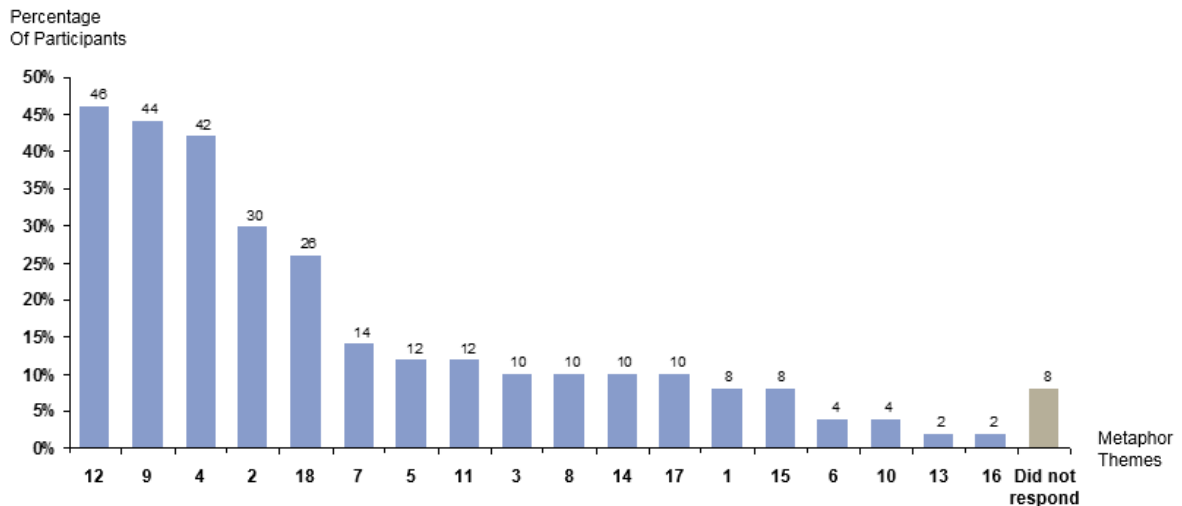
**Figure 5-20   Percentage distribution of the themes emerging from preservice teachers'
perceptions about metaphors**

Figure 5-20 shows that 46% (23) of the fifty participants identified Theme 12, which states that creating a metaphor to encapsulate ones' beliefs about their identity as a teacher resulted in *a deepened understanding of their pedagogy in practice*. This is a very reaffirming response from preservice teachers as the self- study inquiry was designed to develop their disposition as well as their ability to reflect deeply and meaningfully on their practice to enrich student outcomes.

Similarly, metaphor Theme 9, *reflect on my beliefs and values creatively* was raised by 44% (22) of the preservice teachers. This subgroup confirmed that metaphor was a creative way to stimulate critical reflection using one's espoused beliefs about teaching and learning enacted in practice as a lens to deepen their understanding of themselves as teachers. Then, a similar proportion (42%) described Theme 4; *reflect against principles*, as important, in that reflecting against their principles of pedagogy provided a framework to focus critically on their practice.

This realisation and awareness of how values and beliefs underpin their identity as a teacher and subsequently drives their pedagogical and professional practices is important. Thus, adopting a critical reflective disposition will contribute to a deepened understanding of teaching and learning, in turn building preservice teacher capacity as effective teachers. This transformative thinking which drives future actions should result in an improved quality of teaching.

The fourth highest theme identified in Figure 5-20 was Theme 2, *self-exploration*

with 32% of the preservice teachers in agreement that creating a metaphor to capture their understanding of teaching and learning afforded them the opportunity to explore their identity as teacher. This was achieved through an interrogation of their espoused beliefs leading to a statement of their principles of pedagogy. Moreover, metaphor creation required the preservice teachers to engage in higher order thinking, leading to a re-evaluation of the drivers that inform their pedagogical and professional practices.

Of note is that approximately one-quarter of the preservice teachers' (26%) responses fell in the thematic category 18: *teacher identity*, where they recognised that the process of creating a metaphor raised the question, *Who am I as a Teacher*? This is also an important outcome as well as a critical question for preservice teachers to consider as they embark on their final five-week professional experience in early years of the school context. This is also the final supervised professional experience in the early childhood degree program. It is critically important that preservice teachers can articulate their philosophy of education when engaging in pedagogical conversations with their mentor teacher. Also, in the near future these preservice teachers will be interviewed for a position with various education authorities or school administrations. In addition, this dialogue should lead to a deepening of their understanding of their practice as well as functioning as an enabler for preservice teachers to re-evaluate, refine or revision their pedagogical and professional practice.

Evident in Figure 5-19, 14% of the preservice teachers related to Theme 7, *create standards to foster student learning*, which means that the act of reflecting on their principles of pedagogy as a standard or framework promotes a very focused view of the teaching and learning context, in turn acting as a conduit to improve student outcomes. With 12% relating to Theme 5, *professional discussion with metaphor as a lens* and Theme 17, *how I view teaching*, these responses further support the claim that creating a metaphor to capture preservice teacher beliefs about teaching and learning is an extremely effective process. Those raising Theme 5 acknowledged *that metaphor acts as a lens to enhance and expand the professional conversation,* with their responses referring to how the creation of a metaphor for teaching and learning afforded them an opportunity to re-evaluate and confirm what is critically important to them as teachers.

Finally, 10% of the responses from the participants contributed to each of the following themes: Theme 3: *it is rewarding to reflect*; Theme 8: *not only reflect on*

teaching and learning but also on connecting to the school and community; Theme 14: *theories that inform practice*; and Theme 17: *how I view teaching, my perception of teaching*. Again, all responses confirm the value and the importance of creating a metaphor as a means to enhance reflective practice. Theme 3 is illustrative of a positive disposition towards reflective practices, while Theme 8 expands the reflective lens to include the wider community thus recognising the importance of viewing the child as part of a community and not in isolation. Furthermore, by mentioning Theme 14, this sees participants' again magnifying the critical reflective lens to acknowledge the importance of being conscious of which theories of learning are informing preservice teachers' practices and why. The last theme in the cluster, Theme 17 how I view teaching, is another way of expressing the concept of teacher identity.

Although only mentioned by a minority of participants, Theme 1, *empower*, Theme 15, *the metaphor provides a vision,* are positive in nature whereas Theme 6, *challenge,* is a reminder that the creation of metaphors was challenging, yet some also acknowledged that their *metaphor allowed them to dream* (Theme10). Related to this was Theme 13; *metaphor creation is an inquiry of the mind,* and finally, Theme 16 recognises that the *visual representation of the metaphor also acts as a reflective tool*.

5.6.2 Exemplars of responses about how metaphors assisted reflection

The next two exemplars show different ways in which preservice teachers expressed their perceptions of how creating a metaphor assisted them to reflect on their practice.

The creation of my metaphor enabled me to examine my values and beliefs thoroughly. Sometimes this can be overlooked as we are constantly reviewing the views and beliefs of other theorists and their theories throughout our teaching degree.

Excerpt 1

Through the creation of my metaphor, I could focus my thinking enabling me to state more clearly who I am as a teacher, what I believe and the practices that are reflective of my beliefs. Overall the creating of my metaphor provided a more well-rounded approach to critical reflection allowing me to reflect in a more meaningful way on the effectiveness of my teaching and my understanding of the learner.

Excerpt 2

Some preservice teachers proffered additional ways in which creating a metaphor had proved particularly helpful. The following excerpts are some of these additional statements.

> Through the creation of my metaphor, I was forced to practice deeper thinking and identify my beliefs and values of teaching and learning from different perspectives. This encouraged a deeper more thorough understanding of how to put those beliefs and values into words defined as principles into practice.
>
> Excerpt 3

> Creating the metaphor essentially opened my eyes to see things from a different perspective and review the teaching and learning process in different ways. This enhanced my professional growth both in theory and in practice as an early childhood educator.
>
> Excerpt 4

In conclusion, the following excerpts highlight the value of metaphor as a consciousness-raising exercise to deepen preservice understanding of their teacher identity: The value of the visual metaphor is particularly highlighted.

> The images I selected to represent my metaphor were pictured in my head so vividly that when I reflected they helped me to draw on my principles of teaching to articulate my thoughts. I feel more passionate about my metaphor after my placement and feel that it has shaped my identity as a teacher.
>
> Excerpt 5

> The visual representation of my metaphor allowed me to constantly critically reflect on my values and beliefs as a teacher. As I had taken my visual representation of my professional experience, I was able to see my metaphor throughout the day which assisted me in reflecting on practice.
>
> Excerpt 6

> Creating the metaphor was a deep process allowing me to reflect on what values and beliefs were important to me as a teacher.
>
> Excerpt 7

Creating a metaphor was clearly a valued activity amongst these participants. Themes that emerged from the analysis of their perceptions were positive in outlook and affirming of the task. Both the written and visual metaphors were appreciated. Some participants were particularly eloquent, not only in the writing of the actual metaphor, but also in their description of ways in which their metaphor had assisted them. Their writings express many "ah ha" moments that they experienced about themselves, their beliefs and identity, in their interactions with their metaphors.

5.7 Findings Part 6

5.7.1 Results of the analysis of teachers' perceptions of critical reflection

These findings form the answer to Research Question 6. *What were preservice teachers' perceptions of the value of critical reflection?*

Again, during the final phase of the self-study inquiry, preservice teachers were asked to reflect on the value and impact of critical reflection on their practice as well as the formation of their teacher identity.
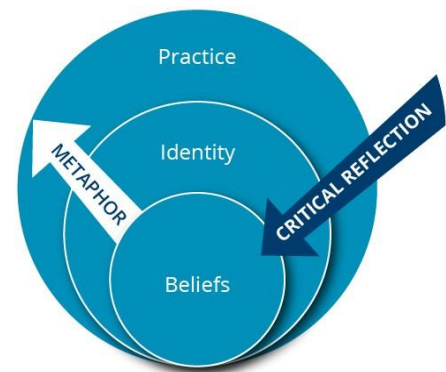
Preservice teachers were invited to provide up to three responses to the question presented in a short narrative. The responses from 42 out of the 50 participants were coded into 10 themes presented in Table 5-12.

These themes varied from general statements such as Theme 1, *Professional growth*, to specific identification of strategies they found particularly useful to help them reflect, such as the *Transformative moments* in Theme 7 and *Metaphor* in Theme 9. It was heartening to see a perception that critical reflection *builds confidence* in Theme 3 and that it is a *vital tool* in Theme 4.

Table 5-12   *Themes arising from preservice teachers' perceptions of critical reflection*

Theme No.	Critical Reflection Theme
1	Professional Growth
2	Deepen understanding of how children learn
3	Builds confidence to teach
4	Critical reflection is a vital tool in strengthening my understanding of teaching
5	Reflect on beliefs to determine relevance to practice.
6	Learning is a reflective process
7	Reflected most deeply on transformative moments.
8	Evolve and continue to learn
9	Metaphor assists in focusing critical reflection
10	Critical reflection has helped to develop my teacher identity.

Figure 5-21 is a percentage distribution to illustrate the range of participant views about the value of critical reflection in their practice.
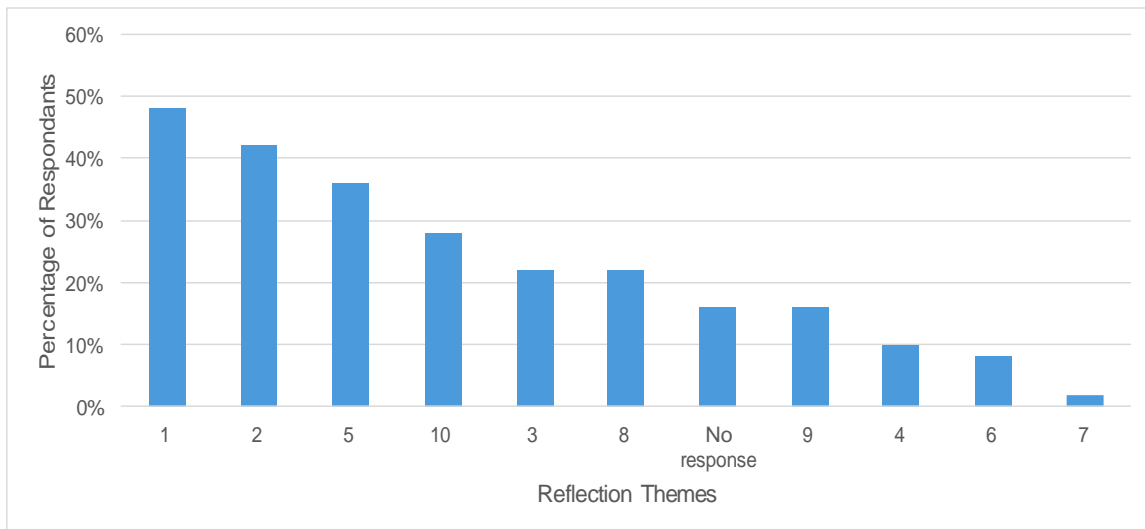
Figure 5-21   Percentage distribution of themes about critical reflection

The three most popular themes were critical reflection contributes to Theme 1: professional growth (48%); Theme 2: deepen understanding of how children learn (42%), and Theme 5: reflect on beliefs to determine relevance to practice (36%). The next cluster of themes ranging from 28 % to 11% includes Theme 10: critical reflection has helped to develop my teacher identity; Theme 8: evolve and continue to learn; Theme 3: build confidence to teach; and Theme 9, metaphor assists in focusing critical reflection.

The 42 respondents (8 participants did not respond to this qualitative question) have indicated a number of ways they found a critical reflection, an integral lens in the self-study inquiry, a valuable process contributing to their professional growth and understanding.

5.8 Findings Part 7

5.8.1 Overview of the findings of the self-study inquiry

These findings form the answer to Research Question 7. *How did the self-study inquiry assist preservice teachers in conceptualising their teacher professional identity?*

The results presented in response to research questions 1-6 indicate that each element in the self-study inquiry achieved its goal of contributing to an effective investigation designed for preservice teachers to learn more about themselves as teachers. Participants' conceptualisations of their professional identity were represented in the self-study in a number of ways:

- 96% of preservice teachers successfully identified their beliefs about teaching and learning as illustrated in their responses to the *Philosophy of Education Inventory.*

- 96% of preservice teachers successfully created a metaphor for teaching that also illuminated who they are as a teacher.

- 96% of preservice teachers created five principles of pedagogy to guide their practice during the five-week professional experience.

- 96% of preservice teachers were able to create a metaphor for teaching that captured their understanding of teaching and learning as a learner-centered approach which reflects their identity as a teacher.

- 96% of preservice teachers gathered artefacts during their professional experience to demonstrate their principles of pedagogy, to varying degrees of competence, in practice.
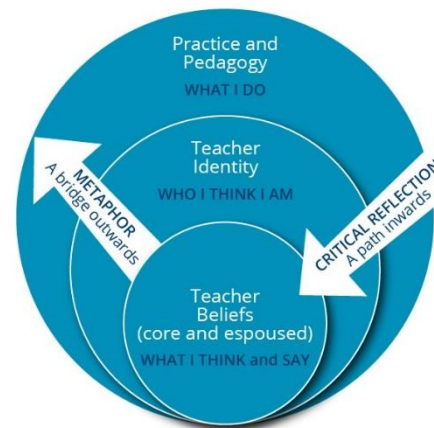
- At a minimum, all participants could select authentic artefacts to demonstrate their self-created principles of pedagogy in practice. Of note was the group of preservice teachers with a more sophisticated knowledge of their practice as seen in artefacts and annotations that scored level five ratings on the artefact rating rubric. This subgroup wrote more detailed and explicit rationales (annotation) for selecting a nominated artefact to represent a principle of pedagogy in action. Many preservice teachers did not write explicit annotations to accompany the artefacts, thus scoring lower ratings on the artefacts rating rubric. Consequently, the range and scope of artefact ratings illuminated the differences in preservice teachers' knowledge of pedagogy coupled with limitations in the ability of some participants to reflect deeply on their practice.

- 96% of preservice teachers were able to able to identify a transformative moment that captured the essence of a particular principle in practice. Preservice teachers' ratings for their transformative moments highlighted the differences in levels of awareness of their teacher identity in practice.

- 96% of preservice teachers were able to analyse their transcript of an explicit literacy lesson using multiple lenses to inform their interpretation of the data. A range of preservice teacher capabilities were evidenced in this task revealing an array of abilities from those preservice teachers able to notice effectiveness or non-effectiveness of their practice to those preservice teachers able to engage in transformative thinking about implications for their future practice.

- 96% of preservice teachers were able to to determine what is effective or not effective in their pedagogy in practice (lesson transcript) by identifying strengths and limitations in their lesson and by suggesting strategies to improve their future practice.

- Most preservice teachers reflected on the usefulness of the two tools, metaphor and critical reflection used to illuminate the connectedness of beliefs, teacher identity and practice.

In summary, it is clear that preservice teachers found the process of metaphor creation including the formulation of their principles of pedagogy a valuable process of inquiry as evidenced in the self-study inquiry to explore their teacher professional identity. This process afforded preservice teachers an opportunity to drill deep to uncover their beliefs that inform their practices in the classroom. The course assessment presented as a self-study inquiry created an authentic context for preservice teachers to articulate their espoused beliefs orally before their professional experience and receive feedback to further enhance their understanding of their role as teachers and deepen their understanding of the learner. The connected assignment tasks were designed to build preservice teachers' confidence to engage in pedagogical conversations with their mentor and other professional staff in a school context. Furthermore, the metaphor creation process ensured that preservice teachers had a meaningful and personalised framework to scaffold critical reflection during their professional experience and onwards into the field. Thus, this self-study inquiry process provided a scaffold and model to engage in building preservice teacher capacity to determine what is effective or not effective in their practice. Consequently, they were enabled to improve the quality of their teaching and deepen their understanding of the learner.

Overall, these participants affirmed the value of both lenses selected for this self-study, that is, metaphor and critical reflection, as ways to traverse the conceptual framework that has underpinned this research. Metaphor provided a bridge outwards from their beliefs, through their identity to their practice, and critical reflection worked in the opposite direction as a pathway from engaging with their practice to see how that illuminated their identity and their beliefs. Collectively, these two lenses afford these participants with the capacity to continue to be reflective practitioners. Through this building of their capacity they should be more classroom-ready and this in turn, should result in improved student outcomes.

Chapter 6   Discussion and conclusions

6.1 Introduction

This study used a conceptual framework involving beliefs, identity and practice to examine the impact of authentic tertiary pedagogy on the formation of preservice teachers' professional teacher identity. The findings indicated that the self-study inquiry developed as a model of authentic pedagogy provided a space for preservice teachers to learn deeply about themselves as a learner and becoming a teacher within the context of a professional experience. Through a holistic approach to critical reflection, using evidence of practice, preservice teachers' capacity was developed to enable them to determine the quality of their teaching. The self-study created an intersection between thinking and action – theory and practice - to generate a dynamic learning context for preservice teachers. This contextualising of theory within practice should pervade every aspect of professional practice and identity development in initial teacher education (Carr & Kemmis, 1986).

As described in Chapter 3, the self-study inquiry was the foundation of a new fourth-year course designed for preservice teachers specialising in the early years of school. The course sought to scaffold the preservice teachers' examination of their teacher identity in the context of their practices during their final supervised five-week professional experience. This investigation, described in Chapter 4, embraced a design-based research approach to explore this self-study inquiry as an authentic tertiary pedagogy for this purpose. As previously indicated in Chapter 5, data were collected from multiple sources both before and during their professional experience. These data, presented in Chapter 5, illuminated how final year early childhood preservice teachers conceptualised teaching and learning; their ability to provide evidence of their espoused beliefs enacted in practice; their ability to critically reflect as a central disposition to teacher identity formation; and metaphor as a bridge into uncovering beliefs.

Chapter 6 interprets the results to illuminate new knowledge that has been revealed as a result of this investigation, addresses limitations, and provides conclusions and recommendations. New knowledge includes North's 5Is Model of Self-Study Inquiry and the North Philosophy of Education Taxonomy for Metaphors. According to the literature, the best initial teacher education programs have developed a conceptual

framework for a shared vision of purpose linked to professional standards for teachers. This study has relied on a robust conceptual framework as elucidated in Chapter 1 which also provided the basis for analysing and presenting the findings. This framework in part was derived from an examination of the professional standards for teachers and reports (Darling-Hammond, 2006; TEMAG, 2015 that indicated problems with existing initial teacher education programs. Part of the data analysis also involved mapping results against the professional standards for teachers. Consequently, this study stands as having adopted best practice both in the design of the course and the design of the research.

Effective tertiary pedagogy would include consideration of the following factors:
- extended clinical experiences;
- extensive connections to practice (through case methods, portfolios, and performance assessments);
- explicit strategies to help students confront their deep-seated preconceptions about teaching; and
- shared beliefs among school-based and university-based teachers. (Darling-Hammond, 2006)

All of these strategies were adopted in the designed course and this research study. The results of this study confirms the key aspects of Darling–Hammond's vision of effective tertiary teaching but also adds to the research in initial teacher education by presenting additional principles of authentic tertiary pedagogy to foster the development of an effective teacher identity.

6.2 Findings in response to research question 1

What are preservice teachers' espoused beliefs about teaching and learning?

The findings highlight that preservice early childhood teachers' beliefs align with progressivism and humanism as their dominant philosophies of education. Preservice teachers espouse a social constructivist paradigm as their preferred approach to teaching and learning. That is, the role of the teacher is not seen as the *sage on the stage* but rather teachers who act as a *guide on the side* (King, 1993; Morrison,
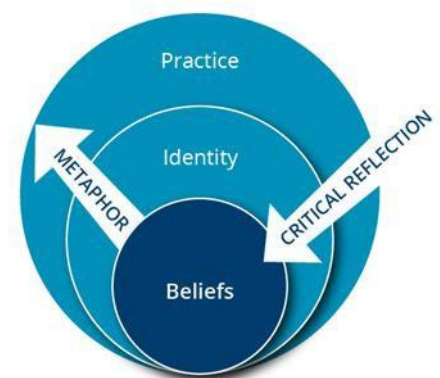
2014). These participants believe that knowledge is actively constructed and that learning is developed through an inquiry pedagogy situated in supportive learning environments where students feel safe to question and reflect on their learning.

This social constructivist approach was actively modeled for the preservice teachers in the designed course. The scaffolded self-study served to raise preservice teachers' consciousness of their beliefs about teaching and how children learn, and to help preservice teachers define and understand their practice, including themselves as professionals. Also, identifying preservice teachers' pre-assumptions is important as Lortie's (1975) research highlights how preservice teachers frame their beliefs through the lens of their school experience as students. This frame, in turn may inhibit and limit their understanding of contemporary theories of learning in action.

Similar statements have been made over the years by several researchers, including Bullough and Gitlin, (1995); Hollingsworth (1989); Holt-Reynolds, (1992); and Korthagen (1988). More recently, this stance as evidenced in the self-study inquiry was co-confirmed by Leavy et al (2007, p. 3) who states: "While changes in beliefs have been found to occur, and often as a result of initial teacher education programs, preservice teachers are not seen to develop new perspectives during teacher education courses unless they are confronted with their held beliefs".

Therefore, it is vital that initial teacher education course design incorporate tertiary pedagogy that facilitates the intentional and systematic interrogation of beliefs due to their impact on preservice teachers' practice. An important outcome and the first contribution to knowledge of this research is the development of a new model for self-study inquiry. The five steps of North's 5Is Model for Self-Study Inquiry (5Is model), first presented as in section 3.7 of Chapter 3, will be alluded to as the findings of this process are discussed.

The first step in the 5Is model, **Interrogate,** was designed as a consciousness-raising strategy for preservice teachers to activate their prior knowledge and to increase awareness of their espoused beliefs about teaching and learning. This insight was achieved by completing a *Philosophy of Education Inventory* [PEI] to determine and make preservice teachers aware of their dominant philosophy of education. Preservice teachers predicted which dominant philosophy aligned with their beliefs. This workshop activity generated a great deal of discussion before the preservice teachers completed the

inventory. Many preservice teachers were surprised by their results. Completing the inventory sparked preservice teachers' thinking about their image of self as teacher and considerable discussion amongst them in their role as students. This first step in the self-study inquiry was an effective scaffold into creating metaphors for teaching and to commencing their inquiry into their professional selves.

6.3 Findings in response to research question 2

To what extent are preservice teachers able to articulate their professional identity?

The findings suggest that early childhood preservice teachers' metaphors and principles of pedagogy revealed that their perceived teacher identity aligned with a social constructivist paradigm. This finding was based on how they conceptualised the role of the teacher and the role of the learner in a classroom context. Participants identified the following principles of pedagogy themes as being the most significant: safe and supportive learning environment**;** cater for all students and individual learning; and children learn best through authentic, engaging and challenging experience; which further substantiates the finding of these preservice teachers holding social constructivist espoused beliefs about teaching and learning. Adopting an approach based on these beliefs means that control in the classroom is shared between teacher and students creating an environment that is supportive of the learner. Contemporary theories in early childhood initial teacher education support a social constructivist pedagogy as the most suitable approach to engaging young children in learning within the context of these vital early years of schooling.

In the **Illuminate** step of the 5Is model, preservice teachers' metaphors were elicited and analysed using the *Oxford Taxonomy* to categorise metaphors. The *North Taxonomy* was used to confirm the qualitative analysis of metaphor with quantitative data from the PEI. In the **Innovate** step of the 5Is model, preservice teachers' principles of pedagogy were used to triangulate the data. The results presented from the multiple sources of evidence and analysis confirmed the researcher's conclusion that preservice teachers were learner-centred in their approach to teaching and learning. It became clear that these preservice early childhood teachers perceived their teacher identity as that of a

social constructivist which was a vehicle to enact their espoused beliefs of *what teaching is*, and *who they are as a teacher* in practice.

Findings indicate that the principles of pedagogy themes align with six of the Australian Professional Standards for Teachers (2011). It is of concern that no principles of pedagogy or principle of pedagogy themes aligned with standard 2, *Know the content and how to teach it*, and that preservice teachers had not considered this standard as being a key issue in achieving quality outcomes in their teaching. Two large clusters of the principle of pedagogy themes aligned with two standards, standard 1, *Know students and how they learn,* and standard 3, *Plan for and implement effective teaching and learning.* This outcome further illustrates preservice teachers' perceptions of themselves as being learner-centred.

Additionally, there were only two principles of pedagogy themes that focused on using multiple sources of data to inform decision-making and planning in their teaching. It is surprising given the significance of standard 5 that the gathering and analysing of student data to inform planning failed to draw preservice teachers' attention. These findings suggest some aspects of the professional standards may require more attention in the University's initial teacher education program.

In summary, all the principles of pedagogy themes selected by participants to conceptualise their understanding of teaching and learning were reflective of a social constructivist paradigm. This perspective was confirmed when the principle of pedagogy themes aligned with the results of the analysis of participant metaphors. That is, 100% of participants were learner-centred in their preferred pedagogical approach to teaching and learning. It is also interesting to note the results of the PEI where 60% of participants favoured a progressive perspective as their dominant educational philosophy while 28% aligned with a humanistic perspective in education, and 12% scored equally between progressive and humanistic perspectives in the PEI. Again, this conclusion confirmed preservice teachers' strong preference for alignment with Standards 1 and 3. The triangulation of these findings further supports the conclusion that these fourth year early childhood preservice teachers' professional identities were being conceptualised as social constructivists.

A first step in building an effective preservice teacher identity is the envisioning of self as teacher. The research by Beauchamp and Thomas (2009) as well as Chong, Low, and Goh (2011) illuminates the importance of the envisioning process as a way of raising preservice teachers' understanding of the significance and impact of their professional identity on their practice. This study examined the value of using metaphor to further interrogate beliefs to form a process of envisioning self as teacher. The self-study inquiry was developed to facilitate a deep space for preservice teachers to reflect on their beliefs about teaching and learning. A separate model has been developed for this phase of the inquiry to highlight the value and importance of envisioning self as a teacher and its contribution to teacher identity formation, to be presented in Figure 6.1 after elaboration of its development.

As Beauchamp and Thomas (2009) posited, initial teacher education course design needs to focus explicitly on developing teacher identity as a vital part of *becoming a teacher*. However, while envisioning self as a teacher is a fundamental element of the formation of an effective teacher identity, this process has not been fully researched in the literature (Beauchamp & Thomas, 2009). Also noted by Thomas and Beauchamp (2011) is the value of metaphor as an efficient means of investigating difficult to articulate concepts. The course began by first discussing the concept of metaphor to ensure that the preservice teachers were familiar with the concept before being asked to write their own about teaching. Further preparation for eliciting their metaphor was accomplished using the *Philosophy of Education Inventory* to **interrogate** preservice teacher beliefs. This important step has been included in the envisioning model presented in Figure 6. 1.

The results of the PEI were discussed and the philosophies unpacked. In the first iteration of the course upon which this research study is based, the next step was to elicit their metaphors using a simple prompt *Teaching is ….* An advantage of design-based research is that it is iterative, and a subsequent modification used in further offerings of the course has been the inclusion of an extra step. This is a mind map of the question *Who am I as teacher?* Mind-mapping **illuminates** key issues and theories of learning that influence practice, principles of pedagogy, the image of the child, and beliefs about teaching and learning that impact on the image of preservice teachers' professional self. This step has been included in the version of the model shown in Figure 6.1. This provided better preparation for the next step of eliciting the metaphor, both written and visual,

which completes the **Illuminate** step of the self-study inquiry captured in Chapter 3 as North's 5Is Model of Self-Study Inquiry.

Finally, asking the preservice teachers to **innovate** (step 3 of the 5Is model) and create their principles of pedagogy as a framework to explore and explain their metaphor for teaching proved valuable. This process provided an interesting lens into the scope of each preservice teacher's conceptualisation of teaching and learning during the final year of their education degree. The final model of envisioning self as a teacher is presented in Figure 6.1 below.
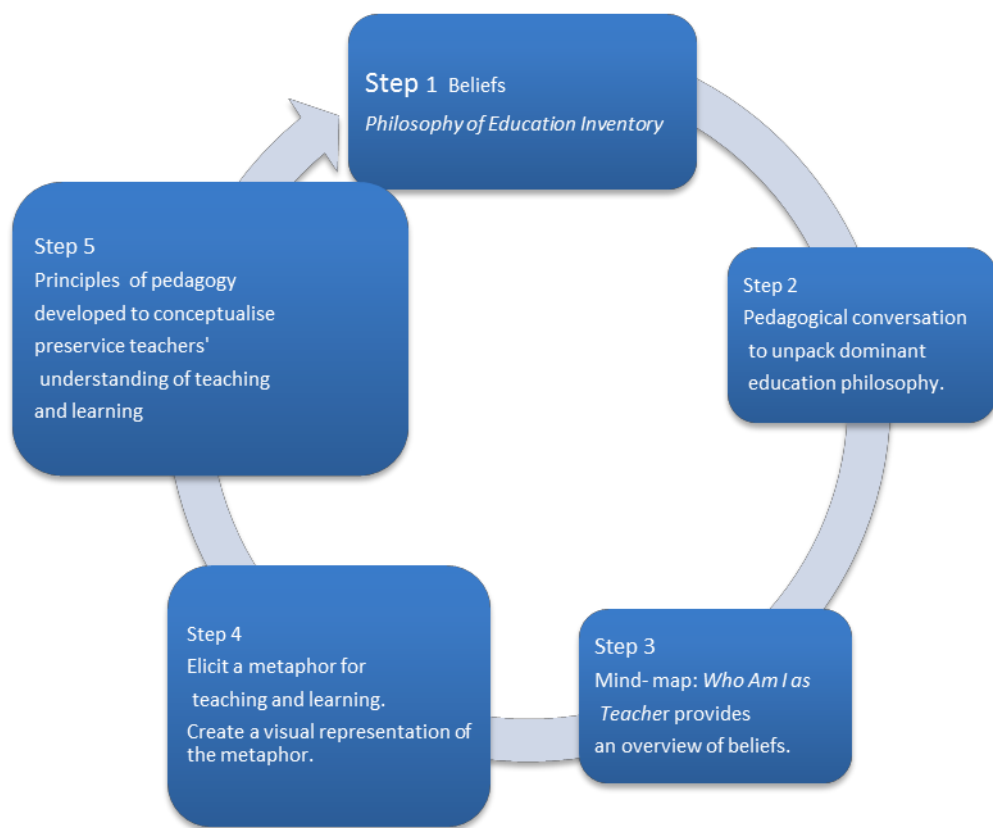

Figure 6-1   Envisioning model for teacher identity formation using metaphor

6.4 Findings in response to research question 3

To what extent are preservice teachers able to enact their espoused beliefs in practice?

In the **Investigate** step of the 5Is model, there were three tasks with the purpose of identifying, describing, analysing and justifying evidence of practice. They were 1) The collection and annotation of artefacts to demonstrate their principles of pedagogy in action; 2) The writing of narratives describing transformative moments in their practice during their professional experience; and 3) The analysis of an explicit literacy lesson using three analytical tools. These three tasks will be discussed in the sequence that they were completed by the preservice teachers.
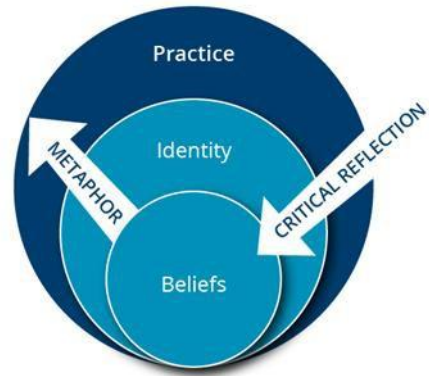
1)   The findings show that preservice teachers were able to observe and collect authentic artefacts, twenty in all, from their practice to demonstrate and evaluate their principles of pedagogy in action with varying degrees of competence. Artefacts with accompanying annotations were rated on the artefact rating scale from a level 2, minimal understanding, to a level 5, advanced understanding. However, explaining the activity featured in the artefact and explicitly providing a justification for the selection of each artefact proved very challenging for many participants.

2)   The submission of *transformative moments* provided a second opportunity for preservice teachers to demonstrate their espoused beliefs as expressed in their metaphor and principles of pedagogy in practice. The findings indicate that the majority of preservice teachers scored a level 3 rating (critically reflective adaptation) or a level 4 rating (creative re-visioning) on the four- point Sterling (2001) scale for levels of critical thinking for learning. Application of this scale identified the effectiveness of their transformative moment in capturing the intent of their principles of pedagogy. The results indicate that the participants found this evidence of practice task easier than the other two evidence of practice tasks.

Nonetheless, the findings indicate that capturing transformative moments did provide some clarification for preservice teachers of the explicit intent of their principles of pedagogy in practice, and also reassured them that at least some of their principles do in fact translate from theory into effective practice.

3) The third evidence of practice task was the preservice teachers' analysis of their explicit literacy lesson transcript taught during their professional experience. This task proved to be the most challenging of the three included as part of the **Investigate** step of North's 5Is Model of Self-Study Inquiry. Just over half of the preservice teachers scored a level 3 or level 4 on the Sterling (2001) scale for levels of critical thinking for learning in education. This result is much less (by 30%) than achieved in the second evidence of practice task (transformative moments). However, the task of using three lenses to analyse a transcript for the quality of student-teacher interactions in the classroom as well as the preservice teachers' scaffolding of the sequence of learning to achieve the stated objectives of the lesson was considered valuable by the researcher. It provided the most specific information about how their practice reflected their beliefs and identity.

The identified lesson strengths and limitations will be discussed in the next section of this chapter as part of the discussion of research question four.

The **Investigate** step of the self-study inquiry process is reflective of an aspect of the Reggio Emilia approach (Rinaldi, 1998) where observation is considered as an essential disposition and competence for early childhood teachers. Observation, for preservice teachers, is only the first step in the collection of the data aimed at capturing children's experiences in the classroom using pedagogical documentation as well as progressing preservice teachers' developing understandings of their practice. Pedagogical documentation becomes a tool for teacher research, reflection, collaboration, and decision-making. The expanded view of the teacher as an observer was broadened in this investigation to include documenter, inquirer and researcher.

Pedagogical documentation, where data is collected to document practice, has great potential for improving initial teacher education. Furthermore, the documentation of

children's learning processes, the analysis of the documentation, revisiting, and creating documentation of their practice enhances reflective thinking for preservice teachers (Moran, 1998). This **Investigate** step of the self-study inquiry makes both children's learning and preservice teachers' learning visible.

There are five benefits of engaging in this process of pedagogical documentation of evidence of practice:

1. It makes the learning of both children and preservice teachers visible and can be shared in some way, e.g., with a critical friend, colleagues, children, and parents.
2. It involves analysis, interpretation and evaluation of data as a process of inquiry to build teacher capacity.
3. The learning that is rendered visible is strengthened by analysis of multiple sources of data.
4. It stimulates critical reflection.
5. It leads to transformative thinking and improved outcomes in the future.

Documentation of evidence of practice is effective as a step in a self-study inquiry, creating a challenging dilemma, that is, the theory-practice gap, for preservice teachers to investigate as a capacity-building exercise. Rinaldi (1998) highlighted the benefits of a holistic approach to critical reflection using documentation of preservice teachers' evidence of their practice in the quote: "Documentation is not about what we do, but what we are searching for" (p. 24). Additionally, Rinaldi (1998) writes:

> By documenting evidence of practice, the most interesting and advanced moments of teachers' professional growth are preserved. It is a process in which teachers generate hypotheses and interpretations of theories that can modify the initial, more general theories. Documentation makes it possible to create knowledge not only for teachers but also for researchers and scholars. (p. 121)

These quotes support the inclusion of this process in the self-study inquiry undertaken by the participants in this study.

6.5 Findings in response to research question 4

To what extent are preservice teachers able to examine the quality of their teaching?

Preservice teacher capacity-building was enriched by the analysis of the dialogic pedagogy in lesson transcripts. The findings suggest that this task of using evidence of practice, that is, an analysis of an explicit literacy lesson focused on identifying the quality of teacher-student interactions was a very challenging capacity-building exercise for preservice teachers. The results scored on a lesson rating scale showed over half of the participants engaging in transformative thinking. The widespread results are illustrative of preservice teachers' varied capabilities in using evidence of practice and critical reflection to inform their planning and practice. These findings also indicate the increased complexity of this evidence of practice task, that is, the analysis of teacher moves and classroom interactions using transcripts of lessons.
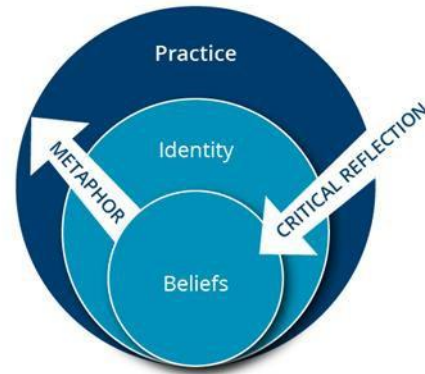
These findings also highlight the importance of moving beyond reliance on a retrospective approach to critical reflection, which deals with preservice teachers' perceptions of their practice to an evidence-informed approach to critical reflection on practice. This approach to the development of preservice teacher identity reveals their actual practice and raises their awareness of a possible gap between espoused beliefs and their practice. It is a skillful way of building preservice teachers' capabilities to determine the effectiveness and quality of their practice as well as their limitations.

Additionally, the results of the lesson transcript analysis in Chapter 5 illustrated the themed reasons that preservice teachers identified as strengths. The top three strengths identified by preservice teachers in their reports were engagement, an explicit model of instruction (introduction phase), and activating prior knowledge. These strategies are important pedagogical considerations when focusing on improving student outcomes although these identified strengths relate primarily to the lesson introduction.

The findings also highlighted limitation themes; they are a group of pedagogies that were challenging for preservice teachers to integrate into their practice. The dominant limitation themes were: an explicit model of instruction (reflection phase), questioning and

interactive dialogue to engage students in the learning process. For example, a factual question will only afford students a limited opportunity to respond, that is, elicit a one-word answer or yes/no. This form of a question does not give students the opportunity to provide an extended response that would enable engagement in higher order thinking as well as an opportunity to use the metalanguage of the lesson. It is interesting that the highest scoring limitations are focused on the quality of talk in the classroom interactions as well as the types of questions used to scaffold the talk. These strategies are crucial due to their impact on the learning opportunities afforded their students. Without using lesson transcripts with a focus on analysing the dialogic pedagogy, preservice teachers are unlikely to consider these high stakes strategies that improve and impact on student outcomes. This is especially true if retrospective styles of reflection are adopted as a one-pronged approach to critical reflection. The dominant "strength themes" are focused on the phases of a lesson and lesson plan, and through perception alone, it is unlikely that reflection would dig deeper into the quality of the classroom talk or the equity of the opportunities for students to engage in the learning in early childhood contexts.

It is also interesting to note that the principles of pedagogy frequency score showed that the highest rating principle of pedagogy was care and supportive learning environment. This aligns with the features that are needed to create an optimal learning environment for young children, including a classroom environment that fosters a dialogic pedagogical approach. The principles of pedagogy themes showed a low-frequency score related to the value and importance of scaffolding learning as well as using assessment data in preservice teacher practice.

Participants' ability to reflect critically on evidence of practice provides a lens into the participants' pedagogical strengths and limitations, which in turn are reflective of their philosophical perspectives on how children learn. If participants hold a socio-cultural perspective then the analysis of transcripts would reveal a strong emphasis on effective questioning, scaffolding, and meaningful interactions that encourage higher order thinking and provide opportunities for students to use the metalanguage of the lesson. Rather than using guess what's in my head questions, preservice teachers are encouraged to use moves (strategies) that extend and deepen the dialogue such as the scaffolding interaction cycle (Rose, 2005).

The fact that these key strategies have emerged as limitations shows the importance of both using evidence of practice and the critical importance of analysing lesson transcripts as a way of building preservice teachers' capabilities to determine what is or is not effective in their practice. This evidence-informed inquiry assists preservice teachers to become aware of their espoused beliefs that they were unable to translate into practice and which pedagogical strategies they plan to adopt to improve their practice in the future so that it aligns with their theories in use.

6.6 Findings in response to research question 5

Is metaphor an effective strategy to bridge between preservice teacher beliefs and identity and practice?

The findings indicated that preservice teachers found that metaphor situated as part of the self-study inquiry was an effective strategy to bridge beliefs, identity and practice. This view is supported by the 18 themed responses by preservice teachers to the question, *In what ways did the creation of your metaphor(as part of a self-study inquiry)provide an opportunity for you to reflect on your values and beliefs?*

This qualitative question prompted early childhood preservice teachers to reflect critically on their teacher professional identity during the first semester of the fourth and final year of their education degree. Preservice teachers showed that the process of metaphor creation including the formulation of their principles of pedagogy was a valuable part of the self-study inquiry designed to explore their teacher professional identity.

This critically reflective process afforded preservice teachers an opportunity to drill deep to uncover the values and beliefs that inform their practices in the classroom. The self-study inquiry also provided an authentic context for preservice teachers to articulate their philosophy of education orally before their professional experience and receive feedback to enhance their understanding of their role as teacher to further and deepen their knowledge of the learner. Likewise, the metaphor creation process ensured that preservice teachers had a meaningful and personalised framework to scaffold critical reflection during their professional experience and onwards into the field. The final step in
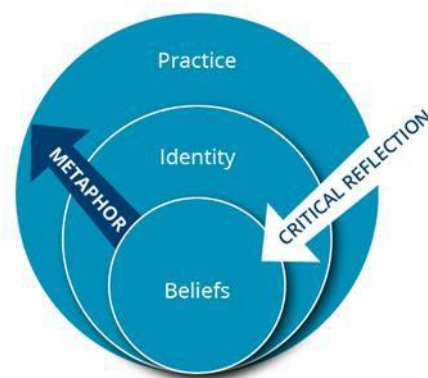
the 5Is model for the self-study inquiry, **Iterate,** provided an opportunity for preservice teachers to review their professional growth during this semester including a five-week professional experience. Gillis and Johnson (2002, p. 37) state that "because they (metaphors) reveal our educational values and beliefs and principles, they contain information essential to our growth as professionals".

Moreover, the elicitation of metaphors requires preservice teachers to explore their beliefs about their teacher professional identity including how they conceptualise teaching and learning as well as developing a collaborative language for discourse about their practice. Thus, initial teacher education programs need to move beyond the imparting of knowledge about teaching and learning to provide authentic tertiary assessment for preservice teachers that enable the interrogation of their values and beliefs that impact so profoundly on their practice. Furthermore, the elicitation of metaphor task was developed by this researcher to scaffold and facilitate the creation of metaphors and principles of pedagogy. This process also contributed to the validation of the metaphor. Indeed, Wan and Low (2015) summed up the importance of indirect methodology with the statement: "One might hope in the above situations that indirect approaches could prove to be more than justifiable and verge on the ideal" (p. 5). Multiple sources of data which allowed direct and indirect data to be compared also helped to ensure greater trustworthiness of these data.

According to Zheng and Song (2010), "Research in the field of teachers' thinking shows that teachers' teaching behaviors are guided by cognitive psychological processes that construct theories, beliefs, metaphors and mental models" (p. 44). Moreover, preservice teacher beliefs are not directly observable. As Johnston (1992, p. 125) has indicated, the prior beliefs "are not usually consciously articulated without some assistance". Therefore, by identifying, analysing, and critically reflecting on their metaphors for teaching, beliefs are made conscious and explicit. As Berliner (1990, p. 86) noted, for teachers, "Metaphors are powerful forces, conditioning the way we come to think of ourselves and others". Thornbury (1996, p. 284) noted, without adjustments at the level of awareness of prior beliefs, "the effects of training may only be superficial". It is important that preservice teachers be given many opportunities to investigate their beliefs about teaching and learning using evidence of practice to determine their professional growth.

A number of key findings resulted from the analysis of the data within this research study. Firstly, a significant issue raised in the literature identified that methodologies used to analyse metaphor data and subsequently categorise these metaphors are not often addressed. This research recommends an extension to the *Oxford Taxonomy* which was used to categorise the elicited metaphors in this investigation by aligning each metaphor with one of four educational perspectives. To this end, the researcher developed an additional taxonomy that enables the triangulation of quantitative data gathered from the *Philosophy of Education Inventory* with the qualitative data analysed using the Oxford Taxonomy. The new taxonomy called *The North Philosophy of Education Taxonomy for Metaphors* is presented here as a contribution to the literature on methodologies. It was used to analyse metaphors as well as providing trustworthy data to inform our understanding of preservice teacher professional identity.

As highlighted in the review of the literature, metaphor analysis is a qualitative research tool that permits researchers to examine how teachers and preservice teachers conceptualise their role as teacher (Armstrong et al., 2011). Similarly, Kochis and Gillespie (2006) speak of metaphor as an interpretative tool that assists in the conceptual analysis of data. However, specific procedures for analysing data are less often explicitly described in research studies, and similarly nor are how researchers' findings were triangulated or confirmed (Ritchie, 2003; Todd & Harrison, 2008). Indeed, Armstrong et al., (2011), purports that metaphor analysis is most effective when an intentional plan for triangulation is built into the design as evidenced in this research study. Hence, the new North metaphor taxonomy scaffolds triangulation of both quantitative data and qualitative data in a single taxonomy yielding trustworthy results from the analysis of metaphor data. As an object of research, metaphors are powerful instruments, which when studied for their conceptual and linguistic insights reveal the intuitive and implicit beliefs which teachers bring to bear on their experience and practice (Saban, 2010). This new taxonomy was presented in Table 2.7 (in Chapter 2), and the research aspects of the taxonomy were presented in Table 4.3 in Chapter 4.

Another contribution to knowledge from this research study is also in response to the literature that suggests there is an absence of training tasks that discusses the design and relevance of the elicitation task as a scaffold for preservice teachers to create their metaphors for teaching. Wan and Low (2015) justifies the use of indirect methods of

research using the following rationale:

- The participants cannot be expected to know (and thus discuss) the theories or methods in which the researcher is ultimately interested.

- The participants might be strongly tempted to respond by giving the party line or what they think the researcher wants to hear.

- The participants have not given the topic much thought and thus, have few already formulated responses.

- The participants are very used to the topic and would benefit from an approach that seems different and which encourages them to consider it from a new angle (Wan & Low, 2015, p. 4).

Wan and Low (2015) also posited that using multiples sources of data increased the amount of indirect data intersected with more direct sources of data from the same study, and this would enhance the trustworthiness of this data.

This research into the design of authentic pedagogy used in a fourth year curriculum and pedagogy course adopted a trial and error approach to developing a metaphor elicitation task that led to the development of a metaphor elicitation plan. As previously mentioned, after analysing the elicitation data in this investigation, it became apparent that an additional step in the eight-step metaphor elicitation task would assist in synthesising preservice teacher beliefs to scaffold the process of metaphor elicitation further as well as providing additional rich data of participants' beliefs about their pedagogy. This new and supplementary step involves the creation of a mindmap by preservice teachers designed to answer the question: *Who Am I as Teacher*? The mind map would capture preservice teacher beliefs, pedagogies used in practice, theories that inform their practice, prior experiences that inform their beliefs and practices; their image of the child; and any other additional information that each preservice teacher feels contributes to their professional selves. The mind map makes visible preservice teachers' pedagogical beliefs about teaching and learning that impact on the formation of their teacher professional identity.

Moreover, it acts as a springboard into preservice teachers' elicitation of a metaphor which in turn is explained through a framework of their principles of pedagogy. The revised plan for metaphor elicitation is presented in Table 6.1.

Table 6-1   *Revised North's plan for metaphor elicitation*

1	Preservice teachers complete the *Philosophy of Education Inventory* Completion of the inventory is an awareness-raising exercise that involves participants' in responding to the *Philosophy of Education Inventory*. The results of the survey uncovered preservice teachers' dominant philosophical perspectives aligned to an educational theory of learning.
2	Prepare students to create a metaphor during tutorials ensuring that: 1) The concept of metaphor is understood 2) The rationale for creating conceptual metaphor is discussed linking its purpose with the literature. 3) Exemplars of the metaphor task are viewed and considered to consolidate understanding. 4) Mind mapping is adopted as a method for preservice teachers to synthesise beliefs about teaching and learning as well as answering the question: *Who Am I as a Teacher?*
3	Metaphor elicitation using the prompt *Teaching is …* Preservice teachers are asked to write their metaphor and then find a visual image that represents their metaphor.
4	Elicited principles of teaching and learning were used to frame and facilitate preservice teachers' explanation of their metaphor for teaching. These principles provide a snapshot of their values translated into practice.
5	Analyse metaphor data A qualitative method of metaphor analysis was adopted using the *Oxford Taxonomy* to align metaphors with an educational perspective informed by participants' principles of pedagogy as well as determining the participants' perception of their role as a teacher as it relates to their students. These data were compared and confirmed with the quantitative data (PEI scores), using the North taxonomy for metaphors. This comparison of indirect data sources with direct data from the same study contributes to the trustworthiness of the study.
6	Principles of pedagogy were mapped against the Australian Professional Standards for Teachers. These data provided further verification of the data while positioning participants and their beliefs about teaching and learning.
7	Evaluate participants' ability to enact metaphor as framed by beliefs into practice. This analysis is determined by their evidence of practice, in the form of artefacts gathered during their professional experience. It affords the researcher an opportunity to evaluate if participant metaphors are consistent with their enacted practice using artefacts as data.
8	Provide an opportunity for the participants' to reveal if the process of metaphor elicitation and application impacted on their learning and positively on their teacher professional identity.

6.7 Findings in response to research question 6

What were preservice teachers' perceptions of
the value of critical reflection?

Critical reflection is a crucial part of the development of an effective teacher professional identity. It has been acknowledged in teacher education that the systematic and intentional evaluation of preservice teachers' teaching through critical reflection helps them understand their identity and professional growth. Therefore, it is interesting to note preservice teachers' reasons why they see reflection as an essential ingredient to their professional growth. The ten themed responses presented in Table 5.12 were all positively oriented; not one made any comment that devalued the process or found it too difficult, tedious or unnecessary. This was despite the challenges that the analysis of some of the evidence of practice tasks presented.

Critical reflection was specifically seen as contributing to their professional growth, deeper understanding of how children learn, connections of beliefs to practice, confidence to teach and their professional learning that contributes to their evolution as a teacher. These ten themes that related to preservice teachers' perceptions of their professional growth illustrate their valuing of critical reflection to inform and challenge their understanding of teaching and learning, their professional self and the quality and impact of their teaching on student achievements.

To build on the research identified by Collin et al., (2013) and Beauchamp (2015), a model for a holistic approach to critical reflection in initial teacher education has been developed to guide a meaningful process. This model of a holistic approach to critical reflection recognises the impact of preservice teachers' beliefs on their practice as well as the recognising the importance of exploring their teacher professional identity. Kelchtermans (2009) also supports this perspective in his statement that urges the following:
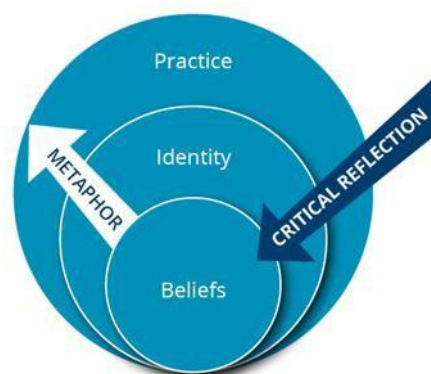
A concept of reflection that does justice to the specificity of the teaching

profession does not only need to be broad or wide in its content but also

deep enough. By this 'depth' I mean that it should move beyond the level

of action to the level of underlying beliefs, ideas, knowledge, and goals –

in other words to the personal interpretative framework with its self-

understanding and subjective educational theory. (p. 269)

In this way, critical reflection, when situated as an essential part of professional practice creates a space for praxis.

Using multiple sources of data as evidence of practice informs the critical reflective process which impacts on the shaping and reshaping of teacher professional identity. Beauchamp (2015) states that the approach to critical reflection must be profound and include an interrogation of beliefs and values as highlighted in her extensive review of literature related to reflection. As a result of this investigation; I concur with Beauchamp that reflection begins as beliefs are interrogated as they impact and frame classroom practices and thus should be considered in this holistic model of critical reflection in teacher education.

Interrogation of beliefs creates a space for teacher identity formation in initial teacher education. The self-study inquiry created a space for knowledge building and meaning making that was enhanced by an explicit focus on raising preservice teachers' consciousness of their beliefs and how these beliefs impact on their practice. A holistic approach to critical reflection as illustrated in the model presented in Figure 6.2 is focused on authentic practice situated within professional contexts that provides an opportunity for meaningful professional learning that in turn builds teacher capacity as a major contributor to the formation of their teacher identity.

This holistic approach to critical reflection as illustrated in this **Investigate** step of the 5Is model for self-study inquiry is a pivotal part of enacting preservice teachers' philosophies of education in practice. This process is designed to strengthen preservice teachers' capacity to teach effectively while contributing to the formation of an effective teacher identity. Furthermore, providing and analysing evidence of practice makes the professional learning visible as well as requiring a deep level of critical reflection. This learning is enabled as preservice teachers show evidence of their practice which also

reveals if there is a gap between espoused beliefs and their pedagogy in practice. The self-study inquiry process creates a space for deep learning about their perceived strengths and in turn the challenges and limitations of their practice.

By using an evidence-based approach to critical reflection, preservice teachers developed their capabilities through the documentation of the artefacts of their pedagogy to analyse, interpret and evaluate the effectiveness of their practice. Moreover, as their evidence of practice was drawn from multiple sources, it demonstrates an alignment of their practice with their beliefs about learning and teaching conceptualised through their metaphor and principles of pedagogy. A holistic model of critical reflection is presented as a contribution to knowledge in Figure 6.2.
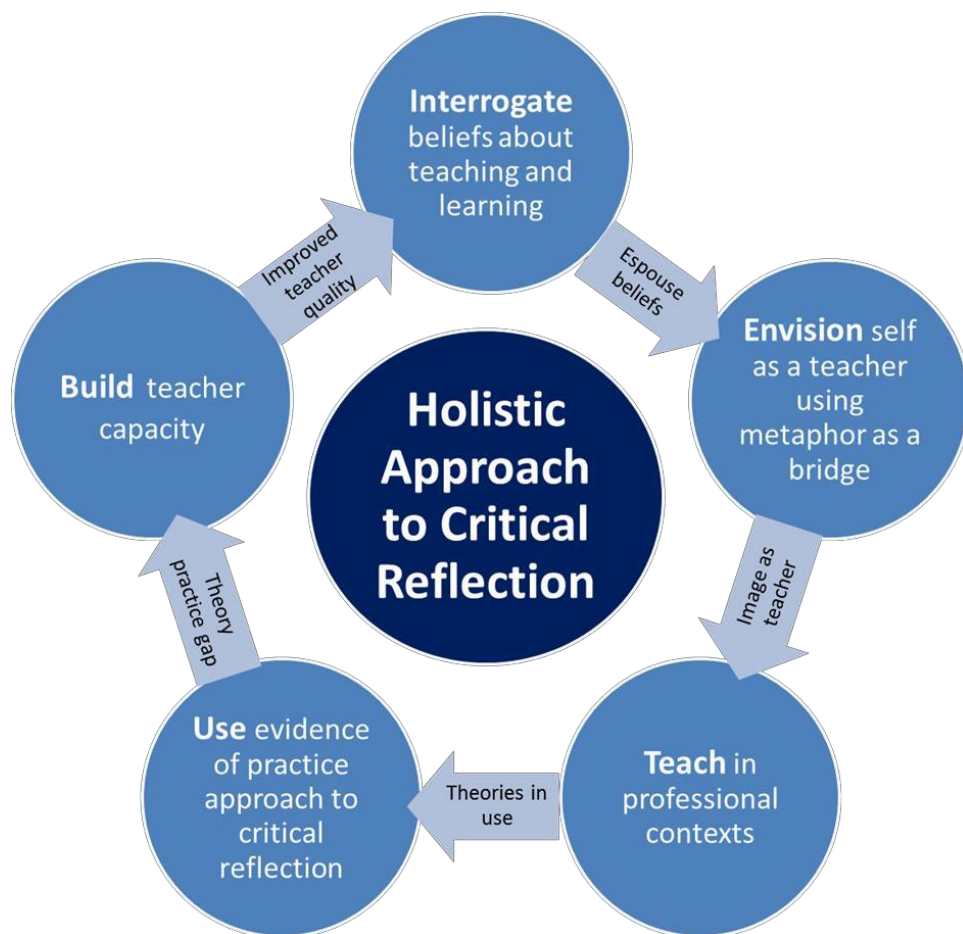

Figure 6-2 **A new holistic approach to critical reflection**

6.8 Findings in response to question 7

What were preservice teachers' perceptions of the process of a self-study inquiry in terms of conceptualising their professional identity?

The findings provide considerable evidence of the effectiveness of the authentic assessment tasks designed as a self-study inquiry in an early childhood fourth-year curriculum and pedagogy course. The self-study inquiry as assessment captured the complex nature of the teaching by exploring, interrogating and conceptualising their teacher professional identity in a quest for making meaning about themselves so that they could answer two important questions: '*Who Am I?';* and '*Who Am I as a teacher*?'
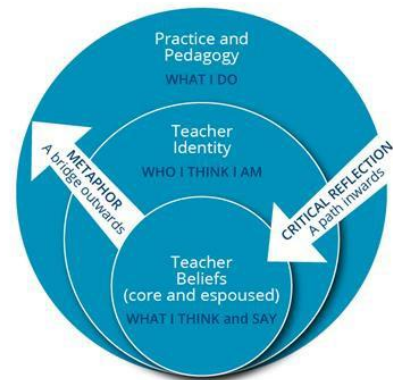
The self-study inquiry process was also successful in linking theory and practice through the connectedness of the course assessment situated within a five- week professional experience. Using multiple sources of evidence enabled preservice teachers to critically reflect on their pedagogical beliefs to confirm those enacted in practice and disconfirm those not enacted in practice. The self-study inquiry process created a space for early childhood preservice teachers to deepen their understanding of themselves as teachers. The engagement in this process of deep learning and knowledge creation through the analysis of multiple sources of data revealed preservice teachers' actual pedagogy used in practice thus illuminating any discrepancies between preservice teachers' perceived teacher identity and their actual teacher identity revealed when actively engaged in professional contexts.

The findings indicate that the self-study inquiry achieved its goal of contributing to the effective development of preservice teachers' professional identity. All preservice teacher participants' conceptualisation of their professional identity were presented in the self-study in a number of ways. Preservice teachers:

- successfully identified their beliefs about teaching and learning as illustrated in their metaphor for teaching;
- created five principles of pedagogy to guide their practice during the five- week professional experience;
- gathered artefacts during their professional experience to demonstrate

their principles of pedagogy in action, to varying degrees of competence and presented in an e-portfolio; and

- used tools, to various levels of competence, that enabled them to research their practice by analysing the data to determine what is effective or not effective in their pedagogy in practice e.g. analysis of lesson transcripts.

At a minimum, preservice teachers could select authentic artefacts to demonstrate their self-created principles of pedagogy in practice. Of note was the group of preservice teachers (16%), with a more sophisticated knowledge of their practice as seen in artefacts and annotations that scored level five ratings on the artefact rating rubric. These preservice teachers wrote more detailed and explicit rationales (annotations) for selecting a nominated artefact to represent a principle of pedagogy in action. Many preservice teachers did not write such explicit annotations to accompany the artefacts, thus scoring lower ratings on the artefacts rating rubric. Consequently, the range and scope of artefact ratings illuminated the differences in preservice teachers' knowledge of pedagogy coupled with limitations in the ability of some participants to reflect deeply on their practice.

Preservice teachers were more able to readily identify a transformative moment that captured the essence of a particular principle in practice. Preservice teachers' ratings for their transformative moments highlighted the differences in levels of awareness of their teacher identity in practice. More challenging was the analysis of a transcript of an explicit literacy lesson. This task was complex due to the requirement to use multiple lenses to inform their interpretation of the data. The challenges presented by this task meant that there was a range of preservice teacher capabilities evidenced in this task. An array of abilities was revealed, from those preservice teachers able to notice effectiveness or non-effectiveness of their practice to those preservice teachers able to engage in transformative thinking about implications for their future practice.

Table 6.2 presents a detailed overview of the processes and impact of the self-study inquiry designed and developed by the researcher. The table illuminates the model of inquiry; the pedagogical processes used in the inquiry; artefacts of the pedagogical processes employed in the inquiry; metacognitive processes incorporated into the inquiry; the metalanguage of the inquiry and finally impacts of the inquiry designed to build preservice teacher capacity and formation of an effective teacher professional identity.

Table 6-2   *The processes, artefacts and impacts of the self-study inquiry*

Inquiry Model	Pedagogical Processes	Artefacts of Pedagogy Practices	Metacognitive Processes	Metalanguage	Impacts
Interrogate	Complete the PEI. Results of the inventory indicate each participant's dominant philosophy of education. Interrogate, critically reflect on and discuss the dominant philosophy of education with other preservice teachers during tutorials. These pedagogical discussions act as a scaffold into a deeper exploration of preservice teachers' professional teacher identity in preparation for the creation of individual metaphors for teaching.	*Philosophy of Education Inventory*	Awareness of dominant philosophy	Articulation of philosophy of education	Heightened awareness of beliefs about teaching and learning as a result of an interrogation of preservice teacher beliefs.
Illuminate	Discuss purpose and value of cognitive metaphors, as a critically reflective lens to explore: *Who Am I?* and *Who Am I as a teacher?* with preservice teachers. The post-study inclusion of a mind-mapping step here for further preparation for metaphor elicitation. Create a metaphor for teaching and learning, starting with the words: '*Teaching is'…….. The process of creating metaphors assists preservice teachers in understanding complex processes related to teaching and learning.	Metaphor title and visual representation of metaphor.	Metaphorical thinking to raise the consciousness of preservice teachers' professional identity.	• Illuminate; • metaphor; • visual representation on of metaphor; • theories of learning; • knowledge practice.	Tacit knowledge of beliefs about teaching and learning becomes explicit. Preservice teachers articulate their philosophy of education.

Inquiry Model	Pedagogical Processes	Artefacts of Pedagogy Practices	Metacognitive Processes	Metalanguage	Impacts
Innovate	Create five principles for pedagogy i.e. teaching and learning. These principles were used as a framework to explain how their metaphor encapsulates their beliefs about teaching and learning.	Five principles of pedagogy. Principles mapped against standards	Deepening preservice teachers' understanding of standards and relevance. Contribute to an understanding of preservice teachers' professional identity as related to the Australian professional standards.	• Innovate; • principles of pedagogy; • Australian professional standards for teachers.	Deepened preservice teachers' understanding of their professional teacher identity.

Inquiry Model	Pedagogical Processes	Artefacts of Pedagogy Practices	Metacognitive Processes	Metalanguage	Impacts
Investigate	Evidence-informed approach to critical reflection through the lived experience of a five-week professional experience. This professional learning opportunity provided a space for deep learning about themselves as teachers which in turn contributed to an effective development of a professional identity. Pre-service teachers' evaluated how effectively they enacted their principles of teaching in action during a five-week professional experience, gathering multiple sources of data as evidence of practice: • four artefacts per principle (5 principles) • 20 artefacts in total. A transformative moment was identified then explained with a narrative to capture the intent of each principle in practice. The final artefact was a report on the analysis of an explicit literacy lesson, identifying effective practices and/or ineffective practices. This self-study inquiry provided a space to deepen their understanding of themselves as learners and enabled the development of teacher capacity to determine what is effective or not effective in their practice to improve the quality of their teaching.	Multiple sources of evidence of practice to stimulate critical reflection. Artefacts from multiple sources	Deepening critical reflection/ collection of evidence of their theory and practice	• Evidence of practice; • artefact; • annotation; • teacher capacity-building; • multiple sources of evidence; • transformation I've moment; • dialogic pedagogy; • critical reflection; • authentic assessment; • data; • professional experience; • pedagogical conversation n; • explicit teaching	A holistic approach to critical reflection facilitated by using evidence of practice to inform as well as build teacher capacity.

Inquiry Model	Pedagogical Processes	Artefacts of Pedagogy Practices	Metacognitive Processes	Metalanguage	Impacts
Iterate	Reflecting back over the self-study process to consider new knowledge gained that would contribute to professional growth. The process enabled the development of their capacity to successfully determine what is effective or not effective in their practice thus improving the quality of their teaching thus build teacher capacity and identity. A short narrative was written by preservice teachers to describe the impact of the self-study inquiry on their knowledge construction and learning. Also, the impact of an explicit understanding of their philosophy of teaching on the ability to reflect critically on their professional experience.	Narrative data which reveals preservice teachers' voice about the value of the self-study process through the lens of metaphor.	Evaluate inquiry process to enable beliefs in practice. The gap between perception of practice and actual practice.	• Inquiry process; • self-study; • Capacity-building pedagogy; • Impact of professional growth; • Teacher professional identity.	Evaluate the self-study inquiry to illuminate professional growth gained through the capacity-building pedagogy adopted in the self-study to develop their teacher professional identity.

As illustrated in Table 6.2, preservice teachers acquired a new and extended metalanguage. As this developed, this metalanguage facilitated their professional conversations with each other and with their mentor teachers during their professional experience. It became clear that the knowledge needed to analyse and improve practice cannot be generated outside of educational contexts.

The self-study inquiry also provided the space for the development of metacognition. This is a complex construct; essentially, it refers to consciously thinking about one's thinking processes. It involves recognising what one knows and does not know and utilising appropriate strategies to promote learning or accomplish a task (Blakey & Spence, 1990). Metacognition is viewed by many (Bransford, Brown & Cocking, 2000) as critical for higher-order thinking and 'deep' learning.

Knowledge of self must be precise, of course, to be useful, and is now closely linked in the literature with self-regulation and self-regulated learning (Keller-Schneider, 2014). Metacognition develops teacher agency as a contributor to the development of an effective teacher identity. Thus, self-study inquiry aims to move beyond reflection by generating questions about the very nature of teaching and learning to contribute to the ongoing process of 'becoming.' A self-study inquiry allows preservice teachers to reflect systematically upon their practice to identify tensions or challenges (Loughran, 2002). Being an inquiring professional is not only learning about research methods and techniques but rather developing dispositions, knowledge, and understanding to become a professional who asks questions and is challenged to learn more deeply about their practice and its impact on student learning.

Figure 6.3 presents the overview of the self-study inquiry and its impact. It illustrates the tensions and challenges experienced by preservice teachers as they move through the inquiry process designed to investigate the shaping and reshaping of their teacher identity. The enactment of beliefs in practice provides a valuable opportunity for preservice teachers to explore and deepen their understanding of themselves as practitioners and professionals. Tobin & LaMaster (1990) suggest that a practice gap exists between the preservice teacher's metaphorical description of their understanding of teaching and learning and the enactment of their beliefs in practice and the quality of their practice. The process of developing critically reflective dispositions requires a deep inquiry situated in a professional context to create a dissonance, conflict and challenge that moves

preservice teachers beyond latching onto techniques without investigating what kinds of teaching practices are congruent with their beliefs about teaching and learning, thus providing insight into whom they are becoming as teacher. Using robust evidence of practice is key to the investigative step of the self-study inquiry process which makes preservice teacher learning and professional development visible to them.
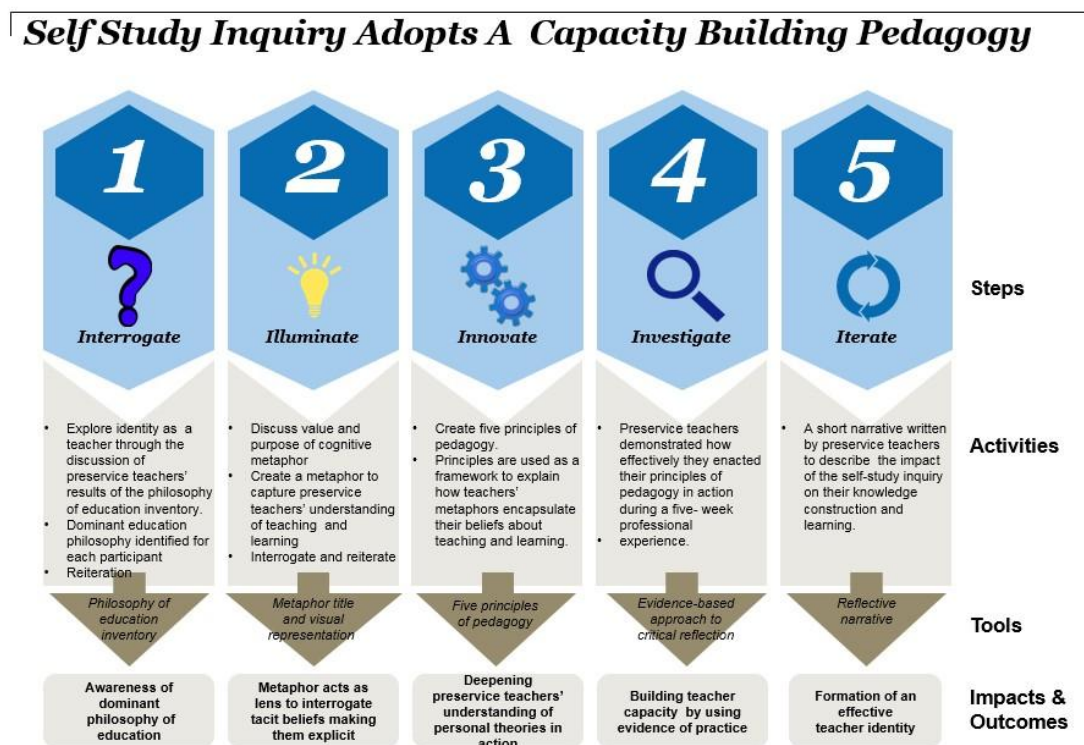
Figure 6-3   Overview to illustrate the self-study inquiry and its impact

Figure 6.3 illustrates how the 5Is model is enacted through the activities and tools for the preservice teachers to enable them to achieve desired outcomes. It provides an overview of the self-study inquiry processes and sequence designed to build teacher capacity to improve the quality of their teaching and raise awareness and understanding of their teacher professional identity.

Figure 6.4 provides another view of the self-study process to illustrate the iterative process of critical reflection as a preservice teacher learns to build their capacity as a means to impact on the quality of their practice.
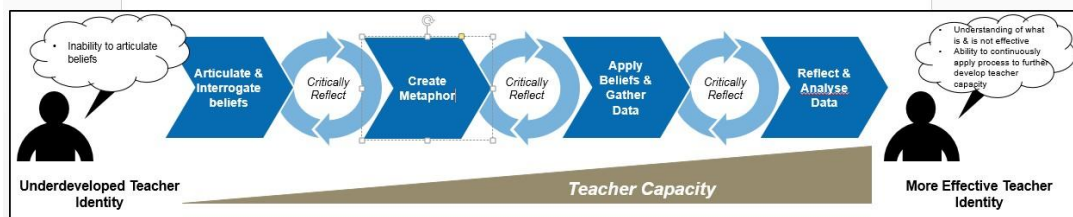
Figure 6-4   How the self-study inquiry builds preservice teacher capacity

Such building of capacity is largely achieved by the preservice teachers themselves; the educator has supplied the facilitating scaffold to encourage the process to occur. Such a scaffold allows self-generative learning to occur as explored in the next section.

6.9 Self-generative learning

Creating a context for deep learning through an evidence-based data-driven inquiry as illustrated in this investigation creates a space for the intersection of knowledge, theory and practice contributing to the formation of an effective teacher professional identity. This inquiry process develops preservice teachers who become self-generative learners capable of building their capacity as teachers, which is described by Keyes (1999) as a data-driven learning process. The principles that frame self-generative learning to build preservice teacher capacity include:

- Adopting a holistic approach to critical reflection using evidence of practice situated in meaningful professional contexts to provide a deep space for preservice teachers to learn about their professional teacher identity.

- Interrogation of preservice teacher beliefs plays a significant role in initial teacher education course design due to the impact of beliefs on practice.

- Authentic assessment as tertiary pedagogy for assignment design promotes a link between theory, knowledge and practice as illustrated in the self-study inquiry.

- Preservice teachers become agents in the development of their teacher professional identity by using evidence of practice approaches as *inquirers* into their professional practices.

The self-study inquiry adopts pedagogy that promotes self-generative learning to build capacity through the analysis and interpretation of data to determine the quality of preservice teachers' practice. Envisioning self as a teacher through the lens of metaphor activated a deeper understanding of their teacher identity.

A conceptual model was developed to guide pedagogy that promotes self-generative learning adopted in initial teacher education to effectively build preservice teachers' agency as well as contributing to the development of their teacher professional identity. "Good teaching cannot be reduced to technique; good teaching comes from the identity and integrity of the teacher" (Palmer, 2007, p. 57). This model is presented in Figure 6.5 below. This building of teacher capacity for self-generative learning is what is required if preservice teachers are to become more classroom ready when they graduate, as was the focus of the issues introduced in Chapter 1 which drove this research. Those issues included declining Australian performance on international tests (such as OEDC, 2013) for which the 'blame' is placed on poor quality teachers. In particular, graduate teachers are not seen as classroom ready (TEMAG, 2015. The responsibility for this then devolves to the Universities who offer initial teacher education programs (TEMAG, 2015).
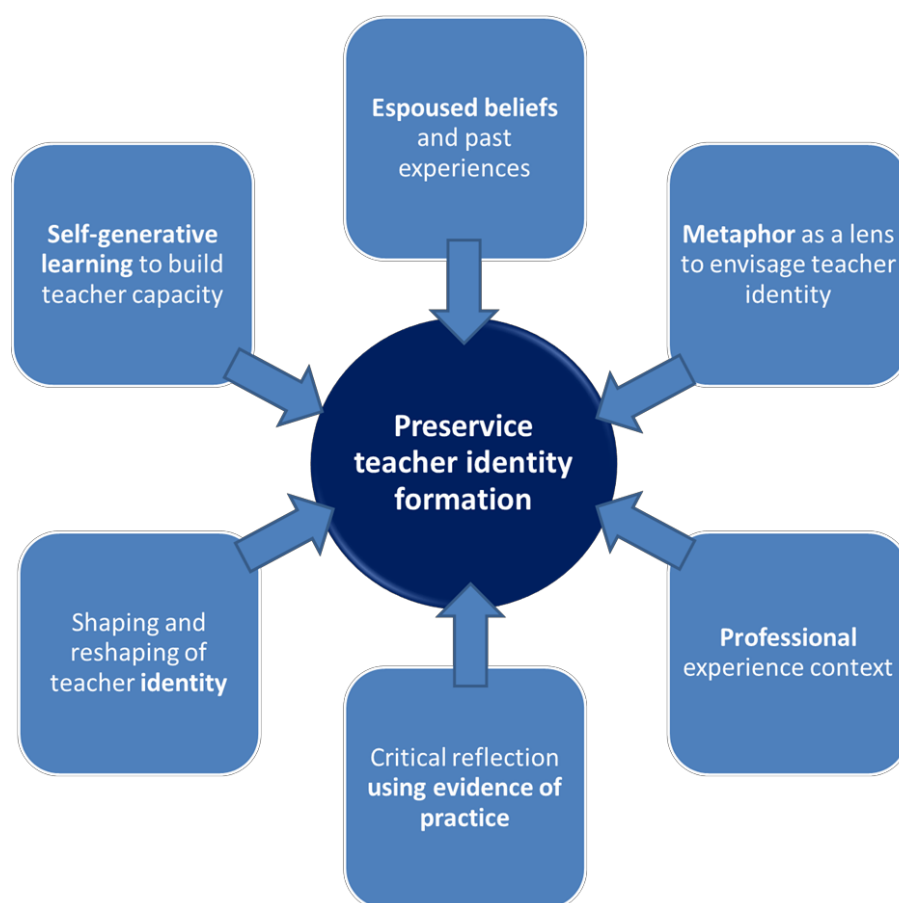

Figure 6-5   A model for teacher professional identity formation in initial teacher education incorporating pedagogy that facilitates self-generative learning.

Note: Adapted from "Contexts which shape and reshape new teachers' identities: A multi-perspective study," by M. A. Flores and C. Day, 2006, *Teaching and Teacher Education, 22,* p. 230. Copyright (2006) by Elsevier.

The literature review indicated that barriers to quality teaching involved clashes between beliefs (Brookfield, 1995; Segall, 2002), teacher identity (Beauchamp & Thomas, 2009; Feiman-Nemser, 2001; Olsen, 2008) and teacher practices (Hammerness, 2006), including the propensity of new teachers to 'teach as they had been taught in the past' rather than to 'teach as they had been taught to do at University' (Britzman, 2003; Lortie, 1975; Tigchelaar & Korthagen, 2004). Current initial teacher education programs have been found to have a relatively little transformative effect on teachers (Borg, 2004; Leavy et al., 2007). However, programs where theory and practice, particularly professional experience, are closely linked have been found to be more effective (Darling-Hammond, 2006; QCT, 2012; TEMAG, 2015). The response of this researcher to these issues was to use design- based research and a conceptual framework that incorporates beliefs, identity and practices to design and evaluate a new course. This course aimed to assist fourth year early childhood preservice teachers to be better informed about their beliefs, identity and practices, and to build their capacity to examine these constructs using multiple sources of self-collected evidence. The adapted model presented in Figure 6.5 shows how all the influences on preservice teachers may be brought together to assist them to understand their beliefs, identities and practices. The evidence presented in the findings of this research demonstrate that the novel course design, instructional tasks that comprise the self-study and the participants' responses indicate that this design-based research has made considerable progress in terms of building teacher capacity and in addressing the issues raised.

6.10 Answering the overarching research question

Can metaphor and critical reflection be used in a self-study inquiry as tools for preservice teachers to examine their beliefs, professional identity and practices?

The literature review presented considerable evidence of metaphor's potential as a tool in this study. Metaphor has been seen as being grounded in teachers' personal histories (Mahlios, Massengill, & Barry, 2010), as a tool for investigating teachers' thinking and professional knowledge (Wan & Low, 2015) and as a bridge (Shiff, 1979). In particular, images and metaphors of teaching are seen to be able to provide a common language of practice for preservice teachers and teacher educators (Thomas & Beauchamp, 2011). For all these reasons, metaphor was selected for investigation in this study as a tool for the preservice teacher participants to examine their beliefs, identity and practices.

In this research, participants were carefully prepared for the elicitation of their

metaphor, and this process alone generated several contributions to knowledge as this has been an under-researched area in the literature. Both written and visual metaphors were elicited in line with the research by Thomas and Beauchamp (2011). The findings as presented in Chapter 5 and interpreted in this chapter indicate that metaphors worked well in terms of being a bridge from the preservice teachers' inner beliefs about teaching and learning to their identity in terms of expressing *Who I am as teacher?* Metaphors were then linked outwards to their practices by creating five principles of pedagogy to explain their metaphors. Preservice teachers took the task seriously and all, except one who wrote a non-metaphor (Education is a lens for learning), were able to write a metaphor, provide an appropriate image, and link their metaphors to five principles of pedagogy. Metaphors were able to be analysed and using a novel taxonomy, triangulated with their beliefs extracted by another mechanism, the *Philosophy of Education Inventory*. The congruence between these two methods of probing beliefs confirms the validity of both measures in that they appear to have measured what they set out to measure.

Furthermore, the participants in the research study reported positively on the value of their metaphors in terms of helping them examine their practices. They particularly appreciated the capacity of metaphor to assist them to deepen their understanding of teaching and learning, to reflect on their own beliefs and values in a creative way, and to reflect against their principles of pedagogy. Other positive words included empower, rewarding to reflect, allowed me to dream, vision, and develop confidence as a teacher. Some acknowledged that the metaphors were challenging but this was not necessarily seen as a negative aspect. The overwhelming response to the task was affirming of the use of metaphor in this way.

In the literature review there was more evidence for critical reflection (Cooper & Olson, 1996; Kerby, 1991) than against it (Akbari, 2007; Atkinson, 2012). However, the literature on critical reflection is peppered with different models (for example Kolb, 1984; Schön, 1983; Zeichner & Liston, 1996), creating contention about levels and hierarchies. Loughran (2002) contends that reflection is only effective if the person doing the reflecting has come to their own recognition of a problem they need to reflect upon and offered some practical strategies such as writing anecdotes about their own teaching experiences. After weighing all the evidence for and against the use of critical reflection, the researcher decided to include it in the designed course, but carefully incorporated all the available advice regarding strategies available in the literature, seeking to maximise its value.

The findings from the study indicate these strategies have been successful. Although some of the participants did find the analysis of some of the evidence of practice tasks difficult, they were able to write reflections about the tasks and the self-study process. Ten themes arising from their perceptions of critical reflection were all positively oriented, using words such as a vital tool, building confidence, helped to develop my teacher identity. At least in this study, levels of critical reflection have been achieved and valued, and are not a case of faking or reflective fiction as claimed by Atkinson (2012).

The conceptual framework about beliefs, identity and practice and the proposed roles for metaphor and critical reflection proved robust. However, the findings from this research have yielded a small modification to the framework as depicted in Figure 6.6 below.
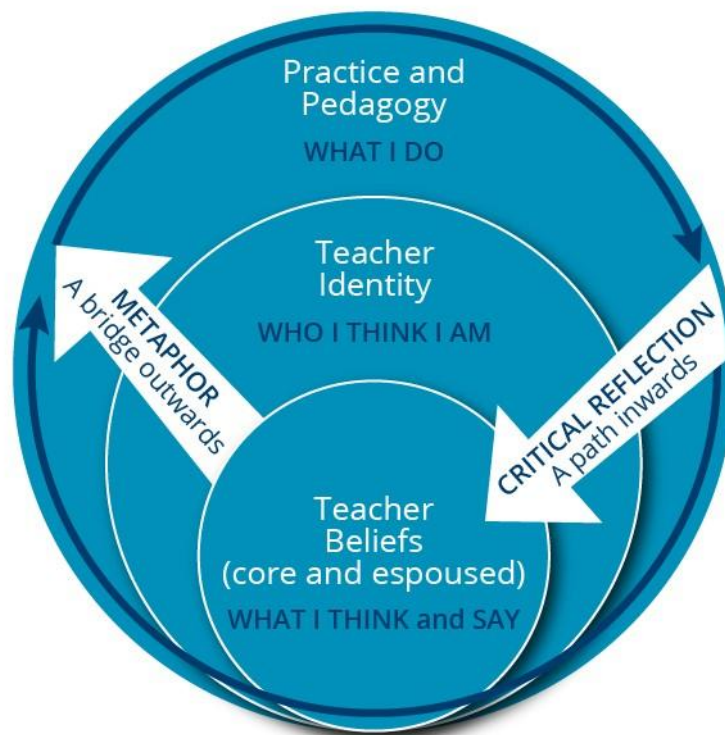
Figure 6-6   Modification of the conceptual framework arising from the findings

The modification seen in Figure 6.6 compared to the framework first presented in Chapter 1 and woven throughout this thesis, is the addition of two new arrows, running near the outer edges of the model and connecting metaphor and critical reflection in both directions. This arose as participants clearly identified that the use of one assisted the use of the other. Themes such as *Metaphor assists in focusing critical reflection*, and *visual metaphor is a reflective tool*, and individual statements such as "The visual representation

of my metaphor allowed me to critically reflect on my values and beliefs as a teacher", and "The images I selected to represent my metaphor were pictured in my head so vividly that when I reflected they helped me to draw on my principles of teaching to articulate my thoughts" clearly indicate that participants appreciated the interweaving of these processes. Therefore, it seems appropriate to represent that interweaving on the conceptual framework.

The conceptual framework proved an excellent organiser of all aspects of this research – the literature review, the design of the course, the design of the research study, and the presentation and discussion of the findings. This framework is one of the outcomes of this research that is recommended to other initial teacher educators as a functional and effective guide to working with preservice teachers' beliefs, identity and practices.

Phase four (Reflection) of the DBR study generates outcomes focused on enhancements of the proposed solution and planned iteration of the intervention. The research study has lead to a review and revision of the self-study inquiry for a second iteration of the course. First, a mindmap was introduced in the first phase of the self-study inquiry as an additional scaffold for the elicitation of a metaphor. The mindmap acted as a graphic organiser to synthesise key elements valued by the preservice teacher and deemed relevant to their image of self as a teacher. Each branch of the mindmap should represent key contributions: theories of learning that inform preservice teacher practice; principles of pedagogy, beliefs about teaching and learning; their image of the child and other significant elements individuals deem important to their teacher identity e.g. partnerships and prior experiences. The final overview of the mindmap provides a comprehensive view of the scope and complexity of their understanding of their teacher professional identity, or their image as teacher. The mindmap was integrated into the interrogate phase of the self-study inquiry.

The investigate phase of the self-study inquiry was also enhanced in the second iteration of the course by improving the depth and quality of the analysis of the artefacts selected by preservice teachers to demonstrate their practice and its impact on their students' learning. This enhancement was achieved by considering each artefact as not as a single source of evidence but rather a collection of evidence to demonstrate their practice aligned to the Australian professional standards for teachers. Specific focus was given to the descriptors such as 5.4, *demonstrate the capacity to interpret student assessment data to evaluate student learning and modify teaching practices* (AITSL, 2011). Rather than

presenting a lesson plan as an artefact, a collection can be developed to include a lesson reflection, mentor feedback as well as students' work samples to accompany the lesson plan. The collection creates an in-depth view of the preservice teacher's teaching and ensures that the preservice teacher's effectiveness is made visible and evident. Coupled with the rigorous nature of the data analysis, an explicit annotation would strengthen their evidence of practice. Annotations to accompany the artefact should now include a rationale for selection of the artefact as evidence of the standard, context of the artefact collection and description of the artefact.

Further enhancements of the self-study inquiry will include the introduction of an additional lens, Myhill's (2006) categories of questions. This analysis tool enables preservice teachers to view the amount and quality of talk enabled in their lesson. Artefacts developed as a result of the intervention will be discussed in the contribution to knowledge section.

6.11 Contributions to knowledge

This research has made several contributions to knowledge, many in the form of models. Although they have been alluded to throughout the thesis and earlier in this chapter, this section will bring these together for consideration. The sequence of their appearance here does not necessarily reflect their relative importance.

Firstly, *a model for envisioning self as teacher*, is a five-step plan designed to scaffold a process for preservice teachers to explore and interrogate deeply their image of themselves as a teacher (*Who Am I?*). Each step has a clear focus which also builds on the previous step shifting their perception of self, moving from an implicit to an explicit understanding of their visions of self as the teacher they hope to be in practice. The process also makes clear to preservice teachers that being aware of their teacher identity and its shaping and reshaping as they progress through their initial teacher education program is essential for the formation of an effective teacher identity. This model was presented in Figure 6.1.

A significant issue raised in the literature identified that methodologies used to analyse metaphor data and to subsequently categorise these metaphors, are not often addressed in research studies. The new taxonomy entitled *The North Philosophy of Education Taxonomy for Metaphors* (Table 6.3 below) contributes to the literature on methodologies by providing a means of obtaining trustworthy data to inform our understanding of preservice teachers' professional teacher identity as it relates to their

beliefs. This taxonomy, an extension of the *Oxford Taxonomy,* now enables the triangulation of quantitative data from the *Philosophy of Education Inventory* with the qualitative metaphor to confirm and justify the results of metaphor analysis and categorisation.

Table 6-3   *The North Philosophy of Education Taxonomy for Metaphors*

PEI (Katzenmeyer & Moller, 2009)	Definition of terms	Oxford Taxonomy (Oxford et al., 1998)	Definition of terms	Representative Metaphors
Behavioural	To promote skill development and behavioural change.	Social Order	Schooling is a production line Teacher control	Teacher as manufacturer, mechanic of the mind, sculptor
Comprehensive	To emphasise the transmission of knowledge	Cultural Transmission	Transmission model of instruction Teacher control	Teacher as conduit, shopkeeper
Progressive	Develop practical knowledge and problem-solving skills	Learner – Centred Growth	Facilitating development of innate potential Shared interaction and control	Teacher as nurturer, scaffolder, counselor
Humanistic	To enhance personal growth and development			
Social Change	To bring about through education: social, political and economic change	Social Reform	Encouraging multiple viewpoints in a democratic community Shared control	Teacher as learning partner, cooperativ e leader, coach

The third contribution to knowledge from the findings also arose in response to the literature which suggested an absence of *training tasks* designed to scaffold the elicitation of preservice teachers' metaphors in research studies using metaphors as a research tool. The literature suggests that there is limited research that reports on the effectiveness of these elicitation tasks. The revised eight step plan for elicitation of metaphor presented in Table 6.1 addresses this gap by providing a clear and transparent description of the training tasks used to prepare preservice teachers for the elicitation of their metaphors including the addition of a mind-mapping step added as a result of the first iteration of the course design. The plan also includes details of how the metaphors were analysed so that readers can judge for themselves regarding the trustworthiness of the data presented in this research.

The fourth contribution to knowledge from the findings of this study was the development of a five-step model, called the 5Is model, used to guide the self- study inquiry. Preservice teachers reported that this model of inquiry employed in the self-study was effective in stimulating their inquiries into self as teacher. Few metaphor studies extend the research to track whether elicited metaphors are in fact enacted in practice to determine the practice gap between espoused beliefs and classroom practice. This research study has achieved this. The 5Is inquiry process made visible to preservice teachers their theories in action to raise their awareness through evidence of strengths and limitations in practice. The process leads preservice teachers to build capacity in their endeavours to raise the overall quality of their teaching in a bid to improve student outcomes. The 5Is model is reprised in Figure 6.7 below.

	INTERROGATE	Completion of the *Philosophy of Education* Inventory allowed preservice teachers to **interrogate** their beliefs.
	ILLUMINATE	Mind map *(Who am I as teacher?).* Elicitation of their metaphor for teaching and learning allowed preservice teachers to further **illuminate** their beliefs and begin to see how these related to their current perceived teacher identity.
	INNOVATE	Preservice teachers were asked to **innovate** and frame their own principles of pedagogy in the light of their beliefs (dominant philosophy of education) and their metaphors about teaching and learning.
	INVESTIGATE	Preservice teachers **investigated** their practice by the collection and analysis of three groups of artefacts during their professional experience.
	ITERATE	Preservice teachers' reflection on their professional growth and reshaping of their teacher identity throughout this course, the tools they have learned to use and the skills they have developed will allow them to **iterate** this cycle of inquiry in future.

Figure 6-7   North's 5Is model of self-study inquiry

The fifth contribution to knowledge is the conceptual framework that has underpinned this thesis. This was developed to capture the relationships between beliefs, identity, practice, and the tools of metaphor and critical reflection that sought to elucidate these relationships. It is the foundation of the self-study inquiry process, activities, analytical tools adopted and developed as well as interpreting the impacts of this model of

authentic tertiary pedagogy. This framework was first presented in Chapter 1, but a revised version, adapted due to the findings of this study, was presented in Figure 6.6.

The sixth contribution to knowledge from the findings of the study is a *Holistic Model of Critical Reflection* presented in Figure 6.2. The literature suggests that positioning reflection critically is an essential disposition for preservice teachers, as illustrated in the evidence of practice approach in the self-study. In addition, the findings indicated that this authentic approach to critical reflection on their practice was valued by preservice teachers as a scaffold to professional growth and reinforced the view by preservice teachers of themselves as inquirers and researchers of their practice.

The seventh contribution to knowledge from the findings of this study was the *model for teacher professional identity formation in initial teacher education* presented in Figure 6.5. This was adapted from the Flores and Day (2006) model of factors influencing teacher identity in novice teachers, presented in the review of literature in chapter 2. However, the model that appears here has undergone considerable modification from the Flores and Day (2006) version.

This model is designed to build preservice teacher capacity as well as raise their consciousness by challenging preservice teachers to investigate the link between their practice (beliefs in action) and their conceptualisation of teaching and learning expressed as their espoused beliefs. Similarly, teacher identity is shaped and reshaped by experiences. Therefore, the quality of the experiences in their initial teacher education program has a profound impact on the effective formation of their teacher identity.

Finally, the eighth contribution to knowledge is the design of the course itself and the specific findings. This is an example of a tested authentic tertiary pedagogy that addresses many identified educational issues.

6.12 Limitations of this research

The conclusions from this research are strengthened by the use of multiple sources of data and the design-based research approach adopted in this study. The scope of the multiple forms of data, including surveys, written metaphors and principles of pedagogy and artefacts of authentic practice, coding and other documentation increased the trustworthiness of the data and the findings.

However, there were some limitations of the study. It is reported in the literature about initial teacher education that there are limitations in the research due to mainly small

qualitative studies of single programs and too few large-scale quantitative longitudinal studies of program effects (Louden, 2008; TEMAG, 2015). However, robust research has established content and process rather than program structures determine effectiveness (Darling-Hammond, 2006). Attempting a large- scale quantitative longitudinal study for a doctorate was not feasible. This study used the maximum volunteer participants available (*N*=50), sourced from a one- semester course situated in the final year of an initial education program at one Australian University. It is acknowledged that this limits generalisability of the findings of the research. This approach was taken due to accessibility of the sample and their involvement in this newly-developed course. To mitigate this, care was taken with content and process following the advice of Darling-Hammond (2006).

Great care has also been taken to be as transparent as possible with details of the course design and the research process, such that a reader can judge for themselves how transferable the findings of this research are to their own situation and context. Furthermore, the design-based research approach means that future iterations of this course will undergo regular modification, and these iterations may be reported in subsequent papers, thus building to a larger-scale, longitudinal body of research.

Second, there was a potential conflict of interest in that the course examiner was also the researcher in this study, with the data gathered from participants being part of their course assessment. This risk was overcome by waiting until course results were released to all students before emailing an offer to preservice teachers to participate in the research study. Also, the course examiner did not act as a marker in the course but rather took on the role of course moderator. Course assessments were marked by other markers for the purposes of the University results. The data was therefore mostly unseen and was viewed with fresh eyes by the researcher during the analysis and interpretation phase of the research.

Thirdly, the researcher was the only person involved in coding and analysis of the data. This is both an advantage and a disadvantage in terms of reliability of the coding. One person could be expected to have a clear understanding of the coding scheme and apply it consistently, which may not be the case with multiple coders. However, to establish the clarity of the coding scheme for other users, multiple raters are deemed desirable and inter-rater reliability reported. It is also possible for a single coder to 'drift' over time, with later codes being applied differently from earlier codes. To ameliorate this

risk, check-coding (Miles & Huberman, 1994) was adopted to strengthen the accuracy of the results; the researcher check-coded the initial thematic coding of the principles, metaphors, artefacts, transformative moments, and lesson reports six months after the original coding was completed and recorded in the database to reduce the potential limitations to this collection of data. Any discrepancies were examined to reach a resolution of the coding decisions and also their potential impact on the rest of the coding considered and addressed. In addition, interpretation of analysed data was discussed with supervisors to mitigate any potential bias in findings arising from the study.

6.13 Conclusions and recommendations

The predominant aim of this research was to explore a key issue in initial teacher education in Australia, that is, preservice teachers are not achieving the desired classroom readiness by graduation. The TEMAG (2015) report highlighted several issues for initial teacher education, including providing opportunities for the integration of theory and practice, a stronger focus on data collection as evidence of practice; more efficient partnerships between the University and school contexts to ensure a space for deep learning about themselves as professionals and the complexities of effective teaching and learning practices. Hence there was a need for a course design that took account of those issues. The course described and evaluated in this research was designed to integrate theory and practice in the context of a five-week professional experience. The course had a strong focus on data collection as preservice teachers were asked to collect 20 artefacts as well as a recording of an explicit literacy lesson. Partnerships between schools and University were fostered in part by ensuring that the preservice teachers became familiar with appropriate metalanguage to facilitate professional conversations with their school mentors. Preservice teachers became enlightened about their beliefs, and how these impact their identities and the complexities of enacting their beliefs in everyday practice.

The conceptual framework that underpinned this study highlighted the key issues and related theoretical concepts relevant to the investigation presented in this thesis. The robustness of the conceptual framework captured the relationships between beliefs, identity and practice, and the significant use of two tools, metaphor and critical reflection. These tools assisted in exploring and examining the relationships and their impact on building preservice teacher capacity to determine effectiveness or ineffectiveness of their practice as a contribution towards the formation of preservice teachers' professional identity.

This study has illuminated the importance of preservice teachers becoming aware

of their beliefs and the subsequent impact of these beliefs on the conceptualisation of their understanding of teaching and capacity to learn in their practice. Due to the impact of beliefs on practice (Lortie, 1975), the first recommendation is that it is essential that initial teacher education program design includes the intentional, systematic and focused interrogation of preservice teacher beliefs. This inquiry assisted preservice teachers to construct meaningful knowledge and understanding of themselves as professionals by identifying these preconceptions and beliefs and their subsequent impact on their practice as illustrated in the first step in the self-study inquiry. This inquiry commenced with an interrogation of preservice teacher beliefs about their perceptions of *Who they are as teacher* and was successful in making tacit beliefs explicit which also contributed to the development of an effective preservice teacher identity.

Over the last few decades, there have been relatively few studies focused on the development of teacher identity in initial teacher education. There have been even fewer studies that focused on the explicit processes that facilitate the development and recognition of teacher identity in a bid to ensure better prepared preservice teachers for the profession. Therefore, the second recommendation is that teacher identity development should be afforded a central role in the design of teacher education programs. Specifically, it is recommended that initial education programs focus on the following two aspects of preservice teacher identity formation:

- Understanding how and why preservice teachers' identity shifts and reshapes during their initial teacher education program.

- Understanding teacher identity formation could contribute to more effective tertiary pedagogy.

The third recommendation is for initial teacher education programs to include authentic pedagogy that engages preservice teachers in self-study in situations where theory and practice can be authentically connected. Self-study inquiry, particularly involving the collection and analysis of evidence of practice, affords preservice teachers the opportunity to come to know themselves and their practices better. It builds confidence and is empowering, for once preservice teachers develop the capacity to analyse their own practice, so they have a greater sense of control over their careers. Preservice teacher development is not an automatic process; it does not necessarily develop with experience, there needs to be a deliberate action to ensure that preservice teachers develop the appropriate competencies to negotiate the challenges of the first few years of their career.

Developing a strong sense of identity, well-being and control over one's practices may be fundamental to the well-being of early career teachers.

A paucity of research into evidence-based strategies that encourage preservice teachers to engage in a wide variety of approaches to inquire thoughtfully into their practice and resultant student achievements has been identified as a gap in the literature. Using critical reflection as a lens to enable a deep analysis of their practice to (or "intending to") developing preservice teachers' dispositions of an inquirer into their practice makes an ongoing commitment to self-generative learning and capacity building. The fourth recommendation is that initial teacher education programs give serious consideration to teaching and fostering critical reflection in an authentic way. That is, the preservice teachers need to identify for themselves the problem on which they are to reflect, and for many, that problem is the dissonance between what they believe and whom they think they are compared to what they do in practice.

The self-study inquiry is a formidable scaffold for using a research methodology or a practitioner inquiry to extend the depth and quality of the research in subsequent courses in the initial teacher education program. Engaging in a self-study would extend the scope of the preservice teachers' identity of an inquirer into that of a researcher. It is critically important that preservice teachers begin to encompass their dual role, that is, of teacher and researcher.

The analysis of lesson transcripts as evidence of practice contributes to building preservice teacher capacity to determine effectiveness and quality of their teaching. The *Graduate Teacher Performance Assessment Task* due for introduction into the fourth year of all Australian initial teacher education programs in 2018 is "designed to reflect the integrated planning, teaching and assessing cycle of practice" (Learning Sciences Institute Australia and Queensland College of Teachers (2017, p. 6). Moderation of this task will determine the classroom readiness of Australian fourth-year preservice teachers.

The fifth recommendation is the inclusion of the analysis of teacher talk and interactions using transcripts of preservice teacher lessons as a component of the *Graduate Teacher Performance Assessment Task.* This detailed analysis of classroom talk using transcripts as evidence of preservice teacher practice makes visible the effectiveness and quality of the classroom talk as well as identifying limitations in their practice. This inquiry process is a powerful tool in developing preservice teacher capabilities to determine the effectiveness of their teaching and in turn to build their capacity to improve

student outcomes.

Preservice teacher professional identity development cannot be left to chance. It does not happen automatically; it must be actively built by raising awareness of preservice teachers' beliefs that drive their practice. Metaphor is a powerful tool by which preservice teachers may illuminate their beliefs. Critical reflection is a key process in determining ways to improve their practice in the future. An explicit focus on the formation of an effective teacher identity and understanding of relationships between beliefs, identity and practice should be a crucial part of every initial teacher education program design.

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