

The Connection between Metacognition and Academic Writing in a Praxis Inquiry Model of Teacher Education

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Abstract

This study aimed to identify a pedagogy of writing that embodies high standards of writing and discerning educators in preservice teacher education. Using Flavell's definition of metacognition, preservice teachers' learning and writing, were explored in two first-year compulsory units of study in the Bachelor of Education course in one Australian university. Metacognition was studied to investigate how thinking skills could provide epistemological and pedagogical knowledge to fulfil the study aims.

A qualitative methodology was employed, with semi-structured one-on-one interviews used to capture the lived experience of fifteen preservice teachers and nine lecturers/tutors in a praxis inquiry model of teaching and learning. Document study and thematic analysis of interview data were undertaken to ascertain how metacognition might impact on writing skills.

The results highlight complexities surrounding an understanding of metacognition. First, 'thinking about thinking' was used to describe metacognition, without a conscious understanding of its cognitive complexity as a concept and skill. Second, in praxis inquiry learning metacognition and high standards of writing relate to the capacity to cognitively analyse theory and practice within reflection for writing in the genre referred to as 'theorising'. Third, as learning constructs both metacognition and praxis inquiry lie within constructivism. However, the ability to reflect at a dialogic level to analyse theory and practice for writing in the theorising genre in praxis requires linguistic discourse knowledge with guided instruction. Vygotsky's concept of scaffolded learning—including explicit teaching in the form of, demonstration, questioning and discussion—was required to reach cognitive transformations for the theorising genre.

This thesis has identified that (a) a heightened consciousness of metacognition within praxis inquiry, and (b) visible pedagogy to develop analytical skills in the 'theorising' genre, have the potential to contribute to the development of discerning educators capable of high standards of writing. Insights gained from this study can inform pedagogy, course design and professional development.

Key Vocabulary

Metacognition, Praxis Inquiry, Academic Writing, Reflection, Writing Genres, Cognitive and Social Constructivism, Transformational learning, Academic Discourse, Information Communication Technologies, Assessment.

Statement of Authorship

Doctor of Philosophy: Student Declaration

I, Violetta Carter, declare that the PhD thesis entitled ‘The Connection between Metacognition and Academic Writing in a Praxis Inquiry Model of Teacher Education is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature



Date 18th March 2019.

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Chapter 1. Purpose and Significance of the Study

1.1. Introduction

This is a study of how metacognition can contribute to learning, teaching and writing in a praxis inquiry process of first-year preservice teacher education. Unlike earlier work in metacognition, this study exclusively explores and describes the direct experience of preservice teachers, and their teacher educators, in how metacognition might contribute towards high standards of writing in a praxis inquiry process of learning. Using a qualitative, interpretative methodology, the experience of participants is captured through interviews at the university where this study took place. Thematic analysis is used to describe generalisations from patterns and variations in the participant data.

This introductory chapter explains the relevance of the study and how the focus on metacognition, praxis inquiry and academic writing developed. It describes the institutional context of the study and gives a brief outline of the analytical framework which informs the study. A brief synopsis of the literature relevant to metacognition is provided. The intent here is to indicate gaps that need further investigation. The questions that guide the study are presented in this chapter and an outline of the thesis is provided to describe the focus of the research, the thesis aims, structure and chapter outlines.

1.2. The relevance and importance of this study

There is a current emphasis by the Australian government on the need for preservice teachers to have high standards of literacy when they enter higher education to meet the literacy demands of their course and their subsequent professional role. Woodward-Kron (2002) argues that one of the characteristics that defines a high standard of literacy in written assignments is critical analysis, as distinct from the mere ability to be descriptive. If we accept that analytical skills are considered important attributes of academic learning and writing, there needs to be an investigation of the role of thinking skills and how these are best developed in the context of preservice teacher education. Currently, there is limited research to be found in the field of metacognition and the academic writing process specifically in preservice teacher education. The literature identified is specific to several fields, including Psychology, Science, Earth Science, English and in the tertiary academic environment more generally. The literature analysed identifies studies into metacognition through reading comprehension (Wilson & Bai 2010; Moon 2008); science (Maggioni & Parkinson 2008); English curriculum (Allison & Mei 2001); Information Communication Technologies (Winters et al. 2008); and metacognition and affective dimensions (Efklides 2006; 2011). Studies focusing specifically on academic writing included Hammann (2005), Reiff and Bawashi (2011) and Negretti (2012). The scarcity of research addressing the relationship between metacognition and academic writing within preservice teacher education specifically indicates this area would benefit from further research. This study will help contribute to that field. `

Building academic literacy is fundamental to success in higher education and to the preparation of future teachers. The changing environment of tertiary education has led to a need to reconceptualise teaching and learning approaches that lead to successful learning outcomes. The question in building academic literacy in this changing environment in teacher education is how to develop high-quality teacher graduates equipped to meet the demands of 21st century learning. This study into metacognition aims to contribute to the preservice teacher education field by investigating, first, how metacognition may contribute towards preservice teachers' development of cognitive epistemological knowledge for 'deep learning' about teaching and learning issues in a praxis inquiry model; and, second, how this may contribute towards high standards of academic writing in praxis inquiry learning. A central focus is to draw attention to how preservice teachers effectively express their learning in standards of written communication appropriate to their work as educators. Understanding the writing process, and how to become a better writer, is fundamental to preservice teachers in their preparation as future teachers and literacy educators (Hammann 2005).

An essential aspect of teacher education courses is that preservice teachers are required to experience school settings. Praxis inquiry at the university where this study took place aimed to develop reflective practitioners in the Bachelor of Education (P-12) program. The topic of metacognition and academic writing has been explored because of the notion that the development of abstract ideas and concepts about teaching and learning may contribute towards developing high standards of written communication (albeit acknowledging this is only part of what is a complex area). An examination of the role of metacognition as a part of this praxis inquiry model has the potential to advance new knowledge to inform preservice teacher educators on how metacognition may contribute towards developing skills associated with high standards of academic writing. In addition, this research provides insight into how metacognition might contribute to preservice teachers become discerning educators in this process.

1.3. Background and context to the study

Metacognition is the focus of this research due to the researcher's longstanding belief as a literacy educator, that cognition and language are integrally bound and that high standards of academic writing are not simply the result of having a sound knowledge of the technical aspects of writing. An exploration of metacognition and academic writing has been undertaken on the basis that it may provide information on how the writing process might be enhanced through a focus on thinking skills.

At the university where this study took place, a praxis inquiry approach to learning was implemented in compulsory first-year education units of the Bachelor of Education course. These units were linked to preservice teachers' practicum placements in primary schools. This was the context in which direct experience in the school classroom provided the platform for the formation of personal theories about teaching and learning. This experience was aimed at providing the opportunity for preservice teachers to

make connections between the theoretical aspects of their academic studies and think about how these related to the practice in which they were participants.

The overarching aim of praxis inquiry is to facilitate preservice teachers' capacity to become discerning, reflective educators who think and develop questions about the broad issues that impact on learners. As Cherednichenko and Kruger (2009) state: 'In Praxis Inquiry, it is the interaction of thinking and action, practice and theory which expands practical consciousness and works to activate a discursive environment for critical consciousness' (p. 23). This praxis inquiry learning environment provided fertile ground to explore how cognitive thinking skills could be developed through the development of metacognition, and how this might translate into high standards of academic written communication. The praxis inquiry nature of learning in this Bachelor of Education course, therefore, required students to exercise independence in the thinking and writing process in the first year of university.

One of the key aims of this research has been to explore strategies that enable preservice teachers to engage in academic discourse and develop intellectual autonomy to become discerning educators. Establishing tertiary teaching approaches that help preservice teachers move beyond a descriptive stage of reflection to a dialogical level for written communication is a central goal of this research

1.4. Theoretical background and previous studies

Metacognition has received considerable attention for its impact on learning across many disciplinary areas over the last four decades (Georghiades 2004). The concept of metacognition emerged as part of a shift in epistemological views about learning from behaviourism to constructivism during the 1950s. This was particularly due to the seminal work of Jean Piaget (1953) on cognitive development theory.

The term 'metacognition' emerged from research in the 1970s on the study of memory in young children by John Flavell (1976, 1979) and Ann Brown (1980). Flavell built on the work of Piaget, who proposed that the individual was not a passive recipient of knowledge from the outside world (a view inherent in behaviourist theories of learning) but actively selected and interpreted environmental information from concrete experience, constructing knowledge (Flavell 1985).

Flavell defined metacognition 'as any knowledge or cognitive activity that takes as its object, or regulates, any aspect of any cognitive enterprise... its core meaning is "cognition about cognition"' (1985, p. 104). This broad definition has gained popular acceptance and encompasses most uses of the term, leading to it commonly being referred to as 'thinking about thinking' (Khun and Dean 2004).

The literature identifies that metacognition fits within the constructivist paradigm of learning associated with experiential, cognitive and social constructivist learning theories. These theories are characterised by the importance of the individual's role in facilitating knowledge construction and generative learning through environmental influences such as language and social contextual factors. This thesis has found

metacognition to be associated with the theories of Dewey (1933), Piaget (1953), Bruner (1966), Freire (1970), Vygotsky (1978), Flavell (1976;1978;1979), Brown (1980), Schön (1983;1987). Kolb (1984), Bandura (1986), Mezirow (1997), Jonassen, Peck and Wilson (1999), Baylor (2002) and Schunk (2008).

Nevertheless, there is a dearth of research specifically addressing the relationship between metacognition and academic writing in preservice teacher education. This study aims to contribute to and extend this field.

1.5. Contribution to new knowledge

The intention at the outset of this research is, first, to identify how metacognition can contribute to successful learning and academic writing in the first year of preservice teacher education; secondly, to identify theoretical issues related to an epistemology of metacognition in learning and writing within praxis inquiry; and, third, to locate pedagogical strategies that can lead to successful metacognitive ability to enhance academic writing. The thesis aims to make recommendations based on findings that can raise awareness to inform course design and tertiary teaching practice in preservice teacher education.

Targeting the research to first-year education students is advantageous in that any resultant findings can be used to facilitate the transition to higher education studies at university. This information will assist tertiary educators develop pedagogical and curriculum approaches that support the academic literacy skills of preservice teachers.

1.6. Methodology

This study is based on a qualitative methodology. The theoretical underpinning for this is based on the interpretivist paradigm (Denzin & Lincoln 1994; Johnson & Onwuegbuzie 2004). Qualitative data will be used to investigate the academic writing experience of preservice teachers and academic staff in one first-year Bachelor of Education program. In this respect, the research will be interpretative/constructivist in nature. This approach is characterised by the following assumptions. First, a qualitative approach to data collection from this study will provide triangulation, authenticity and generative insights. The study is based on the interview method. One-on-one interviews were held with two cohorts of participant groups, comprising preservice teachers and their lecturer/tutors in two compulsory education units of study in a Bachelor of Education course. Additional data collection included document analysis of course guides, policy documents, the scholarly literature and data generated from an online platform called WebCT. Thematic analysis of the data facilitated the identification of key issues relating to metacognition and academic writing.

Metacognition has been identified as a complex psychological cognitive function that has been predominantly located in the domain of quantitative research by psychologists (Veenman et al. 2006). It is beyond the scope of this study to examine metacognition quantitatively. It is not the purpose of this

study to hypothesise and quantify data results but, rather, to explore the potential of metacognition as a thinking skill that may contribute to the development of preservice teacher academic writing skills.

This study captures the ‘lived experiences’ of two particular cohorts of participants in two first-year compulsory education units of study. The research is located in one Bachelor of Education course at a university in Australia where a praxis inquiry approach to preservice teacher education is implemented. There is no attempt to make comparisons with other studies. The intention is to explore participant voices to identify and describe key theoretical learning and teaching concepts that can be generalised from these voices. This research seeks to inform curriculum policy and pedagogy in the preservice teacher field.

This study uses and extends those concepts identified in the literature and is based on the notion of metacognition as it relates to Flavell’s (1976) description. On this basis, the following research questions were formulated.

1.7. Research questions

The primary research question is, ‘What is the connection between metacognition and academic writing in a praxis inquiry model of first-year preservice teacher education?’

Subsidiary questions are:

- What learning theories underpin the development of metacognitive abilities?
- What are the pedagogical issues relating to the development of metacognitive skills within two first-year preservice teacher education units in the Bachelor of Education course?
- What attitudes and assumptions do teacher educators hold about the task of academic writing in preservice teachers’ first year at university?
- What strategies can be adopted by both teacher educators and preservice teachers to promote metacognitive skills?
- What is the role of purposeful coaching in the facilitation of metacognitive abilities and the writing process?
- How do we assess metacognitive thinking in academic writing?
- What is the role of information communication technologies in thinking and writing?
- What specific challenges and issues can be identified for students from diverse backgrounds in relation to academic writing in preservice teacher education?

1.8. Thesis structure

This introductory chapter has outlined the purpose and significance of this study. It has provided contextual background information as to why this topic is relevant. In addition, the investigator’s interest

in the field of metacognition and academic writing is described. The theoretical framework on which the study is based and a synopsis of relevant literature to identify gaps have been presented. The context of the study has been summarised alongside background information relevant to the study. An overview detailing the methodology and the method adopted in this study has also been outlined.

The remaining chapters are organised as follows. Chapter 2 contextualises the study in the relevant literature. The literature review considers a range of definitions and viewpoints on the significance of metacognition in the development of academic writing. It explores where the concept of metacognition fits into a theory of learning and describes pedagogical issues related to this.

While Chapter 2 offers a general literature review, the literature is revisited in Chapter 4 under the heading, 'Defining metacognition. Extending the literature' (p. 65). This was considered necessary due to findings in the data surrounding complexities in the use of the term 'metacognition'. It was considered that an exploration of these complexities was warranted at this point of the thesis to support data analysis and a discussion of findings.

Chapter 3 provides an account of the research methodology and method implemented.

In Chapter 4, the data analysis is outlined as themes associated with regularities and variations in participants' experiences. There are seven major sub-chapters in this section. Each sub-chapter aims to explore these themes to answer the major question and sub-questions.

The first of these sub-chapters provides an introduction to the chapter.

The second sub-chapter provides the contextual background that underpins the praxis inquiry nature of learning in these two units of study. This is necessary because it is the basis upon which the data analysis is formed to draw conclusions.

The third sub-chapter details participant understanding of metacognition, while the fourth presents an extension of the literature here to investigate issues related to understanding and defining metacognition due to findings that emerged in the data.

The fifth sub-chapter explores participant experience of learning, teaching and writing in a praxis inquiry model to identify connections between metacognition and praxis inquiry and details pedagogical strategies that relate to metacognition and academic writing.

The sixth sub-chapter examines the relationship between assessment and metacognition in preservice teachers' written assessment tasks.

Sub-chapter 7 explores the role of Information Communication Technologies and metacognition on academic writing in praxis inquiry.

Given there are two cohorts of participant group, (preservice teachers and lecturer/tutors), a discussion of findings from the data analysis will be presented at the end of each of these sub-chapters. This provides a synthesis of relevant issues to the thesis following the analysis of both data sets.

Finally, Chapter 5 provides a detailed discussion of findings, the conclusion and implications for preservice teacher education in the context of a review of this study.

Chapter 2. Review of the Literature

2.1 Introduction

A search of the literature specifically on metacognition and academic writing in preservice teacher education, indicates this is limited. The literature discussed in this section explores how metacognition fits into a theory of learning and identifies a range of viewpoints on the significance of metacognition in the development of academic writing.

In Western tertiary institutions, one of the characteristics that often defines a high standard of literacy, particularly in written assignments is critical analysis. The terms ‘analysis’, ‘critical analysis’ and ‘critical thinking’ are often used interchangeably to describe higher levels of academic performance in written work. This is distinct from the ability to be merely descriptive with little analysis (Woodward-Kron 2002). If these skills are considered important attributes of academic learning and writing in the tertiary environment, there needs to be some discussion of the role of thinking skills in this process. An investigation into metacognition and how this may contribute towards the development of high standards of academic writing skills is central to this thesis.

An important aspect of teacher education courses in Australian universities is that learning occurs not only in the university environment but also through the school practicum, where preservice teachers are required to participate and be assessed to succeed in their studies. In this learning environment preservice teachers need to become reflective practitioners who can use the skill of reflection to improve their understandings about teaching and the nature of learning. These practicum insights also need to be connected to the theoretical learning that takes place at the university. This is associated with the concept of autonomous and transformative learning. Maclellan (2004, p.1) states that ‘contemporary cognitive psychology indicates that meaningful learning is reflective, constructive and self-regulated and that all learning requires learners to think and actively construct evolving mental models. Learning is understood to proceed in many directions and at an uneven pace’. The writing process in this environment becomes a vehicle for expressing transformations in learning. However, skilled writing requires distinct strategies that involve writers in specific kinds of thinking when they write (Bereiter & Scardamalia 2013). Bereiter and Scardamalia (2013) assert that this means writers need to be able to exercise control over their thinking through deliberate means to achieve the level of skill required in written communication.

The theoretical underpinning for this type of transformative learning has its basis in constructivism. Baylor (2002) describes constructivism as a process whereby knowledge is constructed by individuals and in which there is a strong focus on the facilitation of knowledge construction and generative learning. Constructivist approaches have also been considered beneficial for developing meaningful learning and for engaging students in higher-order thinking (Jonassen, Peck & Wilson 1999). Moon (2008) argues that

writing is a central part of developing critical thinking in higher education, which suggests that further examination of thinking skills through the study of metacognition has relevance.

2.1.1 Metacognition and learning theory

The literature indicates that metacognition fits with theories of learning aligned to the paradigm of constructivist learning principles that emerged during the 1960s and 70s. This paradigm has its origins in the development of cognitive learning theory by Piaget (1953), who argued that the individual was not a passive recipient of knowledge but was active in selecting and interpreting environmental information from concrete experience to construct knowledge (Flavell 1985).

Subsequent theories of learning took into account the importance of the experiential component of learning. This built on Dewey's early works on experience and pragmatic worldviews and Lewin's (1939) social psychology, as well as Piaget's cognitive developmental epistemology.

Vygotsky's (1978) work on the importance of culture as a mediated act of cognition through language expanded the definition of cognitive constructivism to social constructivism by recognising the importance of social interaction for individual cognition. The significant factor in both cognitive and social constructivism is the epistemological belief that the individual constructs knowledge from his or her experience to create and expand their learning. Socio-cultural learning occurs first through interpersonal (interaction with social environment) then intrapersonal (internalization) processes (Vygotsky 1978).

Other significant theorists emerged as part of the constructivist paradigm that contribute to the field of understanding learning. Of note is the work of Bruner (1966, 1991, 1996, 2004), whose emphasis on experiential learning is important. Bruner's (1966) work 'Toward a theory of instruction' had a major impact on pedagogical practices by highlighting not only the importance of the individual's experience for their learning, but also the role of strategies in the development of human cognition. Bruner's work was influential on curriculum reform during the following decades, with a change in emphasis from behaviourist notions of learning (typically based on rote and memorisation of information) to understanding how children themselves 'organize their own learning, remembering, guessing, and thinking' (Bruner 1996, p. 58).

Tatekaya (2013) describes this aptly stating that

[m]ore accurately, it is not a matter of 'presenting' a set of information, but of students' 'discovering' what's worth knowing; moreover, what they are supposed to discover are not just pieces of knowledge but, first, the connections that make the pieces of knowledge meaningful and generative (the "structures"), and second, the nature of knowing processes so that students will become more effective inquirers (what he [Bruner] calls 'metaskills' or 'metacognition'. (p. 21)

Furthermore, Bruner (1996) says, '[l]earning is best when it is participatory, proactive, communal, collaborative, and given over to constructing meanings rather than receiving them' (p. 84). This notion that individual learning is facilitated and constructed from social interaction altered views of learning; Bruner (1996) described it as 'a very different conception of knowledge from where knowledge was taken to be fixed and independent of the knower's perspective. For the very nature of the knowledge enterprise has changed in our times' (p. 59).

This concept of learning has been embraced by a range of theorists, such as Mezirow (2003, 1997, 1994, 1993, 1991), Lave and Wenger (1991), Schön (1983, 1987) and Freire (1975, 1970). These theorists are considered significant for the emphasis they place on the importance of experience combined with social and cognitive learning in situated authentic contexts that result in cognitive and social transformations. In this study, the notion of transformative learning emerges as an important facet of metacognition through experiential learning. Cognitive and social environmental influences combine to impact on preservice teacher learning through praxis inquiry.

Mezirow's work (2003, 1997, 1994, 1993, 1991) identified that instructional strategies have the capacity to influence the process of creating transformations at the cognitive level. This occurs when learners willingly participate in and share learning experiences as part of, the process of knowledge creation. In his work with adult learners Mezirow identified that '[t]ransformative learning helps adult learners understand their experiences, how they make sense or "meaning of their experiences", the nature of the structures that influence the way they construe experience, the dynamics involved in modifying meanings, and the way the structures of meaning themselves undergo changes when learners find them to be dysfunctional' (1997, p. xii). Mezirow highlighted that errors in learning are an important part of cognitive transformations and, with conscious intervention, can result in knowledge creation towards desired goals.

In addition, Lave and Wenger (1991) advocate that thinking, and knowledge construction are inextricably connected to the social and physical context of the learning experience. This is referred to within social constructivism as 'situated cognition', whereby knowledge is conceived and embedded in context-bound situations. Schunk (2008) argues that situated cognition addresses the idea that many processes interact to produce learning and that teachers need to factor these into their planning. He notes that '[c]ognitive theories acknowledge the role of environmental influences on learning, the role of the teacher's demonstrations and explanations as inputs, student practice of skills combined with corrective feedback as needed, promotes learning... Cognitive theories also emphasise the role of learner's thoughts, beliefs attitudes and values' (2008, p. 17).

Schunk (2008) further argues that 'the situation cognition perspective of learning is that it leads researchers to explore cognition in authentic learning contexts such as schools, workplaces, and homes, many of which involve mentoring or apprenticeships' (p. 239). This is exemplified in the work of Schön (1983, 1987), who focuses on the role of reflection within situated cognition to extend understanding of

learning and knowledge construction. Schön's work was directed at investigating the process of learning in workplace settings, such as in the professional development of educators. As part of this investigation, he identified two types of reflection: reflection-on-action, which involves reviewing a task after it has been performed, and reflection-in-action, conducted while undertaking a task. Moon (2001, p. 2) provides a simple definition of reflection: 'Reflection is a form of mental processing—like a form of thinking—that we use to fulfil a purpose or to achieve some anticipated outcome. It is applied to relatively complicated or unstructured ideas for which there is not an obvious solution and is largely based on the further processing of knowledge and understanding and possibly emotions that we already possess (based on Moon 1999).'

Schon's work highlighted the importance of reflection in connecting theory and practice in the education of professionals, which is of relevance to this study. The importance of reflection in knowledge construction for teacher educators is that it can assist in improving their practice. Reflection is also relevant in the development of transformational learning within authentic contexts and connects to concepts about 'deep' and 'surface' approaches to learning tasks within the reflective process. Research by Entwistle (2003) suggests that success in learning is influenced by whether a 'deep' approach to a learning task is adopted rather than a 'surface' approach. A deep approach is where the learner has a specific intention to extract meaning. This requires active learning processes that involve relating ideas and looking for patterns, using evidence and examining the logic of arguments. This approach also involves monitoring the development of one's own understanding (Entwistle, McCune & Walker 2000), whereby the learner is willing to integrate it into their existing body of previous ideas and understandings, reconsidering and altering understandings if required. In the surface approach, Entwistle found the intention of the learner is simply to cope with the task as unrelated bits of information, which leads to more restricted learning processes (Entwistle 2003).

The significance of this work by Entwistle highlights that the intention of the learner and whether they use a deep or surface approach to learning can lead to qualitatively different learning outcomes. Such intentional monitoring the development of one's understanding by the adoption of either a deep or surface approach to learning aligns with metacognition.

In relation to teacher education, the need to develop a consciousness for adopting 'deep' approaches to learning is highlighted in Schön's focus on reflection to enhance the professional knowledge of educators. However, Moon (2001) identifies this requires tacit knowledge, stating that Schön found that

[t]he espoused theory—as learnt in formal institutions and in professional training—is not the theory that proficient professionals eventually use to guide practice. Expertise is built from their practice (theory-in-use) by being reflective however the theory in use tends to be tacit and professionals cannot describe the basis on which they act. A particular role of professional

development is to make this ‘knowing-in-action’ explicit so that it can be the subject of further reflection and conscious development. (p. 3)

Such a need for developing a tacit consciousness in the adoption of ‘deep’ approaches to learning is evident in the work of Paulo Freire (1970, 1975). Freire’s work revolved around the notion of praxis, which emphasises that the theory of learning needs to be united with the practice of learning rather than the two being considered separate entities. In praxis, the importance of thinking is integral to forming action that can lead to a concrete change. While Freire’s work was in revolutionary politics, the notion of praxis within this study is based on epistemological beliefs that a teacher’s work is considered socially and politically important. Praxis inquiry learning requires thinking about theory and practice through reflection on experiential learning. This leads to transformations at the individual cognitive level and, ultimately, to the benefit of the collective good at the societal level. Moon (2001) argues that transformative learning is evidence that the new learning has transformed current understandings in reflective processes. Representation demonstrates strong restructuring of ideas and ability to evaluate the processes of reaching that learning (p. 5).

The facets of knowledge construction discussed above (reflection, situated cognition and environmental factors) are of obvious importance in contributing to an understanding of learning.

The concept that the individual is an active participant in the learning process through their adoption of intentional learning strategies, such as deep or surface approaches and the monitoring of individual learning, helps us understand where the concept of metacognition fits into a theory of learning.

The capacity for educators to describe the basis on which they act is important in preservice teacher education, and this requires tacit knowledge. The concept that ‘knowing-in-action’ needs to be made explicit through conscious development links to the concept of metacognition, which is an important area for further exploration in teacher education.

The concept of metacognition has received considerable attention for its impact on learning across many disciplinary areas over the last four decades. As mentioned in the introductory chapter, the term ‘metacognition’ emerged during research in the 1970s on the study of memory in young children by John Flavell (1976, 1978, 1979) and Ann Brown (1980). Flavell (1976) defined metacognition as follows:

In any kind of cognitive transaction with the human or non-human environment, a variety of information processing activities may go on. Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in service of some concrete goal or objective. (p. 232)

Metacognition has been studied from a variety of perspectives and viewpoints, particularly in the field of educational psychology. These studies explicate that Flavell's definition has been used as the basis of research on the different components of metacognition.

Two main components of metacognition have been identified as basic manifestations of metacognition. The first is the monitoring function, which Flavell (1979) refers to as metacognitive knowledge and metacognitive experiences. The second is metacognitive skills, which are defined as the use of strategies, manifested as a control function of knowledge (Brown 1978, 1983). These two components of metacognition have led to the notion of self-regulated learning as a mechanism to support learners (Pintrich 2000; Winne 1995; Zimmerman 2001). The main attributes of self-regulated learning relate to setting learning goals and monitoring the accomplishment of these. Boekaerts (1996) extends this to argue that these involve, cognition, metacognition, motivation, affect and volition.

Studies in metacognition in the literature highlight that it has been investigated from a range of perspectives. These perspectives relate to self-awareness and self-directed learning, considered to stem from the constructivist paradigm of learning. Advocates of a self-regulated learning model of metacognition agree this refers to the monitoring and control of behaviour, cognition, motivation and the environment. In contrast, Dinsmore et al. (2008) and Schunk (2008) argue that metacognition is mainly limited to the monitoring and control of cognition. The studies into self-regulated learning have built upon Bandura's (1986) social-cognitive theory, which incorporates self-observation, self-judgement and self-regulation. On this basis, Zimmerman (2001) defines self-regulated learning as the process of being able to activate and sustain cognition, including behaviours, to achieve learning goals.

The concept of self-regulated learning, which emanated from Albert Bandura's (1986) social-cognitive learning theory, draws on the idea of reciprocal determinism, whereby personal, environmental and behavioural factors are inherent within the learning process (Shraw 2006). The relevance and benefits of a self-regulated learning view of metacognition for this study is that it embodies many facets that might positively contribute to the inquiry learning process in praxis. The self-regulatory components of metacognition are considered important for their potential contribution to help preservice teachers develop their cognitive understandings and knowledge about education—both theory and practice—achieve greater independence in the praxis inquiry learning process and, at the same time, enhance their academic writing.

An investigation into the current literature indicates that research specifically in the field of metacognition and academic writing in preservice teacher education is sparse. A range of studies have identified that metacognition is strongly associated with cognitive learning. Studies by Baylor (2002), Jonassen, Peck and Wilson (1999), Efklides (2006, 2011) and Wilson and Bai (2010) advocate the knowledge of cognition and regulation of cognition (identified as skills) as major facets of metacognition. Further studies in metacognition and critical thinking by Halpern (1998), Kuhn and Dean (2004) and Magno (2010) propose

that metacognition is the ability to use knowledge to direct and improve critical thinking skills. Studies by Maclellan (2004), Badley (2009), Allison and Wu (2001) and Bereiter and Scardamalia (1987, 1989) contribute positive evidence that there is merit in the use of metacognitive skills to enhance cognitive learning. What has become evident from the literature is that students' domain-specific knowledge and use of cognitive strategies through self-regulation can influence academic learning (Winnie 1995).

The literature indicates that various authors have used the concept of metacognition as part of research into the development of thinking, and essentially embrace Flavell's initial concept. Halpern (1998) defines this as

the ability to use knowledge to direct and improve thinking skills. When engaging in critical thinking, students need to undergo specific metacognitive skills like monitoring their thinking process, checking whether progress is being made toward an appropriate goal, ensuring accuracy, and making decisions about the use of time and mental effort. (cited in Magno 2010, p. 138).

Results of a study by Magno (2010) indicate that 'higher use of meta-cognitive skills results in better critical thinking. Higher order thinking (like critical thinking) requires executive processes that are meta-cognition' (p. 149). This study implies that critical thinking is a product of metacognition.

2.2 Metacognition and academic writing

Several authors—Maclellan (2004), Badley (2009), Wilson and Bai (2010) and Allison and Mei (2001)—have looked at academic writing with a view to examining critical analysis and the extent of reflection in academic essays. These authors support the notion that writing can act as a cognitive function and that the writing process itself can involve generating, integrating and evaluating ideas that can impact on intellectual change (Langer & Applebee 1987).

These studies indicate that there is potential for developing academic writing through a conscious engagement between the thinking of the writer and the mechanics of the writing process. Bereiter and Scardamalia (1987) argue that '[w]riting can only be a mechanism for generative thinking if the writer holds a knowledge transforming view of the writing task and has it as an intentional goal that as a result of engaging in the writing task, there is a possibility for change' (cited in Maclellan 2004, p. 77).

Woodward-Kron (2002; 2004; 2008) and Reiff and Bawashi (2011) focus directly on academic writing and identify linguistic features that demonstrate metacognitive skill. Allison and Mei (2001), Maclellan (2004), Badley (2009) and Wilson and Bai (2010) look at academic writing with a view to examining critical analysis and the extent of reflection in academic essays but not specifically metacognition.

Hammann (2005) studies the role of self-efficacy, epistemological beliefs and self-regulatory behaviours in preservice teachers' academic writing tasks using the 'Metacognitive Awareness Inventory' (MAI; Schraw & Dennison 1994) to measure self-regulation. Findings from this study indicate that the

knowledge and regulation of cognition were related to preservice teachers' writing enjoyment. This stemmed from epistemological beliefs that writing was a learnable skill. Preservice teacher participation in self-assessment of writing was also a contributing factor. Insights from this study highlight a complex relationship between student beliefs and the impact of these on self-regulation in academic writing.

Negretti (2012) studies metacognitive awareness and self-regulation in a longitudinal study of academic writers relating to task performance. This study investigates how novice writers develop the ability to participate in the practices of academic written communication in second-language learners. Findings suggest that understanding the communicative function of academic textual practices provides the basis for students to use metacognitive awareness to self-regulate and evaluate their writing. Metacognitive awareness was found to connect to the development of knowledge and writing strategies applicable to specific writing tasks as a gradual process. This study by Negretti highlights the importance of understanding genre as a factor of metacognitive awareness which is a condition of knowing what knowledge and which strategies are applicable in academic writing. While this study was of second-language learners, these principles can be considered applicable to all academic writers.

The literature discussed in this section identified several relevant areas. First, cognition and metacognition have been associated with psychological perspectives of cognitive and social learning within education. Second, academic writing has been studied from a linguistic perspective where contextual factors in the relationship between language, thought and written textual practices in discourse can impact on writing. Further, two major themes emerge from the literature. These are that metacognition is a cognitive skill that contributes to developing academic thinking, and that pedagogical strategies in the use of metacognitive skills have the potential to enhance the development of academic writing skills.

2.3 A psychological perspective on metacognition as a cognitive skill within education

Defining what it means to display metacognitive skills and how these are measured is complex. Pintrich (2002) states that metacognition, as a construct, is becoming increasingly prevalent in cognitive development research and is defined by Khun and Dean (2004) 'as awareness and management of one's thought, or "thinking about thinking", proposing that metacognitive skills typically do not develop to the level we would like' (p. 270).

Attempts by Khun and Dean (2004) to measure metacognitive skills have identified that

[m]etacognitive functions can be procedural or declarative. One aspect involves an awareness and management of one's thinking, the other involves a broader understanding of thinking and knowing in general, studied under epistemological understanding. The psychological perspective is that like thinking itself, the understanding of thinking undergoes development. (p. 270)

Reiff and Bawarshi (2011) cite studies such as Perkins and Soloman (1988) to demonstrate the difficulty of measuring metacognitive ability in educational contexts. Khun and Dean (2004) propose that there is a developmental aspect to the growth of metacognitive skills from childhood, adolescence and into adulthood. Their research into whether this is a natural progression from one stage to the other finds that this is not necessarily a linear process. They also add that not all adults reach a point where metacognitive ability is evident. Their study defines metacognition as the development of skilled thinking that enables qualities of discrimination and choices to be made from a framework of evidence and argument. They refer to these choices as evaluativist. 'An evaluativist epistemology provides the intellectual basis for judging one idea as better than another, a basis more powerful than mere personal preference' (p. 271).

Research by Mokhtari and Reichard (2002), Griffith and Ruan (2005) and Wilson and Bai (2010) focuses on metacognition within the reading process. These authors demonstrate that metacognitive readers monitor their understanding of text and control their cognitive understanding through the application of reading strategies. These studies recognise the importance of metacognition in differentiating between skilled and unskilled readers and support the notion that metacognition is a key to comprehension, a characteristic of skilled readers.

Alternatively, studies by Winograd and Johnston (1982) highlight the difficulty encountered by assessment measures in trying to assess metacognition. They identify the need for suitable methodologies and assessment instruments that correlate with the component of metacognition being studied. This study by Winograd and Johnston focused on metacognition and reading, particularly on comprehension monitoring through error detection. Results were inconclusive, as the researchers felt unable to draw conclusions that sixth-graders were lacking in metacognitive abilities. Instead, they challenged their methodology, assessing the limitations and difficulties in the use of their assessment tool, which was an error detection paradigm.

2.4 Metacognition and reflection

The importance of reflection within teacher education can be traced back to Dewey (1916) and, more recently, Schön (1983, 1987). However, a search of the literature to date for analysis of metacognition and reflection within the academic writing process indicates that there is a paucity of specific research on this topic within preservice teacher education.

Dewey (1933) and Schön (1983) argued that teachers' work is complex and requires deep and foundational reflective practices. Freire (1970) argued the need for reflection that develops a political consciousness as a means of helping learners become problem-solvers through posing questions on the broader political issues of education. More specifically, McAlpine et al. (1999) focus their research on the importance of teacher thinking through reflection as a mechanism that improves science teaching in higher education. Their study investigated the role of reflection as a method of formative evaluation in the work of six successful university professors. The model focused on the study of the participants' ongoing iterative

process of thinking and action. This included six components based on goals, knowledge, action, monitoring, decision-making and corridor of tolerance. This study documents reflections and analysis of the reflective processes of the six university professors in their day-to-day planning, instructing and evaluating learners from an explanatory rather than predictive method. The results described a metacognitive model and coding scheme that operationalised the process of reflection and aimed to provide a language for describing reflection and, consequently, a method of thinking about how to improve their teaching.

2.5 Metacognition and epistemological beliefs about writing

The role of metacognition in relation to motivation, affect and self-efficacy in the learning process has been found to influence learning outcomes (Zimmerman 1989). Studies by Efklides (2011) support the idea that metacognition, motivation and affect are important components of self-regulated learning. Efklides argues there is a direct connection between the person and task level, with the metacognitive experiences or affective states playing a major role in task motivation. Efklides (2011, p. 7) states:

At this level, metacognition and affect take the form of subjective experiences, that is, the person is experientially aware of the ongoing thinking, feelings, emotions during task processing. This awareness provides the input for online self- regulation of task processing and/or effort and affect.

Similarly, Hammann (2005) in the study described above, highlights the important correlation between epistemological beliefs about the self and writing in preservice teachers' academic success proposing that '[i]n writing tasks, students' self-efficacy perceptions can be powerful predictors of their academic success' (p. 17). This theme is picked up later in the data findings section.

Maggioni and Parkinson (2008) discuss teachers' epistemological beliefs about metacognition, self-regulation and self-regulated learning. Further, Efklides (2006; 2011) argues there are connections between metacognition and feelings that impact upon self- efficacy and confidence in the learning process.

These studies highlight that interactions between components at the person-level of cognitive ability, metacognitive knowledge and skills, correlate with self-concept, perceptions of control, attitudes to learning and emotions. These are all important factors that guide self -regulation (Efklides 2011).

2.6 Metacognition and pedagogical issues

The literature indicates that metacognitive skills need to be explicitly taught. Research into metacognition by a range of authors—Wilson and Bai (2010), McAlpine et al. (1999), Maclellan (2004), Moon (2008), Woodward-Kron (2002; 2004; 2008), Kuhn and Dean (2004), Hammann (2005) and Reiff and Bawarshi (2011)—emphasises the importance of the individual's explicit awareness of the use of metacognitive skills, either from a learning perspective or as a teaching tool.

Research by Wilson and Bai (2010) examines the importance of the teacher's pedagogical understanding of metacognition and the ability 'to think about, talk about and write about their thinking' (p. 269). They demonstrate that an explicit awareness and understanding of metacognition by the teacher is fundamental to an ability to teach students to be metacognitive in learning. Results of this study revealed that 'teachers who have a rich understanding of metacognition report that teaching students to be metacognitive requires a complex understanding of both the concept of metacognition and metacognitive thinking strategies' (p. 269).

The research by McAlpine et al. (1999) aimed to identify the processes that led to improvements in teaching practice by university lecturers. This study emphasises the importance of practitioner content knowledge and, most importantly, the function of decision-making in adjusting their teaching. The ability to do this was 'based upon epistemic reflection which represents a cognitive awareness of one's reflective processes' (p. 110). The process of reflection and metacognitive functions involved in thinking about teaching and learning enabled informed adjustments to be made to teaching. Content knowledge is highlighted as a significant factor in the ability to apply metacognitive skills within the teaching and learning context to improve practice.

According studies by Woodward-Kron (2002; 2004; 2008), Reiff and Bawashi (2011), Hammann (2005) and Negretti (2012), pedagogy that has a focus on metacognition has the potential to develop writers who can monitor and control the thinking skills required for academic writing. However, Wilson and Bai (2010) argue that the ability to facilitate metacognition in student learning requires teacher educators to have epistemological and technical understandings of metacognition. The study by Wilson and Bai (2010) is based on teachers' understandings of the act of teaching metacognition and the challenges related to this. Findings from this study indicate the relationship between teachers' metacognitive knowledge and their pedagogical understanding of metacognition require professional development. This study reveals the teacher's capacity to implement effective strategies for metacognitive learning in their students was dependent on them possessing the knowledge and skills to do this. The value of Wilson and Bai's study highlights the need for teacher educator professional development. Metacognitive pedagogical understanding is required for effective implementation as a teaching and learning strategy.

2.7 Strategies for developing metacognitive skills

Several other studies, by Kuhn and Dean (2004), Badley (2009) and Hattie (2008), indicate the importance of explicit facilitation of thinking and writing skills through modelling, coaching and mentoring. 'Students need models of strategies in action, guided practice as they implement those models and independent practice with the strategies' (Clark & Graves 2005, cited in Wilson & Bai 2010, p. 271). This explicit facilitation requires that teachers have, as part of their teaching repertoire, pedagogical understandings of metacognition that include instructional strategies. This has implications for the role of the teacher, the learner and the learning environment. As such, there needs to be a reappraisal of the relationship between

teacher and learner reflecting theories of learning that are conducive to the development of metacognitive skills. In order for there to be a specific focus on developing metacognitive skills, the teacher must no longer be the transmitter of knowledge, but instead the facilitator of learning in the process of constructing knowledge. Badley (2009) argues that this requires ‘structuring experiences and fostering conversations that are challenging, problematic, engaging and horizon stretching’ (p. 253). This notion also aligns with the work of Freire (1970), Kamler and Thomson (2006), Dewey (1916), Cherednichenko and Kruger (2009) and Mezirow (1997).

The theoretical underpinning for this type of transformative learning has its basis in constructivism. Baylor (2002) describes this as a process where knowledge is personally constructed by individuals, with a strong focus on the facilitation of knowledge construction and generative learning. ‘Constructivist approaches have been found to be particularly beneficial for developing meaningful learning activities and engaging students in higher-order thinking’ (Jonassen, Peck & Wilson 1999, cited in Baylor 2002, p. 6).

Research by Maggioni and Parkinson (2008) indicates that ‘epistemological beliefs about learners and learning are central to the pedagogical practices that enable students to form effective ways to generate and validate knowledge’ (p. 451). Maggioni and Parkinson’s study examines teachers’ beliefs about learners and learning and finds that teachers who adopt a constructivist view of learning engaged in ‘shared authority with the students, encouraged positive and mutually supportive exchanges among the students and emphasized the formulation of meaningful questions over answers to other people’s questions’ (p. 451).

Badley (2009), in a study on mentoring in the process of writing essays, proposes that discussion throughout the process of writing can become a learning vehicle for the development of reflective writing. This mentoring process assists students to become more critically reflective. In using the term ‘essaying’, this paper suggests that ‘this needs to include arguing, describing and explaining. It is through the process of writing that the discovery of new thoughts and ideas are constructed’ (p. 249). Conversations with the mentor provide significant opportunity for the development of ideas that can extend and challenge learning and, hence, lead to improved academic writing. Badley’s study contributes important information relating to the role of tutor as facilitator of the development of critical reflection skills in academic writing. While not specifically focused on metacognition, this study supports the notion that external support, such as that espoused in the work of Vygotsky (1978) and his concept of scaffolded learning, is required to develop the skills associated with high standards of writing. In a similar fashion, Lavelle and Bushrow (2007) refer to a model based on criteria for deep and surface writing. The idea of novice and expert working together to interpret experiences in ways that can be described as having deep and surface meaning is relevant to a discussion on metacognition.

Arsal (2010) examined the effect of diaries and self-regulated learning of preservice science teachers to determine the relationship between self-regulation of learning and academic success. The findings

indicated that diary usage had positive impacts on self-regulation of intrinsic motivation, task value, metacognition and time management strategies. However, there was no significant effect on cognitive strategies such as rehearsal, elaboration and organisation. No specific training about cognitive strategies had been provided to participants. Aarsal's study provides information on the benefits of diary usage to the behavioural impacts of metacognition; however, it also informs us that cognitive benefits were not realised due to a lack of guidance. The findings of this study add to the argument that cognitive strategies such as reasoning, summarising, organising and critical thinking require the facilitation of teacher educators. These cognitive skills need to be embedded into writing activities for the monitoring and self-regulation benefits of metacognition, whether this is in diary usage or any other writing activity.

Concepts such as metacognition and self-regulated learning, inquiry learning, experiential learning emerge from these studies that redefine the learning experience with the focus on the learner to construct their own knowledge. However, the role of the teacher is also redefined in this constructivist learning framework. These studies highlight that the teacher educator is vital in facilitating appropriate activities that can develop learners' metacognitive skills to enable them to challenge their thinking and extend cognition for the enhancement of writing.

2.8 Academic writing from a linguistic perspective

Studies by Woodward-Kron (2002; 2004; 2008; 2009) at one Australian university focused specifically on the analysis of preservice teacher writing utilising a linguistic framework. These studies concentrate on the notion that language as a semantic system is an important tool for investigating the ways in which language can be used in specific contexts. This provides a different focus on metacognitive thinking and writing, one wherein the relationship between language use and thought is the centre of investigation. The studies by Woodward-Kron have some parallels to this current study in that students were required to make connections between theory and practice, evaluate theories and engage in skills around argument and reason. Woodward-Kron's findings contrast with those of other studies on metacognition detailed above, which focused on cognitive, psychological and behavioural factors, such as epistemological and pedagogical issues related to the writing process. In contrast, Woodward-Kron highlights that technical linguistic elements which demonstrate metacognitive functions, can be taught through writing. These are relational clauses, metaphor and abstraction, which express metacognitive thinking. Woodward-Kron's work emphasises the importance of lexico-grammatical choices as metacognitive functions that demonstrate a higher level of critical thinking while learning. The importance of this information is that it highlights the need for teacher educators to facilitate the development of linguistic discourse associated with critical thinking as part of the writing process itself.

Reiff and Bawarshi (2011) analyse the use of genre in the development of metacognitive skill, arguing that an understanding of genre enables the writer to recognise and adapt more effectively and critically when encountering new writing contexts. They argue that genre was selected as a conceptual lens on the

basis that genres ‘can function as tools of cognition’ (p. 314). Their study examines genre transfer in first-year college students in the attempt to study metacognition and the transfer of prior knowledge about genre writing to new contexts. There is merit in the findings, which indicate that a knowledge of genre can facilitate metacognitive skill. Students who were able to identify genre and apply this to new writing contexts performed better in assignment work.

2.9 Disciplinary knowledge studies

Studies by Woodward-Kron (2002; 2004; 2008), McAlpine et al. (1999) and Allison and Mei (2001) highlight the importance of disciplinary knowledge as a key factor that enables students to express a higher degree of metacognitive skill. Findings from these studies indicate that a solid base of disciplinary knowledge provides more linguistic choices for the analysis of theory and practice. The studies by Woodward-Kron (2002; 2004; 2008) were longitudinal in design and identified a significant difference between first-year and third-year student results. ‘By third year, students were able to display investigative and informed links between theory to practice in their writing which was the result of a greater knowledge of the subject field’ (Woodward-Kron 2009, p. 177). The implications of these findings for preservice teacher education is that there needs to be a support base for the development of effective reflection and regulation of epistemological practices. Metacognitive skill requires sufficient disciplinary knowledge in preservice teacher education and the experience of teaching.

In a study by Curwen et al. (2010), the development of teachers’ skills in metacognitive instruction in literacy education was investigated to determine the impact of this on teaching and learning literacy skills. This was a three-year longitudinal study that focused on the effectiveness of curriculum and instructional strategies that integrate literacy with disciplinary knowledge. The goals were to enhance elementary students’ literacy outcomes while simultaneously broadening and deepening knowledge of the content areas. The findings from this study indicate that the use of metacognition and discourse-building techniques result in significant gains to reading comprehension through writing in the content areas. Both teachers and students demonstrated improved ability to use metacognitive strategies in their teaching and learning. While this study was of elementary students, it demonstrates the shift from mastery of facts towards exploratory learning associated with content domains that strengthened students’ metacognitive skills. Increased reading and writing performance resulted in small and large-scale assessments. There were also benefits to the development of thinking skills, resulting in the ability to think deeper and understand the learning process and the self as learner. Although Curwen et al. studied metacognition and literacy education in elementary schools, the framework used has relevance to this study. First, it draws attention to the importance of teacher educator professional development; second, it emphasises that a focused approach to the development of metacognitive skills is required for both students and teachers. It can be argued that the principles of developing reading and writing skills through subject specific content, using metacognitive strategies, can be beneficial and are applicable at any stage of schooling. Duke and

Martin (2008, p. 245) state that 'contextualised reading instruction within a strong focus on knowledge building yields considerable benefit' (cited in Curwen et al. 2010, p. 129).

Hyland and Hamp-Lyons (2002) also investigate the value of discipline-specific learning in student writing from the perspective of the contextualised nature of academic writing. While this study is not specifically in the field of metacognition, these authors highlight that academic writing is the result of the engagement between participants, texts and knowledge building practices. This information is relevant to a study in metacognition and academic writing due to the importance of context and language. The notion of discourse communities emerges as relevant because language and socio-cultural factors impact upon the writing process from environmental sources. Hyland and Hamp-Lyons's study highlights that the term 'academic literacy' is applied to refer to a complex set of skills that encompasses the cultural knowledge required for success in the discourse of academic communities.

It means grounding instruction in an understanding of the cognitive, social and linguistic demands of specific academic disciplines. This takes practitioners beyond preparing learners for study in English to developing new kinds of literacy: equipping students with the communicative skills to participate in particular academic and cultural contexts. (Hyland & Hamp-Lyons 2002, p. 2)

The concept of the discourse community is particularly relevant within the praxis inquiry model of preservice teacher education that forms the basis of the research in the current study. Contextual factors are a significant feature of preservice teachers' learning in these units of study, where academic writing stems from the discourse associated with both university learning and the school practicum setting.

In a further study of discourse communities, Garrison (2016) introduces the notion of shared metacognition based on research called the 'Community of Inquiry' framework. A shortcoming of this study is that it does not define specifically what is meant by metacognition; however, it does focus on the importance of the social influences that can impact on thinking and learning. Social influences are considered relevant given the online learning environment in which the current generation of university students operate. This framework by Garrison (2016) is based on the fusion of reflection and social discourse as features of learning. Garrison's notion of shared metacognition through social interaction as part of a collaborative learning process is an interesting concept that could potentially contribute to improved learning at the individual level; however, a clearer definition of the processes being studied in the collaborative context is required. The question raised by this study in relation to academic writing is, 'How can the concept of shared metacognition impact on writing skills?' This takes thinking skills into new territory. If thinking skills can be developed through collaborative dialogue using information communication technologies (ICT), will this lead to enhanced writing? Studies by Winters et al. (2008), Anderson (2008) and MacGregor and Lou (2004) suggest the use of ICT has the potential to impact on thinking skills as part of the development of discourse associated with disciplinary studies. However, the

role of the teacher educator or a facilitator plays a significant role in the design of tasks that contribute to enhancing learning.

2.10 How this study relates to the existing literature

A review of the current literature indicates that research in the field of metacognition and academic writing specifically in preservice teacher education is limited with the exception of Woodward-Kron (2002; 2004; 2008;2009), Hammann (2005), Arsal (2010), Reiff and Bawashi (2011) and Negretti (2012). This study aims to make a further contribution and to create new knowledge in this area.

The literature discussed above provides some key insights of relevance to preservice teacher education and are summarised below.

- The development of a knowledge and awareness of metacognitive skills as the management of thought processes can potentially improve preservice teacher writing skills.
- The relationship between language use and thought in the linguistic choices that writers can make can enhance preservice teacher writing.
- The explicit facilitation of thinking and writing skills through modelling, coaching and mentoring is important.
- Disciplinary knowledge is a key factor that enables students to express a higher degree of metacognitive skill in writing.
- The role of metacognition in relation to motivation, affect and self-efficacy in the learning process has been found to influence learning outcomes.
- Professional development of teachers' skills in metacognitive instruction in literacy education can positively impact on both the teaching and student learning of literacy skills.
- The process of reflection and metacognitive functions involved in thinking about teaching and learning. can enable tertiary educators to make informed adjustments to improve their teaching.
- The concept of the discourse community and the notion of shared metacognition has relevance to the enhancement of writing skills.

As a result of these insights, existing pedagogies may be able to be adapted to preservice teacher education. Further exploration of the concept of writing as a means of thinking and learning may be the key. The discourse environment of praxis inquiry has the potential to maximise opportunities for preservice teachers to develop their thinking skills. The development of metacognitive skills in this learning process may have potential to improve academic writing within this praxis inquiry process of learning. Resulting insights into pedagogical methodologies would, therefore, have the potential to contribute to existing knowledge.

Studies in metacognition in the literature discussed highlight that it has been investigated from a range of perspectives. These perspectives relate to self-awareness and self-directed learning, considered to stem from the constructivist paradigm of learning. However, Dinsmore et al. (2008), in a comprehensive study

of the literature on metacognition, conclude that they were left with as many questions as answers. The Dinsmore study identifies that definitions of metacognition have become intertwined with self-regulation, resulting in a lack of clarity. In their review, Dinsmore et al. find that, in many studies, the researchers provided no explicit definition of the central processes being studied. Schunk (2008) considers this inadequate and argues that the study by Dinsmore et al. can only make inferences based on the definitions from the measures employed in the studies. This lack of clarity in definitions creates difficulties for research. This is elaborated further in Chapter 4.

Amid this lack of clarity in definition, metacognition, as it relates to the knowledge and regulatory processes of learning in the self-regulated learning literature, has been considered relevant to this investigation into metacognition and academic writing. The purpose of this study is to investigate whether metacognition has the capacity to assist preservice teachers to translate their learning into improved and more sophisticated written communication.

2.11 Gaps within the literature in the knowledge or approaches to the field

The literature chapter has presented research from a range of discipline areas including Psychology, Science, English, Second-language development and the tertiary academic environment more generally. The scarcity of research addressing the relationship between metacognition and academic writing specifically within preservice teacher education indicates a need for further research in this area. This study aims to contribute to this goal.

2.12 Conclusion

The literature presented in this chapter indicate metacognition is a complex cognitive and behavioural concept. Research presented by Dinsmore et al. (2008) and Schunk (2008) suggests there are difficulties with definitions of metacognition. This makes it difficult to research.

Cognitive psychology provides a framework for understanding the role of epistemic beliefs, epistemic knowledge and calibration in the process of metacognition, particularly the self-regulatory aspects of metacognition in the role of the learner. Investigating the concept of metacognition from a linguistic perspective has been useful. Identifying the role of language and thought and how this is manifested in the writing process through lexico-grammatical choices is also important in the realm of this thesis. The study of genre has also emerged as an important feature of academic writing.

A variety of pedagogical strategies have been investigated in the literature that could be useful in developing metacognition and academic writing. Modelling, co-construction of ideas through discussion, questioning and problem-solving are some of these. The concept of discourse communities in the development of the specific disciplinary knowledge and language is a significant factor, and the increasing

use of ICT in the pedagogical sphere cannot be ignored. Teacher educator professional development in understanding metacognition as pedagogical tool was a significant factor that impacts on strategy use.

The question of how metacognition contributes to academic writing that is judged as higher quality in assessment remains unanswered. The literature reviewed is based upon small-scale studies, which make it difficult to generalise. What the findings have demonstrated is that there are significant concepts derived from cognitive psychology and language development. This can help inform pedagogy and potentially be synthesised for the enhancement of academic writing skills in preservice teacher development.

On this basis the following subsidiary questions aim to fill gaps identified in this field. These questions were outlined in the introduction however are provided again here for ease of reference.

- What learning theories underpin the development of metacognitive abilities?
- What are the pedagogical issues relating to the development of metacognitive skills within these two first-year preservice teacher education units?
- What attitudes and assumptions do teacher educators make about the task of academic writing in preservice teachers' first year at university?
- What strategies can be adopted by both teacher educators and preservice teachers to promote metacognitive skills?
- What is the role of purposeful coaching in the facilitation of metacognitive abilities and the writing process?
- How do we assess metacognitive thinking in academic writing?
- What is the role of information communication technologies in thinking and writing?
- What specific challenges and issues can be identified for students from diverse backgrounds in relation to academic literacy in preservice teacher education?

These subsidiary questions are considered relevant to answering and expanding the knowledge creation desired in this study on 'What is the connection between metacognition and academic writing in a praxis inquiry model of first year preservice teacher education?'

Chapter 3. Methodology

3.1 Introduction

This chapter outlines the methodological process of investigation undertaken in this study into metacognition and academic writing in a praxis inquiry approach to teaching and learning. First, it will draw on the literature to provide the rationale for the choice of a qualitative methodology and why this was considered most appropriate for this study. Second, the research design and procedure are outlined to describe the research site, context and purposeful sampling for the study. This includes the implementation process, a description of the choice of data, an outline of the strategy used to gain access to recruit participants and collect data, and an outline of the profile of the participants. Third, it describes the process of data analysis and how this was structured to identify the themes that emerged from the data (the system for representing the data, the data coding process, referencing and anonymising the data findings). Fourth, the researcher's role and potential ethical issues relating to being an insider researcher are presented. This chapter concludes with an outline of credibility issues relating to qualitative methodology.

3.2 Qualitative methodology and design: Rationale and theoretical framework

3.2.1 Rationale for methodology

There are different ways to approach research. These choices are described as paradigms and reflect the fundamental beliefs that underpin the research process. Coles and McGrath (2010) define a paradigm as a 'philosophical or theoretical framework... a way of thinking and organising ideas into a coherent pattern' (p. 191). Two major research paradigms have evolved historically: the 'quantitative' or 'positivist', and the 'qualitative' or 'interpretivist'. Burton and Bartlett (2009) state that these 'paradigms constitute a coherent set of ideas and approaches which are imbued with distinctive sets of values and beliefs. In research, they are often presented as polar opposites' (p. 17). Patton and Appelbaum (2003) summarise the dichotomous relationship between quantitative and qualitative methods:

Quantitative researchers have pressed for explanation and control by searching for cause and effect relationships between a small number of variables that can be applied in any setting. Qualitative researchers have pressed for understanding the complex interrelationships among all elements present... the qualitative researcher concentrates on the instance, trying to pull it

apart and put it back together again more meaningfully while the quantitative researcher seeks a collection of instances, expecting that, from the aggregate, issue relevant meanings will emerge. (p. 64)

In making decisions about the methodological choices available, it is important to determine the fit of the research paradigm with the research focus. This means that in selecting the investigative method to explore specific phenomenon, it is important that the mode of inquiry is appropriate to the research purpose and the form of knowledge that is aimed to be developed (Yin 1994). The significant issue is understanding that different forms of knowledge develop due to the investigative paradigm, as phenomena are investigated differently (Scott & Usher 2010).

While there are many types of study within the quantitative and qualitative paradigms, the methods used within each paradigm are differentiated by a set of distinctive characteristics and worldviews. These comprise different ontological, epistemological and axiological beliefs about knowledge creation, the data collection method, and the analysis of the data. Many authors have discussed and debated the merits of quantitative and qualitative research methods (Patton 1990; Creswell 2005; Scott & Usher 2010), however, Jacob (1989) contends that confusion has occurred particularly with qualitative research because it has been discussed as if it is just one approach arguing that clarification is required to recognise that qualitative research comes in different varieties. The term 'tradition' rather than paradigm is suggested as these varieties have emerged as part of the research tradition. Jacob describes the value in using this term is that it can help to focus the study and method of research stating that, 'I use the term tradition in two ways. First, the concept of tradition focuses our attention on assumptions that researchers make about the nature of the universe, theory, legitimate questions and problems, and appropriate methodologies. Second a group of scholars who share these research-related assumptions are considered to form a tradition' (Jacob 1989, p. 229). Despite issues relating to terminology, Hoepfl (1997) argues that the main feature that separates the two paradigms is that quantitative research is based on the belief that knowledge creation occurs because of researchers who 'seek causal determination, prediction, and generalisation of findings [while] qualitative researchers seek instead illumination, understanding, and extrapolation to similar situations' (p. 48).

Data collection methods and the analysis of data are also key features related to each research approach. Qualitative research is described by Strauss and Corbin (1990) in broad terms as 'any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification' (p. 17). Qualitative research aims to understand the nature of the phenomenon being studied through context-specific settings, whereas quantitative methods test or measure hypothetical generalisations. Kinchloe (2005) contributes further by highlighting the importance of the human factor in defining qualitative research, stating, 'Knowledge of the world is an interpretation produced by people who are part of that world' (p. 17), and that 'the ability to generate rich and compelling interpretations is a key to producing more rigorous forms of knowledge' (p. 21).

Patton (1990) emphasises the context in which the study is conducted is also a significant element of the research process. Understanding the nature of interpretation of data from the context is a major factor in qualitative research or interpretative/constructivist inquiry. This places the researcher as a significant element in qualitative studies. The researcher is described by Lincoln and Guba (1985) as being the ‘the human instrument’ that analyses and interprets the data and is ‘the instrument of choice for naturalistic inquiry’ (p. 193). Unlike quantitative studies, where the data are considered detached from the researcher (Denzin & Lincoln 2003), in qualitative studies that use an interpretive approach, they are the key to generating convincing arguments for their findings (Kinchloe 2005).

While there has been significant debate about the merits of both paradigms, Krauss (2005) argues that, despite being, ‘rhetorically different’, the results of the two methodologies can be complementary. A ‘mixed method’ design is considered an appropriate option where researchers consider that neither paradigm will adequately serve to determine the desired outcomes of a study, and that the interpretations of findings can be enhanced with the use of both quantitative and qualitative methods. Strauss and Corbin (1990) and Onwuegbuzie and Leech (2004) discuss the value of conducting mixed method studies as a way of overcoming dilemmas regarding philosophical issues behind research design.

Krauss (2005) argues that the essence of the quantitative–qualitative ‘debate’ relates to the epistemological stance of the researcher. This is a key issue in deciding on the methodological appropriateness of the paradigm selected. This debate is described by Krauss as relating to beliefs about knowledge construction and the adoption of methodological practices to attain knowledge. Krauss (2005) argues:

Epistemology poses the following questions: What is the relationship between the knower and what is known? How do we know what we know? What counts as knowledge? In the positivist paradigm, the object of study is independent of researchers; knowledge is discovered and verified through direct observations or measurements of phenomena; facts are established by taking apart a phenomenon to examine its component parts. An alternative view, the naturalist or constructivist view, is that knowledge is established through the meanings attached to the phenomena studied; researchers interact with the subjects of study to obtain data. (p. 759)

Freebody (2003) highlights that qualitative research has an important part to play in uncovering areas that may benefit from further research by quantitative methods. This draws attention to the role of qualitative work in helping to ‘identify, demarcate and name those attributes’ (p. 34) worthy of further research using a quantitative method. Freebody argues that, in this sense, ‘all educational research is necessarily founded on qualitative analysis, a set of decisions, theorised and explicit or otherwise, about the moving parts that the project will take to be the objects of its study’ (p. 34). Nevertheless, the essential characteristics that define quantitative versus qualitative research are not just philosophical beliefs about knowledge creation but incorporate how data is collected and analysed within each paradigm.

3.2.2 The philosophical and theoretical framework chosen for this study

In making a choice about the paradigm most suitable for the purpose of this study, consideration has been given to the philosophical or theoretical framework that underpins this work, the type of data and methods for data collection, and the data analysis process. On this basis, it was decided that a qualitative/interpretivist approach was the most suitable for accomplishing the aims and knowledge creation desired from an investigation into metacognition and academic writing in the two first-year preservice teacher education units.

This qualitative paradigm has been favored due to embracing a philosophical stance compatible with a constructivist paradigm of knowledge generation. This aligns to adopting a research approach consistent with interpretivist views.

Interpretivism has its basis in the work of Max Weber (1864-1920) and his concept of 'Verstehen'. Crotty (1998) purports that Weber's 'Verstehen represents a sociological perspective which locates the study of society in the context of human beings acting and interacting and the subjective values and meanings that humans provide in social inquiry' (p. 68).

Oaks (1977) qualifies this further adding that not only is the meaning of any investigation important in 'Verstehen' but the interpretation that creates meaning,

Weber uses the expressions 'meaning' ('Bedeutung' or 'Sinn'), 'understanding' ('Verstehen'), and 'interpretation' ('Deutung') ...To identify a sociocultural phenomenon is to understand its meaning. Therefore, the subject matter of any sociocultural investigation is meaningful, understandable, or interpretable. In Weber's methodology of the sociocultural sciences, these three predicates are truth-functionally equivalent. An item is meaningful if and only if it can be understood or interpreted. (p.21)

Within this interpretivist framework for this study there is an a parallel with constructivist views of knowledge generation. Schwandt (1998) argues that constructivism in the social sciences is a more recent addition to the interpretivist paradigm and that constructivists share the interpretivist focus on the emphasis of real-world experience 'as it is lived, felt, undergone by social actors... constructivists are committed to the view that what we take to be objective knowledge and truth are the result of perspective ... constructivists emphasize the instrumental and practical function of theory construction and knowing' (p. 236).

The purpose of this study was to explore and identify theories of learning and strategies that might illuminate policy and practices in preservice teacher education to enhance academic writing through the participant's experience, it was not to test any preconceived theory.

The objective of this study was to capture the lived experiences of preservice teachers and their lecturers in these two units of study through the meanings interpreted by the researcher from participants' experience. Within this interpretivist/constructivist approach, the researcher is fundamental to the research process in that they interpret these meanings. Lincoln and Guba (1985) state that, 'The observer cannot be disentangled from the observed in the activity of inquiring into constructions. Hence the findings or outcomes of an inquiry are themselves a literal creation or construction of the inquiry process' (p. 19). In doing so, Cresswell (2005) argues, 'The procedures of qualitative research, or its methodology, are characterized as inductive, emerging, and shaped by the researcher's experience in collecting and analyzing the data. The logic that the qualitative researcher follows is inductive, from the ground up, rather than handed down entirely from a theory or from the perspectives of the inquirer' (p. 19).

The benefits of this interpretative/constructivist approach lie in the researcher's capacity to collect data that facilitates rich descriptions of the participants' experience. In relation to this study of preservice teacher education, this reflects a fundamental belief that knowledge is constructed by the researcher through the meanings and understandings that arise from the social and experiential experiences connected to the cognitive and social learning of participants. The study aimed to capture the concrete experiences and subjective voices of the participants as they provide their personal insights in learning and teaching in the two units chosen for this study. Freebody affirms Taylor and Bogdan's (1984, p. 5) influential account of 'qualitative methodology' as referring generally 'to research that produces descriptive data about people's words and their observable behaviour' (Freebody 2003, p. 37). It is the participants' words that constitute credibility in this study. A quantitative method would not produce data suitable for knowledge investigation in this context. The purpose of this study was not to test a theory, or verify a claim, which are inherent aspects of quantitative research. (Coles & McGrath 2010).

This study investigates metacognition and academic writing in two first-year units of study that adopt a praxis inquiry approach in preservice teacher education. The choice of the interpretivist/constructivist approach to this study is considered fitting for both the subject of study (metacognition and academic writing) and the philosophical beliefs about knowledge creation held by the researcher, as described above. Kress (2011) highlights that knowledge is context- and time-dependent. In this study, the subject—metacognition and academic writing—and the knowledge gained are integrally bound within the context of learning and teaching within two units of study. The aim is to explore the concrete experience of preservice teachers and their teacher educators in a learning process through a praxis inquiry methodology. Metacognition, as a concept, has been investigated through an interpretivist lens to discover how this might enhance thinking skills. This is particularly in relation to the impact that metacognition may have on learning and the translation of thinking skills to high standards of academic writing.

3.3 Research design and qualitative research procedure

3.3.1 Purpose

The purpose of this study has been to investigate the phenomenon of metacognition and a connection to academic writing in a praxis inquiry approach to preservice teacher education. An inquiry into how this is manifested within the teaching and learning process, the study aims to contribute knowledge that may inform and guide policy and practice in the field of preservice teacher education.

The decision to use a qualitative/interpretivist/paradigm is considered appropriate for achieving the aims and purpose of this research project for the following reasons. This study aims to investigate and expand knowledge of the theoretical base for understanding how metacognition might contribute to the development of high standards of academic writing. Second, there is a need to understand the effectiveness of current practices and practical applications of pedagogy that can guide teacher education policy. Third, the research skills and tools considered applicable for this study are based upon the philosophical belief that a qualitative design will encompass data and data collection methods that enable analysis from the authentic, lived experience of the participants. The major research question and subsidiary questions were designed to this effect and have formed the basis for this investigative study. These were outlined at the end of the literature review (see page 25).

These questions have formed the basis of the study's implementation process, which has included the review of relevant literature, data collection and analysis. In designing these questions, careful consideration was given to ensuring they were linked closely to the aims of the study.

3.4 The research site/context and purposeful sampling

3.4.1 Research site/context of the study

This study was conducted at two campuses of a university in Melbourne, Australia. There were two cohorts of participant subjects involved. These participants were drawn from the student population studying in the first-year Bachelor of Education course being delivered at both campuses of the university. One cohort consisted of fifteen preservice teachers enrolled in two first-year, compulsory education units in the Bachelor of Education. The second cohort comprised nine lecturer/tutors teaching in these two units of study.

The age range for the preservice teacher cohort was from eighteen to forty-seven years and could be considered representative of the student population at the university where this study took place. Students at this university differ to some extent from the general population of university students, in that they come from diverse social and cultural backgrounds and are far more likely to be the first in their families to attend higher education. The lecturer/tutor cohort teaching in these two units of study could be described

as between the ages of twenty-five and seventy, although their specific age was not requested by the researcher.

The context of this study was two compulsory education units of study, in the first-year program of the Bachelor of Education course at the time of this study. The curriculum content of these two units was based on literacy education. These units of study were conducted at both campuses of the university, although one of the units had a practicum placement attached to it. This will be referred to as Unit 1 throughout this thesis. This focused specifically on literacy education in primary school classroom settings. The practicum placement was a project collaboratively implemented with primary schools that had a partnership with the university and with the Regional Office of the Victorian Department of Education and Early Childhood Development. This practicum placement formed a vital part of the preservice teachers' development of the content knowledge and assessment tasks in both units of study. The classroom teachers provided practical modelling of literacy education practices in their classrooms and a mentoring role for the preservice teachers. The lecturer/tutors conducted debrief sessions at the primary schools and conducted lectures on the university campus. The other unit will be referred to as Unit 2. This was conducted at the respective university campuses on the same day as Unit 1 to complement theoretical learning with the practicum placement learning.

3.4.2 Rationale for sample method and size

Participant sampling was random, in that participant recruitment was on a voluntary basis from the two campuses of the university where the Bachelor of Education course was being delivered at the time of this study. The specific details regarding the recruitment process are outlined below.

This qualitative research project has a sample size of fifteen preservice teacher participants and nine lecturer participants. This is an exploratory study which seeks to investigate the experiences of the connection between metacognitive thinking and academic writing in a praxis inquiry approach to preservice teacher education. The sample size has been considered on the basis that it will generate qualitative data that can be analysed for authenticity and credibility. It is anticipated that data analysis through thematic saturation can be reached with this number of participants (Parker 2004).

3.4.3 Process for recruitment of participants

The data collection process is outlined below and was conducted following approval from the Ethics Committee. This is discussed in further detail on page 42.

Group 1. Preservice teacher participants enrolled in the Bachelor of Education units.

Permission was sought via an email request and gained from the unit coordinators for the researcher to attend lectures in the Bachelor of Education units for the purpose of inviting participation in the research study.

The researcher attended the weekly lectures towards the end of the semester at both campuses of the university where these units were being delivered. The researcher was introduced to the preservice teachers. Preservice teachers were asked if they would like or be willing to participate in the research. The research proposal was outlined, and they were given a letter of invitation that included information detailing the research aims and objectives; methodology; data collection and storage; confidentiality; ethical considerations; timeframe and anticipated time requirements for participation; and contact details.

The researcher informed preservice teachers that she would return to the lecture the following week to allow them time to consider participation in the study. They could then volunteer to participate in the research by notifying the researcher in person after the lecture or by email. If they had any further queries about the research, they were invited to contact the researcher or supervisors prior to deciding to participate in the study.

Preservice teachers who decided to participate provided an exchange of contact details with the researcher and were provided with further information. This included an informed consent form. Preservice teachers who decided to participate in the study were given further opportunity to discuss any concerns or ask any questions before returning the signed consent form. Once the researcher received the signed consent form, the participant was contacted, and a time and place arranged for the interview to occur.

Group 2. Lecturers teaching in the Bachelor of Education units

Permission was sought and gained via email from the unit coordinators for the researcher to invite teaching staff to participate in the research project. This was by a letter of invitation that included information to participants detailing the research aims and objectives; methodology; data collection and storage; confidentiality; ethical considerations; timeframe and anticipated time requirements for participation; and contact details (email address and mobile phone number).

3.4.4 Profile of the participants

Participants were not specifically asked to describe their backgrounds. Therefore, the following information has been determined by the researcher based upon information volunteered by participants during the interview process. The names of the participants have been changed for confidentiality.

Group 1. Preservice teacher participant background:

The participants are introduced in the table below in the order that approximates the duration spent between completion of secondary school education and enrolment into this course. This is used as a criterion for introducing them. Although time away from formal study is not a crucial focus of this study, it is a factor noted by some participants and was of interest to the researcher, particularly in relation to the level of experience with the academic writing process. The range of gender participation in this cohort is four males and eleven females, which approximates the gender proportions enrolled in the units of study.

Table 1. General characteristics of study participants

Name	Relevant Identifying Characteristics
HELEN	First-year enrolment into the Bachelor of Education post-secondary school.
RHONDA	Not specified.
KAITLYN	First-year enrolment into the Bachelor of Education post-secondary school.
JULIAN	First-year enrolment into the Bachelor of Education course post-secondary school.
LUCY	First language is Arabic. Studied English in an American school in Egypt.
MARCO	Two years away from formal study post-secondary school prior to enrolment in the Bachelor of Education.
SHARON	Enrolment into the Bachelor of Education course a number of years post-secondary school but not specified.
CATHY	Not specified.
NADINE	First language is Arabic; has been in Australia for four years.
PAMELA	Previous employment includes: part-time dance teacher and gymnastics coach in schools; managing a restaurant; receptionist for a real estate firm. The number of years away from study post-secondary school not specified.
SUSAN	Employment and completion of a Master's degree in marketing prior to enrolment into the Bachelor of Education course.
DAVID	Ten years of employment in a prison following his secondary school education.
JUDY	English as a Foreign Language (EFL) teacher in Asia for fourteen years prior to enrolment into the Bachelor of Education course.
FLEUR	Eighteen years since previous formal study prior to enrolling in the Bachelor of Education course. Completed a Diploma in Writing and Editing course during this time.
ROD	Twenty-five years of employment as a radio journalist prior to enrolment into the Bachelor of Education course.

Group 2. Lecturer/Tutors.

This cohort of lecturer/tutor participants represents a range of age and teaching experience at the university level. However, all participants were experienced teachers who had taught in the school system (both public and private, primary and secondary) prior to teaching in the first-year Bachelor of Education course. One of these participants had experience in adult education, teaching English as another language to mature-age students. This participant had also taught at another university, specialising in ICT support. Two participants were coordinators in the units of study, with a special interest in transition and retention. Two of the participants were invited to volunteer to participate in this study due to the specialisation of their work in the university's Language and Learning Support Unit. These two participants worked in

collaboration with academic teaching staff in a team-teaching role, as well as providing individual learning support to preservice teachers with their academic writing skills. They delivered special lectures and developed ICT writing resources for the two applicable units of study.

The lecturer/tutor cohort of participants who were teaching in these units of study and were interviewed brought considerable expertise in literacy education, experience and knowledge of first-year preservice teachers' abilities in academic writing. While this experience had not necessarily been gained in teaching in these units of study, their previous involvement teaching the first-year cohort of preservice teachers contributed valuable prior knowledge of the writing capabilities of first-year preservice teachers in the Bachelor of Education course.

3.4.5 Research strategy: Data collection methods

Kemmis (1980) asserts that the value of qualitative research is that it connects to the real world and can describe actions in social and historical contexts that can be rationally critiqued. Data collection methods in this study connect to the real world and seek to capture the lived experiences of the co-participants in the social context of university learning. The data collection methods have been chosen on the basis that they capture and describe the participants experiences of teaching and learning in the context of these two units of study selected for the study.

Castellon (2010) argues that there are three kinds of data collection that are commonly used in qualitative research: interviews, observations and written documents. Qualitative interviews may be used either as the primary strategy for data collection or in conjunction with observation, document analysis or other techniques. It was decided that a one-on-one interview process with two groups of participants (preservice teachers and their lecturers/tutors) and document analysis would be the main sources of data to fulfil the goals of this study. As an interpretivist/constructivist study these data collection methods were also considered appropriate for the purpose of triangulation, authenticity and generative insights.

3.4.6 The interview method

Richardson (2000) argues that while quantitative research can be interpreted through results that display sections, tables, figures, and graphs, qualitative research carries meaning throughout the entire text in how it is written. In this respect, the meaning and significance of the data collected is determined and extracted by the researcher. The decision to use an interview method as a major source of data collection is considered appropriate for this study. Further, data that was obtained from the interviews provided a rich and authentic account of participants' experiences that is captured through their words.

A semi-structured interview process was selected on the basis that this method would support the discovery of new information through open-ended questions that allowed for individual variations (Patton 1990). The data collection process was conducted over a two-year period. Preservice teacher participants

were recruited at the end of each semester following the delivery of the units of study to ensure they had adequate experience of learning and teaching within the units.

3.4.7 Semi-structured interviews

The major source of data collection method was a face-to-face, semi-structured interview with the two cohorts of participants. The interviews were conducted for an average duration of forty-five minutes to one hour. An interview schedule was developed to provide a list of questions (see Appendix E and F) to ensure consistency in the information provided to each participant. Interview questions were designed to gather information that would help to answer the main research question and sub-questions to meet the goals of the study.

The questions were carefully considered for ambiguity, as well as to ensure that ‘leading’ questions were not being asked to maintain integrity of the study and its credibility. The order in which questions were asked was also a consideration. The first question was particularly important as it was designed to allow participants to feel comfortable about discussing their strengths and weaknesses in academic writing assessment tasks.

The benefit of presenting the same interview questions to each participant is that it allowed them the freedom to express their personal experience and opinions, but also provided consistency of topic for analytical purposes. This process was designed to maximise the opportunity to gather authentic data that would identify similar or disparate patterns of participant experience. Capturing the authenticity of this experience was aimed at developing generative insights from the data. The interview schedule enabled good use of the limited time available for interviewing multiple subjects and ensured that data was collected in a systematic and comprehensive manner. Face-to-face interviews also had the advantage of providing the researcher with non-verbal information such as facial expression, capturing the emotions that participants felt while answering questions and voice intonation that could also inform the researcher. Freebody (2003) states that ‘[s]emi-structured interviews begin with a predetermined set of questions but allow some latitude in the breadth of relevance’ (p. 133). This enables the researcher to elaborate on issues should the need arise while interviewees express their views. The advantages for interviewees is described by Freebody as, ‘...hav(ing) something of the best of both worlds by establishing a core of issues to be covered, but at the same time... leaving the sequence and relevance of the interviewee free to vary, around and out of the core’ (2003, p. 133).

All interviews were audio-recorded with permission from the participants and meeting notes were taken as appropriate. Interviews were conducted in a place that was agreeable to both the researcher and participant for privacy and confidentiality. The decision to record interviews was made to capture a detailed verbal account of the interview process which was transcribed verbatim, at the conclusion of the interview process.

Table 2. Example:

Researcher	Sure, very interesting. Okay. Metacognition is a term that's sometimes used in teacher education classes. Can you indicate if you've ever heard of this term and if you have heard this term - - -
Respondent	I have. I don't know whether I can write that word down though, I mean - - -
Researcher	- - - if you have heard this term, can you explain what you understand it to mean, so that goes into your - - -
Respondent	Well, obviously it's a cognitive process of understanding and thinking and well, I suppose it would come into higher order thinking and that kind of thing with Blooms Higher Order thinking, I would say, but I should be able to break that word down and actually know it. I know I should but I can't think of the exact - - -
Researcher	It's simply what your understanding is, so don't feel there's a right or wrong.
Respondent	Yeah. I feel like it's a cognitive approach, and perhaps with that then, ensuring that students actually do understand and finding different ways to actually make them, because comprehension is the biggest thing in learning, so that would be how I would view it in my own words.
Researcher	Okay. So, when you are writing, do you have an awareness of being metacognitive?
Respondent	Yeah, definitely. Well, from what I just said in terms of thinking a lot about what I'm writing, absolutely. Yep. I'm always, I do—like I said, when I have a topic like the question that we had to—for me, that was interesting and I would go and I did research a lot and I did five or six interviews with teachers to try and have a full understanding of actually what was happening and where things were headed.
Researcher	Are you aware of any metacognitive strategies that might assist you with academic writing? If so, please indicate what these strategies might be.
Respondent	Well, I probably should do some more library training in that area because the strategies that I use are what I've discussed already, in terms of I have a think about whatever the question is, then do some research about it, try and find my thoughts whether they're supported or not supported and then have a plan and just make sure that I'm always going back to the actual question and keeping everything concise and tight.

3.4.8 Other data sources: Document analysis

Patton and Appelbaum (2003) suggest that another source of information that can be invaluable to qualitative researchers is the analysis of documents. Therefore, in addition to the interview method, other data sources utilised in this study to assist in the process of answering the research questions included documents such as the unit guides, Web CT, university policies, and published material in the review of the literature. These documents supported the data analysis process by enabling the researcher to cross-reference data sources to support, confirm or refute findings, find gaps in knowledge and develop answers to the research questions.

This data sampling took into consideration the research goals and the need to achieve depth through triangulation of data sources. It was considered that the combination of one-on-one interviews with both groups of participants, supplemented by other data sources of document analysis, was sufficient to achieve saturation and triangulation. According to Patton (1990), by examining information collected through different data sets the researcher can reduce the impact of potential biases. Triangulation helps the researcher guard against the accusation that a study's findings are simply the result of a single source or the investigator's bias.

3.5 Data analysis procedures

3.5.1 Thematic analysis

Data analysis is defined by Bogdan and Biklen (1982) as '[w]orking with data, organising it, breaking it into manageable units, synthesising it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others' (p. 145). An inductive process has been used to analyse the data for the purpose of building generative insights. This has allowed significant themes to emerge and be identified that are relevant to the objectives of this study.

Qualitative data in this study has been analysed using thematic, mind mapping and narrative techniques. The aim has been for the participants to have the opportunity to describe their experience without judgement. In this respect, Marshall and Rossman (2006) convey that the narration of these experiences provides a basis for describing some of the shared meanings of concepts or phenomena that can emerge. The interview process enabled the researcher to use extensive written descriptions to portray experience as evidence. Each interview was transcribed from the audio-recording and then analysed for recurring themes using thematic analysis. Thematic analysis is an analytical tool that supports identifying, examining and reporting patterns and themes that emerge from the data. According to Aronson (1995), a theme captures what the researcher has interpreted as being most significant about the data that relates to the research question and creates a pattern of meaning within the data. This is an active process of analysis that requires coding of data, sorting codes and extracts into potential themes and combining different codes

to support a theme. Thematic analysis involves identifying the story that the data unfolds and how this connects with the research question (Braun & Clarke 2006).

There were two phases of coding conducted as part of this process. These phases were open coding and axial coding. Open coding is a process that begins with the analysis of raw data to identify themes that emerge. During this process, the conceptual categories of the phenomena, 'metacognition' and 'academic writing' were grouped and named. This process created descriptive and multidimensional categories that provided a preliminary framework for analysis. The next stage of analysis required a re-examination of the open coding categories or themes to identify how these were linked. This is a complex process sometimes called 'axial coding' (Strauss & Corbin 1990). Strauss and Corbin (1990) describe this process as one that enables the researcher to build a conceptual model that allows for a new understanding of the phenomena being studied.

The stages of the data analysis process in both open coding and axial coding are described below in greater detail; however, while these are described in a linear fashion, in practice they occurred both simultaneously and repeatedly. The phases of thematic analysis outlined by Aronson (1995), Braun and Clark (2006) and Strauss and Corbin (1990) were used in the process of open coding and axial coding.

Open coding

The stages of the open coding process are listed below.

1. Familiarisation with the data: Listen to the interviews, transcribe the interviews, read and reread data, noting ideas and vital information in the margin and throughout the transcript.
2. Read through each transcript a second time, analyse the findings and generate preliminary codes. This involves systematically coding features relating to the research questions about metacognition and academic writing that stood out across the data set and organising pertinent data into each code. An individual mind map from each participant interview was created as a visual representation of the key themes that emerged from the concepts/codes (see Appendices D and E).

Axial coding

The stages of the axial coding process were as follows.

1. Preliminary concept codes were generated from each participant mind map to systematically code features that stood out across the data set. These were analysed, and pertinent concepts were synthesised as data codes.
2. More generalised concept codes were then organised into possible themes from the code extracts and data pertinent to each potential theme. This was organised into new themes and concepts that emerged from individual mind maps. Themes were reassessed through constant analysis to reduce

and refine the details of each theme to ensure they fitted with code extracts and the data set as a whole. This provided a thematic map of the analysis (see Appendices C and F).

3. Themes were named and defined. The final stage of analysis of all the data, interviews and document analysis, helped to generate a sub-chapter outline for the data analysis chapter. This final analysis provided the opportunity to choose clear and convincing extracts to support the documentation of narrative extracts as evidence within the themes.

3.5.2 *Mind mapping*

Mind mapping was used to complement thematic analysis. Mind maps were developed for each participant using thematic codes developed during the analysis phase. Developing mind maps to visually represent the themes as they emerged contributed to another stage of analysis of the data. This created a thoughtful process that allowed greater authenticity for the interpretation of the participants' views to be documented visually. The individual participant mind maps described data chunks that served to provide the researcher with an audit trail of the speakers' words, phrases and events relevant to the research focus questions, connecting similar categories or themes (Kotob, Styger & Richardson 2016). These themes were then synthesised to form a more holistic axial coding system, which created a fuller picture of how the data shaped the thesis.

It was found the use of mind mapping as an analytical tool complemented the thematic analysis. Using participant narratives allowed for examining and relating meaning at the ideational level of the speaker's experiences for analytical purposes (Huberman & Miles 2002). As such, the researcher was able to interpret the data at a deeper level by questioning the meanings and implications of the emergent themes in relation to the overall thesis questions (Braun & Clarke 2006). Because this research was about thinking skills, it was fitting that a 'thinking tool' such as mind maps (Buzan 1974) should be a preferred option to complement the development of themes. Mind maps can represent individual experiences through graphic construction of meaning (Wheeldon & Ahlberg 2011). (See examples of mind maps at Appendices C, D, E, F).

Kotob, Styger and Richardson (2016) explore mind mapping techniques to assess the suitability of the technique for conducting qualitative data analysis. The conclusions drawn from their study indicate that mind mapping is a suitable technique that is conducive to analysing large amounts of qualitative research data collected from face-to-face, semi-structured interviews. They contend that detailed information on the mind maps facilitates in-depth discussion about the findings. While their study used technology to develop mind maps to analyse data, they discuss the capacity for mind maps developed manually (which was the case in this study) to produce valid research outcomes.

3.5.3 Reporting

The thematic coding process required being conveyed as a story-line to be read by an audience. Strauss and Corbin (1990) convey that this should ideally be a ‘rich, tightly woven account that closely approximates the reality it represents’ (p. 57). In this respect, it was decided that the use of narration or participant voice to ‘story’ the data as examples, was the preferred means of allowing the participant experience to demonstrate the evidence behind the analysis. The individual participant transcripts were repeatedly reviewed against the initial coding process to ensure the most representative data was selected to provide clear and convincing extracts in support of the themes identified and the significance of the themes. At this stage, the analysis, past literature and the research questions were synthesised to provide the final report.

3.6 Researcher’s role and potential ethical issues

3.6.1 Insider research

This study occurred within the workplace of the researcher. At the time of this study, the researcher had been employed for five years as a sessional lecturer/tutor in the Bachelor of Education stream at the university where this study took place. As a result, it is important to discuss issues related to insider research. Insider research is defined by Griffith (1998) in the following terms: ‘The insider is someone whose biography (gender, race, class, sexual orientation and so on) gives her [sic] a lived familiarity with the group being researched’ (p. 361). In this study, there was ‘lived familiarity’ with the group of teacher educators with whom the researcher was working in the two units of study. This created an insider relationship.

The main issue surrounding insider research is the impact it can have on validity or credibility such as in this study. There are advantages and disadvantages to conducting research within one’s workplace. The advantages relate to issues of familiarity with the context and social setting, outlined more specifically by Taylor (2011):

Deeper levels of understanding afforded by prior knowledge; knowing the lingo or native speak of field participants and thus being ‘empirically literate’ (Roseneil, 1993); closer and more regular contact with the field; more detailed consideration of the social actors at the centre of the cultural phenomenon making access to, and selection of, research participants easier and better informed; quicker establishment of rapport and trust between researcher and participants; and more open and readily accessible lines of communication between researchers and informants due to the researcher’s continuing contact with the field. (p. 3)

Essentially, insiders have a better initial understanding of the social setting because they know the context. They understand the links between situations and events, and they can assess the implications that arise

as a result of conducting particular methods of inquiry (Freebody 2003; Coles & McGrath 2010). However, Mercer (2007) argues that, '[w]hat is much more debatable, is whether or not this heightened familiarity leads to thicker description or greater verisimilitude' (p. 11).

The advantages of being an inside researcher in this study stemmed from possessing a strong theoretical base in literacy development, as well as experience teaching literacy education units (including these two units of study) at the university. This familiarity contributed to an ability to be 'empirically literate', as Taylor describes above. This was particularly in relation to understanding the contextual environment of the study, the theoretical content of the units of the study, and the ability to relate to the diverse nature of the preservice teacher cohort. This experience contributed prior knowledge that enabled a deeper understanding of issues participants expressed during the interview and the ability to identify pertinent themes during the analytical phase of data processing. The research process itself was constructivist and unfolded as data was collected, analysed and reported through a storytelling method.

As far as disadvantages to insider research are concerned, the main issue is that, as an insider, there is 'always the potential for accusations of knowledge distortion and that insider views will always be multiple and contestable, generating their own epistemological problems due to subject/object relationality' (Taylor 2011, p. 3). Mercer (2007) notes there are three specific areas where insider research creates dilemmas for the researcher. These are the potential for research ethics, reciprocity in interviews and informant bias. As a result, strategies were put into place in the design phase of the study to avert the possibility of insider research bias as far as was foreseeable to minimise any impact on credibility in this interpretative study. These strategies are summarised below under the headings Research Ethics: Participant Recruitment/Selection Sampling: Data collection Methods/Informant Bias, Data analysis, Credibility/Research Design.

3.6.2 *Research ethics*

Ethical considerations in relation to insider research were detailed in the submission to the university's Ethics Committee. This submission was approved by the committee and clearance was provided on 27 August 2012, prior to conducting this study (procedural details are outlined above).

The need to address the potential for bias as an inside researcher has meant particular consideration has been given to areas where there is known risk of bias occurring in the design phase of the study. The following strategies were employed to avoid bias during participant recruitment, data collection methods and in the analytical phase were implemented to avoid compromising the integrity of the study. These are outlined below.

3.6.3 Participant recruitment: Selection/sampling bias

The risk of sampling bias was mitigated by using a recruitment method which called for volunteers. Preservice teacher participants were drawn from a cohort not known to the researcher. The process for recruitment was deliberately conducted on days when the researcher was not employed as a sessional teacher. None of the students who volunteered to be interviewed had been taught by the researcher and all were totally unknown to the researcher prior to the interview.

3.6.4 Data collection methods: Informant bias

As a researcher considered to be an ‘insider’ in this study due to familiarity with the teacher educator group being studied, the issue of informant bias was not an impediment to the research process. There had been no particular viewpoint or stance expressed about the research topic by the researcher in discussions prior to, or after, the participation of the lecturer/tutor cohort in the study. Two of the participants were coordinators in the course, which typified a power relationship; however, this did not impact on the data collection process at interview.

Interviewer bias is considered by Norris (1997) and Mercer (2007) to be one of the most difficult research biases, particularly in qualitative research. An awareness of this potential for bias during the interview process required that measures be put into place to avoid this as far as possible. As a researcher, strategies implemented were, first, a conscious focus on reading the questions to participants and not engaging in discussion. Second, the questions were designed to allow the participants to express their personal experiences. For this reason, they were open-ended and there were no preconceived answers required from the participants. Third, the transcripts were read by the researcher to check for interviewer bias at the analysis and reporting phase. In addition, during the process of coding the data, discussion with supervisors occurred to ensure objectivity and transparency when generating research themes.

3.6.5 Data analysis

Norris (1997) argues that paradigms, whether quantitative or qualitative, can be prone to different types of error due to the researcher’s capacity to make mistakes of judgement. The main issue regarding insider research is the potential for bias and, therefore, the need for personal and social strategies to address this. These strategies have been outlined above.

In deciding on a qualitative/interpretative approach, it is acknowledged that there can be some inherent researcher bias at the analytical level in the design method chosen and the philosophical beliefs about knowledge creation (Norris 1997; Mercer 2007). The fact that a qualitative study design was selected at the outset of this study indicates that there has been a level of bias from the design perspective of the study. This design was selected due to a preference for a constructivist approach to knowledge creation. This created a need to focus strongly on the data itself to ‘tell the story’ to avoid bias. The choice of using

participants' voices as narration in a 'storying' method has enabled the data itself to be the evidence of their experience.

While the 'insider researcher' issue has meant a greater consciousness of the need to avoid bias, the background knowledge and experience brought to the analytical phase can also be considered a positive feature of researcher credibility. The background of the researcher contributes to generative insights in this study in terms of what Strauss and Corbin (1990) refer to as 'theoretical sensitivity'. This relates to the personal attributes of the researcher to have 'insight, the ability to give meaning to data, the capacity to understand, and capability to separate the pertinent from that which isn't' (p. 42). According to Strauss and Corbin (1990), theoretical sensitivity comes from the researcher's professional and personal experiences, as well as the professional literature studied. Eisner (1991) and Patton (1990) argue that the credibility of qualitative research reports is dependent upon the researcher's ability to be sensitive to the data when analysing and making decisions in the field of study. In this study, the researcher's background knowledge and experience as a literacy educator is considered to have contributed theoretical sensitivity to the research.

3.6.6 Credibility/Research Design

Patton (1990) advocates 'a paradigm of choices that seeks "methodological appropriateness" as the primary criterion for judging methodological quality' (p. 39). The primary reason behind the choice of a qualitative paradigm for this study is that it will produce quality data to understand the phenomenon being studied in a rigorous manner. This is to provide what Lincoln and Guba (1985) argue as having 'credibility, transferability, dependability and confirmability, which conform to the naturalists' equivalents of the more conventional rigour criteria of internal validity, external validity, reliability and objectivity' (p. 5).

The philosophical basis that underpins this study is that the participants and their views of the experience in learning and teaching are an authentic representation of data. This is considered appropriate to inform the development of new insights or knowledge in the field of academic writing in preservice teacher education. The research methodology adopted in this thesis privileges the voices of participants and enables viewpoints, feelings and emotions to come to the surface. It is the rich 'descriptive data' conveyed by their 'words' that is significant for knowledge creation in this study—particularly as the praxis inquiry framework of learning that underpins the units of teaching (the context of this study) was based on constructivist methodology.

Kuhn (1970) advocates that there can be more than one set of beliefs or paradigms that constitutes reality and counts as knowledge yet Mercer (2007) argues that qualitative studies continue to be criticised for a lack of objectivity and generalisability, despite the many positive aspects of qualitative research. Generalisability is commonly defined by the degree to which the findings of the study can be extended to the entire population, but this feature is contestable in qualitative studies (Patton 1990; Yin 1989).

Alternatively, Kress (2011) argues that qualitative or postmodern research is context-specific, which detracts from it being able to be replicated precisely in another location. Kress proposes that additional criteria are required to judge the value of qualitative studies, suggesting that it is the degree to which the study has been transformative to the researcher as well as participants that makes it desirable. Therefore, as an insider researcher in a qualitative paradigm who identifies first and foremost as a teacher and educator, the following quote by Kress (2011) resonates, as well as reflecting on the generalisability of this study into metacognition and academic writing in a praxis inquiry approach to teacher education.

I did not seek to prove the generalisability of my study, but instead considered how other teachers may accommodate my findings to their own reality. To make their accommodation easier, I tried to make my own settings, biases, and details of my study explicit so that teachers could have as much information as possible as they accommodated for their own classroom (p. 190).

Mercer (2007) argues that the primary concern of qualitative research should not be how it can be generalised to the wider population but, rather, the knowledge generated being valued in its own right. Mercer argues that the primary concern should be on the goals of the study when evaluating the quality of research reports.

As a result, it is more appropriate to refer to the triangulation of data as forming the basis for validity or credibility in this study, aptly described by Denzin (2012):

Truths are multiple, ambiguous, literary standards of truthfulness replacing those of positivism. In the middle is work that offers description, exposition, analysis, insight, and theory, blending art and science and often transcending these categories. First-person voice is used; scholars seek intimate familiarity with their textual materials. (p. 83)

Lincoln and Guba (1985) described the goal of credibility as demonstrating that the inquiry was conducted in a manner to ensure the topic was accurately identified and described. The use of in-depth description of complexities of experiences and interactions needs to be embedded in the data and the final text.

In this study triangulation of data collection methods, such as one-on-one interviews with two participant groups, document analysis of course material and the review of the literature are considered to support the credibility of the data analysis and findings.

3.7 Conclusion

In summary, this chapter has outlined the decision to use an interpretivist/qualitative paradigm as being appropriate for achieving the aims and purpose of this research study. This study is driven by theoretical

interests; it has its base in the embodiment of theory and practice, with the relationship between metacognition and academic writing in participant learning being of key interest. The objects for study are the ‘ordinary’ members of a society—in this case, tertiary educators and their students in the field of education. While there have been other forms of inquiry on metacognition—particularly quantitative studies in the field of psychology—there is a gap in qualitative research in the field of metacognition and academic writing in preservice teacher education. The context for this study provides the platform for the voices of these ‘ordinary’ preservice teachers, and those of their teachers, to inform learning in preservice teacher education. The aim of legitimising these voices fits the purpose of qualitative research, which is to ‘generate theories not to verify them’ (Coles & McGrath 2010, p. 57). These theories are outlined in the next chapter and sub-chapters, which provide the data analysis and findings from all data sources.

Chapter 4. Data Analysis and Findings

4.1 Introduction

This chapter investigates and presents the data that identifies information relevant to the main research question and sub-questions. This part of the thesis will be presented as distinct sub-chapters from data gained by thematic analysis. The use of illustrative examples from participant interview transcripts is provided throughout as evidence to describe the experiences of both cohorts of participant group, preservice teachers and lecturer/tutors.

However, before embarking upon these data analysis sub-chapters, an introduction to the praxis inquiry model is presented as background information. This is required to provide the basis for understanding the context and participants' perspectives on their experiences and, the researcher's interpretation of this experience when analysing and drawing generalisations about the data. An outline of the praxis inquiry protocol and written assessment tasks is provided as a distinct sub-chapter under the heading 'Background Information' (4.2).

Following this outline of praxis inquiry, the data analysis findings are organised around the following themes.

- What is participant understanding of metacognition?
- What is the nature of learning, teaching and writing in a praxis inquiry model of teacher education and connections to metacognition?
- What metacognitive strategies are identified by preservice teachers and teacher educators that can inform pedagogical practices to contribute towards the expansion of knowledge in the field of academic writing?

These three themes will be used as headings. The sub-chapter that follows the background information, presents data which describes participant understanding of metacognition (4.3). This provides the basis for determining how both cohorts of participant group understood metacognition. This aims to provide an exploration of issues relating to how metacognition manifests as an attribute that may contribute towards the development of academic writing skills in praxis inquiry learning.

The next sub-chapter (4.4) revisits the literature to explore issues arising from participant understanding of metacognition and a definition of metacognition. The following sub-chapter (4.5) presents participant data that explores learning and writing in praxis inquiry to determine the relationship between metacognition and praxis inquiry, and to identify teaching and learning strategies used by preservice teachers and teacher educators. This aims to identify theories of learning and pedagogy that may impact positively on the development of high standards of academic writing. The next sub-chapter (4.6) examines the role and relationship between assessment and metacognition in preservice teachers' written assessment

tasks. This is followed by an exploration of the role of Information Communication Technologies (ICT) and metacognition, sub-chapter (4.7).

4.2 Background information: The context

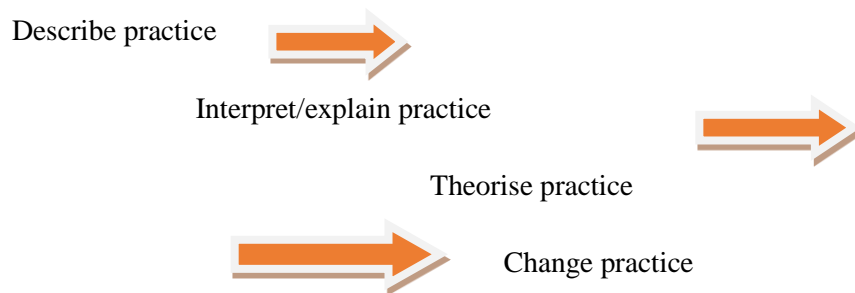
At the time of this study, the College of Education at this university had implemented a ‘praxis inquiry’ model of preservice teacher education. Within this first-year level of the Bachelor of Education (Preparatory to Year 12), learning and assessment tasks in these compulsory education units were linked to the practical school experience placement or field experience that preservice teachers were required to undertake as part of their course and to gain registration as a teacher.

Praxis inquiry emerged at this university as a process that aimed to maximise the learning potential of students from diverse social, cultural and linguistic backgrounds. The educational philosophy behind praxis inquiry was that meaningful learning was generated from authentic experience. Praxis inquiry was considered an avenue to harness and connect university learning to the school practice with the aim of developing discerning educators. Lang (2010) encapsulates this approach in the following statement.

Praxis Inquiry is an ideological framework developed at X University and reported on by Cherednichenko and Kruger in 2005. This framework is organized around several beliefs: (1) the exploration of pre-service teachers’ questions about the ways students experience education and learning is central to their development as future teachers, (2) university-based teaching should be grounded in and responsive to the pre-service teachers’ questions, field experience, and inquiries, and should involve pre-service teachers in collegial and professional discourse to address questions and inquiries, (3) university teacher educators should acknowledge the significant impact social factors have on educational experience and learning, and (4) university teacher educators should engage in partnerships that allow the field-based and campus-based education of teachers to unfold in rich and dynamic school contexts. (Lang 2010, cited in Crowe 2010, p. 72)

Within the praxis inquiry process of learning, assessment tasks were based upon preservice teachers’ personal experience and inquiry questions derived from the practical school placement. Praxis inquiry provided a vehicle that generated authentic questions which aimed to lead to deeper investigation of educational issues through assessment work. The writing tasks in the two units of study for this investigation were predominantly associated with research-based genres of writing. These written assessment tasks consisted of (a) a case and commentary; (b) a research- based inquiry into an aspect of literacy education (both these assignment tasks required distinct conventions of writing associated with research reports); and (c) a reflective journal that accompanied an oral presentation of a digital portfolio. (Issues relating to assessment and metacognition are discussed separately in sub-chapter 4.7.

The praxis inquiry protocol illustrated in the diagram below was designed as a means of helping preservice teachers reflect on their experience in schools, to develop an understanding of how educational theory connects to practice. While all assessment tasks required the use of the ‘praxis inquiry’ protocol illustrated in the diagram below, the reflective journal was structured in a way that guided preservice teachers to write under each of these headings. This protocol aimed to direct preservice teacher thinking and writing, in a manner that helped them to interpret their experience and develop their own theories about the teaching and learning process. (See Appendix G, which details these features in the Praxis Inquiry Booklet (p. 3).



A key aim of the praxis inquiry model of learning embedded into these units was to develop discerning educators by giving preservice teachers the opportunity to work in collaboration with experienced literacy educators in school classrooms. This offered authentic contexts for the development of personal questions and the investigation of literacy education while in a mentor relationship.

To answer the main research question, ‘What is the connection between metacognition and academic writing in a praxis inquiry model of preservice teacher education?’, it is important to begin with an investigation of participants’ understanding of metacognition. This will be followed by outlining participants’ experience of learning, teaching and writing in this praxis inquiry approach.

4.3 Participant understanding of metacognition

This section presents data findings on how metacognition is understood by both cohorts: preservice teachers and lecturer/tutors. This is followed by an additional review of the literature pertaining to issues surrounding a definition of metacognition due to a gap identified in this area.

It is important to determine participants’ understanding of metacognition to identify epistemological issues surrounding how this might contribute towards the enhancement of preservice teacher writing. Any new insights may inform curriculum course design and implementation, pedagogy and professional development for academic teaching staff.

For the purpose of this analysis, Flavell’s (1976) definition of metacognition is revisited. This is used as a reference point to ascertain participant understanding of the term as well as to determine evidence of

metacognition in the data. Participants' personal interpretations outside of this definition are also included. This is to identify any variables that may impact upon this understanding. Flavell (1976) defined metacognition as follows:

In any kind of cognitive transaction with the human or non-human environment, a variety of information processing activities may go on. Metacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of these processes in relation to the cognitive objects or data on which they bear, usually in service of some concrete goal or objective. (p. 232)

The preservice teacher participants' understanding of metacognition are outlined first, followed by the lecturer/tutor perspective under distinct sub-headings. What follows from this is a synthesis of issues that arise from both cohorts of data sets. The aim here is to highlight new insights into how metacognition as a concept is defined and understood by all participants.

4.3.1 Understanding metacognition: The preservice teacher perspective

To determine how metacognition was understood by preservice teachers, the fifteen participants in this study were presented with the following question at interview: 'Metacognition is a term sometimes used in teacher education classes. Can you please indicate if you have heard of this term and, if you have, could you please explain what you understand it to mean?'

Three out of the fifteen participants responded that they had not previously heard the term metacognition. Twelve said they had heard of the term but were unsure of its meaning. Despite articulating uncertainty, these participants made attempts to explain what they thought metacognition might mean and demonstrated a variety of perspectives to how metacognition was understood. These perspectives are outlined in the following examples.

In the statement below, Kaitlyn connects metacognition with cognitive understanding in the learning process when she says,

I've heard of it but I'm not 100% sure what it means. I'm guessing it's how much the students understand and how much they're taking on board? I think metacognition is your understanding of what you're learning, how much you actually take on board. Like you might listen very intently and get most of the main points but you might not get everything, I think, like it's just your grasp on something, I suppose.

In this case, Kaitlyn draws upon her past experience to construct a definition that is meaningful to her. She links metacognition to students' cognitive learning when she refers to 'how much the students understand', and also to her personal cognition when she says, 'I think, like it's your grasp on something'. However, there is also the connotation of an association with a level of cognitive depth in comprehension

which she can't quite express in her comments below. This inability to explicitly define metacognition suggests there is an elusive element; Kaitlyn conveys that metacognition is a term that she has heard and thought she understood the meaning of, until required to provide an explanation:

I heard it before, but it's one of those words that you kind of just hear and you go, 'Yes, I know what that means', but if you try and put it into words, you're—I don't know what that means.

Despite an inability to give a precise explanation of metacognition, Kaitlyn stated that she needed to investigate the meaning when required to do an assignment and explained that she used Google to do this.

I was doing my assignment yesterday that asked a question about metacognition and I had to go and look it up. All I got was that it's taking your own learning into your own hands, kind of expanding on what you're getting yourself. So, like doing the readings and that kind of stuff, but I'm not entirely sure. That was just me Googling what metacognition was.

This statement revealed that while Kaitlyn was unsure of the meaning, there was cognitive awareness that she did need to take responsibility for her own learning to expand her knowledge in this area. According to Flavell's definition, this example can be interpreted as evidence that Kaitlyn was in fact being metacognitive. Her use of the word 'expanding' when 'doing the readings' showed an awareness of the need to extend her cognitive learning through reading. This was being metacognitive, albeit unconsciously, through a constructivist approach to her learning during the research process. From a theoretical perspective, a constructivist learning approach is characterised by use of active learning strategies to develop and extend current knowledge to change and create further knowledge.

Other preservice teachers, Pamela, Nadine, Julian and Susan, associate the term metacognition with cognitive learning styles and learning theories in their attempts to explain how metacognition is understood. In the following example, Pamela interprets metacognition as,

[t]he different facets of your understanding and so the different types of learning, I don't know, that you've—sorry. So, cognitive development would be your knowledge and your understanding, so the meta being 'many', I guess.

Despite being apologetic at her uncertainty to provide a succinct definition, Pamela identified that metacognition is related to cognitive understanding and associates this with different facets of learning as she interprets the prefix 'meta' to mean 'many'. The reference to 'different types of learning' suggests that Pamela is drawing upon her previous knowledge about theories of learning, particularly those of Kolb's (1984) learning styles and Howard Gardner's (1995) multiple intelligences theory. These theorists were studied as part of the first-year preservice teacher curriculum prior to undertaking these two units of study.

In a similar fashion, Natalie also refers to different learning styles and appears to connect metacognition with multiple intelligences. Her explanation below highlights an understanding that metacognition is related to cognition; however, there is a disclosure that despite having heard of the term, it has not been understood sufficiently to provide an explanation. We see this when she says,

I've heard that term but I can't remember what it means, actually. But cognition, it's like learning intelligence and style, and metacognition is something like multiple—I don't know, I can't... Yeah, I've heard it but I can't explain it, and I didn't understand it very much. Cognitive learning style, I know what cognition means, but metacognition, I'm not—I don't know.

Julian also reports that he does not have an adequate understanding of the meaning of metacognition but associates it with understanding his own learning. Like Pamela and Nadine, he does this by extracting prior knowledge from a previous unit of study. Consistent with constructivist learning approaches, Julian dissects the word in his attempt to create a meaning based on prior knowledge, but discloses he feels the need to make a greater attempt to learn more about the meaning. In doing this, his comments denote a sense of guilt, when he says, 'I've heard of the term. I'm not particularly well versed in what it means necessarily. I should learn more about the meaning of that I suppose. I should... From dissecting the word I'd say it's understanding how I learn best'.

This example raises an important issue related to pedagogy and constructivist learning theory and expectations of student learning in the tertiary environment. This sense of guilt conveyed in Julian's response suggests that he feels responsible for his own learning where independent research is required. However, while independence in learning is part of university studies, this example, like the previous ones, suggests that there has been insufficient exposure to the meaning and use of the term metacognition. This provides insights into this study of metacognition which reveal implications relating to a pedagogy of practice.

In addition to previous participant examples, where there is an association between metacognition and learning styles, the excerpt below connects Susan's understanding of metacognition to Benjamin Bloom's (1956) taxonomy of thinking skills. This taxonomy is known for the promotion of learning that relates to a hierarchy of cognitive complexity in thinking processes. However, like Julian, we see a disclosure of the participant expressing feelings that suggest she should know this term. Susan's explanation of metacognition is outlined below.

Well, obviously it's a cognitive process of understanding and thinking and well, I suppose would come into higher-order thinking and that kind of thing with Bloom's higher-order thinking, I would say, but I should be able to break that word down and actually know it. **I know I should but I can't think of the exact...** Yeah. I feel like it's a cognitive approach, and perhaps with that then, ensuring that students actually do understand and finding different

ways to actually make them, because comprehension is the biggest thing in learning, so that would be how I would view it in my own words. (emphasis added)

Susan reveals some key issues relevant to an understanding of metacognition in this statement. One, there is an association between cognition and metacognition that is related to hierarchical thinking. Two, while unable to provide an exact definition, she displays metacognitive thinking in an unconscious manner. Susan demonstrates an awareness of her role as a future teacher and the need to think about successful ways to assist her students. We see this when she asserts,

I feel like it's a cognitive approach, and perhaps with that then, ensuring that students actually do understand, and finding different ways to actually make them, because comprehension is the biggest thing in learning.

This example demonstrates that her understanding that metacognition encompasses evaluative and monitoring qualities which are connected to her own thinking and her future teaching repertoire. Three, in a similar vein to other participants, it would be reasonable to interpret that Susan has utilised constructivist learning principles using her past knowledge of learning theories to decipher a meaning of metacognition. Four, Susan expresses that metacognition is a word she feels she should know, but is lost for a word to express the meaning when she says, in the section highlighted in bold text above, 'I know I should, but I can't think of the exact...' Again, this statement indicates there is a sense of an elusive factor present in her attempts to define metacognition.

In contrast, preservice teachers Rod, and Fleur overtly state that the terms used in specific units of study are difficult to understand. This highlights the existence of linguistic discourse associated within areas of study that preservice teachers need to understand to succeed in their studies. In the following example, Rod expresses frustration and confusion at his inability to understand the 'specific language' associated with the disciplinary units of study which causes difficulty for his studies.

I have heard of it and I think it's the way in which you practice your teaching. I think. I can't remember 100% but I do hear it a lot and I think that's half the thing that confuses people when they first start is some of that language, on top of what you're already learning, other language, but to learn specific language related to your subject can be confusing.

In the example below, Fleur also articulates that metacognition is a new term encountered at university as part of a new vocabulary. She adds that it is also difficult to understand in the disciplinary readings within the units of study. This is attributed to insufficient verbal use of terms, despite the term metacognition being 'unpacked' in lectures.

Okay. I've never really heard the term before I started school (university). Maybe I've read it somewhere, but it's not something that I use. I just know that I have to because there are all

these terms that we read, but we don't get to use them. It has been unpacked in the lectures, but because I still don't use it in my everyday speaking, it's still a difficult term to understand.

This is important information to this study, as it highlights the need for a teacher education pedagogy that has a greater focus on ensuring the linguistic discourse within disciplinary units is understood. An important insight from this information is a need to develop the speech mode of academic literacy in a more holistic manner. We see this when Fleur says, 'It's not part of my discourse' (highlighted below). These examples suggest that an increased focus on discussion through spoken forums is required concurrently with disciplinary readings to develop key vocabulary within units of study. It can be inferred that comprehension and facility with the spoken discourse of disciplinary studies has the potential to impact upon writing quality.

Despite expressing that terms were confusing, Fleur managed to provide a highly sophisticated explanation of metacognition that describes it as being 'beyond cognition', her thought processes and factors that influence her thinking.

So, it's you know, beyond, you know, cognition, the way that you think, your thought processes in the brain and yeah, it's me thinking about how I'm thinking, like what kind of influences my thoughts, you know. And how much my thoughts are influenced by what's happening around me, the age that I'm at, you know, my experiences in the past. So, I can sort of understand that, but it's still a hard term because I don't go home and talk to my husband about the metacognitive—you know what I mean? **It's not part of my discourse.** (emphasis added)

Fleur's reference to metacognition is consistent with the most common definition, 'thinking about thinking', when she says, 'But my idea is—what will I say? It's thinking about thinking, so you know, for me, meta—I thought it comes from the Greeks, doesn't it?' Fleur develops this expression by using her prior knowledge of the Greek language, which enables her to translate the word from her mother tongue. Fleur demonstrates metacognitive skills in an unconscious manner when she analyses her thoughts by asking questions about what impacts upon her thinking. Her insight into what influences thoughts, such as environment, age, and experience, can be interpreted as demonstrating metacognitive knowledge, (cognition) as in Flavell's definition. However, what appears to be missing is an ability to transfer how her understanding of metacognition can be utilised in the praxis inquiry learning framework to support her learning. This potentially relates to her use of the expression, 'beyond cognition', which denotes an elusive, but hierarchical aspect to thinking processes. In using this expression, a complexity in defining metacognition is revealed. This is not only related to cognition and the regulation of cognition as in Flavell's definition, but something else which appears difficult.

4.3.2 Discussion

Several common themes emerged from preservice teachers' understanding of metacognition that provide insights relevant to this study. In the first instance, most participants were unable to provide a succinct definition of metacognition. This was due to insufficient familiarity with an understanding of the concept of metacognition. Data examples indicate that understanding the term metacognition has implications for pedagogy. Reinforcement through verbal use is suggested for it to be understood and used successfully in learning. It can be inferred from this information that the development of spoken language is connected to metacognition, which has the potential to impact on written language. This information resonates with the work of Woodward-Kron (2002; 2004; 2008; 2009) who identified a relationship between language and cognition and the need to develop students' lexico-grammatical choices to develop critical thinking skills in writing.

Furthermore, while many preservice teachers found it difficult to provide a definitive explanation of the term 'metacognition', they were all (except for one participant) prepared to make attempts at an explanation. The significance of information gained from these attempts, and the explanations provided, contribute insights into learning theories and pedagogy. These data examples suggest that metacognition as a construct is connected to cognitive constructivist, experiential and developmental learning theory. Preservice teacher participants drew upon their prior knowledge and experience to decipher a meaning of metacognition. All the participants who tried to explain their understanding of metacognition did so by drawing upon a range of theoretical learning principles. One, a cognitive constructivist approach was evident. Participants actively sought to construct a meaning of the word metacognition using cognitive processes about word knowledge, to build new knowledge about vocabulary. Two, experiential learning that drew on preservice teachers' personal cognitive learning from the school practicum placement and theories of learning from past education subjects featured strongly. There was evidence of participants making links between metacognition and a variety of learning theories based on Gardner's (1985) multiple intelligences theory, Kolb's (1984) learning styles, Vygotsky's socio-cognitive learning (1978), Piaget's (1953) cognitive development and Bloom's (1956) taxonomy of thinking. This information supports the notion that metacognition is connected to cognitive constructivist learning principles. It also connects the concept of metacognition to theories which emphasise diversity of learning style and hierarchical thinking skills.

In addition, some participants demonstrated metacognitive skills—albeit in an unconscious manner—to decipher a meaning of metacognition. These data examples suggest there needs to be a greater emphasis on making metacognition overtly understood for self-regulation benefits of learning to be realised. According to Flavell's definition, it can be surmised that there needs to be conscious knowledge and understanding of metacognition for preservice teachers to have a capacity to regulate their knowledge.

It can also be postulated from the data that experiential and developmental learning factors were an important consideration in preservice teachers' inability to confidently explain their understanding of the concept. This has considerations for pedagogical practices, particularly given the time constraints in the delivery of university units of study.

The data suggests there is a need for a greater focus on making the concept of metacognition explicit as a construct. Other aspects that impact on learning, such as self-knowledge and self-regulation, also need to be identified during the learning process. Given the degree of uncertainty participants expressed in their understanding of metacognition, the data suggest a greater emphasis on pedagogy to complement constructivist modes of learning. A key insight gained from this data analysis is that the concept of metacognition needs to be understood as a conscious and visible process of learning and teaching, to benefit writing. This raises the important questions, 'What theoretical approach to pedagogy will best serve preservice teachers to develop an improved understanding of metacognition so it can be used as a conscious process that improves learning and writing?' and, 'Is there is a potentially dichotomous relationship between constructivism and empiricist approaches?' These questions will be explored further in the data analysis, which aims to identify metacognitive strategies used by preservice teachers and teacher educators (see sub-chapter 4.6)

Overall, the preservice teacher participant examples illustrate that there is only partial understanding of metacognition. In this respect, preservice teachers' understanding of metacognition is potentially the result of two factors. First, experiential and developmental learning is not sufficiently matured at this stage to enable a more comprehensive description of metacognition. This factor aligns to developmental learning theories such as those espoused by Dewey (1938), Piaget (1953), Vygotsky (1978), Kolb (1984) and Mezirow (1991). Developmental learning is generally known to be related to the growth of cognitive functioning as a result of maturation, experience and environmental influences. These theories are particularly relevant due to the praxis inquiry process of learning in these two units of study. In this respect, Mezirow's (1990) notion of transformational learning is significant to metacognition. As a theoretical construct, transformational learning occurs as an outcome of growth and development of cognitive functioning. However, for this transformation to occur there needs to be a maturation factor in the capacity to critically reflect and analyse experience. It can be argued that these skills require metacognitive awareness, as well as the capacity to analyse experience. At this stage of preservice teachers' experience of learning, metacognition as a learning construct has not been fully understood or developed.

Second, critical reflection and analysing experience are skills that are characteristic of higher-order cognitive functioning. It can be surmised that these skills are an inherent aspect of metacognition but require facilitation. According to Flavell's definition, there needs to be a knowledge and understanding of what it means to be analytical. Importantly, the skill of analysis needs to be developed for the regulatory function to be activated. While constructivism is related to individual cognitive processes within metacognition, the data suggests there needs to be external facilitation by a teacher or mentor to develop

analytical thinking skills, particularly at the level required for high standards of writing. This has implications for pedagogy. The data suggests teaching strategies that have a specific focus on developing critical reflection and analysis are required to develop an improved understanding of metacognition and its use as strategy for the enhancement of writing skills.

All the preservice teacher participants who tried to explain the term did so by drawing upon theoretical learning principles, such as experiential learning from prior knowledge and cognitive constructivist approaches. This was demonstrated in examples where participants sought to actively break down the word meaning using cognitive analysis about word knowledge to build new knowledge about vocabulary. Finally, many participants related metacognition to cognitive learning and the regulation of cognition. There was evidence of some participants having a recognition of the need to understand this term better, both for understanding their own learning and for the benefit of their future students in classrooms.

In cases where participants did exhibit some knowledge of metacognition, this was not at a maturational level consistent with developmental theorists such as Mezirow (1991; 2003) for transformational learning to occur. Further experience and understanding of the regulatory factor of metacognition was required for this to be activated as a conscious process that could lead to transformative learning. This contributes important information relating to an epistemology of metacognition and pedagogical practices.

Another pertinent issue that emerged from this data was the presence of an elusive factor that appeared to make it difficult for preservice teachers to provide a conscious, succinct definition of metacognition. This did not appear to be associated with Flavell's definition of cognition and the regulation of cognition, but connotations of something indescribable. This element raised questions as to whether this difficulty was simply due to insufficient study of the term or whether there could be another explanation.

Having discussed some key insights gained from the preservice teacher data on how metacognition was understood, we now move to an investigation of how the lecturer/tutor participant cohort understood the concept of metacognition. Data evidence from this cohort of participants aims to identify issues relating to metacognition from the teaching perspective. This information will be analysed from the lived experience of academic teaching staff in these two units of study. It will then be analysed in conjunction with the preservice teacher experience and synthesised to contribute new insights to help answer the thesis questions.

4.3.3 Understanding metacognition: The lecturer/tutor perspective

The nine lecturer/tutors participating in this study were presented with the following question at interview. This was, in the first instance, to determine how participants understood metacognition; second, to gain evidence of metacognitive strategies being used by preservice teachers in their writing; and, third, to identify learning theories that might contribute towards the development of metacognition. The question presented to interviewees was:

Metacognition is a term sometimes used in teacher education courses such as this. There are three parts to this question. Can you please explain what your understanding of this term is? Do you think your students display metacognitive skills in written assignments and if so, please describe this?

This section will focus on the first part of the question, which aims to investigate how teacher educators understood metacognition. The analysis of the second part of the question, which aims to identify evidence of metacognitive skills in preservice teacher writing, will be discussed in the sub-chapter on metacognitive strategies identified by preservice teachers and teacher educators that can inform pedagogical practices to contribute towards the expansion of knowledge in the field of academic writing. (p. 123)

Findings from the data analysis attributed to the lecturer/tutor responses to this question highlighted some common themes in their understanding of metacognition. First, participants found it difficult to articulate a succinct definition. They provided varied opinions on how the concept of metacognition was understood and defined. Second, metacognition was interpreted as being related to a hierarchical level of cognition and language facility. Third, metacognition was associated with the skill of reflection in the context of preservice teachers' learning in praxis inquiry. Fourth, there was an elusive aspect to defining metacognition which was not explained by Flavell's (1976) definition.

4.3.4 Participant variation in understanding the term metacognition

Data findings on how metacognition was understood by the lecturer/tutor cohort of participants revealed a variety of viewpoints on the term. These viewpoints encompass the term both as a concept and as a skill that manifests in learning and teaching. This was not surprising given the diverse backgrounds of participants and their experience teaching in these first-year units of study. However, what did emerge as significant for this study was that teaching staff responses resembled those of the preservice teacher cohort, in that they also found it difficult to articulate a succinct definition of the term. This is important to a study of metacognition because it draws attention to the need for an explicit and consistent understanding of the term for pedagogical purposes.

Data responses to an understanding of metacognition by lecturer/tutors varied. Some participants expressed apologetic feelings at their inability to articulate a succinct definition. Other responses closely resembled that of Flavell. In the main, however, participants used the common term, 'thinking about thinking', but elaborated with their own interpretation of how this manifested in teaching and learning in these units. This variation in participant understanding is illustrated in the examples below.

Participants such as Gaye and Ann made statements that appeared apologetic for their inability to provide a concise definition. However, despite this, their responses revealed many important aspects to metacognition. We see this when Gaye says, 'Metacognition, well it's how and why the students start to think about what is going on or what they are seeing in a classroom. I should have looked this up before.'

Despite stating she ‘should have looked this up’, Gaye’s interpretation of metacognition reveals she associates this with preservice teacher learning in the praxis inquiry process, which requires a focus on thinking about education pedagogy from experiential learning. In this example, contextual and environmental factors feature as important to the development of thinking skills in metacognition.

An apologetic response also surfaced when Ann says ‘Sorry’ in her attempts to explain the conceptual processes occurring in metacognition in the excerpt below. Ann’s response signals an understanding of metacognition that encompasses complex cognitive functions in the brain that are difficult to explain. This is evident when using the phrase ‘beyond the cognitive’, which has connotations of an elusive element to metacognition that appears to create difficulty. Ann’s response also demonstrates an association of metacognition with ‘narrative’ that emanates from social and cultural factors. This view of metacognition suggests there is a connection between linguistic discourse that is socially and culturally constructed, as a facet of metacognition. In addition, Ann’s use of the term ‘sort out’ alludes to a form of cognitive analysis associated with discourse in the process of being metacognitive. We see this when she says,

[f]or me I’d probably be thinking a bit more in terms of narrative and I mean narrative with a capital N which is probably very similar now thinking back to your metacognition. For me the narrative also goes beyond the cognitive, it also has the social and the cultural implications in there too. That idea of being able to form a distance on things and being able to sort them out in your brain, sorry it may not actually be the brain but we tend to call it that but forming a distance on things, being able to notice patterns between one particular occurrence and another, linking it in a sort of theoretical sense but a very personal theoretical.

Ann’s definition raised some important issues to a study of metacognition. Metacognition is a difficult term to explain explicitly; it has an elusive aspect described as ‘beyond the cognitive’. Ann’s response exhibits an interconnection between cognition with social and cultural factors in her interpretation of metacognition. The use of the term ‘narrative’ indicates that Ann’s understanding of metacognition is a complex cognitive construct, embedded within cognitive and linguistic discourse. This is important in the context of university learning and genre (narrative). The knowledge of such ‘narrative’ is required to enable personal theoretical learning, which is an important factor in praxis inquiry learning in these two units of study. Ann displays cognitive understanding of what metacognition means to her (cognition) and emphasises the regulatory factor of cognition when she uses terms such as ‘sort out in your brain’, ‘from a distance’, ‘notice patterns’ and ‘linking to a sort of theoretical’. These are all regulatory terms associated with the skill of analysis.

Ann’s understanding of metacognition, which connects the individual construction of ‘a very personal theoretical’, indicates that metacognition is linked to constructivist learning principles at the individual cognitive level, drawn from socially and culturally constructed patterns of thought. In this respect, Ann’s interpretation of metacognition is closely aligned to socio-cultural and cognitive development theories

espoused by Vygotsky (1978) and Bruner (1991), in that the individual development of narrative is associated with social context through the mechanism of language.

Overall eight of the nine participants (Shane, Cathy, Emilia, Jane, Paul, Lyn, Ann and Gaye) also demonstrated an understanding of metacognition that included features of Flavell's (1976) definition. This was particularly in relation to the active monitoring and regulation of thinking. This is outlined in the examples presented below.

Shane's definition of metacognition below closely resembles Flavell's when he refers to the relevance of thinking and monitoring thought processes in education and learning. We see this when he highlights the importance of preservice teachers possessing the capability to monitor and control their learning, particularly if they do not understand something or need to improve in some area. Shane's emphasis on the ability to acknowledge learning difficulties and elicit control or regulatory strategies, such as revision, request assistance from others or conduct further reflection on personal understanding, highlights two important facets of metacognition. One is the importance of the individual having a consciousness of metacognition to understand their learning (self-knowledge); the second is possessing the confidence and independence to activate strategies that will improve learning (regulation). This is articulated in the following statement.

I suppose that a common definition is thinking about thinking, but I think also it's particularly relevant in the context of education and learning, because it's often about we need to think about our thinking processes involved in learning, so 'I've just read an article, I read a chapter out of a textbook and I don't quite know what it means, I understood that bit, I didn't understand that bit. Perhaps I need to read it again, perhaps I need to go and ask my tutor or perhaps I just need to sit and think about it for a while.' Do you know what I mean? Actually reflecting upon how you react to a text, particularly a written text, but I think also how you react to what I've seen in a classroom, for example. 'Why do I like that, why do I not like that? What does that mean to me?'

This notion of monitoring and control of learning within a definition of metacognition is also considered applicable to teacher educators. We see this when Shane suggests there is a need to 'explicitly' understand thoughts as part of the teaching repertoire in the excerpt below. This example draws attention to the need for teacher educators to have a cognitive understanding of the self as teacher, to monitor their students' metacognitive skills to develop (regulate) suitable teaching strategies to strengthen these. By highlighting the importance of teacher educators being metacognitive, Shane draws attention to an important connection between metacognition, teacher monitoring as skill assessment, and pedagogy. Pedagogy such as the development of spoken language skills is suggested as an important mechanism to develop thinking skills. This example highlights an understanding of metacognition as a skill that needs to be developed as a process for both teaching and learning, as is evident when Shane says,

[a]nd, then being really explicit in your own thoughts about how that works, and I think for that to happen students need to talk about it because I think students who are weak at metacognition actually benefit from being able to verbalise it and through the verbalisation, they actually discover what they think. Sometimes it's hard to know what you think until you say it out loud.

In the examples below, Cathy and Emilia express their understanding of metacognition in a manner that closely resembles that of Flavell (1976). They claim there needs to be conscious awareness of thoughts (cognition) and the regulation of this by taking some form of action. This is illustrated when Cathy suggests that there needs to be a deliberate attempt on the part of the individual to actively monitor, plan and regulate thinking processes ('take action') in relation to goal fulfilment.

My understanding, metacognition is thinking about thinking or being able to think and plan and to develop your ideas from your thinking. To be open and again... being open to thinking about it, looking through it, working through it and taking action on what you're thinking.

Emilia's definition closely resembles Flavell's in that she describes metacognition as having knowledge about how you learn, self-regulation, planning and monitoring learning.

Metacognition is being able to think about your own thinking in order to be a successful learner. So in order to have knowledge about how you learn and how you think I suppose and understand your own thinking processes. It's being able to plan and monitor your own learning. There's also the idea of that self-regulation and being able to perhaps be aware of your own thinking and being able to evaluate it, maybe assess your own prior knowledge so for me it's quite higher-order thinking and it's quite a difficult process.

Emilia's understanding of metacognition, which makes explicit the connection between metacognition and success as a learner, is an important insight for this study. However, this success requires an awareness of thinking processes and the capacity to evaluate these, which are both linked to self-regulation. Self-regulation has been described by writers on the topic of metacognition as an inherent part of metacognition (see e.g. Zimmerman 2001; see also the literature review in Chapter 2). This information highlights the need for a consciousness of metacognition, as well as the associated evaluative thinking processes for this to lead to successful self-regulated learning. This ability to evaluate thinking and 'assess your prior knowledge' is deemed by Emilia to be associated with the capacity to operate at a hierarchical level of thinking which she describes as 'quite higher-order thinking'.

These comments by Emilia illustrate a meaning of metacognition that encompasses not only an awareness of thinking, but also a complexity associated with evaluating thinking. This evaluative capacity fits with the regulatory function of cognition described by Flavell, as is evident when Emilia describes this process

as ‘being able to perhaps be aware of your own thinking and being able to evaluate it, maybe assess your own prior knowledge so for me it’s quite higher-order thinking and it’s quite a difficult process’.

4.3.5 Metacognition and hierarchical thinking

An association between metacognition and hierarchical thinking skills was a common theme to emerge from the data. Other participant responses in addition to Emilia’s, such as those of Lyn, Paul and Ann, also describe their understanding of metacognition as the ability to evaluate thinking processes associated with higher-order thinking skills. This resonates with theories espoused by Bloom (1956) in his taxonomy of thinking skills and de Bono’s (1985) concept of the ‘Thinking Hats’—particularly the blue hat, which can aid the development of analytical thinking. A connection between metacognition and hierarchical thinking development is an important insight. It informs this study about teaching strategies that can support the development of thinking skills to contribute towards higher standards of academic writing in preservice teacher learning. We see this in the examples below.

Lyn associate’s metacognition with the skill of analysis in learning, as exemplified in her view that thinking skills require development and that preservice teachers’ personal metacognition can be supported through strategies such as de Bono’s Thinking Hats. Her comments cite the blue hat, which facilitates analytical thinking skills. Metacognition, in this case, is connected to her belief that preservice teachers need the capacity to question and analyse their thinking practices to better understand the learning process. The role of the teacher educator here is emphasised as a facilitator of metacognitive learning, but there is also evidence of Lyn being metacognitive herself as part of her teaching repertoire. Consistent with Flavell’s definition, there is a consciousness that she needs to focus on the goal of developing preservice teachers’ metacognitive skills. This is on the basis that she has conducted a self-analysis of her past teaching practice in this area.

I think that’s maybe something that we lecture about metacognition and all of that in relation to what it is and the children at school, but I think maybe what I’m trying to do this year is get them to think more about their personal metacognition. So, for example, this subject is learning to learn and it’s so important to learn how does our brain learn? If you think of de Bono’s blue hat and thinking about the thinking, that’s what it’s all about, do you know what I mean?

Lyn’s definition of metacognition is associated with deep and surface learning connected to the praxis inquiry approach. She sees metacognition as an approach that can lead to deeper learning when she says, ‘I guess the parroting is a surface level of understanding while the taking it on board is the deeper understanding’. Lyn emphasises the potential of metacognition to facilitate deeper understanding when she says, ‘So, in a way, concentrating on metacognition could be a way into a deeper approach to this learning’.

However, Lyn contributes further evidence to the difficulty of the evaluative component of metacognition when she says, ‘So they need to think about their thinking. But that’s a really hard... again, it comes back to that hard process of really thinking “Why am I thinking about my thinking? What’s the purpose of that?” Do you know what I mean?’ This example draws attention to the notion that metacognition needs to be a conscious process in which preservice teachers are able focus on their thinking in a deliberate manner, to question and understand the purpose of their thinking as part of learning in praxis inquiry.

In a similar fashion to Lyn and Emilia, Paul also emphasises the evaluative component of metacognition as an active, regulatory process when he says, ‘I also feel that it is an understanding and awareness of our own thought processes, almost like an analysis of our own way that we put together our thoughts and our actions’.

Alternatively, Ann takes a linguistic stance, asserting that metacognition is connected to cognition and discourse. We see this when she refers to it as ‘meta narrative’, which has connotations of something higher at the cognitive level associated with language use. Ann also used the terms ‘deeper understanding’ as opposed to ‘surface level’, indicating some form of hierarchical comprehension of language being implicit within the process of metacognition. This aligns with theories espoused by Marton and Saljo (1976) and Lavelle and Bushrow (2007), who emphasise that there are degrees of depth in the thinking processes associated with deep and surface learning.

Ann’s view of metacognition emphasises the notion that language is a key aspect of metacognition but there is a hierarchy of language comprehension and use within this. In using the terms ‘meta narrative’, ‘a broader form of narrative’ and ‘the use of language to talk about language’, we get a sense of the importance of language as the vehicle by which narrative can be expanded to become ‘meta’ or ‘broader’. This concept of broadening language facility through a conscious process of targeted use, for the purpose of goal fulfilment (deep learning), aligns metacognition with the theory of praxis used by Brazilian educator Paulo Freire (1970). Freire channelled the development of literacy skills through the concept of ‘conscientization’, whereby a critical consciousness is developed through a process of language use, reflection and action. This provides new insights into an understanding of metacognition that is aligned with language facility, particularly higher-order thinking and praxis inquiry learning.

A key insight that emanates from connecting metacognition to language facility is that a targeted approach to the development of language use has potential for cognition to be simultaneously broadened through verbal and written language skills. This is particularly important in a study of metacognition in a praxis inquiry process of learning. Praxis inquiry as a learning theory aims to develop a critical consciousness of the broad implications of education through reflection. The relevance of language skills, particularly the discourse of education through discussion as a mechanism to develop preservice teachers’ metacognitive skills, is a feature identified by several other participant responses in addition to Ann. Examples from Shane, Gaye and Paul outlined above also note the importance of discussion. However, this also required

reflection on learning from experience in the context of university and the school practicum placement. Reflection on learning was identified as being a prominent feature of metacognition, as outlined below.

4.3.6 Metacognition, reflection and context

A common view among interviewees' understanding of metacognition from both data sets was that reflection was an inherent component of metacognition. Participant responses from Gaye, Jane, Paul, Shane and Lyn identified that reflection was considered a key attribute of metacognition connected with the context of praxis inquiry learning. We see this when Gaye says, 'Metacognition, well it's how and why the students start to think about what is going on or what they are seeing in a classroom'. Gaye's understanding of metacognition is associated with how her students come to an understanding of education in the context of their school placement. This enables them to see the wider implications of education, or what she refers to as the 'bigger picture', which is how she defined metacognition. Similarly, Jane associate's metacognition with the context of the classroom and individual reflection but considers this as 'more than problem-solving'. Jane's view of metacognition is based upon preservice teachers' reflective capacity to cognitively process their direct experiences of teaching and learning within the context of the classroom practice. Jane draws attention to metacognition being the result of reflection on situational context that requires cognitive processing within the praxis inquiry process in preservice teacher learning. Metacognition, in this example, entails cognitive analysis through reflection on the learning process to enhance preservice teachers' skill development. This is evident when Jane says:

For me, when I think of metacognition I think about thinking about thinking skills, so it's more than problem-solving. I think about people being put into situations where they reflect on situations, they reflect on the way that they process in certain situations. If you're talking about praxis enquiry it's all about thinking about what the student is doing, why they're doing it and how the processes are enhancing their skill development.

In a similar manner, Paul's interpretation of metacognition relates to a reflective teaching process described by Donald Schön (1987) as reflective practice, exemplified in the work of teaching. Paul describes his understanding of metacognition as 'beyond cognition', which again gives the impression of an elusive aspect to metacognition with connotations of a hierarchical level of thinking. This is almost intangible but is connected to analysis within reflective thinking and action (regulation).

Well, I've always thought that metacognition is beyond cognition, so it's the thinking about your thinking and that's the way I usually explain it to others, and it's part of the reflective process. We reflect on our actions, but we also reflect on how we're thinking. I also feel that it is an understanding and awareness of our own thought processes, almost like an analysis of our own way that we put together our thoughts and our actions.

Paul's interpretation of metacognition as 'beyond cognition' denotes a highly sophisticated level of cognitive functioning within the reflective process, which he describes as an ability to understand and analyse how thoughts are connected.

In the example below, Shane emphasises the importance of preservice teachers having the capacity to understand their thinking processes to become better learners and discerning educators. A key aspect of Shane's understanding of the term metacognition is the focus he places on the direct experience preservice teachers obtain in the classroom as part of their practicum. The identification and selection of writing content in these two units of work require an ability to make discerning judgements about educational practices through self-questioning. It can be inferred that Shane's reference to having an 'explicit' knowledge of the thinking process required to do this necessitates a level of consciousness within the reflective process that equips preservice teachers to make judgements about meaningful learning experiences. In this case, metacognition is associated with a constructivist learning approach as being conducive to the development of metacognitive skills. This is evident when he says,

I suppose that a common definition is thinking about thinking, but I think also it's particularly relevant in the context of education and learning, because... we need to think about our thinking processes involved in learning... I think also how you react to what I've seen in a classroom, for example. 'Why do I like that, why do I not like that? What does that mean to me?' And, then being really explicit in your own thoughts about how that works.

Alternatively, Lyn introduces the notion that emotion is connected to metacognition that impacts upon higher-order thinking within the process of writing. In a similar vein to Shane, she also emphasises the importance of direct experience, but she highlights that the experience needs to elicit an emotional response that contributes towards thinking at a 'higher level'. As a consequence, this is manifested in the quality of writing. This view of metacognition aligns with the socio-cultural view of learning and thinking advocated by Vygotsky (1978), in which there is a relationship between cultural historical activity theory (CHAT) and genre as social action. This theory of literacy development emphasises the important role of context—where writing takes place. As such, we see the impact of the lived experience and its impact on metacognition in writing, exemplified when Lyn states:

Well the main issue is... if you haven't had an experience about something, how can you write about it?... So when they're thinking about their thinking, they're thinking of it at a higher level because there's that emotion attached to it. So I think that reflects in their writing... So that would perhaps have a result on the effectiveness of their writing. How much emotional resource have they put into their experience? ...the best metacognitive parts are when they actually take and reflect on their own or other students in the classroom... experience, that's the best.

This notion that emotion is an important component of metacognition is also seen when Paul conveys his understanding of metacognition as related to empathy and social skills. The importance of having a knowledge and awareness of personal emotions, and the ability to manage and control these, fits with Flavell's definition of metacognition. However, this is also connected to Daniel Goleman's (1996) theory of emotional intelligence. We see this when Paul suggests that metacognition is an important attribute that is essential to the work of an educator. Teachers require the ability to be empathetic, to understand both themselves as learners and other learners, to effectively cater for these learning needs. This connection between metacognition and emotional intelligence is evident in Paul's statements below.

What I like about the idea of metacognition is that— perhaps you can have metacognition without it but it's a very social skill; it's part of the social world. We are teachers, we are creating the world from our social interactions, and metacognition is one of the skills that we have... They're amateurs at it, but it's part of their repertoire and it's actually possibly one of the reasons why they're into teaching, having a certain amount of empathy means that you think about other people and what they're thinking in that sense of a social position.

However, while Paul refers to metacognition as a skill that some people possess naturally, he suggests this is at an amateur level and requires formal development in the preparation of the teaching profession. This has implications for pedagogy and Paul suggests the use of verbal and written strategies to develop this.

Well, I think it's a valuable skill for a teacher to have and I would encourage teachers to think about metacognition as a way of approaching their profession because how do you know yourself and then you can know others, so I think that's a very important thing for them to do. And, like I was saying before, I think some people are naturals at it but like all natural skills, it would benefit. It can take you so far but if you really want to get into the next level you actually have to do it, you don't actually know what you think until you write it, and I don't know what I think until I say it.

An important insight for this study is Paul's emphasis that metacognition needs to be developed as part of formal study to enable preservice teachers to understand the learning process, both their own and others', in their preparation as future educators.

So, you have the amateur metacognitions who are the people who think about others, comes with the formalising nature of— yeah, somebody's actually studied this and started to talk about different ways that we approach metacognition, and things like... learning, what sort of a learner are you or the multiple intelligences.

In this sense, Paul and Lyn's comments connect metacognition to emotional intelligence. The ability to understand personal and interpersonal relationships is vital to the work of teachers which aligns to Goleman's (1996) theory of emotional intelligence and Gardner's (1983) multiple intelligences theory. Self-

awareness of emotions and self-regulation of these are fundamental social skills required of a teacher, who needs to manage both their own and their learners' emotions, to motivate and devise appropriate learning situations for successful learning. This information connects metacognition to the affective dimensions of learning and contributes to studies in the literature by Efklides (2006; 2011) outlined in Chapter 2.

4.3.7 An elusive aspect to metacognition

Finally, an important recurrent issue found in many participant responses was a sense that interviewees found metacognition difficult to articulate and define. This exemplified something elusive about the term. While the most common definition of metacognition used by teaching staff was 'thinking about thinking', this elusive aspect became evident in the language used by some participants. Statements which referred to metacognition as 'more than problem-solving' (Jane), 'beyond cognition' (Paul), 'beyond the cognitive' (Ann) and 'it's the bigger picture stuff' (Gaye) allude to interpretations of metacognition being associated with higher-order cognitive function that is difficult to explain. This elusive aspect is not fully explained by use of Flavell's definition of metacognition, which is an important insight for this study. This signals a complexity to metacognition that was not found in the literature, outside of Georgiades (2004), indicating further investigation into this elusive aspect would be desirable.

4.3.8 Summary: Lecturer/tutor understanding of metacognition

In summarising this sub-chapter on how lecturer/tutor participants understood the term metacognition, it appears the key features of their understanding were as follows.

- Metacognition was described in a manner that gave it an elusive quality and was aligned with a hierarchy of thought associated with a somewhat indefinable level of abstraction. Participant language conveyed this as being more than 'having an awareness' of thinking and 'more than problem-solving', but related to something 'broader', 'higher', 'deeper', 'beyond cognition'. There is no evidence of this elusive factor in the literature studied. The majority of the studies into metacognition do not question participants' understanding of the term. This data provides new insights into a need to explore what this elusive factor might be and the connection to higher-order cognitive function in defining metacognition.
- Metacognition was associated with an ability to evaluate and analyse thinking connected to the regulation of thinking, not simply cognitive awareness. This is consistent with the self-regulation literature by Winne (1996) and Zimmerman (1995).
- Metacognition was associated with linguistic discourse that is contextually bound in the social and cultural dimensions of language and thought, which aligns with the theories of Vygotsky (1986).

- Metacognition was closely associated with experiential, cognitive and social constructivist learning theories relating to the individual's construction of cognitive learning and the monitoring and regulation of learning.
- Metacognition was associated with the reflective skills that preservice teachers are required to develop in praxis learning from direct experience in the context of the school practicum setting. This highlighted two important facets of metacognition: the cognitive processing that occurs at the individual level of preservice teacher understanding, and the impact of external factors in the environment embedded in the context of a social and cultural learning framework. Dewey's and Piaget's learning principles emerged as significant cognitive development factors within the reflective process at the individual level, as did Vygotsky's (1986) socio-cultural theory in which learning is mediated through tools in the environment (such as language) that act to extend individual cognition. Donald Schön's (1987) work, which emphasises the role of reflection in learning, also featured in both the cognitive and social facets of preservice teacher development.
- Metacognition has social dimensions related to empathy, emotions and understanding the self and others. This resonates with the work of Efklides (2006; 2008; 2011) as being particularly important in the preparation of future educators. These qualities are integral to becoming a discerning educator.
- While constructivist principles were evident in how metacognition was understood, there was evidence that suggested metacognitive skills require development through formal instruction.

4.3.9 Discussion: The lecturer/tutor perspective

The data examples above reveal some key factors in participant understanding of metacognition from the teacher educator perspective. While many participants referred to the most common definition of metacognition, 'thinking about thinking', there was quite extensive elaboration on how metacognition manifests. Strong links were made to the ability to analyse thought processes connected to higher-order thinking skills; connections between cognition, socio-cultural and linguistic discourse factors, reflection on personal experience in the context of the school setting, and emotional and social intelligence were all features considered to be inherent in metacognition. Within these facets of metacognition, participants described features of Flavell's definition that related to monitoring and regulation of thinking processes. However, there was also evidence of a common difficulty experienced by participants in their attempts to explain their understanding of metacognition. This suggested the presence of an elusive factor to meta-cognition that was not consistent with Flavell's (1975) definition and which requires further investigation.

The multiple explanations from lecturers and their individual interpretations of the term metacognition revealed views about pedagogy and learning theories that underpinned program implementation and their teaching strategies in the praxis inquiry approach to preservice teacher learning. These will be elaborated

upon in the discussion that investigates evidence of metacognitive strategies found in preservice teacher writing in praxis in further sub-chapters.

4.3.10 Discussion of issues: Both data sets

Insights relating to understandings of metacognition by both participant groups are summarised below.

Metacognition is a difficult concept to understand. A definition of metacognition that involves understanding how we analyse, process, and put thoughts and actions together highlights the complexity the skill of being, or becoming, metacognitive. This connects metacognition to cognitivist learning theory at the conceptual level, as this requires individual construction of knowledge.

The views of participants presented in this data highlight the notion of intersubjectivity, which suggests there are multiple facets to how metacognition is understood. The aim of exploring participant understanding of metacognition has been to identify the potential of an epistemology of metacognition to enhance preservice teacher learning and writing. The data suggests there is an integrated holistic nature to metacognition, wherein there is a strong interrelationship between metacognition and experiential, social and cultural cognitive constructivist theories of learning.

Metacognition is also linked to a relationship between linguistic discourse and cognitive functioning. This is related to the social and cultural dimensions of language that impact upon the individual's understanding of their experience. This is embedded within the context where both cognition and language use occur.

Using Flavell's (1976) definition, there was evidence of participants demonstrating cognitive awareness, as well as of regulation of cognition; however, this was at an unconscious level. This highlights the need for a focus on pedagogy that makes explicit what metacognition is as a conceptual learning process. It can be surmised that the goal of regulating and enhancing learning, teaching and writing requires a conscious, visible process in terms of conceptual and skill development.

The themes that emerged from participant responses on how metacognition was understood raised some important questions to a study of metacognition. Why is the term metacognition a difficult concept to define which has an elusive quality? Is it related to something 'higher', 'broader', a skill that can be taught or something intangible that requires further investigation? What is the relationship between cognition and language? How is this manifested in learning? How does this impact upon the quality of writing? How do we assess metacognition? These questions will be addressed in the following sub-chapters, which investigate how metacognition manifests as a learning and teaching strategy in preservice teachers' writing in praxis inquiry.

To help answer the first of these questions, a further investigation of the literature has been conducted in relation to defining metacognition. This is important as there needs to be a common understanding of

metacognition if the concept is to be used as a mechanism for developing preservice teacher learning and academic writing.

4.4 Defining metacognition: Extending the literature

As the data findings have identified some complexity to defining and understanding the term metacognition, we now turn to the literature again in the attempt to develop some insights into the cause of this complexity. As researcher, there is an acknowledgement that returning to a review of the literature is not customary at this point of the thesis; however, it was considered necessary to explore this elusive dimension and to understand why the participants found it difficult to provide a succinct definition. This sub-chapter aims to draw on the literature again as part of ‘telling the story’ in this qualitative study to connect it with the findings that emerged in the section above. In this respect, a rather non-conventional approach to reviewing the literature again has been taken in the manner described by Wolcott (1990), who states:

I expect my students to know the relevant literature, but I do not want them to lump (dump?) it all into a chapter that remains unconnected to the rest of the study. I want them to draw upon the literature selectively and appropriately as needed in the telling of their story. (p. 17)

The purpose of this additional review of the literature, therefore, is to investigate the origins of the definition of the term ‘metacognition’ to help understand why participants experienced difficulties. Elements relating to the nature of metacognition are discussed, highlighting some of the difficult dimensions to extend the literature in this area.

Most of the research literature accepts Flavell’s original definition:

Metacognition (‘cognition about cognition’) includes any knowledge or cognitive activity that takes as its object, or regulates, any aspect of any cognitive enterprise. Metacognitive abilities undergo considerable development during middle childhood and adolescence. A distinction can be made between metacognitive knowledge and metacognitive experiences. The former refers to your accumulated declarative and procedural knowledge concerning cognitive matters and can be divided into three categories: person, task, and strategy. (Flavell 1985, p. 116)

Flavell elaborates on this definition to describe each of these categories.

The person category includes your knowledge and beliefs about people as cognitive processors. The task category refers to your knowledge about the cognitive processing implications of task information and task demands. The strategy category includes your knowledge about cognitive and metacognitive strategies. (Flavell 1985, p. 116)

There is little literature to be found that defines metacognition differently and the research has centred around the key elements of knowledge of cognition and the regulation of cognition, with little identified to challenge to this. There is merit in the concept that metacognition can have a potentially positive impact on the learning process, and the studies outlined in the literature in Chapter 2 attest to this.

This study has identified various features of Flavell's definition in relation to the knowledge factor and regulation aspects; however, there is some evidence of another dimension that appears elusive, an almost indefinable quality that has emerged in the data. It is this elusive quality that has led to the question, 'Does a definition of metacognition, that emerged as a result of studies in memory in children during the 1970s, sufficiently serve to address this in adulthood?' Could the term be given other meanings and relationships in the learning process, particularly in the problematic area that Brown (1987) defines as 'the meta' in metacognition? It appears that this is where some participants in this study have interpreted metacognition as associated with higher-order thinking, deeper learning or something indefinable, as 'beyond cognition'.

As noted in Chapter 2, definitions of metacognition have their roots in historical factors related to research in human learning. These connect to cognitive and social constructivist learning theories which emerged following Piaget's assimilation and accommodation model of cognitive development. This was broadly accepted from the 1950s to the 1970s (Georghiades 2004) and, although the theory is no longer widely accepted, it has had a significant influence on later theories of cognitive development, particularly that of Flavell (1985).

Flavell's work on cognition arose from his interest in and development of Piaget's contribution to cognitive development—in particular, the assimilation–accommodation model of cognitive functioning, which proposes that human cognitive functioning 'actively selects and interprets environmental information in the construction of its own knowledge rather than passively copying the information as it is presented to the senses' (Flavell 1985, p. 10). In keeping with this conception that cognition undergoes development and change through many interactions with the environment over time, Flavell (1985) maintains, 'According to this model, the cognitive system plays a very active role in its interchanges with the environment' (p. 10).

This use of the term 'metacognition' by Flavell was an extension of cognitive developmental learning theory. His research on metacognition was in conjunction with another prominent developmental psychologist, Ann Brown, which focused on children's metamemory, or knowledge and control of memory processes.

Research on metacognition by Schraw and Moshman (1995) and Zimmerman (1995) indicates that Flavell's definition has been widely accepted as the basis of studies on the different components of metacognition. Schraw and Moshman (1995) acknowledge that,

[m]ost accounts of metacognition make a basic distinction between metacognitive knowledge (i.e., what one knows about cognition) and metacognitive control processes (i.e., how one uses that knowledge to regulate cognition). Brown (1987) and Baker (1991), for example, distinguish knowledge of cognition from regulation of cognition. A number of studies make attempts to elaborate on the distinction between metacognitive knowledge and regulation and consider sub processes involved in each. (p. 352)

Zimmerman (1995) argues that a self-regulated definition of metacognition as a learning process needs to take into account a complex set of factors that includes social motivational and behavioural factors which impact on cognitive processing.

Georghiades (2004) conducts a comprehensive analysis of literature on metacognition and concludes that,

[m]etacognition is often referred to in the literature as ‘thinking about one’s own thinking’, or as ‘cognitions about cognitions’. This is consistent with Brown (1987) who claims that [metacognition] is usually related to learners’ knowledge, awareness and control of the processes by which they learn ... and the metacognitive learner is thought to be characterized by ability to recognize, evaluate and, where needed, reconstruct existing ideas. (p. 365)

Of particular interest is that the study of metacognition by Georghiades (2004), found there was uncertainty surrounding the term. ‘The number of definitions, terms and analyses of what metacognition stands for has been the cause for some confusion in the literature. Weinert (1987) for instance spoke of a “vague” and “imprecise” working definition of metacognition’ (Georghiades 2004, p. 366).

The difficulty of defining metacognition was acknowledged by Flavell himself, when he stated, ‘What is metacognition? It has usually been broadly and rather loosely, defined as any knowledge or cognitive activity that takes as its object, or regulates, any aspect of cognitive enterprise (Flavell 1981a). It is called metacognition because its core meaning is “cognition about cognition”’ (Flavell 1985, p. 104).

The fact that Flavell refers to the term as, ‘broadly and loosely defined’ indicates the lack of a strict definition. This creates uncertainty, which allows it to be interpreted with some flexibility. Despite this, Flavell states that ‘[m]etacognitive skills are believed to play an important role in many types of cognitive activity, including oral communication of information, oral persuasion, oral comprehension, reading comprehension, writing, language acquisition, perception, attention, memory, problem solving, social cognition, and various forms of self-instruction and self-control’ (Flavell 1985, p. 104).

This lack of clarity—from the source of the term ‘metacognition’—suggests that further research would be desirable to develop insights that can help explain this difficulty surrounding understanding the term.

The study by Georghiades (2004) identified that Flavell’s definition of metacognition can be broadened to include a range of complex functions that include psychological factors beyond the cognitive elements.

These relate to concepts identified by Flavell (1987), which include ‘executive processes, formal operations, consciousness, social cognition, self-efficacy, self-regulation, reflective self-awareness, and the concept of psychological self or psychological subject’ (Georghiades 2004, p. 367).

Veenman et al. (2006) contribute further to this discussion on the confusion about the term metacognition. They convey that there has been a range of metacognitive terms that have emanated from Flavell’s and Brown’s reference to metacognition as,

the knowledge about and regulation of one’s cognitive activities in learning processes (Flavell, 1979; Brown, 1978). Terms such as, metacognitive beliefs, metacognitive awareness, metacognitive experiences, metacognitive knowledge, feeling of knowing, judgement of learning, theory of mind, metamemory, metacognitive skills, executive skills, higher-order skills, meta-components, comprehension monitoring, learning strategies, heuristic strategies, and self-regulation are terms that have emerged and are commonly associated with metacognition. (Veenman 2006, p. 4)

Veenman et al. (2006) argue that while these terms have been beneficial, in that they have helped to focus research, the domain of metacognition lacks coherence because the terms involve multidimensional factors. These authors point out that terms relate to the different foci of studies. These can relate to a range of factors, such as general knowledge and skills in metacognition, different age groups and tasks, as well as both cognitive and metacognitive processes. As such, these authors conclude, ‘the relationship between some terms within the overall concept of metacognition have [sic] not been unequivocally defined’ (p. 4).

The literature indicates that the terms and features of metacognition have led to a broadening of understanding to a point where clarity becomes difficult. This has been particularly evident when terms such as ‘self-regulation’ emerged as part of studies on the control factor within definitions of metacognition. Veenman et al. (2006) highlight that ‘[s]ome researchers consider self-regulation to be a subordinate component of metacognition (e.g., Brown & DeLoache 1978; Kluwe, 1987), whereas others regard self-regulation as a concept superordinate to metacognition (e.g., Winne 1996; Zimmerman 1995). According to the latter social-cognitive perspective, self-regulation also involves motivational and social-emotional processes’ (p. 4).

Schunk (2008) argues that the term ‘self-regulated learning’, as used by Zimmerman (1986), served to add to the complexity of defining metacognition, which was described as ‘the process whereby students activate and sustain cognitions and behaviours systematically oriented toward the attainment of their learning goals’ (p. 465). However, Zimmerman (1995) identifies the need for a broadening of the term ‘metacognition’ to encompass a relationship between declarative knowledge and procedural knowledge. He argues: ‘Self-Regulated Learning involves more than metacognitive knowledge and skills. It involves a sense of personal agency to regulate other sources of personal influence such as emotional processes, as

well as behavioural and social environmental sources of influence' (p. 218). Zimmerman also proposes that,

knowledge states and deductive reasoning form part of the rational metacognitive processes, personal agency formulations assume that self-beliefs and judgements often informed intuitively and applied behaviourally in specific contexts are important. Contextually related self-processes such as perceived competence and self-efficacy have been shown to be well suited to explaining motivational issues such as effort and persistence. (p. 217)

Schunk (2008) raises some interesting points that emerged from studies which emphasised the control processes involved in metacognition, self-regulation and self-regulated learning. He notes that these studies raised questions such as, 'What controlled the use of control processes?' (p. 464). Schunk attempts to provide some differentiation in these terms, noting that Dinsmore et al. (2008) state that 'theorists all agree that Self-Regulated Learning is a broader process that refers to the monitoring and control of behaviour, cognition, motivation, and the environment. Metacognition, which by definition also involves monitoring and control functions (Flavell, 1979), is mainly limited to the monitoring and control of cognition' (cited in Schunk 2008, p. 464).

In an attempt to identify some delineation in the terms, Schunk (2008) states that '[t]he focus on self-regulated learning emphasized the agentic role of the learner (Boekaerts 1996, 1999; Boekaerts & Corno 2005; Pintrich 2000; Winne 2004; Zimmerman 1989, 2008). Self-regulated learning (SRL) refers to the setting of one's goals in relation to learning and ensuring that the goals set are attained. Key components of SRL are cognition, metacognition, motivation, affect, and volition' (Boekaerts 1996, cited in Schunk 2008, p. 464).

Dinsmore, Alexander and Loughlan (2008) attempt to address this lack of clarity of meaning of the three terms—metacognition, self-regulation and self-regulated learning—by conducting a comprehensive literature search. In doing this, they explore the terms with the intention of identifying the conceptual boundaries of each and where they may be related, to provide clearer definitions of each term. However, their results found the conceptual overlap between terms in various studies to be cause for concern.

As mentioned in the literature review (Chapter 2), a significant finding from this study by Dinsmore et al. (2008) was that researchers in many studies provided no explicit definition of the central processes being studied. As such, they found it difficult to separate the conceptual boundaries of the three terms in the literature. Technical terms within particular disciplines were used without specifically defining their meanings, or the boundaries of the terms, under the assumption that readers would already know these. This was particularly concerned with '[i]ndividuals' monitoring and regulation of their learning and the concomitant inability to articulate sufficiently the conceptual boundaries between these three often entangled bodies of literature... In effect, the more we read, the more researchers' language left us confused' (p. 392).

As a consequence, Dinsmore et al. (2008) concluded that there is a perceived assumption among researchers that ‘metacognition is a rather well-established term that needs no further clarification beyond a suitable citation’ (p. 399). Their findings suggest that one of the more significant problems is that the literature on metacognition provides ‘a deceptively simple conceptualization of metacognition such as “thinking about thinking.” This is in contrast, to the relatively complex interaction of behaviour, cognition, and motivation emphasised in the Self-Regulation and Self-Regulated Learning literature’ (p. 399).

They also found there is more theoretical diversity represented in the ‘Self-Regulation’ and ‘Self-Regulated Learning’ research in comparison to the more clearly cognitive perspective in metacognition. As such, they conclude that,

[r]esearchers in Self-Regulation and Self-Regulated Learning find the explicit definition of their constructs a means to align their research with a particular segment of the literature, be it more social-cognitive, as in the writings of Zimmerman and Schunk (2001), more cognitive behavioral modification for Graham et al. (2007), or more information processing, as in the work of Azevedo and colleagues (e.g., Azevedo and Cromley 2004). However, regardless of the reasoning, reliance on implicit definitions is a concern. (Dinsmore et al. 2008, p. 399)

The study by Dinsmore et al. (2008) highlights the confusion; as they note, ‘these definitions have become diluted to the point where today we ask such questions as: Is metacognition part of self-regulation? Is self-regulated learning part of self-regulation? Is self-regulation more environmentally sensitive than metacognition, which is more of a personal factor?’ (quoted in Schunk 2008, p. 465). This lack of clarity is corroborated by Veenman et al. (2006), who argue that more precise taxonomies of metacognitive knowledge and skills are needed.

Extensive descriptions of metacognitive activities have been made for text-studying by Pressley and Afflerbach (1995; Pressley, 2000). Meijer, Veenman, and Van Hout-Wolters (in press) developed a hierarchical model of metacognitive activities for both text-studying and problem-solving tasks in different domains. Additional to these taxonomies of components and subcomponents of metacognition, the relations amongst those components need further clarification. (p. 4)

In addition, writers such as Veenman et al. (2006) attempt to draw distinctions that highlight that cognition is inherent within metacognition. They argue that to have adequate metacognitive knowledge of one’s competencies in a domain, there needs to be a substantial amount of (cognitive) domain-specific knowledge. This includes a knowledge about relevant concepts and theories in a specific domain, as well as the intrinsic difficulties within this, which includes the ability to discriminate between what is relevant and what is not.

Dinsmore et al. (2008) conclude that,

[d]ifferences between metacognition, SR, and SRL may lie in what is being monitored or controlled. In self-regulation and self-regulated learning, monitoring or control may refer to behavior, cognition, or motivation, while metacognition likely emphasizes monitoring and control of cognition, specifically. The high percentage of implied definitions, overlap of explicit definition keywords, as well as the potential nesting of constructs, contributed to the difficult task of organizing data by construct. The challenge we experienced in attempting to untangle these three constructs indicated that the clarity and boundaries of these constructs were issues to be addressed. (p. 401)

Research by Hacker and Dunlosky (2003) identify the difficulties involved in the use of metacognition as a tool for learning, in that ‘it is not something easy to identify or stimulate in students’ (p. 73). Their study in problem-solving through active monitoring and control of thinking found that, in using metacognition as a learning strategy, there needs to be an awareness of the characteristics and processes inherent in metacognition. As a consequence, they developed frameworks to support this. However, the main difficulties in the use of metacognition as a tool to promote learning stem from the inability to characterise what is meant by the term. They state that,

[w]hilst metacognition is generally defined as knowledge that people have about thought processes and individual monitoring and control of their own thoughts (Hacker, 1998), Unfortunately, many advocates of metacognition have not recognized that, like most thought processes, metacognition is neither easily characterized nor easily stimulated in students, much less easily used as a psychological tool to promote problem solving (Kozulin, 1998). Moreover, merely promoting metacognition does not ensure its efficacy. For example, monitoring is commonly viewed as reflecting, but reflection is not always accurate and may even produce distorted views of one’s thoughts. (Nisbett & Wilson 1977, cited in Hacker & Dunlosky 2003, p. 73)

Alternatively, Georghiades (2004) identifies one of the key difficulties in trying to define metacognition as arising from the nature of what is meant by ‘meta’ in the word metacognition. There has been an absence of discussion on this component in the literature reviewed. Georghiades notes a single term has been used to refer to both knowledge about cognition and regulation of cognition, which he believes to be a key factor that causes confusion in the literature. Georghiades cites Flavell’s co-researcher, Brown (1987), as confirming this difficulty, stating: ‘Any attempt to discuss the nature of metacognition is inevitably linked to the problem of distinguishing what is “meta” and what is “cognitive”’ (Brown 1987, quoted in Georghiades 2004, p. 371).

It would appear that this lack of focus on the ‘meta’ component of the term might be the source of what is proving to be so problematic in defining metacognition. The term ‘metacognition’ is being applied too generally, which is encapsulated by Weinert (1987), who says: ‘On the surface, it seems easy to distinguish between cognition and metacognition. Metacognitions are second-order cognitions: thoughts about

thoughts, knowledge about knowledge, or reflections about actions. However, problems arise when one attempts to apply this general definition to specific instances' (p. 8).

In addition, most of the literature has focused on the regulatory aspects of cognition, accepting the common term 'thinking about thinking' without a focus on defining what is meant by 'meta'. This is an area that would benefit from some further study. This may require a need to revisit Flavell's (1976, 1979) definition, which has been widely accepted without any identifiable challenge in the literature. Yet the term 'metacognition' originated from Flavell's work with children and his research on memory. The term metacognition emerged from his term 'metamemory', the 'knowledge or cognitive activity bearing on anything mnemonic; it is, therefore, metacognition that takes memory as its object' (Flavell 1985, p. 240).

This has evolved into the common reference to metacognition as 'thinking about thinking'. As Weinert (1987) suggests, this may be too simplistic for the complexity of the cognitive functioning and regulatory activity that the literature conveys as inherent within metacognition. This complexity might explain the difficulty experienced by some participants in this study in articulating a succinct definition. It would appear from the literature that defining, let alone understanding, metacognition is fraught with difficulty. This leads to the important question, 'Where does this leave an investigation into how metacognition might contribute towards preservice teachers' learning and enhancement of academic writing, in praxis inquiry learning amid a lack of clarity and absence of a firm definition?'

Insights gained from this additional literature review inform us that further research would be desirable to help understand what the elusive factor in participant understanding of the term might be. As far as the present study is concerned, any answers to this elusive factor might be found in understanding where metacognition fits within a theoretical construct of learning. Despite uncertainty in defining metacognition, it can be surmised there is merit in the use of a cognitive and social constructivist framework for studying metacognition, as this is where it has its origins as a construct for learning. The agentic nature of learning in praxis inquiry indicates benefits to a definition of metacognition that requires cognitive knowledge and ability to consciously act upon or regulate learning. Despite the lack of clarity in definitions, it would be reasonable to conclude there are benefits to learning outlined in the studies on metacognition, self-regulation and self-regulatory literature (see to the literature review in Chapter 2). As a result, Flavell's 1976 definition has been used to analyse the data responses to answer the main research question and sub-questions. This definition has been used to identify any benefits to metacognition as it relates to metacognitive knowledge (what one knows about cognition) and metacognitive control processes (the regulation of cognition) to investigate how these might contribute towards preservice teachers' academic writing skills in praxis inquiry learning and teaching.

Using Flavell's definition, the next section explores the participant experience of learning and teaching in praxis inquiry to identify connections with metacognition

4.5 What is the nature of learning, teaching and writing in a praxis inquiry model of teacher education and connections to metacognition?

4.5.1 Introduction: Writing and praxis inquiry learning

This section aims to identify information that will help answer the main research question pertaining to how metacognition and academic writing are connected to praxis inquiry learning.

Having explored participant understanding of metacognition, we now move to an investigation of preservice teachers' and teacher educators' experience of learning, teaching and writing in a praxis inquiry approach in these two units of study. This is important because it aims to contribute to an understanding of how metacognition manifests within praxis inquiry learning to unearth any resultant impact this can have on writing. Information gained will identify any significant connections between metacognition and praxis inquiry that can provide new insights into a pedagogy of academic writing in preservice teacher education.

This study explores the connection of metacognition and the development of academic writing skills through this praxis inquiry framework. There are three parts to this section. First, the data illustrates how the experience of praxis inquiry is understood by all participants. Second, the data aims to identify the strengths and challenges of learning and teaching in this praxis framework to identify factors that impact on the generation of academic writing capabilities. Third, key issues relating to how metacognition manifests in praxis inquiry learning and writing is summarised and discussed.

As noted earlier in this thesis, both cohorts of participants—preservice teachers and academic staff—were asked to answer a range of interview questions (Appendices A and B). The intention of these questions was to elicit responses to gain an insight into the strengths and challenges experienced by preservice teachers in their learning, and by academic staff in their teaching, in a praxis inquiry approach within these two units of study. Understanding these strengths and challenges should provide insights into the key factors that impact upon preservice teachers' ability to present their learning from praxis inquiry in written communication and identify how metacognition may contribute to the enhancement of writing skills.

While the analysis of data above focused on gaining an appreciation of participants' understanding of the term 'metacognition', the following section outlines the data findings from preservice teacher participants' experiences of academic writing in a praxis inquiry model of learning. This will be followed by the responses by the lecturer/tutor cohort.

4.5.2 Writing in a praxis inquiry: The preservice teacher experience

Data responses from interviews with preservice teachers identified four common themes in the experience of academic writing significant to this study of metacognition in these two units of study. These are outlined below.

1. Understanding the academic discourse and terminology was fundamental to learning and writing using a praxis inquiry approach.
2. Reflection was a major component of learning in praxis inquiry that connected theory to classroom practice which had the potential to result in transformative learning.
3. Familiarity and experience with the academic writing genres and the ability to reference correctly was required for successful writing.
4. There were affective dimensions to learning and writing that impacted on writer confidence and writer identity.

4.5.3 Understanding the academic discourse and terminology

It was important to explore participant understanding of the term ‘praxis inquiry’, given this was the dominant pedagogical approach adopted for implementing the teaching and learning program in these units of study.

Data findings identified that preservice teachers had varied understandings of the term ‘praxis inquiry’; however, nine out of the fifteen participants found the term ‘praxis’ difficult to define. In a similar manner to the understanding of metacognition, many participants expressed confusion in their attempts to articulate a clear understanding of praxis inquiry. This was misunderstood and referred to as ‘practice’ in many instances. However, despite a general inability to explicitly describe the meaning of praxis inquiry, many participant responses included links to reflection, personal experience and connections to texts and theories. This was an indication that preservice teachers were using processes inherent in praxis inquiry as strategies for learning, despite being unable to articulate clearly the underlying principles of praxis inquiry or the discourse associated with it.

This information is important because it highlights a need for pedagogy that makes explicit an understanding of this key term, ‘praxis’, and the learning process that it represents. Without an explicit understanding of this as a learning process, preservice teachers’ capacity to utilise this form of learning is potentially compromised. The capacity to write in the genres associated with the higher standards of writing in this praxis inquiry model required the ability to cognitively process what was being observed in classroom practice. In addition, there is a need for preservice teachers to connect their practical experiences through a theoretical lens. Understanding the term ‘praxis’ was necessary to generate explanations for the pedagogical choices that classroom teachers make. This was significant because the aim of praxis inquiry learning is based on an epistemology that teacher education should develop

discerning educators who can ‘identify substantive teaching and learning issues from inquiry about student learning’ (Cherednichenko & Kruger 2009, p.18).

This confusion and misunderstanding is evident in the extracts below from Rod, Fleur, David, Judy, Lucy and Helen as they attempt to explain their understanding of praxis inquiry. These participants use the term ‘practice’ rather than ‘praxis’, which suggests they thought of it as a teaching method they were required to practise. While praxis inquiry does need to be practised and is inherent within the teaching process, these participants misunderstood what was required in this practicum placement. (It is important to note that this practicum placement was predominantly observation and preservice teachers were not required to teach.) The purpose of this practicum was to make observations, develop questions of personal interest and connect their observations and experiences to theories about teaching and learning in literacy education. This information suggests that participants have not fully understood the discourse associated within praxis inquiry learning required in this placement. This is outlined in the following examples.

Rod exhibits confusion with the discourse when he says,

I take it as a practical enquiry so you basically go and do the actual work so whatever theories are in place you go and practice those theories and then you reflect on if those theories worked, whether you think the theories could be changed or you could do them in a different way and other questions that could be raised from those type of theories.

Despite not fully comprehending the meaning of terms such as ‘theories’ and ‘practice’, Rod identifies many of the key processes used in praxis inquiry learning that can be interpreted as associated with metacognition. He recognises the need to make connections between theories and the practical implementation. Further, Rod understands that reflection is a strategy required to assess the effectiveness of theories. In doing this, he demonstrates an evaluative aspect to his thinking when he states, ‘you reflect on if those theories worked and... do them in a different way’. This suggests he has understood the need to analyse and respond to the practice, which is an important component of the praxis inquiry protocol. This evaluative component is significant to metacognition, as it suggests evidence of both cognitive awareness and regulation. Rod has also learnt that questioning is a part of the praxis inquiry process and can lead to the generation of further investigation to expand his learning (a major goal of praxis inquiry). This example demonstrates the presence of metacognitive skills, in that Rod is thinking about how he can improve his learning to apply in his role as a future educator.

In the excerpt below, Fleur also interprets praxis inquiry as practical teaching but connects this to passive and active learning. She identifies praxis inquiry as being associated with making connections between theory and practice which occurs through immersion in literacy experiences in the classroom. There is evidence of an awareness of different modes of learning that can be considered metacognitive. She has analysed and made evaluative judgements about her learning preference for active learning in the field placement compared with the more passive learning in a lecture theatre. We see this when she says,

[t]o me, praxis inquiry is actually doing the practical work. So instead of me sitting in a lecture, and having a lecture about literacy, I get to actually go out into the field, the classroom, and participate in it. So I'm learning literacy by doing literacy and observing literacy, rather than just hearing about literacy and reading about literacy. So that's what I think praxis is.

These comments illustrate that Fleur is conscious of different theories of learning connected to constructivism and behaviourism although unable to describe them as such. Despite her admission that the theories are not always clear, in the second extract below Fleur identifies an experiential, constructivist approach to learning represented by active learning in the school classroom. This facilitates her ability to develop her understanding of literacy education from both contexts, university, and the practical placement. However, in a similar fashion to Rod, Fleur's comments illustrate confusion of the meaning of praxis.

In the first semester we did all this thing about different theories and I'm actually finding it a little bit harder to connect all those theories in such a broad range to my praxis... the theories are not always clear cut to me from the praxis.

These comments indicate the difficulty Fleur is experiencing in synthesising theory with the classroom practice. However, despite confusion at this stage of her learning, her admission that she doesn't fully understand the theories is indicative of cognitive self-analysis; she has identified a gap in her knowledge. This suggests metacognitive skills are at play, albeit unconsciously.

In addition, participant responses by Judy also furnish evidence that the discourse and terminology associated with assignment work in praxis inquiry has not been fully understood. This is evident in the extract below, when Judy refers to 'an observation assignment'. This reveals she has not understood the discourse related to the research genre of writing required for this assignment. In addition, her use of statements such as 'the psychological terminology' illustrates insufficient comprehension and correct articulation of the vocabulary associated with the disciplinary unit of study. Judy also reveals that she is unclear about the meanings of terms such as technical and epistemological questions.

So, my understanding is actually a very good breakdown of an observation assignment basically. Obviously, you have to know what you are looking for so that's defining questions. Don't really understand the psychological terminology of the technical questions and the epistemological questions. I'm not clear on that but I do understand that you go in a school and observe what's going on which is practice described... I think if I'm not mistaken and then you explain that practice using literature that you read.

The assessment task that Judy refers to above is the major assessment for Unit 2. This task required preservice teachers to develop research questions into literacy education through an ontological, epistemological and technical lens. A literature review and data collection were also required in this

assignment. While there is evidence of Judy's inability to use the discourse and terminology correctly, there is some understanding of the praxis inquiry protocol of writing displayed when she says, 'I'm not clear on that but I do understand that you go in a school and observe what's going on which is practice described... I think if I'm not mistaken and then you explain that practice using literature that you read'.

In contrast, Lucy and Helen overtly admit to having difficulty understanding the terminology and being confused. Lucy states:

It's funny you say that, because yesterday I texted one of the girls and I'm like, 'What's the praxis inquiry? What is that?', and they were like, 'It's the journal entries you wrote for placement', and I was like, 'Oh okay'. So, I didn't know what it meant until yesterday. So, just pretty much a reflection on anything you did, like for placement we had to do journals every Tuesday we were there, and every Tuesday we'd write a journal about an artefact or something that we saw or we did. So, pretty much just reflections.

While Helen did not have a full understanding of praxis inquiry, she did identify that reflection and documenting her learning was a key aspect of this learning process.

The data examples above indicate that, despite confusion and misunderstanding surrounding the term praxis, there was some evidence that metacognitive skills were inherent within praxis inquiry learning. This was associated with preservice teachers' awareness they were required to connect theory and practice. However, it can be surmised that reinforcement of the discourse associated with praxis inquiry is necessary to build metacognitive knowledge. The knowledge factor is important in metacognition, as without it preservice teachers' capacity to regulate their learning is compromised. In this case, a knowledge of the correct discourse associated with praxis inquiry learning is required to enhance (regulate) the quality of both thinking and writing skills. Competence in the discourse associated with theoretical learning in praxis inquiry is also required to conduct assignment work correctly as this impacts on writing quality.

4.5.4 Reflection and praxis inquiry: Connecting theory to classroom practice and transformative learning

While many participant responses displayed confusion in defining the term 'praxis inquiry', the majority did make the important connection that reflection on experience was a key aspect of learning from the school placement and theoretical readings for their assignment tasks. In the excerpts below, participants such as Kaitlyn, Julian, Marco and Cathy reveal how they identified the skill of reflection as being an inherent part of their learning.

Kaitlyn states 'I am still hazy' in response to her understanding of the meaning of praxis inquiry. However, despite this revelation of uncertainty, she identifies that reflection on her personal experience in the

classroom is part of the learning process in addition to her readings and collection of artefacts for writing content.

I am still hazy on it, but I kind of got it as practical inquiry... So, for me, it was just reflecting on what's happening in the classroom instead of just what's in the text... It's taking your own experience in what you see and putting it into like a journal entry and artefacts and those kind of things, but I'm still kind of hazy on the term.

In the example below, Marco highlights the importance of analytical skills as part of developing his understanding of the learning and teaching process. He conveys the importance of learning in the practical setting to enable analysis of teaching and learning in making judgements about the educative process, rather than just learning from academic readings. There is a sense that Marco also understands that praxis is a different way of learning associated with active, rather than passive, learning that enables him to become discerning in his views about what constitutes effective implementation of theory. While unable to use the theoretical term 'constructivist', these principles of learning are evident.

I understand that praxis is another term for more practice, so putting practice inquiry together it's basically just—not study but looking through and analysing how teachers and students go about their learning and education through analysing on a practical level, rather than just looking through textbooks and just reading up on specific information.

In the following example Cathy can see the benefits of reflecting on classroom practice, despite stating that she does not understand praxis inquiry. While she is unable to use the academic discourse associated with these education subjects, she can see that reflection enables her to analyse and be discerning in her judgements about the effectiveness of what she has observed.

Well, I'm still iffy about praxis inquiry... But, I think it's good to look back on what happened and then reflect why it happened and why it's good that it happened that way or if it's bad, then why it's bad. I think it's still a bit of an iffy subject for me. I think I missed that lecture, so I struggle a bit with that one.

In contrast to the difficulties experienced in articulating the meaning of praxis inquiry by the sample of participants above, there were participant examples, such as Sharon, Julian and Susan, who demonstrated thinking processes that overtly connected praxis inquiry and metacognition.

Sharon demonstrates the use of metacognitive skills as part of praxis inquiry, which contributes to her ability to make judgements about the effectiveness of learning and teaching in the school setting. There is evidence that Sharon has an awareness of metacognition as a process of analysing her thoughts about student learning in the classroom. There is also evidence that she is attempting to regulate this knowledge by thinking about how this knowledge can be put into classroom practice. We see this when she says that,

[f]inding out what works for the students and what doesn't, finding out what works for the teachers and what doesn't, and just— thinking about the thinking in the school, so how you're learning, where the students— and all that. So, it's kind of like metacognition a little bit, so you're thinking about your own thinking and then that's put into place in the schools.

In the following statement, Julian demonstrates a connection between metacognitive thinking and reflection evidenced in his ability to be evaluative about his learning while writing. Julian's comments reveal a consciousness about the relationship between thinking about learning, the writing process, and reflection.

I think it is just about being able to write about what you have learned, how you learnt it and how you can improve in your learning as well and doing that through reflecting on what you've done. That's what I get out of it anyway.

In the extract below, Susan highlights the benefits of praxis inquiry for the development of thinking metacognitively about educational issues. This is demonstrated by her reflection on the school experience and analytical skills in this process, where she uses self-questioning techniques to make judgements about the effectiveness of instructional teaching methods. There is evidence of a connection between analytical skills within metacognition as she reflects on the children's learning, the teacher's implementation of assessment and its effectiveness. This example offers strong evidence of Susan thinking about her thought processes during the analysis of her own ideas about the teaching and learning. According to Flavell's definition, this indicates she has metacognitive knowledge and is making attempts to regulate this knowledge.

Well, I suppose just looking back, like after a scenario. For example, with the individual reading, then thinking about it and wondering about it and thinking, 'Why didn't I think that this is quite right? Well, that's because I've actually been with six children who haven't read one thing.' So, then I would think about it and think about how I could maybe make that better, how I'd change it. I know the assessment has to be done and probably in that school it has to be done then because when else do you do it? So, I found that kind of thing I was reflective about, thinking about how maybe it could be changed or improved or that sort of thing. And, taking in the information for me as a teacher to take away with me to use and jot down notes. I've got my little book.

In summary, the participant comments above revealed an understanding that reflection was a key aspect of learning in praxis inquiry. Reflection occurred from experiential learning in school classrooms and university readings. However, only a few participants were able to consciously describe a relationship between praxis inquiry and metacognition while reflecting on their experiences of teaching and learning to connect theory and practice.

4.5.5. Metacognition: connecting theory, practice and transformative learning

Preservice teacher participants were questioned about their experience of connecting theory and practice during the interview process (see Appendix A). This aimed to investigate the potential of praxis inquiry to improve academic writing and to determine any connections with metacognition.

An important insight to emerge from responses to this question was that the practical school experience was vital. This enhanced preservice teachers' ability to understand the theoretical basis for the practice they observed. Participants expressed positive benefits to their learning. We see this when Julian says, 'I find it pretty easy to link those two things. I found that when I was in schools in my head I was always saying this is an example of this and that, and I find that it's much easier to explain theories when you've had that grounding in what you've seen in schools.'

This example provides evidence of metacognitive thinking that relates to the regulation of cognitive learning. This is evident when Julian refers to the self-talk that occurs while he is processing theoretical learning during observations in the classroom placement. There is evidence of analytical or cognitive discriminatory function as he selects theories of learning that match what he is observing. This demonstrates a consciousness of thinking in which attempts are being made to connect relevant theories to comprehend the practice. In this case, self-talk can be interpreted as being metacognitive about learning. This aligns with Vygotsky's (1978) theory of language and thought. Julian acknowledges that the school experience provides the concrete experience, or 'grounding', that contributes to his ability to explain theories. This acknowledgement of the value of such experience testifies that experiential learning, as espoused by Dewey, contributes towards cognitive transformations in learning within this praxis inquiry approach.

In a similar vein, Marco also demonstrates the importance of direct experience, in that it provides a concrete base that enables him to better understand academic reading and writing.

So, whenever I read a specific academic text and a specific quote, I try and relate that back to an experience that was very prevalent, so when I'm writing an essay or a piece of writing just thinking back on my actual experiences in regards to a specific citation.

Similarly, Sharon demonstrates the benefits of her experience within the classroom as it enabled her to achieve a depth of learning through the research assignment.

I like finding positives and negatives to specific research kind of things, so with this one I did it on technology so I could find that my first view was, I found I didn't really like it in the classroom but then after doing all of it, I found it was really beneficial. Especially with this assignment, there were five different parts to it so that's what I liked really, finding in research... and delving a bit deeper into that.

This statement by Sharon demonstrates a good understanding of the praxis inquiry process, which indicates metacognitive skills are being used. This is evident as she questions and evaluates her views

about the effectiveness of the use of technology in the classroom. There is evidence of metacognitive awareness when Sharon identifies that the research process has led to positive results in her learning that have led to transformations, as a result of conducting a deeper investigation. This tends to indicate that the process of inquiry during the research process is connected to the regulation of knowledge. This is an important facet of metacognition. The transformative nature of learning within this praxis inquiry process suggests that metacognition can be generalised to connect with theories of learning espoused by Mezirow (1997) on transformative learning.

In addition, Sharon claims the research experience contributed towards her ability to develop her own theories about teaching and learning from her observations, indicating that this has contributed to her becoming a discerning educator. Her use of the term ‘delve deeper’ indicates that this research process is conducive to learning at a deeper level, which aligns with the theories of Marton and Saljo (1976). In addition, her reference to a five-step process for developing this research assignment indicates she has found the scaffolding process of learning to write in the research genre beneficial.

This transformative nature of learning in praxis inquiry is also evident in the following example from Nadine, who describes the struggle she experienced due to conflicting philosophical approaches to the education of a student who had autism. Nadine describes the need to consolidate her personal views about the most appropriate methods to cater to a student’s individual learning needs in her practical school placement.

Of course, we did a practice so we were observing and recording what was happening in the classroom, and we were reflecting on what we liked and what we didn’t like in the classroom. When I read, I start finding articles... about an issue that happened in the classroom. For example, an autistic student—there was an autistic student, and I was placed in a Steiner classroom, so I was a bit confused. In a Steiner classroom there is no computer-aided programs, only the teacher and students so there’s no variety of resources, only a library teacher and classroom library... So I did the reading and I found that computer-aided programs would help students with autism learn better.

There is evidence of metacognitive skill as Nadine describes the dilemmas experienced in her learning. First, she has identified a need for more information (cognitive knowledge) about the use of teaching resources for students with autism. Second, action to regulate this learning has been taken by conducting research on the use of ICT that may assist the learning of students who suffer from autism. Third, there is evidence of analytical thinking evidenced by her questioning the Steiner philosophy of education implemented in her practicum placement, where computer-aided resources are not recommended. This conflicts with her research, which informs her that computer-aided resources can assist the learning of students with autism.

This example highlights the significance of reflection on reading material in concert with direct classroom experience to facilitate preservice teachers’ capacity to become discerning educators as they construct their own theories about teaching and learning.

In the example below, Pamela constructs her understanding of theory based on her prior experience as a gymnastics teacher. There is evidence that she understands that praxis inquiry requires connecting theory to practice; however, Pamela discloses she is confused about her ability to identify theory from observations in the classroom context. There is evidence of self-questioning as part of an evaluative process at the cognitive level where methods of teaching are being processed against theories of learning. This suggests metacognitive skills are being used, although again in an unconscious manner.

I can now use—with the theories that we've all learnt about, see where that theory came from and how I developed that skill, and where the kind of methods that I was using to teach, I can see how it relates. When I'm looking at others, I double back and I have to ask myself a few times of what theory links to that practice. I think I understand the theories, but I struggle with seeing how they're applied in the real classroom... So, I don't know exactly yet, so it's something that I'm a little bit confused about.

These participant examples indicate that the school practicum was considered vital to enable active engagement with theory at a cognitive level. Situated learning within the school setting, integrated with inquiry- and research-based written assignment work, contributed to transformative learning. Metacognitive skills were evident as preservice teachers described their experiences of connecting knowledge of theory and analysing this knowledge, to connect with the practice observed in the school placement. Metacognition in these examples is aligned to theories of learning such as Vygotsky's (1978) socio-cognitive theory of language, Schön's (1983, 1987) work on situated learning, cognition and context, Mezirow's (1997) transformative learning and Marton and Saljo's (1976) concept of deep and surface learning.

4.5.6 Academic writing genres, referencing and writer confidence.

4.5.6.1 Academic writing genres

As mentioned earlier, the writing tasks in these two units of study were predominantly through a research genre method, except for the reflective journal and the digital portfolio. Overall, participant data indicated a general lack of knowledge of academic writing genres associated with research methods. While all the assessment tasks required preservice teachers to make connections between theory and practice, the structural elements of writing to document learning in the research genre format proved difficult for most preservice teachers.

Participant responses demonstrated confusion in relation to the learning and writing process for documenting the case and commentary and the research assignment in particular. This can be attributed to a lack of understanding of research methodology, as these two assignments were effectively concerned with a research process of learning. This required the development of skills on how to conduct and document research, as well as the writing structures and conventions associated with these research genres.

Examples of participant responses to these written assignment tasks, and the associated difficulties experienced when confronted with these new writing genres, are presented below.

Kaitlyn expressed that she was unable to understand what was required in assessment tasks: ‘I think I found a lot of the assignments weren’t explained very well, like especially this semester with data collection. We were all kind of like, ‘What’s happening?’... But that might just be the unit. I was a bit hazy... but I think that that’s probably just coming to university.’ This participant also described this assignment as, ‘Like it’s just a different way of schooling’.

This example illustrates that the research genre of both learning and writing were new methods of ‘schooling’, as Kaitlyn has described. The assignment that Kaitlyn refers to above was based on research methods which required that she collect data as raw evidence from her practical placement. Her lack of familiarity with the methodology underlying the assignment was problematic due to a lack of understanding research and the writing conventions required in a research report.

Rod also describes the impact of how learning to write in a new structure and style represented a change from what he experienced in the past, which affected his confidence. This is evident when he says, ‘A lot more confident now. I think the first semester was a bit of a shock... It’s the layout and the structure of how you want to get across what you’re actually saying that I had trouble with at first and not doing it as you would have learnt in high school’.

Similarly, Judy conveys that she experienced difficulties with understanding the writing genres of assessment tasks. We see this when Judy refers to these assignment tasks as essays. ‘I find it very hard to write shorter essays. All of my essays usually go over.’ The use of the word ‘essay’ demonstrates a lack of familiarity with the language used to describe academic writing genres. It is important to note that none of the written assessment tasks in these units were based on the essay genre of writing.

Fleur also indicates that she is confused about writing genre when she says, ‘I don’t like that kind of essay writing’ when referring to a research assignment. This example provides further evidence that the terminology and process of writing in the different academic writing styles or genres has not been understood. Fleur, however, has made the important connection that academic writing is associated with ‘voice’ when she says,

[s]ometimes what I’m finding difficult is the different voices I have to use in the different styles of essays. So, if it’s just a simple essay question, I feel okay writing it. When the questions are more research-based and they want a kind of, you know, scientific voice behind it, the research ones. I don’t like that kind of essay writing. And then I have to switch my brain and do an essay for poetry or contemporary fiction and I’m finding that I’m losing my voice and I’m writing to a kind of formula which I don’t always feel comfortable with.

This statement by Fleur draws attention to some interesting aspects about voice in academic writing and genre. Her reference to a need to use ‘different voices’ in writing can be interpreted as a knowledge there are different styles of writing and that these are associated with academic ‘voice’. While not entirely incorrect, Fleur appears to be confusing genre with academic voice, in her attempt to construct a meaning for describing writing genres. This is particularly evident when she uses the example of a ‘scientific voice’ required for research-based assignments. There is also evidence of metacognitive awareness when Fleur indicates she has a preference for a particular style of writing. Her concern that she is ‘losing her voice’, and feelings of constraint when required to write in ‘a particular formula’, indicate she has evaluated her writing capabilities in the different genres. Fleur’s comment that she needs to ‘switch her brain’ to write ‘poetry or contemporary fiction’ is evidence that she is conscious of different writing conventions and stylistic requirements. In stating that she needs to ‘switch her brain’, there is evidence of a consciousness about thinking processes that includes an evaluative aspect, consistent with the use of metacognitive skill.

This example highlights a connection between academic voice and writing genre. It also draws attention to the notion that metacognitive knowledge is required to activate or ‘switch’ cognitive knowledge about the appropriate use of ‘voice’ in genre, for the different purposes of writing. Such regulation of knowledge requires an understanding of genre.

Academic writing in these two units required knowledge of the research genre as part of conducting data collection and reporting on this. Preservice teachers were also required to develop the skills of writing a literature review as part of their research investigation. Theoretical readings were fundamental to all writing tasks and required the capacity to read analytically and reference the ideas of others from academic readings. This task proved to be a particular area of difficulty that many participants identified as challenging.

4.5.6.2 Referencing skills

Data responses demonstrated that one of the major challenges participants experienced in learning to write academically was their ability to correctly reference their reading from literature sources.

Incumbent within all assessment tasks was the requirement that preservice teachers analyse, synthesise and draw conclusions based on their course readings and translate this into their writing. Theoretical readings were an essential part of praxis inquiry. The ability to write in a scholarly manner required making informed connections between theoretical readings and the practice observed in school classrooms.

In the following example, Kaitlyn describes difficulty with her capacity to research and correctly reference material. Her comments below indicate she has a consciousness or awareness that she needs to find relevant theory but finds it difficult to discriminate information from literature sources.

Referencing was a huge hurdle, and I also struggle with spelling and grammar because it’s something that I’ve never picked up on well... That’s something I do struggle with sometimes, finding relevant theory information that fits with what I’m trying to talk about.

In the example below, Cathy expresses that she found it difficult to write academically and struggled to learn how to paraphrase and use direct quotes. Her comments demonstrate that she has not fully understood the nature of a literature review which required her to analyse and summarise relevant literature on her research topic. It appears that her assumption that she is unable to use her own opinions, stems from her inexperience of writing in this genre.

Just getting my head around how to write in the third person, I think. With the literature review, that was my biggest struggle because it's all what other people think and you're not allowed to put your opinion in it. And, paraphrasing is my other—it's difficult to get my head around that and I use the thesaurus a lot for that, because it helps me think of other words. I didn't understand the difference between paraphrasing and using direct quotes, that it's better to paraphrase than use direct quotes. That was something I think I've got my head around it now, I'm getting there. So, that was one of the biggest challenges.

Cathy's comments that 'I'm getting there' and 'I think I've got my head around that' are indicative of her monitoring and evaluating her own learning, which can be described as metacognitive. This example demonstrates that Cathy has a consciousness about assessing the development of her learning over time, with evidence that she is using self-regulated strategies to improve her writing skills. Her use of a thesaurus to improve her writing and growth in her ability to paraphrase (an important skill in academic writing) illustrate that she is using metacognitive strategies to improve academic writing skills.

In the example below, Susan said she has done a MBA; however, she admits that referencing has been difficult, not only for herself but also for other students. Susan's inability to use the correct term for citations is also interesting given she has already completed tertiary studies. Susan's recommendation that more support is required for the development of referencing skills given that 70 per cent of students have to resubmit because of incorrect referencing highlights the scale of difficulty first-year preservice teachers experience with the referencing aspect of academic writing.

I just think that would be really beneficial for everybody. I felt there was a lot of confusion about it and 70% of the class on the first task had to resubmit due to not understanding about bibliographies, Harvard referencing, how to incite [sic], incitations [sic] inside the text, a quote, what that meant, the page number and how to do it brackets and how to actually make it flow in the sentence. Nobody really knew how to do it. It's only because I had done my MBA that I had done Harvard. But, I had to go back and print it off and say, 'Okay, this is what I'm doing'. It took me ages to get my head around it and I've done it, I'd just forgotten because I hadn't used it.

This example from Susan illustrates the scale of difficulty in developing referencing skills for first-year university students. This information provides important insights into epistemological views on pedagogy, and metacognition may serve to enhance this development. In this case, the need to resubmit assignment

work to examine and self-correct referencing does not need to be viewed in a negative light. This reflects behaviourist epistemology, where the emphasis is on 'right or wrong'. An alternative view is that the need to resubmit required preservice teachers to participate in self-correction, which can be viewed as an important aspect of writing development through constructivist approaches. A dichotomy of epistemology emerges with this example, and approaches to assessment procedures may require reconsideration. Pedagogy where assessment procedures reflect epistemological views that writing development is part of a constructivist learning process in course construction may serve to facilitate the development of this important aspect of academic writing in the first year of university. Metacognitive knowledge and self-regulation can be considered a mechanism that could facilitate this process.

This example provides important insights into the importance of a pedagogy of writing that views writing as a learning process whereby drafting and editing can result in the correct conventions being developed. This example also serves to help answer the question, 'Do lecturers make assumptions about first-year students' academic writing skills?' The scale of difficulty reported in this example signals important information to tertiary educators that it should not be assumed preservice teachers arrive at university with the knowledge and ability to use referencing skills at the level required for university study. It would be reasonable to conclude academic referencing skills need be considered part of a continuum of learning to write in the academic genre, with appropriate pedagogy to facilitate this development.

The participant examples above provide important information relating to the preservice teacher experience of learning how to research and use referencing skills in the first year of university. The use of reading material and the ideas from others is generally accepted as that which differentiates academic writing from other types of writing. In using the term 'academic writing', it needs to be clarified this does not refer to a homogeneous genre but rather to writing in the academic environment, which contains many genres (Nesi & Gardner 2012). In these two units of study, the development of writing encompassed many things—cognition, linguistic skills, (spoken and written), mechanical and technical factors—but were essentially research-based writing genres. These genres comprised textual practices that encompassed the set of rules, practices and formal structures, or mechanical aspects, to present ideas within the disciplinary field of literacy education through a research genre of which theoretical reading was fundamental to writing.

Learning to reference the views of others was cited as one of the major stresses by preservice teacher participants. It can be argued that it is in the use of referencing that the development of voice occurs when we ask first-year preservice teachers to write academically. The requirement to read scholarly references, and then use the skill of analysis to synthesise the ideas of others and develop their own voice, requires a level of linguistic discourse knowledge to accomplish. Ivanič (1998) argues that academic writing is always connected to academic reading. The requirement to read, summarise and analyse the views of others on any given topic, in the development of one's own views, is an essential part of academic discourse and developing 'voice' in writing. This discourse is identified in the linguistic choices made that

connect to the literacy practices of the group. It would appear from preservice teacher responses that learning these discourse practices in university learning was major challenge and cause of anxiety.

Referencing is considered a fundamental requirement in all university learning. However, this data suggests it was a major difficulty for many participants. Academic writing in these two units of study was inherently bound to reading skill. This required not only a knowledge of the conventions associated with referencing, but also the capacity to read academic literature skilfully, to analyse and discriminate relevance. The ability to analyse the views of others, paraphrase these and form personal theories about learning and teaching in the praxis inquiry framework were considered essential skills for high standards of writing. Academic reading and theoretical learning from literature facilitated the ability to understand how theories were linked to classroom practices to make discerning judgements for transformations in learning. The data identified that this ability—to read, analyse and reference the views of others to theorise learning from the practical school experience—was particularly challenging emotionally. Preservice teacher data identified affective dimensions to metacognition in the writing process in praxis inquiry

4.5.6.3 Affective dimensions, metacognition and writing in praxis inquiry

Data responses revealed strong emotional responses in preservice teachers' experience of learning to write in the academic writing genres associated with assessment tasks. This had an impact on writer confidence, self-esteem, self-efficacy and writer identity. These will be addressed below under separate headings.

According to a study on emotions and learning by Pekrun et al. (2002), the construct of emotion is understood as 'psychological responses whereby affective, cognitive, physiological and motivational aspects are interrelated' (p. 95). A study of emotions is, therefore, important to an investigation into how metacognition might enhance academic writing skills in a praxis inquiry learning environment. The impact of positive emotions on learning, including the use of metacognitive strategies, is outlined by Pekrun et al. (2002), who state that 'activating positive emotions can strengthen motivation and the effortful pursuit of academic goals, they can also be assumed to benefit the elaborate processing of relevant information, including metacognitive and cognitive strategies of learning' (p. 160).

Emotions are connected to a view of metacognition as a process of self-regulated learning which includes planning, monitoring and evaluating writing as well as cognitive processing of learning from the socio-cultural dimensions within a praxis inquiry environment. This discussion aims to extend the (limited) studies on metacognition as it relates to the affective dimensions of learning and writing. Pekrun et al. (2002), Pekrun (2005), Hammann (2005), Efklides (2006; 2011) and Veenman et al. (2006) emphasise the importance of emotions to learning more generally, highlighting that socio-cultural aspects involve motivational and social-emotional processes where environmental influences can impact upon the learner.

4.5.6.4 Emotion and writer confidence

Preservice teacher data responses revealed writer confidence was an important factor in their encounters with the academic writing task in the first year of university. Participant examples from Kaitlyn, Lucy,

Judy and Fleur describe the emotional impact on their confidence as writers in their narratives, as they discuss uncertainties that arose when confronted with written assignment tasks. This is exemplified by the language they use, with emotive terms such as ‘scared’, ‘struggle’, ‘fearful’ and ‘panic’ employed to describe their experience.

The data displayed evidence of a powerful emotional connection with the self during the academic writing process. This was demonstrated as participants talked about writing in terms of disabling emotions like anxiety, fear and self-doubt—statements such as, ‘I just worry about’; ‘I know when people read my original drafts, it’s like, this doesn’t make any sense. I know’; ‘That really ties me up in knots’; ‘I’m spending so much time checking all the citations are done properly and all that and it just makes my head hurt.’

When reflecting on the writing challenges encountered, Kaitlyn highlights that her university requires a ‘different’ way of learning. This way of learning causes her to doubt her ability to achieve. We see these reflections when she talks about writing in the following way: ‘That’s something I do struggle with sometimes about me, and just—I don’t know... I think that’s probably just coming into university. Like it’s just a different way of schooling.’

Lucy describes the emotional impact on her ability to write. In her words, ‘Well, sometimes I feel nervous and scared... when I do my academic assignments I think I can do it but when I get to writing I go completely blank’. Lucy’s linguistic background was not English, which suggests there may have been a compounding effect on her confidence.

Judy describes issues of self-confidence in returning to university study and the ‘panic’ that she experiences when being confronted with assignments.

When I came here in February to start this course I was a little bit scared, because I’d been out of the loop for quite a long time with studying. I just wondered whether I’d be able to handle it... When I do get assignments, I panic, I think it’s something harder than it actually is... the only thing I feel scared about is the referencing.

The experiences described above also connect with Fleur’s account of university writing, which describes issues of self-doubt and self-confidence when confronted with difficult assessment tasks. She also questions her ability to engage in positive self during times. She states, ‘I don’t know if it’s just me not believing in myself... just a confidence thing. Second-guessing myself, believing in myself that I can do it.’ Interestingly, despite expressing this self-doubt, Fleur acknowledged that a deeper level of insight arose as a result of the discomfort she encountered. She described an ability to challenge her views about teaching ideologies alongside those practices that best suited her views. She notes that ‘it’s been good because a lot of ideas I’ve had have been challenged and it’s made me feel uncomfortable and it’s made me really look at myself... this is in terms of my teaching ideologies’. Fleur’s statement describing the discomfort experienced is particularly enlightening in this study of metacognition and writing in a praxis. It highlights that, paradoxically, it is the discomfort generated by the emotional challenges of academic

writing that have created the shift in cognitive development as a learner. This example attests to the transformative learning that occurred, which is a major aim of praxis inquiry. It can, therefore, be surmised that it is the very nature of learning in this new way, through cognitive constructivism in praxis inquiry, that has generated such growth in the learner.

The data suggest that affective dimensions to learning and writing are important, and emotions need to be taken into consideration at the pedagogical level by teacher educators. The data more generally suggest that developing writer confidence needs to be factored into nurturing academic novice writers, while simultaneously challenging them cognitively. A dilemma for teaching staff emerged in that, while a certain level of discomfort was required to create the transformational changes described by Fleur, too much discomfort has the potential to cripple the writer, leading to issues such as ‘writers block’ as in the case of Lucy. Nevertheless, the impact of emotions can be a powerful determiner of success. This is substantiated by Maidment and Crisp (2011) in their study of the impact of emotions on learning; they conclude that ‘the impact of emotion leaves no doubt that emotional responses can be considered as both outcomes and predictors of learning’ (p. 410).

4.5.6.5 Emotions, cognition and self-efficacy

Studies by Pekrun et al. (2002) and Meyer and Turner (2002), emphasise the need to look at the role of emotions and learning as a synthesised approach. This is due to the interdependency between the individual learner and the context of learning, which creates important interrelationships between emotional, motivational and cognitive processes.

The emotional impact on cognitive function is particularly relevant to this study of metacognition, which has a focus on preservice teachers processing their cognitive learning from two contexts, the university and the school practicum. Learning through praxis inquiry was a new method of learning for the majority of these preservice teachers. This required analytical skills in academic reading to cognitively interpret theory in classroom practice. Bohn-Gettler et al. (2014) identify that learning experiences, particularly thinking skills, can be powerfully impacted by emotions during reading and writing tasks.

We see this impact of emotions on learning in the following example by Fleur, a participant who was a mature-age student returning to study. Fleur disclosed that the reason she wanted to participate in this research was because her first experience as an undergraduate student at another university was traumatic. As a consequence, she ceased her study stating that, **‘It’s always made me feel like I’m not good enough’** (emphasis added). Feedback on her writing by her lecturer at the time left her feeling so incapacitated that it took twenty years to regain her confidence to enrol in another undergraduate university course. Fleur recalls:

I also had this other experience back in the 80s... when I did my HSC [High School Certificate], I passed my HSC and ...when I got to university ...we had to hand in like a preliminary essay and the teacher basically gave me the essay and said to me, ‘You can’t continue with this subject’. And I said to him, ‘Why?’ and he said to me, ‘Because you can’t write’. And I was like, ‘What? But I passed HSC, I got into this university and this is what I

want to do... I want to be an English Lit. teacher'. And he said to me, 'Oh my dear, whoever taught you English did you a gross injustice... Your syntax is appalling'. And he put me in a class and he said to me, 'The only way you can continue my course is to do this class'. I didn't even know what ESL [English as a Second Language] students were... and that really upset me because I considered myself an Australian, and to be put in a class with people who couldn't even speak English really kind of, really hurt me kind of thing and so I've always—because of this expression business, it's always made me —and now I'm going to get emotional... It's always made me feel like I'm not good enough.

This example is powerful. In this case, the significance of teacher feedback and the damaging effects of negative labelling demonstrates the detrimental consequences on the psychological and emotional wellbeing of the writer. This trauma can be exacerbated for students whose first language is not English, as was the case for Fleur. The impact of emotions on writer confidence and their sense of self indicates the role of the teacher feedback is fundamental to building confidence and success in academic writing skills. Pedagogy such as that advocated by Dweck (2012) and Hammann (2005) indicates that positive interventions can lead to enhanced learning and writing skills.

4.5.6.6 Writer identity: A socio-linguistic perspective

Several authors discuss the importance of identity in the development of academic writing, from a range of perspectives. Williams (2006) looks at the issue of identity in academic writing from the perspective that identity is present in all forms of writing, advocating that 'identity is *always* present in writing' (p. 712). Ivanič (1998) provides a linguistic perspective in her work on discourse and identity, which is based on studies of language and context by Halliday and Fairclough (1992a, 1992c). Halliday's functional grammar serves to explain language in context, emphasising that meaning is dependent upon the 'context of situation and the context of culture... Meaning is created by the context of situation (and the linguistic choices which follow from it) is dependent upon the actual immediate situation in which it is used.' (Halliday, cited by Ivanič 1998, p. 39); words 'get their meaning from activities in which they are embedded, which again are social activities with social agencies and goals' (Halliday & Hasan 1989, p. 5, cited by Ivanič 1998, p. 39).

Data responses from preservice teachers indicate that developing confidence as an academic writer is connected to developing a new identity, which evolves as part of learning the linguistic and social discourse of the university environment. A number of issues relating to writer identity emerged. First, socio-linguistic factors impacted upon the social construction of identity as preservice teachers learnt the oral and written discourse of the university environment. This related to the specific linguistic conventions associated with academic speech and writing genre within the disciplinary units of study. Self-efficacy and membership of this discourse community were an integral part of developing writer identity while these linguistic conventions were developed.

Second, psycholinguistic factors, such as the development of 'Voice' in academic writing, occur as a result of the integral connection between literacy, cognition and the academic discourse as learners develop the ability to convey their personal learning in written communication. Language and thought are inextricably linked, which aligns with the socio-linguistic theory of Vygotsky. Vygotsky (1986) identifies that language is learnt within interpersonal interactions that serve as a social interactive tool and is an abstract representation for internal reasoning. Vygotsky proposes that language drives cognitive development through participation in intellectual and social environments. While Vygotsky's work was developed in the field of social interaction and children's language acquisition, his theories have been accepted as relevant to all learners. Sannino (2008) states:

The communicative use of language is both a product of activity and a key determining factor of human mind and action, which affects the activity itself. In other words discursive exchanges do not only stem from activity but also generate and regenerate activities through the agentive initiatives of those involved. (p. 268)

The experience of preservice teachers in this study demonstrated that interactions within the social and intellectual environment of both university and school field placements contribute to new forms of cognitive organisation. This was expressed through the oral and written language formats in assignment work related to genre.

The concept that language constructs convey social identity for writers is highly relevant in the development of an identity as an academic writer within this preservice teacher education study. Ivanič (1998) proposes that social identity will affect the way that an individual uses language to construct their message, stating that '[t]he language system itself has been socio-culturally constructed' (p. 40). Participants conveyed that they experienced an important transition in developing the language associated with being a university student as well as a preservice teacher in classroom context. This created uncertainties for participants in their efforts to become academic writers. We see this in Julian and David's comments below. Julian says that,

it is the jump from Year 12 to now as well, there's challenges because of that and it is also challenging because the subject matter and what I have to write about and it does challenge you a bit to think abstractly and about these concepts.

Similarly, David describes the difficulties encountered with the change in language use for writing.

There's general words that actually come across... I'm not really used to in academic writing, so that's where I think the problem actually lies... it's a bit confusing whether... my writing is a little general. 'Why is it general?' It's really hard to pinpoint where the problem actually is lying. ..Oh just a whole change in language. Just a complete change in everything that I actually do.

These comments by Julian and David reveal the dilemmas experienced as they tried to develop the academic discourse conventions appropriate for assessment tasks. Ivanič (1998) describes this when she says that,

decisions concerning what sorts of things to write about, what counts as grounds for a claim, what to include and what not to include, are all determined by discourse conventions just as much as decisions concerning how to write it. Every discursal decision positions the writer doubly: as a thinker of such things and as a user of such words and structures. (p. 39)

Examples from this study indicate that writer identity developed through the writing process itself as participants were required to theorise their experiences. Familiarity with the disciplinary knowledge, the vocabulary, concepts and conventions of the writing task were an important part of this process. The development of ideas was manifested through the contextual environment and the expression of these, which required linguistic choices to be made in the new genres being experienced. This required metacognitive knowledge to actively regulate these choices for writing tasks.

Participant data aligned with Ivanič's (1998) work illustrating how language is socially constructed and provides a framework for how discourse and identity are connected. Halliday's functional grammar is also considered a powerful tool for the study of language in context, to understand the relationship between language and identity. Of particular relevance is Ivanič's statement regarding how the literacy conventions that one adopts brings about membership to a discourse community: 'when a writer words something in a particular way, by a particular choice of words and structures, they are aligning themselves with others who use such words and structures, and hence making a statement of identity about themselves' (Ivanič 1998, p. 45).

Writer identity emerged as important to a study of metacognition and praxis inquiry, in that preservice teachers were required to analyse their learning through the lens of both university student and future educator. This required a shift in identity as a writer, as described by Cameron, who states that 'this identity shift entails positioning oneself not as an inexperienced student but as writer and academic with a legitimate voice and contribution' (Cameron 2009, p. 269). As future educators, preservice teachers had to begin to identify with becoming an educator in the teaching profession and all that this entailed. This involved observing classroom practice through the identity of a teacher, not just a university student, which required adapting to new culture, values, beliefs, vocabulary, concepts and disciplinary content as well as the literacy conventions. This shift in identity was necessary to become a discerning educator who could translate learning to academic writing.

Williams (2006) presents the notion of identity being present in all writing; however, his analogy of the best academic writing being similar to the best music, great art and authors driven by a passion for their field resonates when he says that 'we too often forget that the best scholars and researchers are driven by a similarly forceful passion for intellectual work. When we get the opportunity to see inside intellectual

work, to have identity and experience revealed to us, it can be as thrilling and inspiring' (Williams 2006, p. 712). This statement highlights the importance of writer identity as a manifestation of the intellectual engagement and passion for teaching and learning that creates the potential to facilitate high standards of academic writing in these units of study. A major aim of praxis inquiry was to develop discerning future educators who can demonstrate a passion and commitment to learning through questioning and engaging in self-critique. One can draw the conclusion that it is a writer's ability to demonstrate their passion in an intellectual and scholarly capacity, through identity as a passionate educator, that will constitute the best type of academic writing in teacher education courses.

Furthermore, it can be argued that William's (2006) concept of successful academic writing requires confidence and both intrinsic and extrinsic motivation in an intellectual capacity. Studies by Pintrich (2002) and Hammann (2005) confirm the importance of positive epistemological beliefs to success as a writer. This raises the challenging question for educators in higher education, not just in the preservice teacher education field. How can we develop passion, confidence and enjoyment of writing when authors such as Cameron (2009) and Fernsten and Reda (2011), as well as the participants in this study, describe a lack of confidence and self-efficacy in academic writing?

We now move on to investigating the teacher educator participants' experience of writing and teaching in praxis inquiry learning.

4.5.7 Writing in Praxis Inquiry: The Lecturer/Tutor participant experience

This section looks at the data findings from the interview questions presented to teaching staff, which aimed to identify the benefits of the praxis inquiry approach and to examine the challenges faced when engaging with this process in teaching. The purpose of this was, first, to identify participant perceptions on how the praxis inquiry model contributed towards preservice teachers' academic learning and writing; and, second, to uncover what theories of learning and teaching strategies contribute towards metacognition as a means for enhancing the writing process within praxis inquiry learning.

An outline of the data responses to the benefits of praxis inquiry will be presented first and will be followed by the challenges. The insights gained from this examination will serve to inform this thesis about a potential relationship between praxis inquiry, metacognition and academic writing.

4.5.7.1 The benefits of praxis inquiry

Data findings from interview transcripts by the lecturer/tutor cohort highlighted that there were benefits to preservice teacher learning from a praxis inquiry approach. The data revealed a unanimous view that learning through the context of the practical school placement in conjunction with the university setting was beneficial to the development of future literacy educators. The school placement experience was considered essential for cognitive and social learning, assessment, and academic writing development.

The participant data identified the following benefits to preservice teacher learning, which revealed connections between metacognition, praxis inquiry and academic writing. These benefits were linked to learning theories that related to cognitive and social constructivism. These are summarised below and used as sub-headings to detail evidence from interview transcripts.

- Experiential learning: connecting theory and practice.
- Learning in communities of practice: situated learning: linguistic discourse.
- Reflection, cognition and learning.
- Writing genres and praxis inquiry.
- Developmental learning: scaffolding.

4.5.7.2 Experiential learning: Connecting theory and practice

Participant data identified that cognitive and social constructivist learning through direct experience was an effective method for developing theoretical understandings about teaching and learning. Participant responses highlighted the significance of preservice teachers' concrete experience to learning abstract theoretical concepts in the practical classroom setting. The role of mentor teachers in modelling and demonstrating good practice was vital to provide the cognitive, social and cultural aspects of learning to facilitate this process, as was the debrief session by lecturer/tutors.

Teaching staff identified that direct experience and context provided the platform for authenticity in preservice teachers' writing. The importance of experiential learning espoused by teaching staff aligns to the educational learning theory of John Dewey, which maintains that cognition is facilitated through direct or vicarious experiences. In the examples below, Cathy, Lyn, and Emilia demonstrate the importance of experience in school settings to building cognitive understanding of theories of learning. According to Flavell's (1976) definition, cognitive understanding is required for the regulation of cognition.

We see evidence of the value of such experiential learning when Cathy asserts in the extract below that the school placement provides an essential starting point for understanding theory. This experience is considered essential as it provides the basis upon which preservice teachers can reflect on their observations, process these at the cognitive level and connect with prior knowledge of theory. This is evident when Cathy says,

I guess it asks the students to really reflect on their actual practice, on things that they're seeing, doing observing, rather than just theoretical. So it's a practical approach to their development of their understanding and it's relating their theoretical to the practical. So rather than just starting with the theory, they're starting with the practical and then connecting it to the theory. The challenges are ensuring they have that practical grounding, that they have the ability to see the practical, to see it in practice or to bring their own practical experiences to it, rather than just to take the theory.

A range of benefits to learning in praxis inquiry are highlighted in this example. The process of learning through immersion in concrete experience is considered the catalyst for cognitive understanding of theory at the individual level. Furthermore, the context facilitates thinking skills associated with analysis where preservice teachers are required to connect known theories to the practice observed. There is a sense that active learning is occurring at the cognitive level as preservice teachers are required to filter their knowledge of theoretical learning to identify how this translates into practical teaching. This example suggests that constructivist learning is advantageous, as evidenced when Cathy refers to the benefits of learning in praxis, as a 'practical approach to their development'. Finally, Cathy highlights that immersion in classroom contexts facilitates reflection, which suggests that the skill of reflection on theory and classroom implementation mediates cognition. This aligns with the work of Kolb (1984) and Schön (1983), who advocate the importance of developing educators capable of constructing critical questions on the effectiveness of teaching and learning events through reflection on practice. Kolb (1984) argues that adult learners assimilate information into their personal 'experience bank', against which they can then make comparisons to future learning events. This allows new concepts to be developed. However, unless learning is applicable to life situations or work, Kolb contends that learning will not be as effective.

In a similar fashion to Cathy, participants such as Emilia assert that it is the genuineness of the experiences in the school context that creates meaningful learning opportunities for preservice teachers to develop their cognitive understanding of theory. Her stance is on the teaching aspect; she asserts that the authenticity of the learning experiences in school settings is a critical feature of her teaching approach in praxis. This makes 'the theory come to life':

For me the benefits are definitely that it's a more authentic approach so we are able to look at real authentic examples of what teaching and learning is and then come back and dissect it and apply it to the theory. So for me it's a lot more meaningful, it's practical, it gives the teaching and the learning a sense of purpose and it also makes the theory come to life which I think is really important.

In the excerpt below Gaye adds that it is the emotional impact that preservice teachers experience as part of their learning in the school placement that contributes to their capacity to connect theory to practice.

I think the benefits for the students are that they can see the praxis, the theory and the practice together and the connections so students are able to make connections between the two interconnected elements of learning and teaching. I think they can feel it. I think there's some sort of emotional elements behind it, well that's what they tell me and I think that's true from when I see students at the start of the semester.

Gaye also highlights the developmental nature of experiential learning, discourse, context and the transformational nature of learning in praxis. There is a sense about the power of discourse, tied to the

growth and transformational benefits evidenced by the cognitive ‘shift’ described in thinking processes and the associated language use, when Gaye says:

To me I suppose the assessments, most were able to show that, and you could hear the student’s language completely change... and I didn’t see anything near of the growth of thinking at my previous university and you’re talking about two units that only last 12 weeks and 12 weeks in five hours, that’s quite a shift. I think it’s the benefits of the going into and the coming out of the school as well, because there are **different places** where you do the learning and there’s something about how you shift students in their space and their time... The benefits are very clear. I can remember one student’s portfolio, for example, within a semester, she used the metaphor of a door closed at the start of semester and she went through the aspects of the assessment which really drew all the threads together for literacy and students learning in a literacy context and 15 minutes later she said, ‘The door had opened for me’.

These examples contribute important information regarding the role of experiential learning theory in facilitating preservice teachers’ cognitive and social learning in the construction of personal understandings of pedagogy in these two units of study. Within this construction of understanding, there is a relationship within praxis inquiry learning and metacognition. This occurs as preservice teachers cognitively process their individual experience to connect with theoretical learning within the situated learning context in a community of practice.

4.5.7.3 Learning in communities of practice: Situated learning and discourse

Participant data identified that the context of learning was a significant factor in both praxis inquiry learning and metacognition. The school placement experience served to enculturate preservice teachers into their future profession. This was fundamental to understanding the purpose of praxis inquiry, where formal academic study serves as a process to develop personal theories and become discerning about the quality of teaching and learning. The discourse associated with ontological, epistemological and technical knowledge of these units of study was integrated into this situated learning context.

The teacher educator examples below emphasise the significance of learning in communities of practice for the development of the linguistic discourse associated with learning and writing in the praxis inquiry process. Theories of learning that underpin teaching practices were found to relate to social constructivist approaches, as in the work of Vygotsky (1978), Lave (1993), Wenger (1999; 2002), Ivanič (1998) and Gee (1991). These theorists argue that learning is social and occurs within the process of being engaged in a community of practice through the language and discourse of the community. This is evidenced in the following examples from Lyn, Jane and Gaye.

In the extract below, Lyn draws attention to the advantages of immersion into the whole school experience and not just the classroom. She asserts that the provision of opportunities for preservice teachers to see ‘the whole picture’ in the experience of being part of a school learning community broadens their capacity

to connect theory and practice. This context provides a holistic approach to learning as preservice teachers interact with children in classrooms, their mentor teacher, staff and parents. Lyn's reference to 'connectedness' gives a sense of theory and practice being intertwined at both the cognitive and social level. Metacognition here develops from individual immersion into the broader context of education beyond the university. This example is important to a study of metacognition because it places an emphasis on the context or situation for experiencing the real-life world of schooling and education to process cognitive learning to make sense of theory. According to Kolb (1984), this makes learning more effective. This also aligns to theories of situational learning in communities of practice proposed by Lave (1991). In this model of praxis inquiry, situational learning in a community of practice provides authenticity as well as the discourse and content for academic writing. Theoretical cognitive learning is embedded within social learning. We see this when Lyn says:

Going out to the schools gave them that connectedness between the practice and the theory, and I think that was the most beneficial part. When you've got the two, then you can start writing about it and reflecting on it because you've got the whole picture in a sense; you've got the two parts that come together, where when you have to write about the theory, you can write about it, but you can't really relate to it, you haven't got that experience. So that experiential learning that's taking place for them in the placement, I think is invaluable.

These examples draw attention to the context as an important factor connecting metacognition and praxis inquiry learning. This is found in the process of reflection and cognitive processing of knowledge gained, and the regulation of this knowledge.

In the extract below, Gaye describes the significance of the linguistic facets of the cognitive and social learning that takes place in the school context. This is illustrated by an epistemological view that cognitive learning is facilitated through social interaction and language from situational learning contexts. This example connects metacognition to the development of the linguistic discourse used in these units and the associated conceptual understandings, which are fundamental to learning in this praxis inquiry environment. This information also aligns metacognition with linguistic theories of learning identified in the preservice teacher data, such as Halliday (2004), which consider language a social semiotic system and meaning as developed in socio-cultural constructs. It can, therefore, be inferred that preservice teachers' facility with the semiotic system is required for high standards of academic writing. Gaye's comments highlight that pedagogy arising from socio-cultural and linguistic theories of learning drives the methodology used for teaching. She cites the use of collaborative learning practices where preservice teacher learning occurs through discussion within such communities of practice. In addition, the context is considered fundamental.

Situated learning provides the basis for critical reflection at the cognitive level and discussion contributes to both cognitive and social learning derived from the situated context of the classroom experience. This aligns to Vygotskian principles on social-cognitive, constructivist approaches to learning through use of strategies

such as discussion and critical reflection. Finally, the quality of teaching is highlighted as an important factor in facilitating critical reflection. Gaye asserts there are benefits to a consistency of teaching approach being implemented among a large collection of staff who work professionally as a team.

I think the benefits are also that we broadly replicate and give opportunity for the Vygotskian principles of social constructivism to be used and applied so the students are learning together. They talk together, we talk together as a community, so there's those kind of concepts so they are threaded right through the two units so they work hand-in-hand. A praxis gives them a chance to start the critical reflections; the best of the students manage to do that. I have to say some of that comes with the lecturer as well, the teaching, how the teaching works amongst this large collection of staff and the benefits are that we get a relatively consistent message across all the staff because we tend to work together as staff. So, for me, there's a professionalism, there's professional benefits to working together.

The participant examples above identify benefits to learning in praxis inquiry that connect with metacognition. Metacognition was embedded within the cognitive and social learning experiences in situated learning within communities of practice. This provided the context for the linguistic discourse and disciplinary knowledge to develop, which enabled preservice teachers to analyse and synthesise theory and practice required for learning and writing tasks.

4.5.7.4 Writing genre and thinking skills: A hierarchy of thinking processes while learning to write through praxis inquiry

Participant data identified that cognitive learning and academic writing within the praxis inquiry approach was a developmental process. The praxis protocol provided an incremental approach to preservice teacher learning as they were guided through a thinking process, which contributed towards their learning and writing capabilities (see diagram p. 49). In the examples below, Cathy, Lyn, Paul, Jane, Emilia and Ann describe their experiences of how the praxis inquiry protocol assisted preservice teacher in the development of writing skills.

Cathy outlines the benefit of praxis inquiry as being the individualised construction of understanding based integrating classroom experience with readings and more general life experience. The incremental nature of working through the praxis inquiry protocol towards the goal of transformational learning through reflection on these experiences is illustrated when Cathy says:

Oh absolutely, I think there are very definite benefits to the praxis enquiry approach. I think really getting the students to focus on what they're observing, what they're seeing, what they're doing—whether it's in the classroom or other aspects of their life—or even within their readings. They're reading and what are they thinking and what are they understanding, rather than what is the theory telling them? Really looking at it from their own personal perspective,

whatever they're doing, and so there's real benefits to it. If you look at the praxis approach, if this is described practice, explained and practice changed. I mean really, working through that approach and then the reflection at the end—What have I found out from this, what do I understand, what have I learned, how will that change my understandings for the future? Whether it's in my practice or my knowledge or my experiences. How would it change me?

These comments suggest a connection between praxis inquiry, reflection and metacognition evidenced by the individualised cognitive construction of preservice teacher understanding. There is evidence of a targeted focus on processing information from experiential knowledge which involves cognitive learning in conjunction with the regulatory component of metacognition. This unfolds within the analysis of experience for the purpose or goal of transformative learning.

A hierarchy of thinking skills found within the genres of writing in the praxis inquiry protocol required preservice teachers to make cognitive adjustments to shift from descriptive to analytical writing. The descriptive genre was a recount of the events and situation, generally considered to be the least cognitively or intellectually demanding type of writing. Lecturers such as Shem Lyn, Elaine and Amanda referred to this as demonstrating understanding at a 'surface level'. Further to the descriptive writing genre, the expository genre was used to explain understanding of classroom events to justify and theorise learning. This required greater intellectual rigour, as preservice teachers drew on their readings about theory to explain the practice. The final stage, 'practice changed', required preservice teachers to reflect in a critical manner and write a critique of their learning that indicated some form of transformation and action as a future educator.

Theorising, to explain and draw conclusions from the practice, was found challenging. In the excerpt below, Emilia indicates that preservice teachers required a greater knowledge of writing genre to be successful at university. She takes a pedagogical stance when she refers to the need for 'explicit teaching' in the excerpt below. Her comments illustrate that analytical skills are integrally bound within the discourse of the theorising genre of writing in praxis. Practice and modelling are required to develop preservice teachers' thinking skills for deep learning, as illustrated when she says that 'they need to practice how to think like this and how to write in an analytical manner' and to 'think more deeply'. These comments highlight the importance of the teacher educator and their epistemological beliefs about their role in the teaching of writing skills. Emilia states that she provides weekly writing tasks to develop the skills for writing in praxis inquiry learning.

It can be surmised that teaching approaches that develop metacognitive skills through genre methods have the capacity to extend thinking skills. However, Emilia's use of the term 'explicit teaching' informs us that a level of teacher intervention is required for this to occur. Regular activities to facilitate analytical thinking and writing skills are necessary in praxis inquiry.

Once again, I think that explicit teaching is essential and I also think that they need to practice. They need to practice how to think like this and how to write in an analytical manner so once again short examples each week, doing little warm up activities that allow them to think more deeply about the content or about an issue is really important. That's about it.

The acquisition of thinking skills required for analysis and thinking 'more deeply' about educational issues required the development of reflective skills in praxis inquiry. Reflection played a significant part in leading to transformations in learning and the ability to write in the explanatory and critique genres of writing.

We see this in the example below, when Cathy describes a process of 'deep reflective engagement' by a preservice teacher that led to such transformative learning. While reflective skills were considered the conduit for processing the visual experience of observation, the analysis of reading material is also attributed to creating a shift in cognitive learning about literacy pedagogy.

Cathy describes the benefits of praxis inquiry to transformative learning through reflection and analysis on all sources of learning: investigation of readings, data collection from the school setting, and classroom observation, which enabled 'deeper learning' to a preservice teacher's views on teaching spelling.

Those that do it well are really showing a deep reflective engagement with what they're seeing. They're looking at it and they are reflecting on what they've been reading, what they're talking about and bringing that into it. So their strengths are that ability to reflect, that ability to see the connection between the practice and the theory. Again as I said before, to use that, to change, to use that, to build their own understanding and to say, 'Well from what I've seen and what I've read in my classroom, this is what I would like to see'. So they're using what they're looking at, what they're learning about to change their own perceptions. I had an example with one student before she did her research, she was adamant that you had to teach explicit spelling, even at prep. She could not see how you could have invented spelling... 'No you must teach', and she was adamant. Through her research project, she worked through that with a prep class and she did fabulous collections of data, and a lot of reading. In her final presentation, she went, 'You know, I started out thinking this and what I have done has changed my perception totally and now I believe that the only way to do it is to encourage them to use invented spelling'. So it was a perfect example of somebody who has used that praxis enquiry approach and changed her whole perception or whole understanding in a couple of months, through the work that she'd been doing. That practical theorising.

This example describes that observation, without inclusion of analysis of a wider body of knowledge and reference to the literature, can result in a narrow, surface description of classroom events. In this case, the quality and effectiveness of reflection from all sources led to the transformational shift in the preservice teacher's understanding of theories about how children learn to spell. Initially, this preservice teacher's views on the teaching of spelling exhibited associations with a behaviourist model of learning with a focus

on the teaching. Following the experience in the school setting, and the research process exploring theories about how children learn to spell, the preservice teacher's views shifted towards constructivism, with a focus on the learner. This was consistent with her discovery that young children use 'invented spelling' while they actively construct their knowledge about orthographic rules through generalisation, trial and error.

These examples indicate that theoretical knowledge is fundamental to the development of the cognitive understandings required to analyse or regulate this knowledge. This information draws attention to the importance of understanding theory to be metacognitive in learning within praxis inquiry. It can be surmised that preservice teachers' capacity to be analytical of theory and practice, to evaluate and draw educationally sound conclusions, is an important attribute for extending writing beyond the descriptive phase. Analytical skills result in written communication that can display deeper and more meaningful insights into teaching and learning. This is an important insight for this study as it draws attention to the skill of analysis as an important component of metacognition for cognitive regulation to write in a high standard.

4.5.8 Challenges experienced by teaching staff in the praxis inquiry model

This section aims to identify the challenges that the teacher educator participants experienced within their teaching in the praxis inquiry model. In the previous section, participants identified benefits to preservice teacher learning through a praxis inquiry approach, with a relationship between metacognition and writing uncovered. We now move on to explore the challenges that this cohort of participants found in their teaching within the praxis inquiry approach. This aims to identify insights important for understanding those teaching and learning practices that may enhance a preservice teacher's academic writing.

Interestingly, while there were many benefits to learning in a praxis inquiry approach, data findings demonstrated that there were several major challenges encountered when implementing this model as a direct result of the benefits. These challenges related to (a) changing preservice teacher epistemological views of learning and teaching in an inquiry-based, experiential, cognitive and social constructivist model; (b) introducing praxis inquiry learning required teaching staff to challenge their teaching practices to identify effective ways of introducing a new model of learning to preservice teachers; (c) developing preservice teacher reflection skills; and (d) developing facility with the academic discourse for critical reflection and writing.

4.5.8.1 Changing preservice teacher attitudes to a new way of learning and writing

Participant responses identified that one of the most significant challenges the lecturer/tutor cohort experienced in teaching these units of study was the need to transition preservice teachers into a new way of learning. This related to learning through constructivist approaches in praxis inquiry, where learning occurred in two contexts. Praxis required they analyse the theory and the practice from both settings to develop their own philosophical views about what it means to be an effective literacy educator through questioning and reflection.

Lecturer/tutor participants expressed that difficulties arise because most preservice teachers came to university with a notion of learning epitomised by the behaviourist model, or what Freire (1976) refers to as the ‘banking concept’ of education. Teacher educators indicated these attitudes to learning presented challenges for their teaching. A major problem identified was that preservice teachers were over-reliant on the teacher and lacked confidence to express their own views. Data indicated this stemmed from a belief there were right and wrong answers, consistent with behaviourist theories of learning. As a result, preservice teachers looked to their tutors to provide the necessary information for learning.

There was a common view among all the teaching staff—Lyn, Cathy, Paul, Gaye, Emilia, Shane, Rod, Ann and Jane—that helping preservice teachers transition into this new way of learning was a major challenge. Some examples of teacher educator comments of these challenges are outlined below.

In the excerpt below, Paul asserts that teacher education in these compulsory education units required a different set of skills to that which preservice teachers may have developed in their education prior to coming to university. He emphasises the course is not one where you learn facts but, rather, places value on a different form of learning that occurs through a different process. Paul’s statement regarding the metaphor of ‘the empty bucket’ is pertinent. The statement, ‘we don’t believe in the empty bucket’, reflects an epistemological view of pedagogy that aligns with Freire’s banking concept of education. The individual does not need to be filled with information. Further, his statement, ‘if we kept the metaphor going’, reflects the view that preservice teachers are considered central as learners, with the responsibility to ‘fill the bucket’. In saying this, he advocates constructivist principles of learning that place emphasis on the individual’s cognitive processing of learning. This happens through the experience of university, within school settings and through a social environment as a community of learners.

Many of our students come straight out of a school system which many of us consider to be hide-bound and narrow with the wrong sort of focus on outcomes and a productive, almost mechanistic, industrialised system, and our students say, ‘What do I have to do to pass?’, and we are thinking, ‘Oh, I want you to learn something’, alright? And that tension is a challenge for a lot of them. Another challenge for our students that have come from other areas, the mature-age ones often come from other industries, they are surprised that we’re not telling them how to do it as well, ‘This is the way to do it, here it is. You are the empty bucket and we’re filling it. Isn’t that nice for you and at the end of this you’ll be full and you’ll be able to go out.’ So, they don’t know that they have to actually—well, we don’t believe in the empty bucket, but if we kept the metaphor going, we want **them** to fill it up. (emphasis added)

This example by Paul is significant because it draws attention to the tensions that emerged from a dichotomous relationship between behaviourist and constructivist theories of learning. Preservice teachers had to reconcile these epistemological views in praxis inquiry learning, which manifested as confusion and misunderstanding (discussed previously). Gaye’s comment below also highlights the need for

preservice teachers to redefine and reframe their views on the role of a teacher in a praxis inquiry framework, where the responsibility is on the learner to construct their personal theories. This example indicates preservice teachers have not fully understood that praxis inquiry learning is an inquiry-based approach that has at its core questioning techniques, rather than a behaviourist approach where the teacher disseminates information. The difficulties encountered as a teacher educator in a constructivist mode of learning are evident when Gaye says,

I think the real difficulty is them understanding that they have a responsibility to question what's happening in a classroom. They're not used to asking questions. They think our job as a lecturer is to tell them stuff and I'm sure some of them think that it's a cop-out to ask students to come up with their own questions... There are some students across a range of diversities that we have, who think the job of teaching is filling the bucket and those students in particular have a difficulty understanding that questioning is part of your professionalism and that the PI [praxis inquiry] framework challenges them in that sense.

Teaching staff generally remarked that many of the benefits identified as positive features of the praxis inquiry model were difficult to implement, particularly in the first year of this Bachelor of Education course. Tensions relating to the adjustment of learning through a praxis inquiry approach were evident in both data sets (preservice teacher and teaching staff). Teaching staff grappled with an expectation that by the time preservice teachers enter university they should be independent learners. However, the praxis inquiry process in this Bachelor of Education was not just focused on learning at university. The practical school placement was equally important and preservice teachers were novice learners in both contexts. Teaching staff were challenged by the need to help preservice teachers develop independence in learning within both these contexts while simultaneously needing to nurture what can be described as dependent learners in a new way of learning.

This lecturer/tutor data displayed a recognition that praxis inquiry learning posed challenges to their teaching in their endeavours to support preservice teachers transition to a new way of learning. This required them to be metacognitive about their teaching to make appropriate adjustments.

4.5.8.2 Lecturer/tutor challenges in teaching and introducing praxis inquiry skills: Modelling, mentoring and demonstration

Given the praxis inquiry approach required a different way of learning, teaching staff expressed the need to reflect on their own teaching practices to facilitate preservice teacher learning. Strategies such as modelling and demonstration, and practising praxis themselves, as well as explicit teaching of skills were examples provided as part of this process.

Paul's comments below illustrate a need for a shift in the mindset of educators when dealing with the challenges of implementing praxis inquiry learning successfully. He advocates the importance of

understanding where the learner is at, recognising that preservice teachers are at a 'novice' stage in this form of learning. In addition, he states that modelling praxis inquiry in his own teaching is important. This requires analysing his own teaching practice so that preservice teachers can learn through his modelling. This statement reveals the importance of teacher educators being metacognitive within their teaching. Furthermore, he acknowledges that a commitment to praxis as a process of continuous improvement is required to develop quality educators who stand out as exemplary teachers rather than average. This is reflected in his metaphor, 'It's not just delivering cheese in a cheese factory'. Paul describes the challenges of implementing praxis inquiry learning in his teaching.

One of the challenges that I have in Year 1 of the program is that we're dealing with the novices, we're dealing with the people that we're introducing the way we do things to them. So, one of the challenges is, we have to work out ways to introduce it so that it works. Not only are we trying to teach praxis enquiry, we're trying to do it ourselves. So, in our praxis which is teaching these students, we have to think about our practice, what we are doing, and, we have to put in play the theorists, and also think about 'Ah, right, so in what way am I benefitting the students...' so we endlessly come backwards and forwards in the cycle, which is the benefit. So, the challenge is to always be within this cycle and not to become complacent and to be always aware that what we are doing, is like praxis enquiry, there is meant to be a beneficial outcome. It's not just delivering cheese in a factory; not that there's anything wrong with that, but let's see the difference between the Kraft processed cheddar factory and an artisan dairy in the country, right? So, one produces great cheese and the other produces millions and millions of units of s—— .

Similarly, Lyn also raises the importance of modelling good practice and using scaffolding as a mechanism to develop praxis inquiry skills. In the excerpt below, Lyn states she sets goals to improve her practice, which displays metacognitive skill on her part. This is evident from her insight that she needs to help preservice teachers identify theory in the context of the classroom through individual mentoring. In doing so, Lyn demonstrates metacognitive knowledge about her learners and has analysed her practice to regulate her teaching. We see this when she identifies the need to 'ask more probing questions' to make connections between theory and practice overt.

This year my goal, for example, is to if I see something when I'm moving around the room and talking to the preservice teachers, I'm going to say, 'Okay, so what sort of teaching framework is being used here? What theory, can you see a connection to a theory?' So maybe, for me, for my personal learning so I can help them, maybe I need to ask more probing questions about what they're experiencing and that way they can see that connection between the theory and the practice.

In a similar vein, Jane also states the need to use questioning techniques through individual mentoring and guidance within the classroom context to support preservice teachers' observation skills. We see this in the excerpt below, where individual scaffolding is suggested as a means of assisting preservice teachers identify incidents that connect to theory.

The other thing is that they're in a number of different classrooms so taking the opportunity to sit down with a student and direct their observations there in the classroom is something I we've talked about in our sessions... I find it really important to get them to reflect about what they see, how that might fit with some of the theory that we've looked at, or the things that classroom incidents and connect these to theories as they occur. They are only first years as well, so trying to post questions to get them to think more about what they're seeing I think is really important as well. I find that challenging when you've got a group of 20–25 students to unpack that in that way.

This example suggests the development of the type of thinking skills required to connect theory with practice occurs best through reflection on practice as it is occurring. Schön (1983) refers to this as reflection in and on action. While preservice teachers were only observing, not teaching, at this stage of their learning, this teacher educator data suggests that assisting them to learn how to reflect on the practice was essential but required scaffolded learning situated within the classroom. These examples from Lyn and Jane highlight the importance of individual guidance through coaching and mentoring to enable preservice teachers reach deeper understandings. Such depth is required to develop academic writing skills to extend beyond the descriptive stage of reflection. The data identified that the skill of reflection on classroom events and the ability to synthesise the practice with theory was vital to successful academic writing in praxis inquiry learning, but preservice teachers required external support to develop their critical reflection skills.

4.5.8.3 Developing preservice teacher reflective skills

The need to facilitate and develop preservice teachers' skills for successful reflection of learning through praxis inquiry was identified as a benefit to praxis inquiry learning, but also a key challenge for teaching staff.

Teacher educator responses, such as that of Lyn, identify a need to place greater emphasis on helping preservice teachers understand the nature of reflection. Her comments reveal that reflection occurs at different levels because 'It's got to be at a deeper level because you need to have the theory to tie in'. This suggests a hierarchical aspect to reflection related to depth of learning, which requires a knowledge of theory. This example highlights epistemological knowledge (theory) is required for preservice teachers to analyse and synthesise literacy practices in classrooms. This suggests prior knowledge and experience form important components of reflective capacity.

This example also reveals that depth of understanding is connected to the development of analytical skills, as when Lyn says, ‘you need to have the theory to tie in’. This indicates the type of reflection required to achieve more complex understandings is connected to the capacity to reflect at a dialectical level. This depth Lyn refers to can be likened to the concept of dialectical reflectivity (Taggart & Wilson 2005).

I think we probably don’t spend enough talking about reflection and its uses, so that could be something for future learning, because it’s not just a matter of thinking about ‘Oh yeah, this is what happened at my placement today... I think I’ll write about it’. It’s got to be at a deeper level because you need to have the theory to tie in, you need to have that prior knowledge in order to be able to reflect on that particular experience. So, for me I think that’s the biggest challenge, getting them to reflect at a deeper level, not just that... it’s almost like a report of an observation they do rather than be a little bit more analytical, and I think that’s where we want them to go so they can really analyse that experience and tie it all in together.

This example also draws attention to the importance of the writing genre that is associated with high standards of writing. This is evident when Lyn says, ‘we want them to... really analyse that experience and tie it all in together’, rather than ‘report... an observation’. These comments suggest that analysis and synthesis are considered key attributes of high standards of writing and are connected to a hierarchy of thinking and writing skills in the genres of writing, within praxis inquiry learning.

In a similar vein to the examples from Lyn and Jane above, Shane attests to the need for mentoring support from teaching staff to assist preservice teachers in reaching deeper understandings of classroom incidents. He cites the importance of writing being understood as a process wherein the prewriting stage includes prompting through questioning as a strategy to bring out the strengths in preservice teachers’ writing. This is evidenced when he says there is a ‘the need to work through these ideas’ to reach the end product.

I think the prompting helps bring out the strengths and I think they don’t all have it. I think some of them do it much more easily than others, and I think when it comes to writing about it, it’s sort of like the finished product is what they’re focused on, but they’re sort of forgetting that in getting to that finished product, you really need to work these ideas a lot... you need to talk about them and I suppose that’s what my questioning and prompts are about, getting them to think about it. So, you’ve got a whole range of events and thoughts and ideas that you can then pick and choose and mix and match and put together into an essay. But that’s just the finished product; it’s part of this whole process that you’ve been through. The process is important

This example emphasises the importance of the teacher educator supporting the development of thinking skills through discussion to assist the development of reflective analysis and synthesis of learning in praxis inquiry. This example is suggestive of writing being seen a process rather than just an end product as advocated in the work of Graves (1980).

4.5.8.4 Developing facility with academic discourse for critical reflection and writing

Participant data identified challenges in assisting preservice teachers develop facility with the academic discourse of these units of study. This discourse required them to analyse and write about their experiences.

In the excerpt below, Jane identifies challenges associated with supporting students from diverse linguistic and cultural backgrounds. This example draws attention to the background of this cohort of participants. The social and cultural capital these preservice teachers bring to university learning requires particular support. (This information helps to answer the sub-question relating to challenges where English may not be the dominant language and the impact this might have on preservice teacher learning.) Developing the academic language required for critical appraisal in writing was identified as being particularly challenging for these students. We see this when Jane says, ‘the critical reflection, using the theory and putting it into their own words is more of a challenge and I think particularly for students in this university to articulate what they’re saying perhaps takes a bit more time’. Skills such as the ability to use critical reflection in writing; to make the connections between theory and practice; and to express ideas without too much reliance on readings, were raised as specific difficulties.

Jane asserts that writing in praxis inquiry is more difficult than in speech, particularly for those preservice teachers who had not read broadly enough or, engaged in discussions. This demonstrates the interrelationship between language modes, spoken and written. An important insight is that facility with academic discourse is required to enable critical reflection.

I think it’s probably more challenging in the written task than it is in the portfolio and I suppose when we look at some of the initial essays or reflections that they do, it’s thinking about learning or their own learning style, I think that some of them who haven’t perhaps read broadly and engaged in discussion in sessions find it a little more difficult to express themselves in the written form. When they have their portfolio presentation I think they are able to articulate sometimes a little better as to what they’ve actually seen... They can talk about it, put it into their own words but they have trouble using academic language to write about it at times.

In a similar manner, Lyn states that facility with academic discourse related to disciplinary knowledge is a key component of the ability to express theoretical constructs in writing. She further notes that the specific terminology associated with literacy education in these units requires development. This information is important for learner agency in writing. The discourse of disciplinary knowledge is required for the regulatory factor in metacognition.

Preservice teachers find it challenging to put labels to the practice that they see—connecting theory and practice is a difficult thing in the first year but develops with time and experience. Again, I think it’s challenging them to label the practice in a way... So when they were

reflecting, they were reflecting but still not able to make so much of a connection between 'This is what I'm experiencing and this is the theory for it', so bringing that connection together. So I think that's the challenge, to give the practice a label that matches the theory.

Alternatively, Emilia takes a pedagogical stance, asserting there is a need for explicit teaching of skills to enable effective engagement in the praxis inquiry learning process. Her comments highlight the challenges involved in introducing first-year preservice teachers to a system of learning that is unfamiliar. These challenges relate to the following issues, (and were also raised in the preservice teacher participant data). There is a need for explicit teaching of the academic discourse associated with the processes required for effective engagement in praxis inquiry. In addition, the skills involved in research for assignment work and for deep reflective analysis of classroom observations need to be taught. We see these factors in Emilia's comments in both extracts below.

I think it's very difficult for them to engage in the praxis enquiry framework or model if they don't understand what it is. So often we're throwing around terms like praxis enquiry or framework or theorising and they don't actually know what these things mean, so it's a challenge for them and also the same thing applies to understanding the research process in regards to Unit 2. They don't know what research necessarily looks like so it's very hard for them to be able to have an understanding of what they're engaging in if they're not explicitly taught those skills, if you like, so that's what I find my challenges are in regards to those two subjects.

I think there are a lot of challenges with the process but I think, once again, some of them are not aware how to engage in the process because they haven't been explicitly taught how to engage in that process. So for some of them they go into the school, they sit there, they observe, they take small groups etc., they don't know what to do with that. They then don't know how to think more deeply about what they've seen and how to make those connections so I think once again they need to be explicitly taught what to do with what they've seen, where to next so for me that's a key, that explicit nature of the framework and the process.

Another major challenge for teaching staff was helping preservice teachers develop an academic 'voice'. We see this when Shane outlines the difficulties experienced by preservice teachers in their attempts to synthesise experiences from academic readings and connect these to their school experience.

I think what the students really have to struggle with is managing those two voices, so the voice of the theory or the theorists and their own observations and their own reactions and their own experiences and being able to use those two ideas side by side and move between the two. And, I think in the beginning stages, which they are in first year, they're sort of full of 'Well I like this, I don't like that, this is what I saw and here's something I have to read...'

and they can't quite make the connection, so I think it's that beginning to bring the two things together.

Shane's notion of developing academic voice in writing is important in the study of metacognition and academic writing. It can be argued the difficulty described as 'managing the two voices' epitomises a crucial component of written assignment work in the praxis model. This requires analytical skills to synthesise cognitive learning from two contexts of learning. Like other teaching staff, Shane indicates that preservice teachers find it difficult to navigate their ideas and connect the theory with their experiential learning of the practice, to develop academic voice in writing. Strategies related to social constructivist methods are suggested to facilitate complex ideas through discussion, sharing ideas and demonstration. He suggests that a collaborative approach to learning and writing can facilitate analytical skills to support the synthesis of experience from both university and school settings.

I think they might be able to do it a bit in speaking about it, which I think is an essential step before they write about it because I don't think you can just go boom, and write about quite complicated ideas or begin to make those links, as we said, between personal experience and theoretical ideas without actually nutting it out in your head or talking about it with somebody else, sharing ideas and actually having it shown to them that this is a theoretical idea and it does make a link with what you've just seen or heard or experienced, and how could we talk about this, how can we bring these two things together? So, getting those voices, managing those voices is difficult in speaking but it's difficult also in writing.

This example portrays writing in the praxis inquiry model as an active cognitive process connected to the development of academic voice. Shane asserts that the cognitive aspects of learning need to be built through social discourse. It is through such discourse that complex ideas in theoretical learning can be connected to personal experience. However, this requires pedagogy related to socially supported and guided instruction from teaching staff. This example highlights the connection between language and thought and the benefits of a pedagogy of writing that recognises the importance of discussion in the prewriting phase to facilitate cognitive analysis of learning. Again, this aligns with the Vygotskian process of scaffolded learning from a more knowledgeable other (Vygotsky 1978) within a collaborative learning approach.

4.5.9 Discussion of findings from both data sets: Connections between metacognition and praxis inquiry

This section aimed to identify information to help answer the main research question pertaining to how metacognition and academic writing are connected in praxis inquiry learning. This was to contribute towards an understanding of how metacognition manifests within praxis inquiry learning to unveil any resultant impact this can have on writing. The intention was to identify any significant connections

between metacognition and praxis inquiry learning to provide new insights into a pedagogy of academic writing in preservice teacher education.

Data findings identified three important factors where metacognition was connected to preservice teachers' learning to develop their written communication skills in the praxis inquiry process of learning. These three factors were personal or individual cognitive learning, social environmental factors, and behavioural, affective dimensions.

The findings emerging from both data sets suggest there are significant connections between metacognition and praxis inquiry as a cognitive learning process in which theory and practice are synthesised to create individual theories about educational practice. Preservice teacher participant data indicated that metacognition presented in learning and writing, but this predominantly occurred in an unconscious manner. Participants were generally not able to explicitly identify that they were being metacognitive; however, there was evidence of an ability to cognitively process what was observed in classroom practice and attempt to connect this to theoretical learning. This required skills such as cognitive analysis during reflection in praxis inquiry learning. This manifested as the regulation of learning through the research process contributing to cognitive transformations in the development of personal theories. This information suggests there is a connection between praxis inquiry learning and metacognition as defined by Flavell (1976). However, there are implications for pedagogy related to transforming what was generally an unconscious process in preservice teacher learning into a conscious process. An increased knowledge of metacognition as a concept and skill is required for further benefits to enhance writing.

Both participant groups identified experiential learning in the school placement experience as having a positive impact on preservice teachers' attempts to connect theory with practice. This provides important insights into pedagogy based upon experiential learning for cognitive transformations. Conclusions can be drawn that the challenges for both participant groups stemmed from preservice teachers' difficulties in understanding the theoretical basis and conceptual process of constructivist learning. This included the discourse associated with praxis inquiry, the genres of documenting research reports, the skill of referencing and preservice teachers' capacity to analyse learning within reflection.

The revelation of these challenges highlights a need for pedagogy that can assist preservice teachers understand the theoretical learning framework that underpins both praxis inquiry learning and metacognition. This is important because understanding praxis inquiry as a learning process was fundamental to preservice teacher success in these units of study. Insufficient comprehension of key terms associated with praxis inquiry had the potential to impact on the ability to conduct assignment work correctly. It would be reasonable to conclude that comprehension and facility with the linguistic discourse associated with these two units of study was fundamental to the development of academic writing success.

Conclusions drawn from the teacher educator data indicate the major challenges experienced in their teaching within this praxis inquiry process also stemmed from the difficulty transitioning preservice

teachers into an inquiry-based process of learning. This presented a dichotomy of epistemological views for their practice. Dilemmas occurred as a result of a learning process that required individual cognitive construction of learning, while the skills for cognitive analysis involved in reflection on learning required teacher educators to shift their teaching approach towards explicit teaching. (This will be elaborated on in the next section.) It can be surmised that academic writing in the praxis inquiry model is a process of cognitive learning built through socially constructed discourse from university learning. Complex ideas from theoretical learning needed to be linked with personal experience but this requires external facilitation from teacher educators.

The next section explores metacognitive strategies employed by preservice teachers in their writing, and academic teaching staff in their teaching, using Flavell's definition as a benchmark. The aim is to provide further insights to answer the main question and sub-questions relating to learning theories and strategies that contribute towards preservice teachers' academic writing skills

4.5.10 Metacognitive strategies identified by preservice teachers and teacher educators

This sub-chapter provides examples of the responses from both cohorts of interview data that aimed to identify metacognitive strategies used by preservice teachers in their written assignments and teacher educators in their teaching. The purpose of this is to identify how metacognition might contribute to the enhancement of preservice teacher learning and writing.

The first section will detail the data responses from the interview question to preservice teachers, which asked them to identify metacognitive strategies they used in their academic written assignments. The second section will provide an overview of lecturer/tutor participant responses regarding whether there was evidence of metacognitive skills in preservice teacher written assessment tasks. This will also detail teaching strategies that were used to develop metacognition.

A synthesis of issues arising from both data sets is undertaken at the end of this process. This aims to contribute to answering the thesis questions relating to (a) metacognitive teaching and learning strategies that have the potential to enhance writing, and (b) theories of learning that are conducive to the development of metacognition.

4.5.10.1 Preservice teacher data findings

This section aims to identify issues related to metacognitive strategies used by preservice teachers to assist them in their academic writing tasks in praxis inquiry learning. This information is based on the analysis of preservice teacher responses to the following question presented at interview: 'Are you aware of any metacognitive strategies that assist you in academic writing tasks?' This question was presented to preservice teachers directly after being asked to outline their understanding of metacognition.

Data findings from preservice participant responses to this question indicated a general uncertainty articulating their awareness of being metacognitive or recognising metacognitive strategies used for academic writing tasks. It is posited this uncertainty was connected to the difficulty experienced by preservice teachers in expressing understanding of metacognition in a conscious, explicit fashion in the first instance. Twelve of the fifteen preservice teacher participants responded that they were unsure of the meaning of metacognition, and two said they had not heard the term.

Despite the uncertainty expressed by those participants who said they were unaware of being metacognitive when writing, evidence of metacognition according to Flavell's (1976) definition was identified in some participant responses. This was evident in the monitoring and regulation of writing concerned with the goal of writing improvement. While this generally occurred in an unconscious manner, there was some evidence that participants were consciously able to identify metacognitive strategies used to assist in writing tasks.

Evidence of metacognitive strategies occurred predominantly in the following areas: reflection from the school practicum placement experience; the research phase of planning assignment work, which included making connections between theory in readings, lectures, tutorials and the school practical placement; and the editing phase of writing. These are outlined below.

4.5.10.1.2 Reflection in the context of the school practicum placement

Preservice teacher data identified that reflection was a key attribute in how metacognition was understood. This also surfaced as a strategy, with reflection from the classroom experience identified as a means for the development of writing. We see this in examples such as Kaitlin, where metacognition emerges during the school experience phase of her learning. Kaitlin initially states that she is unsure of the meaning of metacognition but displays cognitive analysis based on the emotive effects of her observations of classroom pedagogy. We see this when she responds to this question with the answer, 'No, I don't think I do. I just write what I see and how I felt about it and how it affected me and how I think it affected the students and the teacher involved. I don't know if that's right or not'. While Kaitlin is not consciously aware of any metacognitive strategies being used, there is acknowledgement that, when she writes, she is analysing feelings about observations in the classroom—her own and those of her students and the mentor teacher. This example demonstrates that emotive affects that elicit thinking about writing content are associated with metacognition. Metacognition may be triggered by emotions that elicit theorising, which relates to Goleman's (1996) concept of emotional intelligence. There is evidence that Kaitlin is using her observation skills to select writing content that is authentic and meaningful to her learning. This awareness (cognition), plus her active selection of learning incidents in the classroom to write about (regulation), is metacognitive according to Flavell's (1976) definition.

In the following extract, reflective thinking is also highlighted as a metacognitive strategy by Fleur. Reflection enables her to analyse information and solve problems from readings to extend her learning.

It comes later, yes. Sometimes, if I'm—if I give myself the time to do an essay and I start the essay, I start the research, and then by day two or three, sometimes I find myself waking up and a thought that I had the night before pops in my head and I find a solution for it. Does that make sense? Or I make connections that I haven't made before. So yes, but it doesn't always come. It might come—I need to spend time on an essay... and you know what I'm actually finding the most interesting is sometimes—like I had a lecture in Unit 2 about critical literacies and somehow I made a connection there with something that I had done in reading contemporary fiction and it was about, you know, race and all that. And it was like, 'Oh', I thought, 'that's good', because I'm making a connection. I'm going to use that... in my reading for the contemporary fiction essay, and I did.

This example suggests deep cognitive function is occurring within the reflective process. It appears that Fleur's thinking skills are quite active and undergoing transformations as she makes various connections between ideas; as she says, 'I find myself waking up and a thought that I had the night before pops in my head and I find a solution for it... or I make connections that I haven't made before'. Fleur demonstrates good insight into the value of reflection as a strategy that enables her to improve her learning and writing both within these units of study and in applications to other areas of study. This example demonstrates that reflection is an important facet of metacognition related to cognitive functioning. This can be an overtly conscious process in learning, or it can occur at the subconscious level, as in the case of participants such as Julian who was not conscious of using metacognitive strategies.

4.5.10.1.3 Planning and research

The planning and research phase of writing was another area where metacognitive strategies were identified in the data. It can be posited that the planning phase is where participants were required to be discriminating about writing content for the purpose of writing composition. Participant comments relating to the selection of information from readings, lectures, classroom observation notes and discussion with mentor teachers illustrated that they possessed the knowledge that planning and research, were important to writing quality (cognition) and were taking action (regulation of this knowledge). This can be considered metacognitive and is demonstrated in the following examples.

Helen was able to articulate the importance of the planning phase of her writing to avert difficulties. In the extract below, Helen demonstrates an awareness of her thinking skills and identifies a weakness in her writing ability (cognition). There is evidence of a conscious attempt to implement regulatory strategies to improve these weaknesses by using summaries to help guide her writing. This example illustrates benefits of using metacognitive strategies to improve thinking skills related to the writing process. Cognitive awareness of deficiencies or weaknesses in the writing process, are being supported by regulatory strategies to improve writing quality.

Am I aware of my thinking when I'm writing? At the start I am, and then I tend to forget and then I just start writing other stuff, so I start off by writing what I'm thinking and then I just go into anything, and that's when I struggle and that's why I always go off the subject. Planning and just going with what the dot points say, instead of—yeah. That's the main thing; I just need to plan out everything before I just go straight into writing because it helps. It makes it easier.

Sharon's response to this question was contradictory. On the one hand she answered confidently, articulating that metacognition was 'thinking about thinking'; however, when asked to explain the meaning, she expressed uncertainty. 'So, maybe—thinking about it, I'm not sure. When I'm doing assignments, with the case and commentary which was a subject, that was a lot of really looking into references, finding the information.' Despite this uncertainty, Sharon responded confidently that she used a range of strategies that can be considered metacognitive to support academic writing tasks. These strategies were taking notes to analyse areas for improvement; self-questioning as an evaluative component of metacognition; and the development of action plans to make connections from her notes and evaluate how this information might be translated into classroom practice. Her statement, 'Is there more I could delve into that' is evidence of evaluative thinking about how she might develop and expand her learning when editing her work. The word 'delve' gives the connotation of her consciously thinking about improving her writing. Sharon exhibits both cognitive awareness and implements regulatory strategies to enhance not just her writing, but how this learning can be transformed into practice as a future educator. This example highlights key aspects of metacognition being applied to enhance writing.

Well, like I said before, I think it's thinking about your own thinking... through our notes we should be annotating, looking at the thinking about that thinking, how we would handle that, and then—what I think metacognition is, is that through my notes I go back and look through it and I'm thinking, 'Is there more I could delve into that', action plans and things like that, I think that they're really to do with metacognition, because then you're figuring out how you're going to put it into practice, really. So, that's what I think it is.

This example highlights some important insights relating to metacognition as a mechanism that can lead not only to the improvement of writing, but also to transformational learning (Mezirow 1997). Sharon's narrative tells us that she is conscious of using strategies such as note-taking and action plans as revision techniques to focus the development of her thinking about writing content. These are task-oriented actions aimed at processing information that will be applicable to classroom practice. According to Flavell's definition, this demonstrates regulation of cognition towards a goal.

Sharon's ability to cognitively adjust her thinking beyond the present and into a future role as educator indicates transformational learning has occurred at the cognitive level. This implies a relationship between metacognition and transformational learning. The strategies Sharon uses for supporting written tasks occur

predominantly in the research phase. This suggests facilitating metacognition in the prewriting phase has potential to impact positively on the end-product of writing. This has implications for pedagogy in teacher education programs.

Sharon's story also demonstrates evidence of being conscious of evaluating her own thinking and performance. She is making judgements and comparisons which are characteristic of analytical thinking. This is evidenced when Sharon contemplates that she could have been more proactive in exploring the views of her mentor teacher to extend her learning.

I could have done a bit more with the actual placement teacher to see my thinking compared with her thinking, obviously because she's been a teacher and she's qualified and everything, she's going to know the correct strategies and things like that that I might not be aware of that even books and things like that.

In addition, Sharon recognises the need to apply analytical skills to make connections between theory and practice as part of the research process.

But, then also I like looking into books... So I try and put both of them together, experiences as well, and I know quite a few teachers so I try and get their point of view. Like with a couple of assignments that I've done I got five teachers to find their point of view on the situation and what I thought, so that's also giving me a background knowledge for later on when I'm studying and when I hopefully become a teacher.

In a similar fashion to Sharon, Rod draws upon his experiences of observation in the classroom as a strategy to develop his thinking about theory and practice, particularly in the planning phase of writing tasks. There is evidence of self-knowledge and assessment expressed as concern and doubt about his ability to theorise the practice in his written work. This is indicative of cognitive analytical skills being applied to his thinking and writing.

It's what I actually observe. I'm normally a visual person anyway... So, if I see something there that, you know, I think that is interesting, for example, inferring which I learnt about this semester, I will actually match that with a theory. So, I'll read about it and I'll match that with a theory and actually say, 'Okay, this makes it a lot more sense'... You know, but I don't think that what I do as a piece of writing does, you know, what my train of thought is, you know, it matches with whatever the theories actually are.

Having identified areas of weakness in his writing skill (cognition), there is evidence that Rod is taking the initiative to further his understanding of classroom practice by research into theory (regulation). There is evidence of metacognitive skills being applied demonstrated by good self-awareness. Rod has analysed his writing skills, acknowledged his learning strengths as a visual learner and taken regulatory action in pursuit of improvement.

In the next example, Kate's response indicates she is uncertain of what metacognition means. This creates difficulty for her in articulating metacognitive strategies. She does, however, exhibit some knowledge of metacognition when she connects this to the research process, stating, 'A little bit, I think, because you have to go and independently research and stuff, so a lot of the stuff you're doing, you go from one idea to another and—I'm not sure. It's hard because I'm kind of hazy on what it means'. Kate's inability to fully understand the meaning of metacognition inhibits her confidence and ability to identify strategies. In the following excerpt, there is evidence of an association with the research process as a strategy connected with learning. Kate displays use of analytical skills to discern relevance during the research process but seems unable to translate how this will manifest in writing. This suggests she interprets these as two separate processes: the research process, which is connected to evaluative thinking (and, therefore, metacognition), and the mechanical aspects of writing.

Not so much writing them, when I'm researching them more. When I'm writing them because I start with a stream of consciousness ... it's kind of just like words—but when I'm researching, I'm thinking about what I'm learning from it, if it's relevant to what I'm learning, that kind of stuff more than when I'm writing.

This example suggests pedagogy is required that can assist preservice teachers to understand that reading in research and writing is an integrated process. Metacognition can be considered a skill that underpins both thinking about ideas and the structure of writing. This suggests that metacognition is related to the research process, as this is when analysis is required to make evaluative judgements about relevance of reading for writing content. Despite Kate's uncertainty, there is evidence of metacognitive thinking skills being used through the use of self-questioning within the research process. Self-questioning indicates the presence of cognitive analysis as a mechanism for discerning relevance in her learning.

Well, I think maybe like because when I'm researching I kind of ask questions. Is this relevant? Is this talking about what I'm talking about when I'm trying to fit what I want into it? Because I've done that previously... So, you have to kind of think of it. Is it relevant? Does it work? Is it what I need?

Metacognitive skill was demonstrated by Kate despite her inability to consciously understand or articulate that this was the case. Her use of self-questioning to discern relevance in her writing can be considered self-regulation of cognition, which is an important facet of metacognition. This also relates to Vygotsky's (1978) notion of self-talk, which connects language and cognition to metacognition. This notion of inner speech is considered by Vygotsky to be a mechanism by which the individual processes thoughts through language.

In contrast, participants such as Susan and Pamela responded confidently, acknowledging an awareness of being metacognitive when writing. As with the participant examples above, this also occurred predominantly at the planning and research phase of writing.

In the extract below, Susan asserts that the opportunity to select topics of interest to conduct research in her assignments is a motivating factor. Motivation was identified by Efklides (2011) as being connected to metacognition, in that affective dimensions of learning impact on both cognition and regulation of learning. This example suggests the genre of the assessment task, which is a research-based assignment, is conducive to metacognition for a variety of reasons. (See Appendix I, Assessment Rubric.) First, the underlying pedagogy of research-based learning is associated with constructivist learning principles (Piaget 1953; Vygotsky 1978; Freire 1976; Kolb 1984). This gives the individual ownership over the learning process, which therefore requires self-regulation of learning. The research genre involved the selection of writing topic and content. Gathering information in pursuit of data and literature to build knowledge was constructivist in nature. This required both cognition and the regulation of cognitive learning throughout the writing process.

In the excerpt below, Susan is able to consciously convey the benefits of being metacognitive when writing. This is illustrated when she states her enjoyment in selecting a topic of interest, conducting research and interviewing six teachers to gather information. It can be surmised that the authenticity of the constructivist learning mode required throughout this research-based assignment has drawn on metacognitive skills.

Yeah, definitely. Well, from what I just said in terms of thinking a lot about what I'm writing, absolutely. Yep. I'm always, I do—like I said, when I have a topic like the question that we had to—for me, that was interesting and I would go and I did research a lot and I did five or six interviews with teachers to try and have a full understanding of actually what was happening and where things were headed.

In the excerpt below Susan again displays a consciousness of being metacognitive, as evidenced by her recognition of learning needs. Here, Susan is evaluating her knowledge base and skills (regulation), identified by the need to develop library and analytical skills. This example demonstrates that Susan is quite conscious of her thinking and the skills needed to refine her written assignment work. There is evidence of cognition and regulation of cognition.

Well, I probably should do some more library training in that area because the strategies that I use are what I've discussed already, in terms of I have a think about whatever the question is, then do some research about it, try and find my thoughts whether they're supported or not supported and then have a plan and just make sure that I'm always going back to the actual question and keeping everything concise and tight.

Pamela also demonstrates metacognitive skill when she states, 'I don't know. Thinking about my thinking. I definitely always wonder if what I'm thinking is right.' There is evidence that Pamela is evaluating her thoughts by self-questioning in this statement, conveyed by the self-doubt expressed. Pamela also responds that she is unaware of being metacognitive when writing: 'I guess—no, I don't know. I think

when I write I basically, I kind of just look at what other people have written. I don't really critically analyse it properly yet.' Despite her uncertainty about being metacognitive, this statement reveals Pamela has cognitive awareness and has evaluated her reading skills. She has identified an inability to critically analyse references, which demonstrates evidence of good self-knowledge about her reading skills. According to Flavell's (1976) definition, Pamela's degree of self-awareness demonstrates both cognition and regulation of cognition. A weakness in learning has been identified (cognition) and action (regulation) has been taken to develop analytical skill by conducting research into the literature.

In the following extract, Pamela articulates in a very conscious manner a process of planning, monitoring and evaluating her writing. This displays evidence of using metacognitive strategies with the goal of improving academic writing. Thought is given to academic writing skills, such as decision-making for relevance, order, and the use of questions, paragraphs, sentences, paraphrasing and quotations that result in a fluent assignment.

So, sub-questions, then once I have those questions, trying to format it into some kind of flow, so what links in with what best. And what order it should all go in and then once I have—so, once I have the questions and then I've got my say, 200-word paragraph for each, well, 150-word paragraph for each one, and I put them in a kind of order and organise linking sentences for each one that link into the next paragraph and link back up to the top, so that way it's still related, or try to make it still related. I find that if I have all the quotes that I want there and I just paraphrase all of those, that helps.

Julian responds to this question by describing himself as being too conscious of his thinking: 'I am an over-thinker so I think that makes me predisposed to doing that a bit. I think subconsciously I do think about what I am thinking and everything.' However, when asked to identify metacognitive strategies he is unsure. This is shown in the extract below, where Julian conveys that he uses mind maps to develop his writing but does not recognise this as a metacognitive strategy.

Maybe. I think some aspects of it could be, maybe. I think just the act of putting, like if you're writing a mind map and I think just the act of putting thoughts on paper and thinking about what you've written in itself could be classed as that in my opinion but as for strategies I'm not too well versed.

Julian is not aware that mind mapping is, in fact, a thinking tool designed specifically to develop and extend thinking skill. This example provides further evidence that, with a clearer understanding of what metacognition meant, Julian might be able to overtly identify the use of mind mapping as a metacognitive strategy used to develop his writing skills.

Judy also uses mind mapping as a strategy to develop her thinking but, unlike Julian, confidently identifies this as a metacognitive strategy. Judy describes the use of mind maps as a conscious process of organising

her thinking, particularly at the planning phase of written assessment tasks to enhance the quality of her writing.

I think I can only tell you what I do myself which is a lot of mind mapping. I guess that might be thinking about thinking. I find that planning it out that way really helps me not to repeat myself because in a lot of ways if I just write it straight out without planning it, which I can actually do, I kind of reread it again and I think I've just said that but in a different way above so doing the mind mapping plan beforehand and making sure everything is in one place rather than scattered about. I find that helps a lot, thinking that way.

Fleur identifies her thinking as needing to be extended beyond what she describes as her 'comfort zone'. This displays cognitive awareness in which evaluation of personal cognition has taken place. In the example below, Fleur has thought about regulation of thinking skills, evident in her suggestion that discussion through group work could facilitate the development of thinking. This suggestion aligns with Vygotsky's (1978) theory of social-cultural learning, where cognition is expanded by social interaction through language. There is also evidence of Vygotsky's concept of 'inner speech', demonstrated in Fleur's awareness that language is connected to thinking that can be extended through discussion with others. This is evident when she says, 'now it's just me talking to myself'.

Fleur's proposal of group work as a strategy suggests collaborative pedagogy has the potential to develop her metacognitive skills. Fleur's awareness that she needs to be taken out of her comfort zone (highlighted) illustrates a need to extend ideas beyond what she is already capable of on her own. This is indicative of Vygotsky's (1978) concept of scaffolding being required from external sources. From a theoretical perspective, scaffolding is described in general terms as individual learning being supported by external sources, such as teachers, mentors or peers. This example also gives the connotation that the extension of thinking requires a level of discomfort, to reach a new level of complexity. This also has connotations of hierarchies of thinking, with the expansion of thinking skills not a simple process conducted at the individual level. This notion of discomfort was also raised by teaching staff in the previous sub-chapter, when they described the ability to be metacognitive as being very difficult.

Look, I think **if I got out of my comfort zone** and probably did a bit more group work, that would probably help with metacognition because I think sometimes when you talk about things and you discuss ideas and you bounce off each other, so it's like you're in the class, you know, you've done your reading, you go to the lecture, you know, they've unpacked a bit of your reading. You've gone to the tutor maybe a little bit and then, for me, when I go home and I start writing the essay—okay, like I said, it doesn't come straightaway, but if I keep, you know, trying to work out what my reflection and my connection and put it together, but I think that if I had some students that I felt comfortable working with and we could actually sit together and try and write an essay or do an essay plan, then that would probably help with

my metacognition because now it's just me talking to myself. You know, so I think, yeah, talking about things, yeah.

This example draws attention to some important insights for this study. Reflection is connected to a cognitive evaluative process in the development of ideas. In addition, individual cognition can potentially be expanded by external factors such as group discussion. This connects metacognition to socio-linguistic and socio-cultural approaches, where language and thought are developed simultaneously through interaction. This is demonstrated by Fleur's statement, 'when you talk about things and you discuss ideas and you bounce off each other', rather than 'just me talking to myself'. Collaborative writing is also suggested as a means by which the group can develop the discourse for writing content. This suggests a type of group metacognition whereby collaboration of thinking through talking and writing is integrated, and writing becomes a mechanism for extending individual learning. This resonates with theories such as that of Emig (1977) in which writing becomes the mechanism for learning.

Flavell (1976) describes metacognition as the interaction between cognition and experience. This example from Fleur draws attention to the quality of experience as a source of metacognitive development that can impact on and can enhance metacognition. This example illustrates that pedagogy such as Vygotsky's (1978) concept of scaffolding and language use can potentially support to extend the learner's development. This is an important insight, in that it suggests metacognition is not just a solo cognitive function but can be enhanced through pedagogy that targets its development through social interaction.

4.5.10.1.4 Metacognition and the editing phase of writing

The editing phase of writing was an area in which participant data demonstrated evidence of metacognitive strategies being applied. In the following examples from David and Marco, we see a process of cognitive awareness of editing as a mechanism for evaluating and improving written work. This awareness demonstrates cognitive regulation skills.

In the extract below, David responds that he is aware of being metacognitive during the editing phase to improve his writing. There is evidence that David has conscious knowledge that analytical skills are required to assess his writing from the reader's perspective. David also demonstrates a capacity to understand that he needs to cognitively place himself in the role of a reader (his audience). There is a cognitive switch from writer to reader in this process, which suggests a degree of cognitive complexity is required at the individual level associated with writer identity and personal assessment of writing. There is also evidence of inner speech through self-questioning as an analytical process to determine writing quality. We see this when David responds to the question, 'When you are writing do you have an awareness of being metacognitive?'

Yeah I think I am. After I read through things I dissect it and then I'll usually go back through what I've written on it and have a quick skim over it again and then most of the time I'll look at what I've written and then sort of ask questions to that and say would I actually say that or

could something else be interpreted with it. Most of the times so it just depends but I think I do usually think about it.

This example illustrates that David is using metacognitive strategies during the writing process. First, he demonstrates a knowledge (cognition) that the editing phase of writing is significant. Second, he has a knowledge of strategies (cognitive analysis through self-questioning and switching roles) that can assist in enhancing his writing. And, third, he has the capacity to act on this knowledge (regulation) with the intent (goal) to improve written work.

In contrast, Marco responded that he was not aware of being metacognitive: ‘I don’t think so, I don’t really take that much into account, personally’. However, further on in the interview, in response to a different question, he demonstrates that he analyses his work, which he did not do in the past. According to Flavell’s (1976) definition, such monitoring of work with the goal of improvement can be interpreted as using a metacognitive strategy. As with other participant examples outlined above, this is done in an unconscious manner. Through the editing process, Marco is conscious of the need to analyse language use and grammar, and seeks to improve vocabulary, but cannot articulate that he is, in fact, executing the regulatory function of being metacognitive.

I think before, like more so in semester one, I never used to analyse my work as much as I should have, just like even reading through each paragraph and analysing if the language and the language use, the grammar is correct and ways in which—yeah, just all that improvement, I suppose. So, just analysing my texts a lot more and maybe trying to find different synonyms for different words rather than using simple language, trying to mix and match a bit. So, I think that’s what I do a lot more.

This example also suggests a maturational factor is relevant to a discussion of metacognition, which aligns with developmental learning theory. The skill of analysis is a factor inherent in the capacity to be metacognitive, evident when Marco says, ‘I never used to analyse my work as much as I should have’.

4.5.10.1.5 Discussion of findings from preservice teacher data

Data findings indicated that, in most cases, preservice teachers were not able to overtly identify that they were using metacognitive strategies when writing. There were conscious and unconscious factors of metacognition connected to participant understanding of metacognition. However, according to Flavell’s (1976) definition, there was evidence of metacognitive strategies being used by many participants, despite them being unaware of this. These strategies manifested in a range of areas throughout the writing process. This was in the planning phase of writing, which required reflection on learning for inclusion as writing content; during the research phase, in the selection of information from literature and classroom experience; and during the editing stage. These functions required cognitive processing as part of a monitoring and regulation process for the intent purpose of improving writing.

Insights gained from this information suggest that pedagogy is required that will assist preservice teachers in developing an improved understanding of the role metacognition can play in the writing process. It can reasonably be concluded that benefits to enhance writing can be gained from the application of metacognitive strategies, but this requires both cognition and regulation of cognition as a conscious process.

Where there was a correlation between participant understanding of metacognition and identification of metacognitive strategies used in writing, participants consciously and confidently articulated what these were. This information suggests that having a greater consciousness of metacognition has the potential to enhance writing, although no assessment of the standard of participant writing was undertaken as part of this research. This would require further research that includes assessment of writing standards to determine the efficacy of consciousness of metacognition

Learning theories

The preservice teacher data revealed important insights related to learning theories that have potential to inform pedagogy on metacognition and academic writing. The data suggest that metacognition is associated with cognitive and social constructivist learning theories. However, the constructivist nature associated with writing in praxis inquiry learning is developmental and the data indicates that a greater emphasis on making metacognition a more visible or explicit process is required to support the development of concepts and skills as a conscious process in learning and teaching. The data suggests there needs to be improved cognitive knowledge about metacognition for it to be useful as a conscious strategy to enhance learning. This aligns with self-regulation theories and definitions of metacognition by Zimmerman (2001), but also connects to socio-cultural theories of literacy that focus on individual empowerment through access to the discourse associated with social power. It can be argued that Freire's (1976) notion of conscientisation—a consciousness of the language associated with the learning (knowledge)—is fundamental to an ability to regulate this knowledge. This notion of language and empowerment is supported by Gee (1989), who claims that learning that is tied to good teaching can provide the metacognitive and linguistic skills to critique various literacies throughout life. Gee argues it is imperative that literacy development for such individual empowerment be learnt as a conscious process by being taught. Like Freire, Gee claims there is a socially defined discourse associated with access to social advantage.

While there is evidence of participants being metacognitive at an individual level, there is merit in the suggestion that this could be enhanced by use of discussion through collaborative learning pedagogy. Vygotsky's (1978) social learning theory is relevant here, stressing as it does the role of social interaction in the development of cognition. This highlights the connection between language and thought as central to metacognition. Vygotsky (1987) also documented the importance of private speech considered as a

transition point between social and inner speech, where language and thought unite to constitute verbal thinking.

Evidence of self-questioning in participant examples demonstrates that Vygotsky's (1987) notion of inner speech is part of metacognition, as this served the function of self-regulation of thought and problem solving (Diaz et al. 1992). In this respect, cognitive development occurs through the internalisation of language and inner speech, which can be considered an important aspect of the regulatory function of metacognition. Language is the tool for cognitive functions, which are socially and culturally determined as part of intellectual adaption. It can, therefore, reasonably be generalised that intellectual adaption to the social and cultural environment of university learning is mediated through language. External forces, such as environment or context, can shape or impact on cognitive functioning, which in turn can impact on the writing process.

Having a consciousness of being metacognitive has emerged as an important insight from this data. This raises the question, 'If preservice teachers are more fully aware of the meaning of metacognition, can this lead to a more deliberate use of metacognitive strategies at a conscious level to improve academic writing?' Pedagogy such as John Hattie's (2008; 2015) work on visible learning and Freire's (1976) concept of conscientisation emerge as theories of learning in which pedagogical strategies may have potential to facilitate this process.

A major insight gained from this knowledge is that preservice teachers were unconsciously using metacognition to improve their writing, enabling the inference to be made that metacognition is potentially a strategy or learning tool that can positively contribute towards the enhancement of writing. However, this requires preservice teachers to have a conscious knowledge of what constitutes a high standard of writing and the skills to regulate this knowledge for enhancement. This suggests that curriculum design and pedagogical teaching practices that focus specifically on understanding metacognition as a concept and skill have potential to enhance academic writing. This would require further study to determine the efficacy of such pedagogy.

4.5.10.2. Metacognitive strategies identified by the lecturer/tutor cohort

We now move to an exploration of the data that aims to identify metacognitive strategies that lecturer/tutors found in preservice teachers' written assignment work and in their teaching. Data was gathered following the initial question asking teacher educators to define metacognition. Participants were then invited to answer the question, 'Do you think your students display metacognitive skills in written assignments?' Findings in relation to this question indicated that, in most cases, answers were influenced by how each teacher educator interpreted the meaning of metacognition. Explanations of the metacognitive strategies and processes used reflected the influence of this individual interpretation of metacognition. As a result, there are parallels between how metacognition was understood and teaching strategies to support metacognitive development.

Overall, five broad themes emerged from the data related to metacognitive strategies identified in preservice teachers' written assignment work. These were, first, that the ability to be metacognitive was considered a developmental process associated with the epistemological approach to learning within praxis inquiry in these first-year units of study. Second, there was a connection between writing genre and metacognition in the praxis inquiry protocol. It was identified there was a hierarchical element to writing that displayed higher-order thinking skills such as analysis. Third, metacognition presented through the skill of reflection from concrete experience in the school practicum. Fourth, scaffolding was a strategy to develop preservice teacher thinking skills. Finally, there was a strong connection between metacognition, language and thought, reflecting socio-linguistic and socio-cultural factors. These themes are explored further in the next section.

4.5.10.2.1 Metacognition as a developmental process

The data illustrated a common view among lecturer/tutors that some preservice teachers had the ability to display metacognitive skills in their written assignments. However, there was general agreement that the majority were not able to do this independently. This was considered a developmental learning process during preservice teachers' first year of a four-year Bachelor of Education course.

Teacher educator responses identified the main attributes considered metacognitive in preservice teacher writing as the ability to be reflective, to see the 'bigger picture' and to show a deeper understanding and higher-order thinking. Strategies identified in the data to support these attributes manifested in a developmental learning process through experiential learning, within the praxis inquiry process of learning. Within this developmental learning framework, there was a recognition by teaching staff that preservice teachers were novice learners who required structured support through scaffolding.

Metacognition was also found to be associated with the writing genres within the praxis inquiry protocol, which required a hierarchy of thinking skills. The writing genre connected to theorising and analysing experience was identified as an indirect strategy in the praxis inquiry protocol that facilitated metacognitive thinking skills in the writing process. Reflection on experience was identified as an individual cognitive skill that was part of Flavell's definition relating to the knowledge and regulation of cognition. Finally, metacognition in preservice teacher writing was found within the cognitive and socio-cultural dimensions of language facility associated with Vygotsky's theories of language and thought.

Examples of participant data that illustrate lecturer/tutor perceptions of preservice teachers' metacognitive skills as part of a developmental phase of learning are described below.

Cathy acknowledges that preservice teachers display a variety of skills but states that only few demonstrate metacognitive skills. The pedagogy being implemented in her teaching reveals epistemological beliefs about learning that belong to developmental learning theory. There is acknowledgement of a continuum of learning that grows from experience and teacher guidance which is consistent with constructivist principles.

[N]aturally I think again there's a wide variety, but the metacognitive skills are something that we are hopefully developing with them through the work we're doing, but first-year students, it's very much a process in development rather than they are now able to show metacognitive skills. A few of them can but most of them are still learning that process.

Similarly, Gaye expressed that only a few preservice teachers could demonstrate the ability to write about the 'big picture things', which aligned with her definition of metacognition. She argues there is an individual aspect to how effectively this is done, citing background experience and engagement within the course, and particularly how well preservice teachers have oriented themselves to what she terms 'that space'. In using this term, it can be inferred that Gaye considers a particular adjustment to a new way of learning is required to succeed in these two units of study. We see this in her comments when she says, 'not many students. I think it depends on the student and where they've started and how well they've engaged with the unit in the course... if they can't—they struggle to get themselves into that space.'

Gaye's comments can be interpreted as meaning that there is a type of learning that belongs within these units of study. The ability to become metacognitive requires experience and development of the thinking skills associated with the ability to theorise as part of the praxis inquiry protocol. Preservice teachers are required to make connections between theory and practice and to develop questions about education. Prior experience and knowledge gained from both the school experience setting and theory from lectures, tutorials and readings, require the skills of analysis and synthesis. This necessitates a transition to a new way of learning and a shift in mindset to adapt to or engage with this process.

Gaye's comments below suggest this a developmental learning process, as is evident when she says, 'as long as there is a glimpse of it'. This response has connotations of progressive development in the capacity to make connections between theory and practice associated with the notion of a continuum of learning. Gaye's comments describe this continuum, suggesting preservice teachers are at the novice stage in their first year. Metacognitive skill is also seen to be connected to readings and discussion, important while at this novice stage of writing development.

I usually can see a glimpse, and as long as I can see a bit of a glimpse of it and as a first-year student I'm not so bothered. At least as they can talk about it. They won't always be able to write about some of the big picture things they see or discuss but at least if they can talk about it and link it back to some readings or something like that, for a first-year student I think that's probably good enough. It's when I see them in third year and fourth year that I have some concerns.

Other examples where metacognitive skills are connected to preservice teachers' developmental learning include Lyn's response, in which she cites the use of reflective journal writing as a strategy that supports thinking skills. In the extract below, Lyn describes the developmental effects of experiential learning on thinking and writing progress in the school practical placement over the duration of the semester.

I think the journal helped in that because it had to make them stop and think about what they had to reflect on, and in turn by using the journal as a tool and recording and thinking on the day they could then go away and think about that thinking process that took place on that day. So when they had to write their essays at the end—and I had dialogue with a couple of students—they could see how their thinking had shifted, how when originally they went out in the schools and they had these fantastic ideas, ‘This is what I thought, this is my thinking...’ but by the end of it all their experience enabled them to think at a different level and to look at their thinking from how did that thinking change and then in turn that reflected in their writing. So I think the journal, to a certain extent, the logbook is a key to developing that metacognition which they need to transfer to their writing. Did I make sense?

Acknowledgement of developmental factors in metacognition by teacher educators has implications for a pedagogy that is aligned to experiential, cognitive and social constructivist theories of learning. This highlights the role of the lecturer/tutor in creating learning opportunities to develop metacognitive skills for the improvement of preservice teacher writing. An important insight from this example is the need for an emphasis on discussion as a mechanism within a holistic process in the academic teaching environment. It would appear that metacognition needs to be seen as inclusive of all language modes—speaking, listening, reading and writing—as an integrated process.

4.5.10.2.2 Metacognition and writing genre

A common response from many participants was that preservice teachers’ capacity to demonstrate metacognitive skills in their writing was linked to higher-order thinking skills in the theorising genre of writing. This can be explained in terms of the praxis inquiry protocol, which consisted of writing genres that included an inherent hierarchical thinking process within each style of writing. While this protocol was not specifically designed to overtly develop metacognitive skills, the genres of writing within this protocol did require different thinking processes for each of the genres. These thinking processes were strongly associated with preservice teachers’ capacity to analyse their experiences through reflection. The writing characteristics exemplified in this protocol had an incremental aspect that aimed to guide preservice teacher reflection and writing. This ranged from communicating a description of experience in the school setting, to explanation and theorising associated with the higher-order thinking skills of analysis and synthesis.

There was agreement among many lecturer/tutors that preservice teachers found it difficult to demonstrate writing that displayed more than a descriptive account of their experience. Metacognitive skill was associated with writing genres that required a capacity to ‘theorise’ in the praxis protocol. This was linked to analysis of theory and practice, and the ability to develop personal theories about education. This writing genre is characterised as one that is reflective, critical, analytical and demonstrates a synthesis of ideas from both theory and practice. This is evidenced in Emilia’s response below which highlights an

association between writing and genre that is inextricably linked to a hierarchy of thought and depth of learning.

Not all of them no. I think some do but not all do, no, and I sort of think that, as I said earlier, I think some of them are still at that very basic level of describing and recounting, retelling experiences instead of actually analysing and going into that deeper thinking with that critical lens if you like.

Similarly, Paul describes preservice teachers' experience of getting beyond the descriptive phase of writing as difficult. His comments indicate that the use of literature is required as part of applying metacognition as a strategy for theorising their learning. He asserts preservice teachers tend to understand the literature but are not able to advance their thinking from the descriptive stage to the explanatory and theorising level.

Now, that doesn't always occur, and I'm happy enough that people are understanding the literature when they're talking about metacognition and sadly enough, I still get a lot of ... 'We went into the classroom, we did this, looked at this, taught that, the kids did this and they went out'. And, I'm thinking, 'Well that's—that's very good'. It's like in our praxis enquiry protocol, praxis described, that's a good start but it's when they get into the explained and the theorised that you're thinking, 'Oh wow'.

Ann reports that she uses metacognitive strategies focused specifically on developing writing in the analytical genre and the associated linguistic features that define the genre. The use of demonstration and modelling using concrete examples are useful in this process.

It's a big question. Obviously, it's important but how, in what ways. I'm trying to think if I was trying to get a student, apart from what I've spoken to go from description. Well often I'd give them examples, give them concrete examples and get them to try and notice what is the same between what a piece of writing that might be say a description and one that might have analysis, what's the difference, how do you know, what part of the language tells you about that. Okay, so then if I gave you this or you were trying to describe that how would you then do that other part, the why and the how. See, analysis for me, it depends. Supposing you were taking a particular model or something and you might have three or four or five criteria or key points within something, analysis in that sense might mean where you look at each of those and you apply them to a situation.

This example highlights the important role of teaching through modelling and demonstration. Targeting the skill of analysis as an explicit teaching focus is necessary to extend preservice teachers' writing skills beyond the descriptive genre.

These examples from Emilia, Paul and Ann indicate that there is a connection between metacognition associated with genre and the inherent higher-order thinking required in the specific writing genres associated with praxis inquiry. This information is significant, as it signals a need to make an understanding of writing genres in the tertiary academic writing environment more visible as a conscious process in teaching and learning. According to Flavell's (1976) definition, preservice teachers require a more explicit or conscious understanding of genre. This is the cognitive knowledge required for the capacity to analyse or regulate this knowledge, in the quest for higher standards of writing.

This raises questions related to theories of learning, and pedagogy, as well as the question, 'Would a more explicit or conscious focus on developing preservice teachers' understanding of genre and metacognition, lead to higher standards of preservice teacher writing?' The data suggest there is a developmental factor to metacognition that stems from experiential learning in the school context. However, the data also indicate that preservice teachers require support in learning to write in the genre associated with theorising their learning. It can be reasonably concluded that pedagogy based on constructivist approaches alone is inadequate given teacher educators reported only a few preservice teachers were able to write in this genre.

4.5.10.2.3 Reflection and disciplinary knowledge

A common response in the data responses by teacher educators was the role of reflection in metacognition for writing. The importance of disciplinary knowledge as 'a theory base' was cited as an important part of the capacity to write in the praxis inquiry process. We see this in examples such as Jane in the excerpt below where she describes writing is connected to preservice teachers' self-awareness as learners as well as a reflective learning process which requires drawing upon theories in these two units of study. Metacognition is connected to reflection when Janes says,

I do see that coming through particularly in these units they are thinking about themselves as learners and by introducing them to a theory base I think that they do begin to think about themselves and their learning and their preferred learning styles and I think they are able to reflect on that and that enhances their writing as well. Does that make sense?

Jane's reference to the introduction of a 'theory base' in the example above highlights the importance of disciplinary subject knowledge for the capacity to analyse experience. This relates to cognitive knowledge as a facet of metacognition required for the regulatory function, which is analysis. Therefore, it would be reasonable to conclude that the ability to advance writing competence associated with the explanatory or theorising stages of writing in the praxis inquiry protocol requires disciplinary knowledge. This is fundamental to the development of analytical skill required for personal theorising or transformations in learning to which Paul's response also attests. Paul highlights the importance of a theoretical base for the ability able to make connections between experience and a knowledge/content base. In this case, theory emerges as a significant component of metacognition and the enhancement of writing development to advance beyond the descriptive genre.

I try and bring the theory into—the praxis theory dichotomy into it as well by going back on our theory, which is that we want the students to reflect, and the process we get them to do is describe and then explain, which requires reflection, which is part of understanding what you’re seeing and explaining what you’re seeing, and then taking it to theorising, drawing from that ideas and principles that might be applicable elsewhere. That’s what theorising actually is, and I think the issues for young people is that that is not—strangely enough, some people naturally seem to do this. They are a reflective person and they’re the thoughtful ones that stand back and think. And, they are very good but, of course, a lot of people who are coming to teaching are not like that.

Paul’s response above highlights the important role of the teacher educator in assisting preservice teachers develop their reflective skills through a scaffolded approach. There is a consciousness that the diverse backgrounds of learners in the preservice teacher cohort may not furnish the skills to reflect at the level required for theorising their learning. While constructivist approaches to learning in praxis inquiry through reflection are learner-centred, this example adds further information that highlights the importance of pedagogy including guided support to complement constructivist learning. For first-year university students, the development of reflective skills for deep learning and theorising experience requires the support of a facilitator for effective learning.

There was general agreement among lecturer/tutors that developing preservice teachers’ thinking skills through a scaffolded approach—particularly at the prewriting stage—was an important strategy for developing metacognitive skills. Personal reflection, as well as discussion and questioning, were strategies identified by teaching staff as important to writing development.

An example that illustrate these views can be seen in Shane’s comments below, which highlight the importance of reflection on learning based on authentic, meaningful learning experiences. These experiences are fundamental to the development of metacognitive skills in writing. He stresses the importance of reflection using the senses as an analytical filter for preservice teachers to identify why particular incidents resonate as being more meaningful than others.

I think at most, it’s getting people to think and getting them to reflect and do that in a way which is meaningful to them and they can answer, ‘Well, why was that important? Tell us and what did you think about that, what did you feel about that? Why have you chosen that incident and not those seven others you’ve listed? What’s meaningful for you?’

This example illuminates the importance of teacher questioning, and their ability to ask the right type of questions, to developing preservice teachers’ capacity to reflect in a critical manner. Metacognition here is associated with critical reflection on learning. This example suggests that the quality of the thinking and learning taking place through reflection is significant to the development of metacognition and, consequently, to writing, but requires teacher educator support.

4.5.10.2.4 Scaffolding as a strategy to develop preservice teacher thinking skills

Participant data revealed that strategies such as scaffolding were commonly used to support preservice teachers' metacognitive skills. Teacher educators held epistemological beliefs about learning and teaching consistent with developmental learning theory (Piaget, Bandura, Vygotsky, Gardner, Maslow). These epistemological views were manifested in the strategies that teacher educators adopted to assist preservice teachers develop their metacognitive skills. The most common strategy adopted was aligned with Vygotsky's (1978) concept of learning based upon a continuum from novice to expert, through zones of proximal development. This was particularly evident in the data associated with the writing process in the praxis inquiry protocol. Teacher educators described scaffolding as a mechanism to progress preservice teachers' capacity to write within the hierarchical stages' concomitant with the genres of writing in the praxis inquiry protocol. Most lecturer/tutors described preservice teachers as being at a novice stage in this process and finding it difficult to theorise their learning. The skills required to reflect, think and write about experiences in praxis required teacher educators to use scaffolding as a strategy to develop learning in all facets of the process.

The following examples from Cathy and Gaye illustrate that the educator's purpose was to provide experiences that assist or enhance the learner by drawing on their current skills and knowledge. Metacognition here is developed through teacher guidance. This is evident when Cathy describes the importance of the planning phase of writing to develop thinking skills through scaffolding.

I think this year we've done more or better than in the past in terms of helping them to understand the metacognitive approach, the really thinking about thinking, or the planning and working through the process rather than jumping off the deep end and not really thinking about what you're doing... It can come at the beginning or it can come during it, but that thinking needs to come in to actually put it together as a final piece of work... Yes, some people... will be happy to sit down and start writing, knowing that it is just getting their ideas down and their thoughts down and then go back and mould it into a piece of writing that actually works through a planned process.

This reference to a need to 'mould' writing is consistent with Graves's (1975) process approach to writing and the virtues of a writing process that includes prewriting activities, drafting, conferencing and editing. This example also showed evidence of Cathy being metacognitive about her teaching skills when she says, 'I think this year we've done more or better than in the past in terms of helping them to understand the metacognitive approach'. There is evidence that Cathy has analysed past performance and taken regulatory action to improve her teaching skills.

There is also evidence of a continuum of learning in Gaye's reference to expectations of first-year preservice teachers' writing when she says, 'as long as there is a glimpse of it', referring to 'the big picture things' (which is how Gaye defined metacognition). This can be interpreted as the existence of a wider

body of knowledge, ‘the big picture’, associated with becoming an educator, which requires transition and development. This is also connected to preservice teachers’ background experience or stage of learning associated with Vygotsky’s (1978) zones of proximal development. The role of the teacher educator thus emerges as a prominent feature in the facilitation of metacognitive skill in a continuum of learning from novice to expert, through scaffolding within the praxis inquiry protocol.

Similarly, Shane feels greater emphasis on the development of writing and thinking through scaffolding is required.

That’s a bit chicken and egg. Okay, why do we write? Why does anyone write? And, what is the value in writing? And, I think being able to say ‘Well, writing is actually part of thinking and part of showing what you think and it’s an evolution’, and academic writing is—it’s not actually one thing, it’s a whole range of things but it’s one form of that among many and you’re being sort of apprenticed, I suppose, into this new way of building of what you know but you’re expected to write in a particular kind of way... I think we need to sell that, both as teachers of university students but also as teachers of teachers. I think that’s an assumption that we don’t often look at or challenge.

Shane raises a number of important aspects of the writing process in this statement. First, in proposing that writing is many things, he alerts us to the concept that writing has many functions according to the purpose and context, which determine the genre of writing. It can reasonably be considered that this is the metacognitive knowledge required for preservice teachers to regulate their writing. Second, writing is inextricably interconnected with thinking and learning. Third, writing is a developmental process, which Shane refers to as an apprenticeship, indicating that there is a continuum of learning within academic writing. This notion of apprenticeship has connotations of working with a ‘more knowledgeable other’, associated with Vygotsky’s (1978) zones of proximal development. Finally, Shane’s reference to ‘building what you know... in a particular way’ can be interpreted as meaning the academic writing genre, with all its conventions, needs to be learnt.

This example, which highlights the need to challenge and promote a multidimensional concept of writing, is important to a discussion of metacognition and writing. It can be theorised that understanding the concept that writing fulfils many functions according to audience and purpose (the knowledge factor) is required for regulatory action. Furthermore, Shane’s comments highlight the need for academics in the field of preservice teacher education be cognisant of this: ‘I think we need to sell that, both as teachers of university students but also as teachers of teachers. I think that’s an assumption that we don’t often look at or challenge’.

Similar to other participants, Ann conveys that not many preservice teachers are able to display metacognitive skills in their writing when she says, ‘not many preservice teachers have that “awareness”’. In using the term ‘awareness’, there is a connotation of a lack of consciousness or knowledge. Again, this

suggests strategies that focus on metacognition as a conscious process are required for purposeful regulation in preservice teachers' writing.

The need for lecturer support to develop ideas or metacognitive thinking is acknowledged by most teacher educator participants. Gaye's comments attest to staff being very good at helping preservice teachers develop the technical aspects of academic writing, but she acknowledges that staff experience difficulty to elicit what she calls the 'bigger picture ideas' that relate to more 'sophisticated writing'.

Our staff are very, very good in the technical side of the work, the written work that they want. I think the more difficult thing is getting the bigger picture ideas and getting the more sophisticated writing.

Another significant aspect Gaye raises, is the importance that lecturers having high expectations for student learning when she says, 'to start off by having high expectations and giving students the opportunities to reflect on and go to those higher expectations.' This suggests metacognition needs to be a specific goal for teaching, which aligns with Dweck's (2012) work on the importance of teacher attitudes. The impact of having a 'growth mindset' on intellectual flourishing can be associated with the affective dimensions of metacognitive learning.

Ann's response also raises the importance of emotions associated with the academic writing process. In the excerpt below, she notes that the term academic writing is problematic, creating anxiety and raising barriers to preservice teachers' capacity to be metacognitive. Ann asserts that preservice teachers interpret academic writing as something that is alienating and 'formulaic', which inhibits their capacity to be metacognitive. This example suggests a perception that preservice teachers consider writing as consisting of two separate components: the mechanical aspects of writing in the academic environment, which are found to be alienating, and the need to have an 'awareness' of thinking or metacognition.

Yeah, I don't think they have that awareness. They see writing as a sort of mechanical thing and that's why I think sometimes the word 'academic writing skills' might also kind of delimit what could be in terms of I see this as academic literacy, I suppose, but, yeah, it tends to be very much that polar view, you know, limited and locked in so I don't think—write down, copy it down, that's what you're supposed to do, I'll do that. They don't, it becomes more of a mechanical skill... That's important too, but I think you need to be able to move from one to the other.

Ann's suggestion that the term academic writing be replaced with 'academic literacy' could solve this problem, allowing the writing process to be inclusive of both the technical features of writing and a focus on thinking. She asserts, 'they need to be able to move from one to the other'.

Participant data identified that scaffolding of preservice teachers' learning using curriculum tools was useful. Examples such as mind maps, graphic organisers and de Bono's Six Thinking Hats were cited as

beneficial to supporting thinking skills. This is evident when Lyn describes the use of de Bono's 'blue hat' to support the development of a consciousness of different thinking skills, particularly analysis which is associated with the blue hat.

So, for example, using the de Bono hat, the blue hat, so it provides the visual, that they can see the hat, it's got what the hat is on it so the writing there so that linguistic element, do you know what I mean? So tapping into the student's learning styles as much as one can, just trying to give them different experiences... you can use that as a starting point to get them to try to think about their thinking and they can visualise it.

In a similar fashion to Lyn, Cathy also describes teaching strategies using mind maps to scaffold the development of preservice teachers' metacognition at the planning stage of writing. Mind maps originated in the 1960s with the work of Tony Buzan, who advocated the use of a visual representation of ideas to facilitate the development of further ideas through thematic associations as groups. This example illustrates there is an explicit focus on the development of thinking skills by use of graphic organisers and discussion to support the development of writing skills.

I do try to use some mind mapping or brainstorming type of approaches with them and so when they have an assessment task coming up, we'll spend time in the tutorial beforehand trying to unpack it, trying to mind map it or brainstorm it or somehow graphically work out on the whiteboard what are we asking, what are the expectations of this task, what are the sorts of the things you need to remember to touch on or what are the sorts of things you need to bring into it. So I guess the pedagogical strategy, so the graphic organising of a task and that discussion around what the expectations of the task are. If that's called scaffolding, then yes. As a pedagogical strategy, I try to scaffold them in their learning to develop that metacognitive skill.

Curriculum tools such as visual graphic organisers were used to facilitate the development of thinking skills associated with higher-order thinking skills as part of a scaffolded approach to teaching. The use of such tools also demonstrated lecturer/tutor attempts to use inclusive practices to cater for the diversity of learning styles in this cohort of preservice teachers.

4.5.10.2.5 Metacognition as a socio-linguistic and socio-cultural phenomenon

Participant data revealed that the use of language to facilitate thinking skills as part of metacognition was an important facet of the writing process. In the following examples, Shane and Gaye describe the connection between cognition, language and writing in the planning phase. Shane asserts that discussion facilitates metacognition, particularly through questioning techniques that force the writer to justify their ideas, indicating the importance of analytical skills. The use of collaborative pedagogy, such as peer evaluation, is also described as being conducive to developing metacognitive skills to enhance writing.

I'm of the firm belief that students before they write should talk a lot about it. They should plan and then they should go back and talk about it a bit more. I think in my experience where I've found metacognition coming into academic writing quite strongly is in students taking a plan or a draft of their essay and working in a small group to peer evaluate, and I know there's a lot of issues in regard to how that works and the practicalities of it, but I've found that's one of the best ways to get students to actually verbalise or articulate what it is they're trying to do in their writing to someone else, because when I read your example or your draft essay, for example, I say, 'Vi, what did you mean by that? You've said that here but I think in that second paragraph actually you're saying the same thing. What's the difference between these two?' and you can say, 'Well, I was thinking that here I wanted to talk about my understanding of x and there I thought I was talking about my understanding of $x+1$, but it's probably just the same. How would I fix that or how would I make that clearer?' And, I think that's the sort of activity which can step people through. Your writing's not just for your lecturer but it's for an audience of your peers and it's at this sort of developmental phase I found it quite a useful way of getting people to be explicit about what they're doing. And, look, there's probably lots of other activities but that's one that I've done that I've found very useful.

This example raises a number of important features of writing as a process. The first is the importance of discussion and verbalising ideas during a drafting process. Second, the writer requires feedback. In this case Shane refers to the importance of questioning as a process that requires the writer to justify their thinking and ideas. Third, the use of collaborative pedagogy with peers or others can provide the opportunity for preservice teachers to develop a sense of audience, an important facet of the writing process. Fourth, writing is described as a developmental process.

These features of the writing process are also considered important attributes and illustrated in the following example from Ann.

Sometimes it's talk, sometimes it's questioning and probing, pushing a bit further, getting to the why kind of questions and the how. I find I'm very much a believer in students' oral skills, you know, talking about it as I mentioned before, rehearsing. I see that as very important and that can be working in groups and pairs as well as with the teacher.

Alternatively, Gaye looks at building metacognitive skill as an integrated approach developed through the actual process of writing. She refers to a circular aspect to this, in that thinking is developed through the process of writing: 'you have to write to improve your writing. You have to improve your thinking to improve your writing so it's a kind of virtual circle'. These comments connect closely with a psycholinguistic theory of learning in that cognition, thoughts and ideas are conveyed simultaneously through the orthographic process. This example demonstrates that language and cognition are interconnected, and that writing is the process by which we document our thoughts to build new

knowledge from prior experience (Emig 1977). This example suggests the quality of the thinking and learning taking place is significant both to the development of metacognition and to writing.

The connection between cognitive functions such as analysis and synthesis suggest there needs to be an integrated approach to the development of verbal language skills, simultaneously with written language. Such an integrated approach aligns with the social-cognitive theories of Vygotsky (1978), Bruner (1986), the work of Emig (1977) and Gee (1991). An important insight from this information is the notion that, while discussion is fundamental to the development of ideas or conceptual learning, the ability to represent verbal language through written language needs to be taught (Gee 1991). These are two distinct processes. Writing genres have conventions, which require teaching. This is conveyed by Lyn when she says there needs to be a more explicit focus on writing.

So I think that whole writing process may be... I don't know, maybe it needs to be looked at or we need to unpack it a little bit more for them, even at the beginning. Just spending a bit of time, each of these components, this is what we're going to be looking for, why are they different, this is how it's all going to come together. So outlining it all a little bit more.

Data examples highlight the significance of social constructivist modes of learning that focus not just on the learner, but also on the important role of the teacher educator in planning for facilitating the development of academic writing skills.

4.5.11. Summary: Both data sets

Participant data identified a variety of issues associated with the development of metacognitive skills and preservice teacher writing.

Metacognition, as a construct that exhibits Flavell's (1976) notion of metacognition, requires a consciousness of the role of thinking skills associated with writing in academic genre for high standards of writing. Metacognition was associated with a hierarchy of reflective thinking within the different genres of writing in the praxis inquiry protocol (described on page 44). The style of writing considered to be a high standard was associated with the theorising genre.

Teacher educators acknowledged the following facets required scaffolded teaching strategies for the development of high standards of writing consistent with Vygotsky's (1978) socio-cognitive and socio-cultural theory: (a) a consciousness of metacognition as a concept and cognitive skill associated with learning; (b) reflection on cognition; (c) analysis associated with higher-order thinking skills; and (d) writing in the respective genres.

The data findings identified that the main strategies used by teaching staff were based on learning theories associated with constructivist principles. The teaching process described by participants was based upon developmental learning, which encompassed experiential, cognitive, social and cultural learning in

communities of practice. The improvement of writing was seen to be the result of the development of cognitive learning from direct experience within a socio-cultural process of learning in two contexts.

However, the theories of Vygotsky (1978,1986) and Bruner (2004) imply that all cognitive functions, such as analysis and synthesis, develop through advancing facility with the language modes themselves. This leads to conclusions that indicate a strong connection between metacognition and the writing process itself, as thought and speech are interconnected. The concept that thinking can be developed through writing as a symbolic representation of speech connects with heuristic approaches to learning. Writing can be considered a vehicle for the development of ideas through socio-cognitive interaction. These theories imply that higher cognitive functions, such as analysis and synthesis, develop through a capacity with the spoken and written language modes. The concept that thinking is developed through writing highlights two important facets of metacognition and the writing process. One is the quality of thinking associated with higher-order conceptual operations is connected to linguistic facility; the second, that a knowledge of the technical features of academic writing requires the knowledge and ability to use the conventions associated with academic writing genres. The data identified that both these facets require external facilitation.

The significance of analytical skills signals important information for a study of metacognition in praxis inquiry learning and academic writing.

- (a) The skill of analysis is closely linked to the regulation of thought processes. As such, the development of analytical skills, identified as higher-order thinking skills, is required to write in the theorising genre of praxis inquiry.
- (b) There is a need for pedagogy that makes explicit the concept of metacognition as part of preservice teachers' cognitive learning (knowledge), as well as the development of analytical skills to enable the regulatory factor to be generated (regulation). While there were examples of metacognitive strategies being used in an unconscious manner, it can reasonably be argued that this needs to be a conscious process on the part of both teaching and learning if the associated benefits of metacognition are to be realised for writing in the theorising genre.
- (c) Preservice teacher participant attempts to draw on prior experiences to construct individual meanings of the term 'metacognition' align with cognitive and social constructivist learning approaches. There was evidence that participants made links between metacognition and learning theories while trying to construct a personal understanding of metacognition. Reference to models such as Gardner's (1985) multiple intelligences, Kolb's (1984) learning styles, Vygotsky's (1978) socio-cognitive learning, Piaget's (1953) cognitive development and Bloom's taxonomy of thinking (1956) were evident in participant examples.

4.5.12 Discussion: Learning theories and teaching strategies where metacognition has the potential to enhance academic writing skills in praxis inquiry learning

The purpose of this section was to identify how metacognition might contribute to the enhancement of preservice teacher writing and pedagogical practices surrounding this. This sub-chapter aimed to identify metacognitive strategies identified in preservice teachers' writing and teacher educators' teaching.

A synthesis of issues arising from both data sets has aimed to contribute towards answering the thesis questions relating to (a) teaching and learning strategies that have the potential to enhance writing, and (b) theories of learning that are conducive to the development of metacognition. Findings aim to inform curriculum course design and implementation, pedagogy and professional development for academic teaching staff.

Information gained from this data has identified the following factors significant to this thesis. First, writing genre as associated with a hierarchy of thought (cognition) has emerged as important in metacognition, praxis inquiry and academic writing. This information contributes and extends studies by Negretti (2012) on genre awareness, which did not specifically focus on hierarchical thinking in genre.

Second, most teaching staff identified that few preservice teachers had the capability to write in the genre associated with deep learning that represented the higher-order level of thinking skills. Teacher educator participants reported there was little evidence of preservice teachers' capacity to analyse or synthesise learning required in the more complex task of writing in the explanatory and theorising genre. It can be surmised from this information that there is a connection between metacognition and a hierarchy of thought within reflection in the theorising genre of writing in praxis inquiry learning. This information contributes to new knowledge by extending the study of metacognition to the theorising genre in academic writing within praxis inquiry learning in the field of preservice teacher education.

Third, this insight provides information that can inform pedagogy. The development of thinking skills for 'deep learning' (the theorising aspect of praxis inquiry learning) requires a conscious, explicit focus on developing reflection. The skill of analysing cognition within reflection in praxis inquiry for the purpose of written communication requires external facilitation. An important insight from this information suggests that, while metacognition is embedded within the cognitive constructivist paradigm of learning, the data suggest that writing considered to be high standard requires an explicit focus with socially guided support from external sources. Vygotsky's (1978) concept of scaffolded support was identified as a key strategy used by teacher educators to develop preservice teachers' capacity to analyse theory and practice through reflection on experience.

The role of reflection was identified in all phases of writing in the academic writing genres in these units. However, the level of reflection required for the theorising genre in the praxis inquiry—to translate

experience and theory into written communication in the expository and critique genres, to a high standard of writing—required guided support. Taggart and Wilson (2005) refer to hierarchical levels of reflection as ‘technical, contextual and dialectical’ (p. 3). It would be reasonable to conclude that the expository and critique genres of writing require reflection at a dialectic level. This is where transformational learning can occur, where cognition is changed, and where new learning eventuates. How an individual understands the theory, before seeing and experiencing it in practice and without any deep critical reflection, can inhibit learning and leave writing at a surface level of description. This information is an important finding for this study. First, it can be argued that the role of metacognition in the praxis protocol and associated genre writing has the potential to advance thinking processes. Metacognitive skills have the capacity to support preservice teachers’ development of writing skills—to help them get beyond the surface level, as required for high standards of academic writing. However, developing preservice teachers’ ability to reflect at a dialectic level in praxis inquiry is necessary for writing in the theorising genre associated with high standards of writing. Metacognition is connected to cognitive analysis within reflection at a dialectic level. This information contributes new insights into a pedagogy of academic writing.

Teacher educator participant data identified that the writing of many students did not always develop beyond the recount or descriptive genre. Preservice teachers found theorising—explaining and drawing conclusions from the practice—to be challenging. Teaching strategies were required to expand preservice teachers’ knowledge about written language and the repertoire of writing choices available, such as genre. This suggests there is a knowledge factor, in conjunction with practising the language of these genres. This aligns with Halliday’s (1973) linguistic theory that language has specific vocabulary and grammatical forms, which require development. This also resonates with the work of Woodward-Kron (2002; 2004; 2008; 2009) and genre studies by Negretti (2012). This information suggests that metacognition requires the discourse knowledge of disciplinary subjects as a base for the capacity to regulate this knowledge to write in a manner that exhibits depth of learning associated with high standards of writing.

The data suggests a connection between praxis inquiry, reflection and metacognition which manifests during individualised cognitive construction of preservice teacher understanding of theory and practice. There is evidence that cognitive analysis occurs while processing information from experiential knowledge. This can be considered the regulatory component of metacognition directed to the purpose or goal of transformative learning.

Overall, the participant data illustrate that writing genres in praxis inquiry serve to build thinking skills associated with a hierarchy of thought, which can lead to cognitive and social transformations in preservice teachers’ understanding of pedagogy. The writing genres considered academically challenging required well developed analytical skills to result in transformational learning. This resonates with the work of Mezirow (1991, 1993, 1997, 2003). As a theoretical construct, transformational learning is defined as learning that generates influential change in the learner, which shapes the learner and produces a significant shift through problem-solving activities that impact on the learner’s previous experiences (Clark 1993). Conclusions can

be drawn that by making the connections between reflective skills and writing genres explicit, with suitable teaching support, there is the potential to develop preservice teachers' academic writing skills to display 'deep learning' to create meaningful transformations. It can be argued that metacognition as a skill has the potential to facilitate this process; however, the knowledge component needs to be present. How this knowledge of genre is best developed is a key question. Freire (1976), Gee (1991) and Hattie (2006) argue that literacy in the genres that lead to success in society requires conscious, guided instruction or explicit teaching.

It can be inferred that pedagogical approaches to teaching that make explicit the connections between metacognitive knowledge of a hierarchy of thinking skills within the reflective process, on the one hand, and writing genres in praxis inquiry, on the other, have the potential to develop preservice teachers' academic writing skills to display 'deep learning'. This extends the current knowledge of genre and contributes new insights into a pedagogy of academic writing in preservice teacher education.

The data indicates that there is a connection between praxis inquiry and metacognition at this analytical level of cognition required for theorising learning. This is where preservice teachers process their cognitive and social learning from an experiential base to analyse this and connect with abstract theoretical understandings (discussed in the previous section). This analytical process transforms cognition to a new level of understanding, consistent with constructivist learning principles.

However, the degree or quality of analytical performance is a significant factor impacting on the standard of academic writing skill. The data suggest that praxis inquiry requires a certain level of metacognitive awareness and cognitive functioning to generate new learning, or learning considered 'deep learning'. This type of cognitive functioning is associated with analysis and synthesis, or 'higher-order thinking', within reflection. This connects metacognition to writing genres, encompassing a hierarchical aspect to both the thinking skills and writing associated with 'deep' and transformative learning. This information provides important insights into the need to identify pedagogical practices that will enhance analytical thinking skills and writing genres associated with the explanatory and theorising components of the praxis inquiry protocol. Data information suggests that pedagogy that incorporates metacognition as a conscious process within cognitive analysis into writing genre within the praxis inquiry learning process has the potential to enhance academic writing skills to exhibit 'deep' and transformative learning. Furthermore, facility with the use of the linguistic discourse of disciplinary knowledge is required for successful written communication. Understanding the academic discourse, as well as the learning theories being applied within praxis, is fundamental to effective analysis of theory and practice. The development of linguistic discourse is necessary for the transference of cognitive learning to verbal articulation and written assessment work and, ultimately, is vital to preservice teachers' assessment and academic writing success in these two units.

As for the tensions created by a dichotomy of practice that emerged as challenging for teacher educators (cognitivism versus behaviourist methods), it can reasonably be concluded that teacher educators displayed metacognitive knowledge and strategy use in their choice of teaching approaches. There was evidence that explicit teaching can coexist within a constructivist approach to learning, by using scaffolding. Visible modelling, demonstration, discussion, collaborative group work and mentoring were identified as key strategies within a scaffolded approach by teacher educators.

This information indicates the importance of teacher educators being metacognitive in their teaching. Teacher educator examples suggest they adapted their teaching based on understanding their students' needs as first-year university students, consistent with humanistic learning theory. From a theoretical perspective, this theory is based on epistemological views wherein pedagogy is implemented to positively support learners. Such views acknowledge there are behavioural and emotional factors to achieving successful learning outcomes, aligned with the work of Dweck (2012).

We now move to an exploration of the role of assessment, metacognition and writing in praxis inquiry learning and teaching.

4.6 Sub-chapter: Assessment

4.6.1 Introduction

This section of the thesis aims to answer the sub-question relating to the role of assessment in academic writing and metacognition. Understanding the role that assessment plays in the development of writing is fundamental to examining how this contributes to preservice teachers' ability to demonstrate their thinking skills in a written format and be graded to progress in their teacher education course.

Swaffield (2011) proposes that assessment is an integral part of the teaching and learning process so that both teachers and learners have a shared understanding of the learning objectives and can identify progress in learning. Given the important relationship between learning and teaching, an investigation into the role of assessment aims to inform this thesis about how assessment factors impact upon the quality of preservice teachers' academic writing and what role, if any, metacognitive skills might play in this.

The preservice teacher and lecturer responses outlined below are used to investigate the following questions to gain new insights into the relationship between assessment factors and academic writing skills. 'Were there any specific issues in the assessment process that might contribute towards increasing an understanding of the relationship between assessment and the quality of academic writing?' 'What assessment strategies could be identified where metacognition might contribute to the potential improvement of academic writing?' 'Did the assessment tasks contribute towards metacognitive thinking and how did this impact on writing?'

Investigating such questions is important because assessment is integrally linked to competence in writing. This has historically been political in nature, and still is. The current focus on teacher graduate literacy standards is testament to this politicisation, with the introduction of literacy and numeracy testing (LANTITE) becoming mandatory as part of teacher qualification. The work of Freire (1970, 1976) also demonstrates the political nature of literacy competency and the associated access to social capital and mobility, in his ‘banking concept’ of education.

Freire’s concept of empowerment, and access to the social benefits associated with this, is integrally linked to the ability to produce high-quality writing. However, the ability to produce high standards of academic writing requires a knowledge of the processes involved in developing writing skills in the academic genre, as well as the assessment strategies that can best contribute to this. These skills and knowledge can be considered a fundamental objective of a teacher education course. As future educators, preservice teachers require the capacity to produce high standards of writing and to be responsible for knowing how to develop these skills in their future work with students (Hammann 2005). This requires understanding what constitutes a high standard of writing and how to assess this. However, identifying and defining the attributes of high-quality academic writing and how to assess it has been found problematic. This is due to difficulties associated with identifying exactly what constitutes good writing. Hamps-Lyons (2002) finds that a major obstacle is a general lack of understanding of exactly what good writing is during the assessment process, stating: ‘When writing is assessed, that which is assessed is less well-understood than many other constructs. The questions: What is good writing? How do we know? According to whom? and similar ones, remain intriguing because they remain unresolved’ (p. 5).

An attempt to answer these questions and identify some of the obstacles is outlined below applying a metacognition lens to the analysis of participant experience. Responses to questions relating to assessment tasks identified a range of themes related to how assessment impacted upon writing skills and the connections to metacognition in these two units of study. A presentation of themes from an examination of data responses to interview questions with preservice teachers is presented in the first instance and is followed by the lecturer/tutor data responses. A summary of significant issues from both data sets relating to assessment, metacognition and academic writing ensues.

4.6.2 The preservice teacher participant experience

Three major themes emerged from the preservice teacher participant responses to their experience of assessment in these two units of study. These were:

- the role of lecturer/tutor feedback
- understanding the assessment criteria outlined in the rubrics, and
- the assessment tasks being conducive to developing metacognitive skills.

4.6.2.1 The role of lecturer/tutor feedback on writing

Preservice teacher data indicated the feedback provided by lecturers/tutors on assessment tasks had a significant effect on the learner. This had the capacity to either lead to an improvement of writing or to confuse the writer and destroy their confidence. Positive relationships provided preservice teachers with the confidence to ask for help, which contributed towards developing confidence in writing. The nature of the feedback itself was also important. Constructive feedback resulted in positive effects on writing. Where this was too general, or not specific enough, it resulted in confusion about the standard of writing required. The important role of feedback on writing is outlined in the examples below.

Marco and Helen reveal that lecturer feedback had a positive impact on their writing ability, which contributed towards learning how to write in the academic genre. Marco says,

I've found it's been a really big learning curve, just being out of education for about two or three years, coming here this year. Yeah, the university lecturers have been pretty helpful, they're approachable. In terms of my writing, they've always given me good advice as to how to go about it, what sort of things I need to look out for when I do future assessments, so I believe from here on it it's only up, up and up.

Helen also confirms that the relationship with teachers has been an important aspect of her development in academic writing ability. The comments below demonstrate that Helen is still a dependent learner and writer in the university context. Being a novice, she requires help with her writing. In a similar vein to Marco, Helen stresses that the ability to approach her teachers to ask for help has had a positive impact on the improvement of her writing skills.

Like through help from other people, actually approaching my teacher and asking for help. I feel that when I go and do it on my own without asking for help I don't do it as well as I do when I actually ask for help.

These examples illustrate that, according to Flavell's (1976) definition, metacognitive skills have been applied, albeit unconsciously. Both participants have conducted some self-assessment around the standard of their writing. This demonstrates that evaluative judgements have occurred and, hence, a consciousness to ask for assistance to improve their writing skills. This suggests regulatory action has been taken with the intention or goal of improvement, which is metacognitive. It can be inferred from these examples that applying metacognitive skills during the drafting phase of writing can lead to improved results. This is evidenced through Helen's comments that if she does not request feedback, her grades are compromised.

These examples also highlight the affective dimensions related to confidence, feedback and metacognition. Relational pedagogy is drawn to our attention, indicating there needs to be positive relationships between students and teachers for students to feel comfortable enough to ask for assistance. Furthermore, the nature of the feedback is vital to the improvement of writing. Positive and constructive

feedback by teaching staff can be a significant factor that builds writer confidence, which can lead to successful outcomes.

On the other hand, Kaitlyn and Rod state that the feedback provided to them is often too general and does not address concerns about their writing. In her statement below, Kaitlyn describes feelings of uncertainty regarding her ability to select relevant references for academic assignments. These doubts suggest she lacks confidence and skill in her ability to analyse and decipher what is relevant reading and reference material. She notes that lecturer feedback like ‘you are on the right track’ is too general and does not address concerns or alleviate her uncertainties. Kaitlyn suggests feedback that communicates strategies for how she could improve her writing would be beneficial.

I find with references and really doing that and getting them right, I find that a bit difficult because I find information but then sometimes I think maybe it's not relevant to what I'm doing, so that's when I find it really difficult to get the information of what is right and what's got nothing to do with the topic, kind of thing. That's probably my main concern with a lot of my assignments and everything because—and then when I get them back I don't really get assessed on that, on whether the information that I collected was correct. It's just kind of what I've got there is on the right track but I'm not sure if I could find extra information and things like that, so that's where I find it a little bit difficult.

This example indicates assessment criteria, and the feedback provided, need to specifically address the writer's concerns. In this case, Kaitlyn appears anxious about her progress and ability to research academic reference material correctly. An individual approach to feedback that can address specific writing concerns could potentially improve confidence in her academic writing capability. Similarly, Rod states the feedback provided is not specific enough to inform him on how he can improve his writing skill. This example also draws attention to the subjective nature of assessment by teacher educators.

[L]ast semester [Teacher A] had said to me that clearly I was a writer and I enjoy writing, which is actually true. I do actually enjoy writing, but this semester [Teacher B] has said my writing is a bit too general and so, okay, I'm a little confused and I'm not really getting a precise answer on really what I can actually do to improve that. Last semester, I felt confident; this semester, I'm confident, but, you know, I'm passing but I don't feel that I'm passing sufficiently. I'd like to improve, yeah. Yeah, as I said, it's a little bit confusing whether, you know, my writing's a little general. Why is it general? It's really hard to try and pinpoint where the problem actually is lying.

These examples highlight some difficulties inherent in the assessment and feedback process for academic writing. While the rubrics are the basis for assessing academic writing tasks, these examples illustrate that the feedback participants have received about writing competence against the rubrics has not informed them sufficiently to alleviate concerns or to provide concise information on how to improve their writing. According to Flavell's (1976) definition, it can be surmised that metacognitive skills require having a

knowledge (in this case, specific knowledge) about what is required to improve academic writing. This information (knowledge), can then be activated to regulate this knowledge towards improvement. These examples suggest feedback on writing plays a significant role in the development of high standards of academic writing. The strategies teacher educators use to provide quality feedback on writing can provide the metacognitive knowledge required for the regulation of such knowledge. It can be surmised more concise knowledge about writing skill is required for action towards the goal of developing higher standards of writing. Nevertheless, despite a lack of specific knowledge about the requirements to improve writing, Kaitlyn and Rod demonstrate some evidence of metacognitive awareness. This is illustrated by their capacity to analyse writing skills and understand they need more information to take action for improvement.

The examples illustrated above also signal that metacognition is linked to the affective dimensions of emotions, assessment and writer confidence discussed earlier. This suggests feedback on academic writing ability is connected not only to metacognition at the individual cognitive level but also to the affective dimensions associated with writer confidence.

These examples demonstrate that the quality of lecturer/tutor feedback is a vital component of metacognition, assessment and academic writing ability. The epistemological stance that teaching staff adopt towards feedback and assessment plays a significant role in the mechanisms used to provide feedback on writing. This has the potential to contribute to the positive metacognitive growth of the student, as illustrated in examples from Marco and Helen. It can be surmised that feedback that provides knowledge about writing skill will enable the regulation of such knowledge towards the goal of improvement. This type of feedback suggests metacognition is connected to humanistic theories of learning. Assessment feedback that leads to the growth of the writer resonates with theories that align metacognition with the affective dimensions of learning, such as the work of Efklides (2006; 2008; 2011) and Dweck (2012), and the emotional intelligence theories of Gardner (1993) and Goleman (1996).

4.6.2.2 Understanding the assessment criteria in the rubrics

In addition to feedback on writing, participant responses revealed the assessment terms and the criteria outlined in the rubrics were difficult to understand. This is illustrated by participants such as Fleur, Kaitlyn, Rod, Pamela, and Judy in the excerpts below, where they describe the impact of a lack of clarity in their understanding of the assessment rubrics for assignment work.

In the comments below, Fleur describes the confusion she experienced as a result of not understanding the meaning of the word ‘rubric’ (essential for communicating the assessment criteria for assignment work). Further, while the rubric was comprehensive, it contained too much detail. Fleur describes these feelings of confusion as she attempted to interpret the requirements of the rubric.

Look, before I started this course, I actually did not know what a rubric was. So, they’re talking about a rubric, right, and I’m thinking, ‘What are they talking about?’ So, then sometimes I find that the more information you’re given on how to answer a question and what’s expected, it actually becomes more difficult because there’s this structure that I have to adhere to and it’s

like because I'm trying to tick all the boxes, then my word count gets blown out of proportion and I'm finding I'm doing more work because I'm trying to tick the boxes and then I lose sight of what the actual question is and the bigger picture. So, I find that really—and then that makes me second-guess myself because I'm thinking, 'Oh okay, am I answering every single point on this rubric?', you know, and they say, 'Oh, you know, if you want high distinction, you have to have ten references'. And then it's like, well is this about all the references or, you know, is this about me linking in and my—and then I start looking for references for the sake of looking for references instead of answering the question... So, then when you talk to other students, you start to get confused about what the expectations are. So yeah, so that's all sad.

This example reveals some important insights into the role of assessment rubrics in successful academic writing. The rubric needs to be clear about what attributes are valued for assessment purposes. The grading system needs to be correlated more clearly with the objectives to avoid confusion: 'Is it quantity of references or the quality of analysis?' that determines achievement standards. (This has confused Fleur.) Finally, the rubric can impact on writer confidence, as evidenced by Fleur's statement, 'and then that makes me second-guess myself because I'm thinking, "Oh okay, am I answering every single point on this rubric?"'.

Furthermore, in the example below Pamela discloses her inability to understand the criteria in the rubric in one component of the research assessment task, which had a severe impact on the overall result of the assignment.

And most recently, the biggest struggle I had was clearly understanding component two because I lost a lot of marks on that... I didn't follow the rubrics properly. And not having that, I lost a lot of—yeah, I didn't interpret it correctly and I had this misguided confidence in steward, which basically meant that I kept working with something that was wrong. That's what you do... So, I just scraped through.

In the excerpt below, Judy remarks on the complexity of the rubric, stating the standard appeared to be more like a 'masters' study. However, once support materials were provided on WebCT to illustrate the standard required they had a positive influence on her writing skills. This example indicates that assessment rubrics with accompanied examples can provide the knowledge required to regulate this knowledge for the enhancement of writing.

If you look at just the rubric it doesn't look like this. It doesn't look as simple as E puts it. It looks like a masters' research project for me but then when she puts it into perspective and gives us these examples it's fantastic... and I think that's what's lacking as well for a lot of students for academic writing because it's not something you can just do like that.

This example also illustrates that the provision of writing models helps to alleviate the stress involved in academic writing, which can impact on writer confidence. Judy describes the emotions she experienced, describing as ‘terrifying’ the inability to comprehend what was expected from the rubric.

We have no idea what it should look like and this is half the stress that I have when I look at the rubric because if you look at the rubric for this subject it’s terrifying and I think that might be what’s happened to a lot of students.

Despite difficulties understanding the assessment rubrics, Judy’s comments signal that strategies such as writing models can serve to overcome confusion and provide the cognitive knowledge required for preservice teachers to apply metacognitive strategies for improving their writing. This type of modelling has provided her with the cognitive information required to demystify what she initially thought to be ‘terrifying’. Furthermore, Judy’s comment that academic writing is ‘not something you can just do like that’ also indicates the contradictions that exist in the perceptions of each participant group. Judy’s comments contain connotations that academic teaching staff should not assume that preservice teachers know how to write in the research genre in their first year of university.

However, the teacher educator data evidence was contrary to this. The teacher educator responses indicated they were cognisant of the difficulties associated with the research process of this assignment—hence the development of material online, and in tutorial work (Appendix J), to scaffold their learning. Nevertheless, teacher educators also identified that assisting preservice teachers to develop their writing in the research genre was a major challenge.

These examples provide insights that inform us about how metacognition and assessment might impact on enhancing academic writing skills. First, the standards need to be clearer in the rubrics for preservice teachers to have the knowledge required to regulate this knowledge, to enhance their writing. Second, the feedback on writing needs to convey specifically where shortcomings exist against the standards set out in the rubrics. Alternatively, the rubrics need to be reassessed. The rubrics play a significant role in providing the metacognitive knowledge to enable the regulation of this knowledge.

4.6.2.3 Assessment tasks and metacognition

It would be reasonable to suggest that the preservice teacher data illustrated connections between metacognition and the assessment tasks through praxis inquiry learning, despite difficulties experienced with the assessment rubrics outlined above. Assessment criteria in these two units centred on two major factors: first, analytical skills in the process of analysis of theory and practice (see Appendices H and I) and, second, the technical aspects of academic writing, such as referencing and clarity of expression in writing composition. It can be argued both areas require metacognitive knowledge, including (a) the disciplinary knowledge (theory and practice) to actively discriminate for writing content and regulate this knowledge, and (b) metacognitive knowledge of the various academic writing genres to regulate written communication in the standards required. The skills inherent within metacognition to perform both these

facets well require disciplinary knowledge for analytical reflection and the technical knowledge of academic writing genres.

Conclusions can be drawn that both the knowledge factor (cognition) and the skill (analytical skills within reflection) are important to the capacity to regulate knowledge as required for high standards of writing in assessment.

4.6.3 The lecturer/tutor experience of assessment

Having explored the preservice teacher experience of the assessment process in these two units of study, we now move to an investigation of the lecturer tutor data responses. How teacher educator participants defined high standards of academic writing, and made judgements about this, is pertinent to answering the thesis question. Insights gained from this participant data are used to identify pedagogy that may enhance preservice teacher academic writing.

Four themes emerged from the interviews with lecturer/tutor participants in relation to the assessment of preservice teacher writing.

1. Analytical skills were identified as a key feature that defined a high standard of academic writing. There is a connection between analysis and metacognition.
2. The assessment rubrics used to assess preservice teacher learning are a powerful determinant of the standard of academic writing. Rubrics set out the criteria for grading and provide feedback on the expectations for standards of assignment work.
3. The assessment feedback to preservice teachers on their progress contributes to the development of high standards of academic writing.
4. The assessment tasks were conducive to the development of metacognitive thinking and academic writing.

4.6.3.1 Analysis is a key feature that defines a high standard of academic writing and is integral to metacognition

The skill of analysis was identified by teacher educator participants as a key attribute of a high standard of academic writing. Analytical skills were inherent in metacognition. This is illustrated when Shane says,

Oh, well it's very central to it. I mean analysing is metacognition, I think. Unless you're sort of—well, even if you are doing some sort of scientific analysis of the concrete things, you are thinking about it so when you analyse something you're sorting it, you're putting a value on it, you're deciding whether it's good or bad, whether it's the same or different, I mean there's all that sort of thinking that's central to it.

Emilia concurs, stating, ‘I think it’s imperative. I think they go hand-in-hand. If they’re not at that level or they’re not thinking deeply they’re not analysing, so I think that you can’t really separate them from one another’.

Gaye also expressed a view that analysis is an integral part of metacognition but that there is a need to make this overt. Gaye asserts thinking skills such as analysis and metacognition are interconnected during the writing process and are skills that can be taught. Strategies such as modelling are suggested as a way of being ‘explicit and clear’ about what ‘high-quality analysis looks like’.

Yeah, I think they would go hand-in-hand myself, but I wouldn’t say that we are quite tight enough on being that explicit and clear to students about what does a high-quality analysis look like. So maybe what we should be doing is modelling what students and staff, the analysis framework, and I’ve actually been thinking about this... I think analysis and metacognition, the writing and the thinking kind of are all interwoven, not particularly separate but I think it’s a skill. I think it’s a skill that can be taught.

In the comments below, Emilia illustrates that good analytical skills are an integral part of setting high expectations among teaching staff. However, it cannot be assumed that preservice teachers will know how to do this. Emilia confirms that analysis is a skill that demonstrates high standards of academic writing but, like Gaye, stresses that these skills need to be taught. Teaching strategies such as making writing expectations visible through the provision of concrete examples and constant modelling are suggested here. Emilia emphasises that preservice teachers struggle with analysis (highlighted in bold). This is pertinent information, as it coincides with the experience identified in the preservice teacher data. Emilia argues preservice teachers need to see examples of high standards of analytical writing models to develop these skills. According to Flavell’s definition, this knowledge is required to regulate writing for the appropriate standard. A visible learning approach through modelling and demonstration is suggested by Emilia, which aligns with the work of Hattie (2006) on guided learning.

I definitely think we need to have high expectations and we need to provide them with a canvas so we need to say this is what a good analytical piece of work looks like, this is what I expect from you and this is how and unpack it and I think if you do that then immediately you raise the bar because **often they don’t know what they don’t know, so we can’t expect them to produce something that we want when they don’t really know what that is.** So once again I think it’s constant modelling of that. (emphasis added)

In a similar manner, Gaye and Ann assert that analytical skills are essential to high standards of writing and require the use of pedagogy based on what teacher educators referred to as ‘explicit’ teaching. In the following excerpt, Gaye highlights the need for a greater focus on the development of analytical skills—in particular, critical analysis—so that preservice teachers understand what constitutes a high standard of writing in assessment rubrics. However, she asserts that building teacher capacity in this area is required

to do this more effectively. Staff require professional development to build their teaching skills in this area in order to help preservice teachers progress from descriptive to analytical writing.

The concept of analysis. I think it will mean different things to different students. I think analysis of itself, saying ‘analysis’ in a rubric doesn’t necessarily mean that students will know what it means and some of them think that it’s a description and having just marked some masters assignments I can say that some masters students still think of analysis as description. So I think we need to probably teach the concept of analysis more explicitly and then the concepts of critical analysis more explicitly than just writing it on a rubric... I think concepts like analysis we probably would need to do more work on our teaching, threading through to the rubrics and we would need to do more professionally as a team to get the students to do more higher-quality analysis.

This example draws attention to analysis being difficult for preservice teachers, not only in the first year of this Bachelor of Education course but also in further study. This insight indicates the importance of analytical skills as a key focus within teaching for successful academic writing in praxis inquiry learning. As such, there are implications for course design and assessment rubrics.

The following examples from teacher educators such as Emilia, Shane and Ann confirm the need to develop analytical skills and outline strategies used to do this. These include discussion, questioning, demonstration and modelling. We see this when Emilia states that the development of analytical skills requires modelling and scaffolding.

I think some of them are able to do that and they are able to look for themes and draw conclusions and take a position or take a stance in regards to an area or an issue but, once again, I think that’s really difficult to get to that level and once again it’s through that modelling and that scaffolding that gets them there.

In the example below, Ann describes how individual support is required for some students to extend their analytical skills. The use of discussion and questioning is described through a process that aligns with Vygotsky’s (1978) theory of scaffolded learning with a ‘more knowledgeable other’. In this case, Ann describes how this scaffolded support led to the preservice teachers’ writing extending beyond ‘description’ to analysis, with associated improvement in the students’ results.

Yes, I had a student who had collected, who was referred to me by a lecturer, she’d finished collecting all her data for the research report, she didn’t have many samples of work or any photographs or anything and it was that part when they were asked to put things into themes and she was still at that ‘I found this, I found that’ [stage]. That to me is very much description still, and I finally managed through probing questions, ‘Yes but what does that mean? This part relates to that’, and she suddenly clicked and went, ‘Oh, that’s what was going on, that’s

because they had a literacy program, that's why the teacher brought in the dog and read the story', and yes, it was just superb and that was through talk. She'd done a lot of writing and she'd been sent because she got stuck or couldn't go any further or the lecturer didn't have enough time, whatever, and I was very proud of that. She did very well. She understood what it meant at last. It was great.

This example illustrates the benefits of a conference approach to the improving writing competence. The importance of feedback and a drafting process are indicative of strategies that can lead to an improvement of writing particularly for students. This process of writing development also aligns with the work of Graves (1980), with the opportunity to participate in a cycle of drafting and feedback leading to improvement of writing. This example also demonstrates the value of the university's provision of learning support staff to work in partnership with teaching teams to enhance preservice teacher writing skills, particularly for students 'at risk of failure'.

If we accept Shane, Gaye and Emilia's contention that analysis is an integral part of metacognition, and also a key feature of a high standard of academic writing, it can be surmised this has implications for pedagogy, as Gaye has outlined above. It would be reasonable to conclude that teacher professional development would be of benefit to developing analytical skills, metacognition and the assessment processes conducive to this.

4.6.3.2 The assessment rubrics

As mentioned above, the purpose of the assessment rubrics in these units of work was to create an awareness of the standards required in assessment tasks. These rubrics were to guide consistent standards when assessing preservice teacher work. Teaching staff used the rubrics as shared marking during moderation exercises to ensure consistency in marking assignment work.

Data responses from teaching staff highlighted that the assessment rubrics were problematic. This was consistent with the preservice teacher's reported experiences of confusion and misunderstanding. In the examples below, data responses from teaching staff such as Rod, Gaye, Emilia and Shane outline their experience in the use of the rubrics in the assessment process.

In the following excerpt, Rod highlights the importance of grade allocation to assessment tasks, as this has an impact on preservice teacher motivation and performance. The example below draws attention to the need for grades to be commensurate with the value and expectations appropriate to the task.

It depends on the rubric I think, seriously. When you look at the rubrics, let's say for example I've just got this one in my mind because we're doing digital portfolio today, they haven't done well. I've really been disappointed with that and I think that's because ten marks, it didn't seem like worth doing. The ones I've seen this morning haven't really shown what we were asking them to do... I think sometimes it's what you put in the rubric is going to make a

difference of how well they do it because a lot of it comes from what their expectations are... I think it's important for us when we look at how we go to mark, give a significant mark if it means something.

This example illustrates that, despite teacher expectations being high, the rubric did not reflect this expectation in terms of the mark allocated to the task. According to the rubric (Appendix I), the value of this task was only ten per cent of the total marks for the assignment. In Rod's view, this was too low for what was expected. This required an analysis of the research process as a verbal and digital summary of the Research Report in Unit 2.

This example illustrates that rubrics can be a powerful determinant of standards of achievement, and the important relationship between assessment rubrics and course objectives. This example also has implications for course design, in that it would be beneficial for teaching staff to be included in the design process of assessment rubrics.

Alternatively, Gaye suggests that the rubrics are not fully understood by preservice teachers. (This correlates with the preservice teacher data.) She asserts while the rubric is designed to support an understanding of the nature of assessment tasks, preservice teachers indicate they want the rubrics to be more explicit. It would appear this need for more precise and explicit rubrics stems from preservice teachers' transition into a new way of learning and being assessed in praxis inquiry. This is evident when Gaye describes preservice teachers' desire for more concise rubrics as being associated with a need to be told 'what to think' rather than construct personal knowledge.

The assessment tasks in praxis inquiry required preservice teachers construct their knowledge through an inquiry process. This information is consistent with the preservice teacher responses, which identified that many of the challenges experienced in praxis inquiry were connected to understanding the constructivist nature of learning in these two units of study. As a result, it is not surprising that the assessment tasks and the rubrics created a level of uncertainty.

A rubric is really a tool to support understanding about what the task is. The students' interpretation will vary depending on what position they come from. I think if we look at the assessments, students want more and more explicit rubrics. I think we have, certainly for some students, rubrics are helpful in giving them guidance. I think, for some, a certain other number of students want more and more precision with marking rubrics so that we tell them what to think and that to me is missing the point.

In comparison, teaching staff such as Emilia and Shane indicate there are assumptions made by teaching staff about preservice teachers' capacity to understand, interpret and demonstrate what is expected in the assessment rubrics. They argue the need for more explicit rubrics is derived from preservice teachers'

inability to understand how to demonstrate the analytical skills required for successful writing and high standards of achievement defined in the rubric. Emilia states,

I think once again they really struggle with analysis. When I say to them you need to analyse that or you need to think analytically about that they say to me what does that mean. They don't know what that means and **I find that really hard to answer** and I think, once again, looking at where they've come from and thinking about Year 12 and what their understanding of analysis is from Year 12 is very, very different so **I think that we really need to be very careful in not just assuming that they know what analysis means**. I think some of them are able to do that and they are able to look for themes and draw conclusions and take a position or take a stance in regards to an area or an issue but once again I think that's really difficult to get to that level and once again it's through that modelling and that scaffolding that gets them there. (emphasis added)

This example is pertinent to a discussion of assessment, metacognition and high standards of academic writing. It highlights that it cannot be assumed that preservice teachers understand what analysis means or have the skill to be analytical in this praxis inquiry learning environment. This suggests that while preservice teachers experience difficulty with interpreting analysis, so do teaching staff. This confirms the need for professional development in this area (suggested by Gaye previously). Emilia's revelation that she finds it difficult to answer preservice teachers' concerns about what is meant by analysis (highlighted in bold) is an important insight. It draws attention to pedagogy associated with teaching analytical skills as a complex concern for teaching staff.

In a similar vein, Shane asserts that the challenges in teaching analysis stem from the subjectivity of individual assessors defining, teaching and assessing analytical skills by. He argues this can be problematic if the rubric does not state specifically what analysis means. In addition, he draws attention to the confusion that rubrics can create through a focus on grammar and referencing at the expense of defining more succinctly what is meant by analytical skills. Shane asserts that the use of references does not necessarily mean good analysis, which is pertinent to the achievement of high standards of writing. This issue was highlighted in the preservice teacher data, where confusion was experienced due to a perception that high grade allocation was aligned with the quantity of references rather than the quality of analysis. Shane comments on the difficulties associated with the skill of analysis and how this is defined by the rubrics.

But you could actually do quite a good assignment that's well-written that perhaps doesn't have so much of that and you might get a distinction, or you might get a credit... Just by having references doesn't mean analysis. Just by having good grammar doesn't mean a good assignment. It's all those things together, and I think the difficulty with good grammar and good referencing is that it's sort of the box that it all comes in; it's not the actual thing. And, the thing demonstrating analysis is a hard one, because it's very subjective and what are we

analysing and if my analysis doesn't concur with your understanding of the situation, do you give me a high mark, or do you say my analysis is faulty? So, I think we need to be really careful in what we think shows good analysis, and it shouldn't be good grammar and syntax, although if that's faulty it skews it.

An important insight for this study is the subjective nature of the assessment of analysis raised by Shane. It would appear this is attributable to both the complexity of defining what is meant by analysis, and the application of analytical assessment to something that is already difficult to define.

The difficulties associated with defining analysis are evident in the language used when Shane refers to 'the thing that demonstrates analysis is a hard one'. Reference to 'the thing', and 'hard' by Shane, in addition to Emilia's comments that she finds it hard to explain what analysis means to her students, suggests there is an elusive aspect to how analysis manifests and is assessed in academic writing. (This elusive element was also present in the participant attempts to define metacognition; see sub-chapter 4.3.1) This elusive factor is interesting in that it highlights that both analysis and metacognition are difficult to define, yet analytical skill is generally considered a key attribute of high standards of academic writing and teacher educators described analysis as inherent in metacognition. This suggests the term 'analysis' requires a common definition and understanding among assessors. As with the comments by Rod previously, Shane confirms that the content of the rubrics are a powerful determinant of the skills and knowledge valued, asserting the rubrics need to be specific about the kind of analysis required as well as the marks attributed to the different components of academic writing.

I think if you can find this kind of analysis is what we value and doing it at this level involves doing x and not doing it at all means you wouldn't really get high marks on this criteria, and then all that other stuff about referencing etc, which I've mentioned before, is sort of explicitly out there but has a separate sort of value.

The suggestion of redesigning rubrics for the assessment of academic writing may be a potential solution to this confusion. Separating the technical aspects of writing related to correct referencing, grammar, spelling etc. from those that focus on thinking skills such as analysis, may provide a clearer explanation of writing skills in the rubrics.

4.6.3.3 Assessment feedback in the development of high standards of academic writing

Jane draws attention to the importance of assessment rubrics as part of assisting preservice teachers to develop independence in their learning against the benchmarks set out in the rubric. In the example below, Jane asserts that the rubrics outline the grading system and feedback against these aims to give preservice teachers an understanding of the standards expected. This provides a means for monitoring individual their progress but also determines aspirations towards higher standards of writing.

As in the way that they look at the assessment rubric and understand what's involved to achieve perhaps a higher outcome for themselves. I think the more experience that they have

in working from a rubric and the more experience that they have in their writing and the more feedback that they've been given for their tasks when they are doing an assessment task, I think in saying that, they are able to then aspire to a certain standard and I think that the rubrics that we give generally give them are a guide for that and give them an opportunity to enhance their skill if they're aiming to achieve a high standard.

This example suggests experience in the use of monitoring writing through a cycle of writing and feedback against the criteria set out in the rubrics, is related to the monitoring and regulatory facets of metacognition. However, the teacher educator examples above, suggest it cannot be assumed that preservice teachers know what the standards set out in the rubrics mean. This has implications for self-regulation of writing performance. While taking responsibility for learning from feedback is a vital part of using rubrics to improve academic writing, as Jane has advocated, teaching staff such as Emilia, Shane, Gaye and Ann highlight the need to help preservice teachers understand what these standards look like for success in writing. This information identifies dilemmas associated with teacher educator expectations of first-year students' academic writing ability. The data suggests there is a dichotomy within pedagogy in the teaching/assessment process, with a simultaneous need to nurture learners and to encourage independence in learning. Participant data suggests preservice teachers were at a novice stage on a continuum of learning how to write in the academic genre. They had not yet developed sufficient expertise in analytical skills to theorise learning in praxis inquiry at this stage of their learning, or to make self-assessments to monitor writing against the rubrics.

However, this did raise an important paradox associated with pedagogy and the use of assessment rubrics in this praxis inquiry process. Independent learning is part of constructivism, but unless preservice teachers understand the characteristics required for high standards of writing, feedback can be diluted. It can be surmised that metacognition requires understanding the rubrics for the capacity to self-regulate learning. The need to complement constructivist learning with what teacher educator participant data described as 'explicit' pedagogy suggests this could be a useful time to involve preservice teachers in self-assessment tasks. The use of a constructivist, collaborative approach to the development of assessment rubrics might help demystify what constitutes a high standard of writing in assessment rubrics. This would provide the metacognitive knowledge required to regulate this.

4.6.3.4 The assessment tasks were conducive to the development of metacognitive thinking and academic writing

Teacher educator participants were in general agreement the assessment tasks were conducive to developing preservice teachers' metacognitive skills. Metacognition was associated with the thinking skills required in reflection and analysis of learning in the praxis inquiry framework. All the assessment tasks required reflection on learning and connecting theory with practice. Analytical skills were considered inherent in metacognition, with assessment tasks requiring preservice teachers to demonstrate

their learning and ability to think in ways that showed evidence of ‘something bigger’. We see this when Shane says,

In terms of types of tasks, I think they’re good tasks. I mentioned the portfolio and perhaps thinking a bit more about that, and I think the thing with that one is what is the artefact actually doing? It’s demonstrating or it’s providing evidence of something else, something bigger, and that something bigger, I think, is the learning that’s taking place.

This example illustrates a connection between metacognition and praxis inquiry learning connected to higher-order thinking, referred to as something ‘bigger’ in the learning process.

4.6.4 Discussion: The role of assessment in the development of academic writing and metacognition (both data sets)

This sub-chapter aimed to identify specific issues in the assessment process that might contribute to understanding the relationship between assessment and the quality of academic writing. It also aimed to identify assessment strategies whereby metacognition might contribute to the potential improvement of academic writing. In addition, it aimed to identify how the assessment tasks contribute to metacognitive thinking and the impact on academic writing.

Participant data from both cohorts highlighted the important role of assessment in the development of preservice teacher academic writing in these two units of study. Both cohorts identified important issues in answering questions about how assessment tasks impacted upon preservice teacher’s academic writing and metacognitive skills. These were:

- The assessment tasks were conducive to the development of metacognitive skills, but this was implicit rather than explicit.
- The assessment rubrics were difficult to interpret. Difficulties were experienced by both preservice teachers and teaching staff in their respective use of the rubrics.
- Analytical skills were identified as inherent in metacognition. Analysis was identified as a skill that exemplified high standards of academic writing; however, analytical skills were difficult to interpret for both preservice teachers and teaching staff.
- Assessment feedback was an important factor in facilitating the enhancement of writing skills.

4.6.4.1 The assessment tasks were conducive to development of metacognitive skills, but this was implicit rather than explicit

To discuss how metacognitive skills were manifested in the assessment tasks, it is important to reiterate what was being assessed and how this was assessed. All assessment tasks in both units were drawn from preservice teachers’ experience in school classrooms and required connecting this experience to

theoretical learning at university. There was evidence of an integral connection between learning, assessment and writing through the praxis inquiry framework (see Appendix G).

The assessment tasks were varied and drew upon a range of academic literacy skills. The underlying philosophy of assessment in this praxis model was that the assessment tasks were grounded in preservice teachers' authentic experience within classroom settings over the duration of the semester. From a theoretical perspective this was a formative process of assessment, based on the praxis inquiry protocol. This required reflection on and analysis of learning experiences, drawing on theory to develop preservice teachers' ability to think deeply and question educational issues in preparation for their future role as educators.

The rationale behind the assessment tasks was based on the belief that preservice teachers should be active learners who think deeply about teaching and learning issues. A consequence of this insight is that preservice teachers can then develop personal theories from their practical experiences to become discerning educators. Praxis inquiry learning has its basis in experiential, cognitive and social constructivist learning, and assessment tasks were connected to this learning process.

The data responses from both cohorts expressed views that the assessment tasks were conducive to the development of metacognitive skills. Preservice teacher data responses indicated that these tasks contributed to their metacognitive skills, resulting in positive learning despite difficulties in interpreting the assessment rubrics. The teacher educator cohort also considered the assessment tasks contributed to the development of metacognition, although this was implicit rather than explicit.

From this information, it can be surmised that metacognitive strategies were embedded within the process of learning. The praxis inquiry approach to learning facilitated and encouraged preservice teachers to develop a wide range of skills. The skills of reflection, analysis and synthesis of learning from the two contexts (university and classroom settings) were required in all assessment tasks. These skills are strongly associated with the thinking processes required in metacognition, if we accept Flavell's (1976) definition which relates to cognitive knowledge and the monitoring and control of this knowledge.

The data illustrated that the main contributing factors to the development of metacognitive skills in the process of assessment tasks were related to (a) understanding what was meant by analysis in the rubrics and (b) the role of feedback on preservice teacher writing in regulating improvement of writing. However, while analytical skills were an expectation at university level, the concept of analysis was identified as difficult to interpret from the assessment rubrics by both participant groups. The subjective nature of understanding analytical skill when marking work was identified by teacher educators as problematic.

4.6.4.2 The assessment rubrics were difficult to interpret

The assessment rubrics were intended to define the expectations and criteria of the standard of work required from preservice teachers to successfully complete these two units of study. Therefore, one of the

aims of the rubric was to enable preservice teachers to understand the assessment requirements to equip them to independently monitor their work. Andrade and Valtcheva (2009) contend that,

[a] good rubric describes the kinds of mistakes students tend to make, as well as the ways in which good work shines. It gives students valuable information about the task they are about to undertake and takes the guess-work out of understanding their learning targets, or what counts as high-quality work. (p. 12)

While the intention of the rubrics was to support preservice teachers in their learning, participant data illustrated that both cohorts experienced some difficulty in using the rubrics.

The preservice teacher data indicated the rubrics were difficult to comprehend, resulting in them being less effective as an assessment tool to guide learning. An important insight from this information is that high standards of academic writing are associated with analytical skills, which are considered skills inherent in metacognition. As such, these data suggest that the use of rubrics to enhance academic learning and writing requires a more explicit focus on understanding analytical skills as part of metacognition. This is closely related to pedagogy that makes visible the knowledge required so that preservice teachers can first, understand what a high standard of analysis is and, second, know what it looks like in written communication. This knowledge is required for the regulatory function of metacognition.

Lecturer/tutor participant data also highlighted that the rubrics were designed to assist preservice teachers in their learning and to convey the different levels of achievement. However, the effectiveness of the rubrics was compromised by a lack of clarity in how the assessment criteria were expressed and understood. Teaching staff indicated the rubrics were a powerful influence on preservice teacher expectations, motivation and achievement. It was generally agreed they needed to be explicit and concise to enable preservice teachers understand what was required. This argument for clear and concise assessment echoes Brown (2005), who states:

Current literature on assessment argues strongly that the process should be a transparent one, with criteria that are explicit and clear to all concerned (assessors, those being assessed and moderators reviewing the process) from the outset. Assessment can become valid when the assessors use evidence of achievement, clearly matched against the criteria. (p. 83).

This notion of transparency in assessment criteria is important to a study that investigates metacognition and academic writing, particularly as high standards of academic writing have been identified in the data as associated with the skill of analysis. In addition, analysis was found to be inherent in metacognition. This insight raises the question, ‘If analysis and metacognition are linked, how can assessment rubrics specify this to guide learning and teaching?’ This insight suggests the assessment rubrics need to define more clearly what both analysis and metacognition mean for the achievement of high standards of academic writing.

It can be concluded that the difficulties and confusion experienced by preservice teachers in their attempts to interpret and comprehend the assessment rubrics were associated with their understanding of learning in praxis inquiry. A shift in preservice teachers' ability to understand both the nature of learning and assessment in this process was required.

Data responses from the lecturers interviewed also highlighted challenges in their attempts to assist preservice teachers understand the assessment tasks. Participant responses identified these challenges as emerging during the process of transition to a new method of learning. Teaching strategies, such as scaffolding, modelling and demonstration, were cited as valuable in this process. There was strong evidence from these participants that 'explicit teaching' of analytical skills was required in this constructivist model of learning in praxis.

The data suggest the role of the teacher in an experiential, inquiry model of learning was challenged in the assessment process. This represented a shift from behaviourism—where the teacher provides the knowledge, as in Freire's (1976) 'banking' concept of education—to constructivism, where the teacher becomes a facilitator of preservice teacher learning. The assessment of skills, such as analysis, required for independent thinking and theorising learning was identified as difficult due to the subjective nature of analysis. Analytical skills were connected to preservice teachers' individual cognitive, experiential learning. This was identified by teacher educator responses as a developmental process emerging from reflection on experience. Both cohorts of participant group identified analysis as being difficult to interpret for assessment purposes yet fundamental to success in writing.

4.6.4.3 Analytical skills were identified as inherent within metacognition

The data suggest the difficulties experienced by both preservice teachers and teaching staff in interpreting and assessing analysis were the result of the underlying rationale of the assessment process itself. The assessment tasks in praxis inquiry learning were linked to an inquiry-based, research mode of learning. This learning process was aligned with cognitive constructivist principles and embedded in experiential learning. Reflective and analytical skills were developmental in this learning process and writing tasks were undertaken through a praxis inquiry lens. This protocol required writing in genres that involved a hierarchy of thinking. The data illuminated that preservice teachers experienced the most difficulty operating at the theorising level associated with analysis in reflection on learning. This information provides important insights for this study. First, it can be surmised that there is a sphere of cognitive awareness and ability that is related to the skill of analysis and, therefore, higher-order thinking skills. This is the metacognitive knowledge required for the regulation of cognition. Second, these skills are connected to preservice teachers' developmental stage of learning and experience in school contexts. Third, the skill of analysis, which was found to be inherent in metacognition, requires specific focus and development. These insights have important implications for the assessment of writing, raising questions such as, 'If analysis is a quality that defines a high standard of academic writing, and if analysis is an

inherent aspect of metacognition, how do we assess this? What measures can be applied to concepts or skills that are identified as difficult to define?’

Data responses also suggested that analysis was a complex skill to describe, yet it was considered integral to the development of high standards of writing. Evidence emerged that teaching staff found it difficult to explain and teach ‘analysis’. Kuzmanovic and Bandak (2015) attempt to demystify the notion of analysis and refer to the work of Bourdieu (1992, p. 218) who made attempts to make analysis a ‘craft’ with identifiable features. While Kuzmanovic and Bandak (2015) also fail to provide a definitive explanation of what constitutes analysis, they do acknowledge the complexity of the term advocating that,

By insisting on addressing what goes into making analysis, and what goes on while making analysis in a concrete manner, he [Bourdieu] took up the challenge of putting words to a central analytical concern that students and scholars all grapple with and have difficulties speaking about, not just in the social sciences, as in the case of Bourdieu, but likewise within the humanities: how do we make analysis? (p. 2)

This statement affirms that analysis, as a skill, is problematic across many academic disciplines. In relation to this study, the data demonstrated that teaching staff had high expectations for preservice teacher learning and these high standards were associated with the demonstration of ‘deep’ learning through praxis inquiry. It can be surmised that ‘deep’ learning was associated with analysis; it is described by Lizzio, Wilson and Simons (2002) as the capacity to apply and compare ideas, whereas in ‘surface’ learning there is no attempt to integrate learning. These authors argue that there is a close relationship between learning approaches and the specified outcomes. In this case, the data suggest there are implications for pedagogy and the use of assessment rubrics more clearly aligned with developmental factors in cognitive constructivism. As such, it may be that a process model, such as that advocated by Graves (1980), could be the answer. As far as answering the question related to teacher educator assumptions regarding preservice teachers’ academic writing skills, it would be reasonable to conclude that there were misconceptions on the part of each cohort. These misconceptions arose as a result of preservice teachers’ inability to fully understand the independent nature of constructivist learning in praxis inquiry, and teacher educators’ difficulties in trying to assist them to become independent when they were novice learners in all aspects of this type of learning in their first year of university.

4.6.4.4 Assessment feedback and the enhancement of academic writing

Participant responses demonstrated that feedback from tutors was important to enable preservice teachers to improve their writing skills. Preservice teacher data demonstrated positive relationships with tutors were important as this gave them the confidence to ask for help, highlighting the importance of relational pedagogy. The nature of the feedback was also crucial to the effectiveness and improvement to writing.

Evidence of formative assessment was found in the developmental nature of assessment tasks, which required learning to occur over the duration of the semester. There was evidence of scaffolding assignment

tasks, which also demonstrated attempts at a formative approach to assessment, particularly the different components of the major research project in Unit 2 (Appendix I). The capacity of teaching staff to provide feedback on a drafting process of written work, while desirable, was limited to learning support staff. Where this support was enlisted to provide individual assistance to preservice teachers on their writing skills, it led to successful outcomes. This information suggests that success in academic writing is achievable where a facilitator/mentor is made available to provide individual scaffolding. The provision of timely feedback through a drafting process, individual questioning and discussion was found to support preservice teacher development of analytical writing skills.

These data findings suggest that feedback is crucial for the enhancement of academic writing. As a result, it can be surmised that pedagogy that supports academic writing as a process—which requires time and multiple drafting opportunities with the use of constructive feedback—has the potential to generate higher standards of writing.

The value of formative feedback is described by Sadler (1998):

By quality of feedback, we now realise we have to understand not just the technical structure of the feedback (such as its accuracy, comprehensiveness and appropriateness) but also its accessibility to the learner (as a communication), its catalytic and coaching value, and its ability to inspire confidence and hope. (p. 5)

Nicol and Macfarlane-Dick (2006) contribute further to the benefits of formative assessment as a means of using feedback to empower students in their own learning. We see this when they write, ‘A central argument is that, in higher education, formative assessment and feedback should be used to empower students as self-regulated learners’ (p. 199). This notion of empowerment fits with the underlying learning theories of praxis inquiry. There is merit in giving agency to the learners to have a greater role in self-assessment of their work, which connects strongly to metacognition. Learner agency is essential for improvement in academic writing skills. It can, therefore, be argued that greater participation in self-assessment by preservice teachers would naturally lead to greater self-regulation of learning, which is connected to metacognition. The underlying learning theory underpinning praxis inquiry was fundamentally linked to the notion of independent construction of knowledge. This, in turn, is inextricably linked to self-regulated learning.

Self-regulation of learning has been identified by a range of authors as a student’s ability to regulate aspects of thinking, motivation and behaviour during learning. This type of learning emphasises the agentic role of the learner (Boekaerts 1996, 1999; Boekaerts & Corno 2005; Pintrich 2000; Winne 2004; Zimmerman 1989, 2008, cited in Schunk 2008, p. 464).

Schunk (2008) states that ‘theorists all agree that Self-Regulated Learning is a broader process that refers to the monitoring and control of behaviour, cognition, motivation, and the environment. Metacognition,

which by definition also involves monitoring and control functions (Flavell 1979), is mainly limited to the monitoring and control of cognition (Dinsmore, Alexander & Loughlin, 2008)' (Schunk 2008, p. 464).

It appears that a body of literature supports the notion of metacognition as a mechanism intrinsically tied to the concept of self-regulated learning, but also to the monitoring and control of cognition. It can, therefore, be postulated that there is an important role for assessment in the relationship between self-regulated learning and written communication. A self-regulated approach to assessment, with increased opportunities for preservice teachers to participate in monitoring and regulating academic writing skills through a process of drafting and feedback, could potentially enhance the development of high standards of academic writing.

The data demonstrated a need for clear and explicit rubrics to avoid ambiguities. Data suggest there needs to be a common understanding among preservice teachers and teacher educators of the standards required in assessment rubrics. Opportunities for preservice teachers to design assessment rubrics in collaboration with teaching staff could provide greater clarity for feedback purposes against standards outlined in the rubrics.

4.6.5 Conclusion

This sub-chapter aimed to identify specific issues in the assessment process that might contribute to increased understanding of the relationship between assessment and the quality of academic writing. It also aimed to identify assessment strategies in which metacognition might contribute to the potential improvement of academic writing. In addition, it aimed to identify how the assessment tasks contribute to metacognitive thinking and the impact on academic writing. The purpose of this was to help answer the sub-question, 'How do we assess metacognitive thinking in academic writing?'

The data findings identified that the learning approaches were closely linked to the intended outcomes but were not overtly specified in the assessment rubrics. This suggests a need to create a clearer alignment between the learning objectives valued within praxis inquiry and how these are defined for assessment purposes. The rubrics were found to play an important role in the provision of feedback, considered a vital element in the development of high standards of writing. However, ambiguities found in the rubrics made them difficult to interpret, particularly by the preservice teacher cohort.

The aims of the assessment tasks were to develop writing skills that communicated the depth of thought associated with theorising and transformative learning. This was difficult to communicate and assess in the rubrics. Assessing cognition and higher-level thinking skills, such as analysis, was problematic in this praxis inquiry framework. Data responses led to conclusions that assessment based on inquiry and research principles in formative assessment tasks did try to capture depth of learning through cognitive and social constructivist forms of learning.

Despite the difficulties identified in the responses from teaching staff and preservice teachers, the data indicated analytical skills were considered an inherent part of metacognition. This insight suggests there needs to be a greater focus on analysis and metacognition as overt learning objectives for assessment purposes and that rubrics require redevelopment to take this into consideration. If we accept Flavell's (1976) definition, and the notion that individual knowledge of analysis is required for the ability to regulate this knowledge, it can be anticipated that metacognition has the potential to enhance academic writing. However further studies would be required to substantiate this claim.

Assessment criteria in these two units centred on two major factors: the process of reflection and analysis of theory and practice, and the technical aspects of academic writing, such as researching, referencing and clarity of expression. It can be argued that both areas require metacognitive knowledge for enhancement of writing: first, the disciplinary knowledge (theory and practice) to equip preservice teachers to reflect and regulate this knowledge and, second, metacognitive knowledge of the various academic writing genres to regulate written communication in the standards required. It would be reasonable to conclude that the knowledge factor is important to the capacity to regulate knowledge in metacognition.

The nature of the assessment tasks for both units was driven by the guiding principles of a philosophy of education and tools to support preservice teacher learning. Kearney (2011) argues that the research on assessment in higher education has advocated the development of professional skills such as 'problem solving, critical thinking, creativity, autonomy in learning, and authenticity in learning through innovative forms of assessment (Dochy, Segers & Sluijsmans 1999); these are the skills that will be necessary for our students to thrive in the 21st century' (p. 3). It would be reasonable to conclude that assessment tasks in these two units were conducive to developing these skills and that a conscious focus on metacognition could potentially enhance such skills.

In relation to the sub-question, 'How do we assess metacognitive thinking in academic writing?', the findings suggest the answer lies in the important association between analysis within metacognition and the development of high standards of writing. These high standards are associated with the theorising genre of writing in this praxis inquiry writing environment. However, to assess metacognitive thinking there needs to be a clear definition of the attributes being assessed. These would need to be clearly outlined in assessment rubrics.

Furthermore, the data also suggests the need for staff professional development in this area. It would be reasonable to conclude that a unified approach to understanding pedagogical principles in the development of analytical skills, metacognition, teaching approaches and assessment would have the potential to impact on preservice teachers' metacognitive skills for the enhancement of writing skills. One hopes the introduction of literacy testing in teacher education does not impact on the curriculum in ways that revert back to a system that views assessment as measurement, rather than learning appropriate to the education of 'digital natives' (Prensky 2001).

We now move on to investigate the role of information communication technologies (ICT) in the development of preservice teachers' academic writing skills and the role metacognition might play in this process.

4.7 The role of ICT and metacognition in academic writing

This section outlines the findings from interviews with the lecturer/tutor participants and preservice teachers about the use of ICT as a pedagogical tool in teaching and in preservice teacher learning. The purpose is to identify how ICT might contribute to the enhancement of thinking skills that will enhance academic writing skills. This section helps to answer the sub-question, 'What is the role of information communication technologies in thinking and writing?'

The need for further research in this field arises because of the changing nature of the students' lives and the world of school. The challenge for teacher education is to cater to a population of preservice teachers who represent what has been termed 'digital natives' (Prensky 2001; Prensky & Berry 2001). These are the people who have grown up with a wide range of information communication technologies in their lives and will in turn be educating students who have not known anything but living with technology. This is described by McLoughlin & Lee (2010):

A further driver of change are the students themselves: their preferences, needs, social habits and technology choices. Along with the uptake of mobile devices and the rise of social media, tertiary student profiles indicate that a large proportion of students now juggle work and study, expect constant internet connectivity and web-based services, and view social networking tools as being central to their lives. (p. 31)

Harnessing technological tools that can optimise literacy and learning as part of preservice teacher education is critical at a time that is being referred to by Prensky (2001, part 2) as 'the great technological revolution of the late 20th century and beyond' (p. 3). Investigating which tools, and what contribution they can make to the development of high standards of literacy (both written and digital), can now be considered essential for preservice teacher education courses in the preparation of future educators for 21st century learners.

This investigation of ICT aims to identify how metacognition can contribute to preservice teacher learning and academic writing. Both cohorts of participants, preservice teachers and lecturer/tutors, were questioned regarding their use of ICT in these two units of study. This was to identify what ICT was used, how it was used and any contribution this made to enhancing academic writing and metacognitive thinking.

The use of ICT was threaded within the learning goals of the units, which aimed to enhance preservice teachers' reflective thinking on learning and teaching and have been discussed as part of other sections of this thesis. A more focused analysis of the role of ICT in preservice teacher learning and writing

demonstrated two themes. First, computer programs contributed to enhancing the mechanics and structure of academic writing through editing functions. These programs supported grammatical fluency, spelling, punctuation and paragraphing functions of writing. Microsoft Word software, and internet sites such as the university's WebCT, were cited as the main programs used. Computer programs such as PowerPoint, the Victoria University library website, multimedia, and social media, also contributed to the development of thinking and research skills.

Data findings from these interviews are summarised under headings based on these two themes

- ICT pedagogy as a tool for the improvement of the structural features of writing composition, and
- ICT pedagogy as a tool for the development of thinking skills.

4.7.1 ICT pedagogy as a tool for the improvement of the structural features of writing

4.7.1.1 Preservice Teacher data

Preservice teacher data responses in relation to how ICT contributed to their academic writing identified a range of benefits for academic writing. These benefits included developing the structural aspects of written work, grammar, spelling, and composition of writing, and the use of technological tools to refine writing through the editing functions of the software.

Preservice teachers noted benefits in the use of word-processing software, such as Microsoft Word, and internet sources such as the library website and WebCT for the composition of their writing and during the research and editing phase. The capacity to edit and polish written work while writing indicated preservice teachers were being metacognitive and used the online tools available to them to refine their writing. Data responses indicated this ability to use ICT tools throughout the writing process contributed to the development of confidence in academic writing tasks. There was also a recognition that ICT skills were fundamental to 21st century learning. We see this in examples such as Pauline's response, when she says, 'So, I wasn't very big on computer technology. And now I think now that I'm learning to understand it, it's changed the way I view it and how important it can be in, you know, getting things done quicker. It's definitely made a huge difference'. This example is indicative of the importance of affective dimensions of metacognition, which impact on writer confidence and learning (Efklides 2006; 2011; Hammann 2005).

Editing skills were also connected to metacognition, as preservice teachers regulated their knowledge about writing composition to organise ideas into paragraphs and used spellcheck and grammar checks for the distinct goal of improving writing. Kaitlyn describes the benefit of using word-processing functions to improve the quality of her writing: 'it is the neatest writing tool because it's got spellcheck, but I also use—on the computer, I use a lot of online thesauruses as well because sometimes I look at a paragraph

and I've got the same word five times and it's a little bit too repetitive'. Kaitlyn demonstrates being metacognitive about her writing and is using the available ICT tools to improve this. She has analysed her knowledge about writing, determined it requires improvement and is therefore taking regulatory action to make improvements.

In addition to word-processing functions for the improvement of academic written assessment tasks, Judy described PowerPoint as a valuable tool that enabled her to summarise her learning of key concepts for her digital portfolio assignment.

For academic writing its usually just Word stuff and PowerPoints because sometimes we have academic, like in this subject, at the end we've got to do a presentation and it's a summary of the whole report that we've done, so I do use PowerPoint a lot too but basically just that.

The summary task that Judy refers to in this example required she provide an analysis of the research process and results of an assignment (see Appendix I). This example illustrates the use of the software for presentation skills facilitated analytical skills.

Alternatively, Julian indicates in the excerpt below that he prefers to begin composing assignments using hand-writing and then uses word-processing software to finalise drafts. He attributes his preference for hand-writing to the freedom it gives him to 'cross out' and 'revise' during the planning stage of writing. He specifies the advantages of using word-processing is its capacity to refine his writing. These sentiments are echoed in the excerpt below.

I mainly just use a laptop. I am a firm believer in writing on paper before I type things up because at least if you're writing on paper it's easy to cross things out and revise everything but I think ICT, mainly refining what I've done can be used to good effect and spellcheck and things like that are important as well.

When questioned whether hand-writing facilitated thinking processes, Julian responded he thought this did contribute to his ability to 'collect thoughts better'. This suggested that hand-writing gave him greater time to think about writing content and the development of ideas. He nevertheless acknowledged the use of a computer was beneficial to the production of a final draft of writing.

Yeah. I do find it easy to collect my thoughts if I'm hand-writing. Typing a draft on a computer just feels like an automatic process, hand on the keys and just doing that but I think hand-writing does help collect thoughts better and it helps you think about what you're writing a bit more... it is a lot easier with a computer. It's also good to have a word count and things like that, very easy to make a typing, a final copy on a computer, easy.

The data examples above described how preservice teacher participants used software such as word-processing and PowerPoint as tools for the composition of academic written work and refining writing for

final presentation. The issue of whether writing by hand affords more time for thinking is dependent on individual preference. Participants such as Pauline found word-processing conducive to thinking about the relevance of information and structure of writing while researching.

The following section outlines data examples from the lecturer/tutor participants which demonstrate the role of ICT tools that contributed to academic writing and metacognitive skills.

4.7.1.2 Lecturer/tutor data

Lecturer/tutor participant responses confirmed that preservice teachers' use of word-processing made significant improvements to their academic writing. It was noted improvements had occurred with the introduction of the ability to upload assessment tasks through Turnitin, a software program within the university's WebCT system. We see this when Rod indicates in the excerpt below that the digital submission of assessment tasks contributed to a greater consciousness on the part of preservice teachers, to ensure the full capabilities of word-processing were used to edit work before submission.

The assessment is always the main thing on their mind and to Turnitin... this year they've done it digital and I think I've seen the benefits of that and they have too I'm sure...It's definitely improved it I think. I know they should be using spellchecks and things like that and I'm sure that's an easier way of correcting because some of them in the past... there'd be mistakes through it.

In the example below, Paul highlights the benefits of word-processing for the development of writing as being that writing is not always a linear process. In his view, the introduction of word-processors has had a liberating effect on writers, in that it enables a drafting process that allows thinking, composition of ideas and logical sequencing as required. He asserts that ICT caters to the diversity of learners and thinking styles in a digital age, which enables writers to develop their thinking during the drafting phase of writing. It would therefore be reasonable to conclude ICT is conducive to the enhancement of writing skills. Drafting requires consciously thinking about content relevance and fluency in composition, which is using metacognitive skill. However, thinking about writing content can be a complex task. We see this when Paul says,

So, that whole hand-written, heavy longhand tradition is how I learnt to write, so you tended to do your draft where you had to focus your thoughts and then you did it. But, unfortunately, I don't think that I am a logical mind person. I think I've always been a multi-hyperlinked thinker... they're like a map, they're more than a set piece, so there's always a couple of drafts that hold paragraphs that are lifted and put somewhere else and put somewhere else. And, then when I discovered the word-processor I found it a most liberating experience.

The benefits Paul and other participant examples describe above demonstrate that ICT can be 'liberating' in the writing process. The benefits relate to facilitating access to research and editing functions, and

catering to diverse thinking styles. It can be argued these facets impact on writer confidence. Some interesting questions emerged from these examples such as, ‘Is there any difference in thought processes associated with the use of hand-writing compared with word-processing, or are they both just tools with the same end- result?’ ‘How has ICT contributed to the thinking styles of digital natives?’ And, ‘How can teaching staff tap into the available tools to meet the individual learning needs of their students?’ Some of these questions are the subject of brain research and are generally beyond the scope of this thesis, but they do present opportunities for further study. However, this study did identify some ICT tools that were considered by participants to facilitate thinking skills in academic learning in these two units.

4.7.2 The use of ICT in the development of thinking skills

Participant responses identified a range of ICT tools that contributed to their teaching and preservice teacher development of thinking skills. ICT was embedded within these units both as teaching and learning tools and as major assessment tasks. These had a focus on reflective thinking, the research process and communication more generally using internet and social media. Data findings identified ICT tools conducive to the development of thinking skills included digital presentations in assessment tasks, the university-networked library, WebCT, PowerPoint, multimedia and VoiceThread.

ICT was predominantly used as a teaching tool by staff to scaffold preservice teachers’ thinking skills in praxis inquiry learning, particularly for the preparation of assessment tasks. Teacher educator skill was also cited as important for modelling and demonstration of assessment tasks, indicating a need for teacher educator professional development.

4.7.2.1 ICT and assessment tasks

The major assessment tasks in these units were the digital portfolio and research report discussed in the previous sub-chapter. These tasks required preservice teachers draw on cognitive thinking skills through reflection and analysis of theory with practice, in praxis inquiry learning. Both the research report and the digital portfolio required the use of ICT as thinking and research tools for academic reading, referencing and analytical purposes.

4.7.2.2 Digital portfolios

Digital portfolios were used as both learning and assessment instruments. This placed the preservice teacher at the centre of the learning experience. Assessment criteria for the digital portfolio (see Appendix H) demonstrate that higher grades were associated with thinking skills such as ‘an ability to conceptualise and to link the theoretical concepts addressed with the topic area, an original analysis of the topic and related material’ (Assessment Criteria Unit 1, Appendix H). These skills were associated with preservice teachers’ capacity to analyse their experiences and not just describe these as events.

Using digital portfolios in these preservice teacher education units represented epistemological views that learners shape the learning process through inquiry. The use of these portfolios as part of assessment in praxis inquiry learning reflected cognitive and socio-constructivist methods embedded in these units. The use of ICT tools acted to support praxis inquiry learning in the cognitive and social dimensions. These constructivist methods were based on inquiry, problem-solving and collaborative learning, which required the development of new skills, knowledge and assessment of deeper cognitive processes. (Abrami et al. 2005). Participant data from both cohorts revealed the assessment tasks were conducive to developing metacognitive skills and that the use of ICT contributed towards this.

The digital portfolio enabled preservice teachers to demonstrate their knowledge construction through multiple digital media, including text, audio, and Movie-Maker programs to mention some. However, the major purpose of the digital portfolio was to enable preservice teachers to take responsibility for their learning, conduct self-analysis of learning throughout the semester, and make evaluative judgements to synthesise this learning and present it in creative formats. The selection of content to represent the most significant learning experienced during the semester required evaluative judgements be made. This reflected preservice teachers' personal cognitive engagement and experiential learning.

The opportunity to embrace the available ICT technologies supported preservice teachers' creative thinking skills while developing their digital portfolios through a variety of media. PowerPoint, Movie-Maker, music and VoiceThread were such examples.

The digital portfolio task was conducive to metacognitive thinking because it required preservice teachers to think deeply about their learning and be selective about the content. This required analysis of learning and decisions about what to include and what to leave out. This is related to 'evaluative pedagogy' (Khun & Dean 2004). There was evidence of autonomy of learning, authenticity and creativity. In the process of developing a presentation, there was a requirement to think carefully about the selection of information, relevance and depth of learning. It would be reasonable to conclude that these skills required metacognitive thinking. The view was that digital portfolios demonstrated cognitive understandings of theoretical abstract concepts and the ability to interpret what this meant for classroom practice. Cognitive analysis was required, as was the capacity to regulate this understanding into a format that reflected transformations in learning for future practice. While PowerPoint was the main software program used for developing portfolios, other multimedia software use was encouraged. Metacognitive skills acted as a filtering function to analyse and synthesise preservice teachers' most significant learning experiences.

As assessment instruments, digital portfolios increase active involvement and, therefore, construction of knowledge through evaluative processes on learning (Rickards et al. 2008). It can be argued that metacognitive awareness is embedded into this process of assessing and discriminating self-learning through reflective skills.

The focus of ICT tools used in these units was on the goal of facilitating a constructivist approach to preservice teacher learning through praxis inquiry. However, there was also evidence of a cohesive collaborative effort on the part of teaching staff to use ICT as instructional tools to support preservice teacher learning.

4.7.2.3 ICT, metacognition and writing. ICT curriculum tools

It is generally accepted that a major facet of academic writing in university learning is the capacity to research the ideas of others. This requires the capability to cognitively analyse what is being read, the ability to determine the relevance of information and the skill of referencing. ICT contributes to this process by facilitating access to information through research. However, the individual requires analytical skills to enable effective discriminative choices in the research process for writing composition. In this sense, the technology can act a tool for information gathering to support the development of knowledge but requires the learner to have a conscious knowledge of how these tools can function for this purpose. The regulatory function of cognitive analysis requires the ability to discriminate and regulate the knowledge. This belongs with the individual. Data findings indicate that different ICT tools functioned to support academic writing at various phases of the writing process.

4.7.2.4 ICT as a tool for research

Preservice teacher data findings demonstrated that the benefits of using ICT included the capacity to facilitate research. In the examples below, Pauline, Kaitlyn, Judy and Julian discuss the virtues of using ICT to develop academic learning.

Pauline argues that the ability to research ‘through eBooks and things like that makes a huge difference’. Kaitlyn echoes Pauline’s views when she conveys the contribution that technology, particularly the internet, has made to her ability to research multiple resources for assignments. She describes the benefits of the university’s library website as a research tool that has contributed to her ability to expand her learning through access to resources for assignment work. ‘Originally, I just used Google Scholar. But now I’ve got the hang of the library thing, it’s actually amazing. Because you can narrow it down because often you have to have multiple different sources, in books and general articles.’

Judy adds that the library guides within WebCT were beneficial in helping her to develop referencing skills.

The ‘Lib. Guides’ are pretty good too. I like the referencing one. I’m on that a lot. I’ve actually uploaded it to my computer too. I look at the references, how to do it and all the examples and that’s pretty good.

The data findings above demonstrate that the use of ICT was beneficial for the development of research skills, which are fundamental to academic writing. The library website was particularly valued because it facilitated access to a wide range of resource material.

4.7.2.5 ICT, metacognition and writing

The primary use of ICT was as tools for teaching and learning. The success and contribution these tools made to academic writing was dependent upon the purpose of the task. Any success was attributable to the underlying theories of learning and teaching being used. This was related to how teaching staff or preservice teachers used the tools, rather than the tools themselves. This, in turn, was dependent on the lecturer/ tutors' capacity to plan and integrate sound learning and teaching principles using ICT tools, and, how well these tools facilitated the intended learning goals of the course.

In the example below, Gaye states that she uses WebCT as a teaching tool for the purpose of allowing preservice teachers to conduct self-assessment to improve their writing. The 'Turnitin' program is used to assess written expression and originality to complement other activities.

Well in a way we use the WebCT as a tool to get the students to reflect on what they've written. In fact, I've got an example of a student who I managed to get to lead—not just one... I think a number of them did use the tool then because I talked about how you use that to look at new originality and that sort of stuff. So that to me is potentially an underused tool for getting students to look at their writing because sometimes a bit of distance helps your writing... We used dialogues this semester and journals and that was okay.

Gaye's statement highlights the importance of students being active participants in the self-improvement of written expression and how the use of digital formats empowers them to do this. The underpinning learning theory behind Gaye's use of self-assessment is that learners need to be empowered to take control of their own learning. This reflects a philosophy of teaching and learning in which technology is a tool embraced by the teacher as a mechanism to grow the learner. This theory of learning connects metacognition with self-regulation.

Preservice teacher data demonstrated that a range of ICT resources were used to facilitate communication. In addition to the library website discussed above, WebCT—an online learning tool endorsed by the university at the time of this study—was the major communication program for preservice teachers and teaching staff. Participants also identified social media, such as Facebook, as contributing to learning during assignment tasks.

4.7.2.6 WebCT

Preservice teachers and lecturer/tutors were required to use WebCT as the principal form of communication for course content and delivery in the two units of study. Assessment work was uploaded onto the program, called 'Turnitin'. Teaching staff marked and graded these assessments online and preservice teachers were able to monitor their writing progress online. Weekly information bulletins about course requirements were uploaded by unit coordinators, to communicate with preservice teachers; and

Learning and Teaching Support staff developed online materials to assist preservice teachers in developing their academic writing skills.

The relevance of WebCT to metacognition and the enhancement of academic writing relates to the online writing support material provided through the library guides. These guides were designed to support preservice teachers' writing skills in academic genres associated with assessments.

In the following examples, David and Judy describe these online support materials as helpful to the development of their confidence in academic writing skills. David is conscious that he needs help and can activate or regulate his learning needs. Access to examples and models of writing formats in the genres of writing required for assessment proved useful.

I use the lib guides, they've been really helpful with writing just because they have that example... because there have been a couple of times where I have been stuck thinking, 'What do I do, what do I do?', and I've gone and looked at that and it's helped me move onto the next stage.

Judy attributes similar benefits to these online support materials, stating they supported her writing development by providing models of the research writing genre through a 'step-by-step' approach. In doing so, Judy raises the importance of explicit teaching for first-year university students.

Going back to the ICT, this subject is the only subject, where we've been taken through step by step how to do the academic writing assignment and I think that's fantastic. I think that needs to be done in more subjects... Her [the teaching staff member] PowerPoints are so fantastic and that's what I use. That's one of the other strategies I use to plan. I save the PowerPoint and I put it up at the bottom and I keep flashing back onto it to see if I'm doing the right thing.

These preservice teachers were keen to improve and develop their writing skills. This required that they have the knowledge and the skill to do so. Their actions to improve their writing ability were metacognitive, according to Flavell's definition, and the online writing materials supported their ability to regulate this knowledge towards the goal of improvement.

4.7.2.7 Summary

The majority of teaching staff stated the use of WebCT and, in particular, the library guides had a positive effect on preservice teacher writing. Benefits were described as the accessibility of these resources and the explanatory aspect of academic assessment tasks. The models of written assessment tasks were considered particularly valuable. Most importantly, how these ICT tools were used determined the capacity to improve writing and thinking skills. Teacher educators recognised the value of scaffolding preservice teachers' learning to write in these academic genres by providing 'step-by-step' guidance.

Ann's comments below highlight some important issues about the use of ICT in the development of preservice teacher writing and its capacity to enhance thinking skills. The technology itself can be successful if it can be integrated into the context of learning. Ann states that the success of the library guides was that the content was relevant to enhancing preservice teacher writing. The library guides were developed using the course content and assignment work associated with these two units of study.

Further, Ann attributes the success of the library guides as being a connection between the learning material and the language of subject matter. The disciplinary discourse within the context of learning is highlighted here as significant to creating the foundations of meaning. Ann asserts that the success of WebCT was that it tapped into the language within the context of preservice teachers' learning. In her view, commercially developed material was limited in this respect.

Well the lib guide as you know was very successful. Part of it was, I think some of the pre-made commercial software stuff is, it looks great. It's like a lot of things but it's context. You have to have context. It's got to be immediately related. Students learn academic writing through the subject language of their discipline.

In addition, both Ann and Shane attest to the library guides making a significant contribution to the development of preservice teachers' writing because they met a need for support material. There was quantifiable evidence when Ann describes this as, 'We could tell they weren't just going in they were going in again and again and again. We had 8000 hits the first time, 13,000 for that last assignment... Well, you could see it peaked and came down again, so again, I think it's important.'

Similarly, Shane attributes the success of the library guides to the capacity to provide preservice teachers the opportunity to revise information and use this in a self-paced manner to meet their individual learning needs. This information connects the use of ICT tools to self-regulation aspects of metacognition. The importance of revision and provision of a variety of learning modes (written and spoken) were contributing factors that enabled preservice teachers to identify learning needs and take regulatory action.

That's right! And, a lot of that's fairly static information which could go on any site, but I think what those things do is allows students to go back and back, to go and look at it again and again and the hits on it were enormous. There were thousands of students looking at it. Obviously because it was focused on the assessment task but I think trying to unpack things for students and provide it in different ways, so in the lecture, in the lib guide where they can read about it, and that's why we were keen to get that VoiceThread going because it's another mode. It's the spoken mode...

Rod describes the benefits of the library guides to his teaching as providing a multi-modal resource that complemented his repertoire of teaching strategies.

[J]ust to be able to show them things digitally and show it on the interactive white board and then they can go through things and it's much easier to show it like that than just talk about it from a piece of paper so that's been really helpful.

The participant data above illustrates the major benefit of the library guides was they performed the function of instructional teaching tools to scaffold preservice teacher writing skills. There was a consciousness on the part of teaching staff that support in this area was required and the library guides contributed to this. These examples suggest that pedagogy such as modelling and demonstration in electronic format can be effectively used to complement constructivist methods of learning.

4.7.3 Social media and email

The data indicated social media and email contributed to preservice teachers' academic writing skills. The major benefits of these ICT tools were that they expanded the learning parameters of individual cognitive learning through the realm of online social learning. Evidence was found that these tools facilitated collaborative learning through communities of practice that served to build the disciplinary discourse knowledge required in these units. This is evident when Kaitlyn refers to the benefits of social media, such as a Facebook group with tutorial colleagues, when writing.

And the other thing that I have open all the time when I'm writing is Facebook because we have a Facebook group. The university Facebook group for our class and our friends. And so if we have issues, we put a post up and someone will reply and go, 'Hey look, you don't know what a table of contents is? I'll send you mine so you can have a look'... Yeah, it's really good because everyone's doing the same kind of thing and everyone's having the same issues... So, that's been really helpful and has been a really big support part.

Marco also highlights the benefits of learning collaboratively through ICT, stating, 'Well, the internet is very helpful. I find using a lot of technology helps me a lot.'

Alternatively, while David finds Facebook helpful at times, he also notes it can cause him uncertainty and confusion.

Yeah, we use Facebook. A group of us set up an eLearning Facebook sort of thing and discuss sometimes back and forth which can be helpful. Myself and one of the other students find it more confusing sometimes because they'll start saying I did it this way and I did it this way and I think well I didn't do it that way at all and I don't want to go off their lead in case it's wrong but it can be helpful for other people just for a simple question.

This example provides an important insight into the role and relevance of the teacher educator and their expertise. While Facebook can provide a supportive learning network, it can also lead to confusion. This

highlights that ICT cannot always stand alone as a pedagogical tool in tertiary study but may require the facilitation of teachers with expertise in their disciplinary field to guide the learner.

Overall, the examples above indicate the use of ICT was valuable in assisting preservice teachers develop academic writing skills. This included the technical sphere of writing through the use of word-processing software, library resources, WebCT and social media. Communication through ICT was also significant. The significance of ICT in the development of thinking skills is related to the research component of academic writing and as a communication tool.

4.7.3.1 Social media: Lecturer/tutor perspective

Teacher educators confirmed that the use of social media contributed to aspects of preservice teacher learning and was used as a teaching tool. In the excerpt below, Emilia states that her students use Facebook to discuss assessment tasks and that she uses the program 'Edmondo' in classes. This is a software program used as an online networking application for teachers and students. The benefit of using Edmondo is that it enables a more controlled environment for teaching and learning than Facebook. The content and use is developed by the teacher and used primarily as a tool for within-class communication. Emilia describes the benefit of Edmondo as a teaching tool that provides a forum for class discussion about reading materials and assessment tasks. She highlights the importance of developing thinking about ideas for writing composition through discussion prior to writing when she says, 'it allows us to really tease it out before they put their thoughts on paper'. Emilia's use of the phrase 'really tease it out' denotes the importance of discussion as a mechanism to develop depth in learning. This suggests the need for targeted facilitation in the use of social media towards the goal of enhancing thinking skills for writing tasks by the teacher.

I know that a lot of my students have started using Facebook or some sort of blogging science where they communicate with each other about assessment tasks and I find that that can be really powerful. With two of my groups I've used a canvas called Edmodo, which is similar to a Facebook. It's more of a social media sort of platform but it allows us to just communicate with each other and share thoughts and ideas about assessment tasks and readings and so on. So I think it gets them to really tease it out before they start to put their thoughts on paper.

An important insight into the use of social media for targeted enhancement of academic writing skills lies in the capacity to develop the discourse of disciplinary units through discussion. The data suggests a major benefit of the use of social media tools is communication about coursework through collaborative learning. This is demonstrated when Emilia says, 'But I think that when it comes to using these types of tools it's really about the collaboration and if there is the platform, if you like, to be able to collaborate and articulate and share ideas and thoughts and get support from their peers I think that can be really powerful'. Such collaborative pedagogy relates to the social learning theories of Bruner (2004) and Vygotsky (1978).

Studies by Winters et al. (2008), Anderson (2008), and MacGregor and Lou (2004) illustrate benefits of the use of ICT as tools to support learning.

4.7.4 ICT curriculum tools and metacognition

Participants were questioned to determine whether they were aware of, or used, any specific software to enhance thinking skills in the development of preservice teacher writing. Gaye, Jane, and Rod responded they were not aware of any such software but acknowledged that it was probably available.

Paul, Ann, Shane and Emilia indicated that they were aware of the availability of some ICT, such as VoiceThread, Edmondo, Story Board, Pebble Pad and mind mapping programs, that facilitated thinking skills. In the statement below, Jane indicates she felt the need to make greater use of technology but acknowledges her students use a wide range of ICT tools to develop thoughts and opinions about their learning. This information is significant in that it reflects the nature of 21st century learners—the ‘digital natives’—in taking control of their own learning and tapping into tools their teachers are yet to master. In this sense, the use of ICT is testament to constructivist learning principles, as preservice teachers take charge of constructing their own knowledge and the learning process. They are utilising the tools available to them outside the university environment to enhance their learning. This information provides insights that suggest learners have metacognitive knowledge about their skills and understand that ICT tools are available for regulating their knowledge and skill development towards the goal of improving learning. What this example also raises is a need for teacher educator professional development in the field of ICT, in the development of (a) the knowledge factor (what ICT is available that can contribute towards enhancing metacognition for the improvement of writing skill), and (b) how to use the ICT (skill development) for regulation of knowledge. These issues are highlighted when Jane says of her level of ICT knowledge,

Probably not as much as I should. There are a number of sources that students obviously seek out information from and they may be online articles, they might be clips, there are a variety of things that they might reflect on. It might be a taped conversation, it might be something on YouTube that they can actually reflect on and use to think about, consider when they are developing their best stand point or their thoughts about it.

This example highlights a somewhat paradoxical situation, in that students are leading the way in the use of multiple ICT tools, but the teacher’s role in guiding the learning is essential. There needs to be an epistemological understanding of the purpose of the tools for effective application. In Flavell’s terms, cognitive knowledge needs to be present for the regulation of this knowledge. This knowledge relates not just to the ICT tools but to the disciplinary knowledge base, which is essential to the development of discerning future educators.

Jane also suggests a multifaceted approach is required to develop thinking skills. She highlights the importance of prewriting tasks, such as the use of discussion and talking about subject matter. This is evident when she says, 'it's talking about their thinking and enhancing what they're thinking and perhaps thinking about readings that are relevant on the topic then I certainly am, but if we're talking about enhancing the structure of their academic writing I'm not sure'. This suggests that the use of ICT does not in itself contribute to thinking skills; this requires teacher facilitation and guidance using a multifaceted approach whereby talking, reading and thinking leads to what is then expressed using some form of ICT.

Paul's comments demonstrate how these online materials for student reference played a significant role as instructional teaching tools. The ability to be metacognitive about learning requires a knowledge of academic writing standards for the capacity to regulate learning. Paul's comments draw attention to the benefits of the online materials in providing the knowledge required for particular writing models, correct genre formats and referencing systems, as well as for demonstrating depth of learning.

We have done a mediation, we've gathered together material for you to use and the guarantee for them is that by using this material is that they're on the right track... material is, what we expect and it's current and it's what we're looking at... if we tell them we want them to use a certain referencing system, we'd better make sure every reference we put in there is in the same format... But, not only the surface of it but the depth of it as well.

This example emphasises the need for writing models to demonstrate the correct writing conventions as well as 'depth', not just 'surface' content. This information is relevant to the discussion of metacognition and ICT because building capacity to demonstrate depth of learning in writing requires preservice teachers to have a knowledge of what this looks like. The online materials provide writing exemplars that performed this function. This contributed to developing a knowledge of writing genre and the capacity to self-regulate this knowledge.

The majority of teaching staff indicated they were not aware of any commercially developed software that supported academic writing skills. However, Paul made note of some software that was available to enhance thinking skills. He noted use of a program called 'Inspiration' which was mind mapping and concept mapping software for the development of academic papers and presentations. Paul describes his use of this program.

I was thinking that some of the concept map software can be quite useful. I use Inspiration which is a reasonably high-end mind mapping or concept mapping program and it actually makes the differentiation between mind maps and concept maps, and I have planned out papers and presentations myself using it, so I find it quite a useful device. And, I'm also aware that some people don't think like that. They think in terms of lists and devices and other things, but I do, so Inspiration and a couple of other mind map software.

When questioned whether preservice teachers used mind mapping software, Paul indicated that staff have not introduced this (Inspiration). He expressed certain regret about this when he says, ‘They don’t actually use the software, and we don’t introduce it. I feel this is in some ways a burden.’ This comment suggests there is software available that could be utilised to support thinking skills, but it is not used. PowerPoint was described as the predominant tool used by preservice teachers in the development of digital portfolio presentations; however, Paul expressed reservations regarding Power Point’s utility as a thinking tool. He describes the limitations of PowerPoint for the expression of thinking processes.

[T]hey often use the software, like PowerPoint as an outlining feature so you draw up your ideas in the outlining feature, and they sometimes put together their thoughts in PowerPoint, so they would come up and do each slide as it comes then have a dot point and each dot point is a slide, which is not always the best thought processes.

The significance of this comment is Paul’s view that PowerPoint can influence thinking skills, resulting in a linear ‘dot point’ approach, which he believes is not conducive to the ‘best thought process’. This example reinforces the importance of pedagogy and how the software is used to support metacognitive thinking skills. Paul refers to the use of metaphors about teaching and learning in the formation of digital portfolios, which he believes can promote metacognition. He described the use of such metaphors as ‘a metacognitive way of looking at ideas.’

The whole idea of a dot point—do we think in dot points? I don’t know that we do. If we think in terms of—remember originally, you do PowerPoint, you have a metaphor. We used to have a metaphor of pearls, right? So, the pearls was a metaphor for which you approached—and that was a metacognitive way of looking at ideas... The metaphor is a thinking tool. It’s a thinking tool in a similar way to—less sophisticated, say, than De Bono’s hats but of a [similar] nature.

In contrast, in the example below Rod found software such as PowerPoint a valuable teaching tool to develop preservice teacher’s thinking skills. This was particularly the case in supporting learning during the preparation of assessment tasks such as the digital portfolio. The value of this software was attributed to the teacher educator’s knowledge and skill to model and demonstrate the potential use of the technology.

I’ve always liked using PowerPoint, which is nothing new by any means but just getting your head around it. There are more parts to it than I’ve realised in the past. Me using that better has helped the kids with their portfolios I think.

Rod’s reflections on his own knowledge and skills in the use of digital portfolios indicates he has been metacognitive about his teaching. This is an important facet of metacognition, in that teacher knowledge of metacognition can impact on the quality of learning, as was demonstrated in the Curwen et al. (2010)

study. This example also raises the importance of the teacher educator as facilitator of learning and indicates that technology can enhance this process. This is dependent upon the teacher educator's knowledge and skill in the use of the technology, which suggests the importance of professional development. Again, metacognitive skills are linked to the learner's knowledge and capacity to regulate this knowledge towards the goal of improvement of tasks.

4.7.5 Multimedia and the development of thinking skills

Some pertinent issues regarding ICT, writing and thinking skills are raised by Paul in the excerpt below, highlighting the notion that writing does not always reflect students thinking as accurately as 'other things' in the digital world of 21st century learning. He presents views that reflect his interest and research over the past ten years in the use of multimedia, where words, images and different modes of communicating, are blended using multiple formats to express ideas.

Of interest are Paul's comments that he anticipated he would see 'the death of words and writing, and the emergence of something new' throughout his research, but that this has not occurred. His statement below describes the emergence of a new era of communication, where the written word has not died but is in a digital form, and the expression of ideas has been broadened to be inclusive of technological tools that have emerged. An important insight gained is that preservice teachers are utilising multiple formats and devices 'into various digital worlds' and that teachers in schools are also using multimedia approaches.

It can be argued that this increase in the repertoire of tools to express thinking taps into creativity and, as such, a broadening of thinking that impacts on notions of literacy.

My research and my interest over the last ten years has been in the death of words and the death of writing and the emergence of something new. Strangely enough, writing has not died in that time and the other has not emerged as rapidly as perhaps, me, might have thought. But, it is emerging as a way of thinking and dealing with the word which is to use image, and not only image but the digital word of moving between different aspects of the image and different modes, and we're talking about the fact that the students would move between their mobile phone and their computer and their laptop computer and their iPad or their tablet computer, into various digital worlds like Facebook and there's a myriad of others; Instagram and Twitter and Tumblr and various other places where they exist... and, what I'd like to encourage is the students to introduce the multimedia approach into their teaching, because I notice that in the schools that I go into the teachers are using those electronic whiteboards, even young prep teachers are using them quite consistently and effectively and they're engaging their students. And we, perhaps as a university are a little bit behind that.

An important insight from this example is Paul's final comment regarding school classroom use of ICT and student engagement. This leads to the question, 'Should the university be "a bit behind" school

classrooms, particularly in the preparation of future teachers?’ This leads in turn to many other questions relating to preservice teacher education curriculum goals and resourcing. However, the fundamental answer to these questions lies within the question ‘What contribution can ICT make to learning and teaching?’ This needs to be at the centre of any debate that requires educators to make judgements that draw from the best learning theories in their use of ICT.

In this respect, the use of multimedia tools was encouraged for the development of digital portfolios to develop creative thinking skills by teacher educators in these units. As Gaye asserts,

Creativity is an important aspect of being able to use ICT to embellish their digital learning portfolios... I insisted on our students being creative with that last assignment... So my students came up with some brilliant little tools to illustrate their thinking so that was a great way, so Story Board.

As in the examples from Paul and Jane above, this example also reinforces the notion that students are leading the way in discovering the potential uses of ICT when given the opportunity. This is evident when Gaye says, ‘My students came up with some brilliant little tools to illustrate their thinking’.

In the excerpt below, Shane asserts that the integration of spoken and visual imagery in multimedia can be valuable at the planning phase of writing composition, where ‘getting those ideas together’ serves as preparation for ‘the finished product’. Shane indicates he is aware that mind mapping is a thinking tool that contributes to the development of ideas, which can be done ‘on paper or online’. He also highlights the value of VoiceThread in developing students’ ideas. His comments about whether the finished product is text-based, or another format are interesting. Like Paul, he suggests that learning can be demonstrated in many formats; however, this example contributes further evidence of the importance of the drafting phase of writing as important to development of ideas in the preparation for the finished product.

So, mind mapping, too, around planning things. You can do it on paper or online. The online lends itself to not having to be in the same space but also it can link out to other things as well so I think that can be quite valuable. Things like VoiceThread, too, I’ve used those a lot and I think they are valuable in terms of not just written comments but spoken comments. I think that’s particularly useful for people who perhaps have trouble writing stuff down but might want to talk about it. You can use images, etc. So, I think they actually—again, it’s part of getting those ideas together and in the next question where you talk about enhancing academic writing, I think in terms of the preparation for that, depending on what the actual finished product is.

Shane also cites the use of software such as VoiceThread in the development of online support material. This provided examples of teachers modelling questioning techniques to develop and direct preservice teachers’ thinking skills in praxis inquiry learning.

I mean part of our thinking behind that was to get lecturers to do what they're asking their students to do... But, also I think that lent itself particularly well for getting out kinds of questions that were being looked at. And, I think it made that link between speaking prior to writing which I think is important, so by getting your lecturer to say, 'Well, what shaped me as a teacher or a learner, or this is my philosophy or this is my approach' is a really hard thing to and I think software allows that to happen in a really interesting way which you couldn't do—I mean you could get up in front of a lecture and say that but it's a different experience, I think.

The examples above illustrate the contribution multimedia can make to support the generation of knowledge that can shape thinking skills for academic learning and writing. What is evident from participant responses, both preservice teachers and lecturer/tutors, is that the integration of multimedia spoken and visual formats, needs to be embraced because it is part of the world of 21st century learners. Traditional notions of literacy are changing to include digital literacy, and this cannot be ignored. However, writing has not 'died', as Paul attests above. The data illustrates the role of the teacher educator is a vital factor in their ability to embrace multimedia to support learning goals. The relevance of multimedia lies in how these tools can contribute to a knowledge of effective pedagogy in the field of academic writing.

4.7.6 Discussion: The role of ICT, metacognition and academic writing

According to Flavell's definition, metacognition is displayed when the learner makes a conscious decision to improve their work. As self-regulation is considered a fundamental aspect of metacognition, the use of ICT enabled participants to improve the quality of their assessment tasks by researching, editing their work, organising their thoughts, improve their writing, and interacting with peers and staff to improve their cognitive learning and hence their writing.

Findings from this investigation of whether the use of ICT contributes to metacognitive thinking demonstrate that while preservice teachers were not overtly conscious of any metacognitive function, there was evidence of metacognitive thinking. This was especially so during the planning and the editing process. These were the stages of writing when participants were actively thinking about the quality of ideas and the structural features of their writing. It was also evident that metacognitive abilities were being demonstrated while conducting research and analysing reading material for assignment work.

How did the use of ICT contribute to the quality of academic writing skills? And was there a connection to metacognition? The learning and teaching strategies being used by preservice teachers in their learning, and lecturer/tutors in their teaching, suggest that harnessing the ICT tools available can contribute to the goal of writing improvement. The question regarding quality is inconclusive. This would require further study that includes the analysis of the end product of written work.

4.8 Conclusion

This section has outlined the findings from interviews with the lecturer/tutor participants and preservice teachers to identify how ICT can contribute to thinking skills for the enhancement of academic writing skills.

Participant responses identified that the benefits of ICT to both academic writing and metacognitive thinking lay in the ability of these tools to facilitate communication, to support learning in assessment tasks and to extend the repertoire of teaching strategies. This was demonstrated through multiple formats, including the internet and some multimedia approaches to pedagogy.

It can be generalised from the data that the fundamental learning principles behind the use of ICT and metacognition in assessment tasks such as the digital portfolio remains the same as for any other academic learning task. Metacognition requires a knowledge factor in relation to the task and the standard of the task, before it can be internalised cognitively for self-regulation. Rickards et al. (2008) emphasise the value of digital portfolios in learning, as facilitating self-awareness through reflection. These authors argue that while portfolios require reflection on learning, they raise questions as to how reflection is ‘developed, taught, and modelled as learning behaviour’ (p. 34). These are important questions about the use of portfolios as tools for metacognitive learning.

To answer the sub-question on the role of ICT in facilitating metacognitive skills to enhance academic writing, the important thing about the use of ICT is how it can facilitate learning. This reduces the debate to epistemological beliefs about the nature of learning: constructivist versus behaviourist. There is a danger that an overemphasis on testing in the current environment may lead to the use of ICT for activities such as the acquisition of facts, in line with behaviourist models. An understanding of the needs of learners at the societal level is required to develop suitable curricula to ensure the use of the tools meets the goals of the curriculum. It can be argued that an increase in the repertoire of tools to express thinking can tap into the creativity required for 21st century learning (Prensky 2009). As far as metacognition is concerned, the role of ICT is dictated by epistemological beliefs about the nature of learning.

The capacity of ICT tools to impact on metacognitive skill rests on the individual’s ability to consciously and actively use ICT tools for the improvement of learning and writing. This requires having the knowledge of available programs and software to enhance thinking skills, as well as the skills to operate these technologies for the regulation of knowledge to improve writing.

Data responses revealed metacognitive skills were manifested within the purpose of the task. In Flavell’s terms, metacognition occurs in the self-regulatory capacity of the user to use the ICT for improving particular learning and writing events. It can be generalised from the data that ICT is a tool that can facilitate this process.

High standards of writing were associated with the capacity to demonstrate analysis and synthesis of learning in these two units of study. These skills remain in the realm of the individual's ability to read academic literature, to understand and comprehend abstract theoretical concepts about teaching practice, and to convert information into written communication. It can be surmised that the use of metacognition in ICT use is beneficial in three major facets of academic writing: self-regulation of research, composition and editing to enhance structural fluency. However, the third facet requires the development of analytical skills. The data in previous sub-chapters identified that analytical skills for deep learning required the support of a 'more knowledgeable other' (Vygotsky 1978). This information highlights the role of the teacher educator in facilitating analytical skills as being a crucial element of course construction and the use of ICT.

As assessment instruments, digital portfolios increase active involvement and, therefore, construction of knowledge through evaluative processes of learning (Rickards et al. 2008). It can be argued that metacognitive awareness is embedded into this process of assessing and discriminating self-learning through reflective skills in the development of digital portfolios.

In praxis inquiry learning, the data revealed there were levels of reflection required for 'deep understanding'. The goals set for the use of ICT were important. The focus of ICT tools used in these units was on the goal of improving preservice teacher learning and writing. There was evidence of a cohesive, collaborative effort on the part of teaching staff in the development and use of WebCT to achieve this goal. Alternatively, the preservice teacher data revealed that metacognitive skills were not always displayed as a conscious process. However, ICT was used as part of a self-regulatory process of learning with the intention of improving assignment tasks.

The importance of teacher educators' knowledge and skills in the use of relevant technology and its potential to enhance learning and writing were identified as a significant factor. Both ICT and metacognition can be considered tools for learning and teaching. This requires the individual to have sufficient knowledge of these concepts and the skills to implement these successfully to enhance learning and teaching. This information reveals the need for teacher educator professional development.

While the technology to support and enhance learning is available, the issue of developing discerning future educators requires they have the capacity to read, understand and analyse theory and practice for high standards of writing. The ability to understand theories about how 'digital natives' learn best is required to adapt appropriate pedagogy in the preparation of preservice teachers, so they can educate future learners. Prensky (2009) argues that '[t]echnology alone will not replace intuition, good judgement, problem-solving abilities, and a clear moral compass' (p. 1).

It would therefore be reasonable to conclude that the need to develop preservice teachers' capacity to become discerning educators can be enhanced by the development of metacognitive skills. Having the available knowledge regarding the use of ICT and how it can be used to enhance learning and teaching

should facilitate ‘good judgement’ in the ability to draw on the available knowledge and regulate this for the implementation of appropriate pedagogy.

Chapter 5. Discussion and Conclusions

5.1 Introduction

The purpose of this study was to investigate how metacognition could contribute to enhancing academic writing in a first-year preservice teacher education program using a praxis inquiry model of learning. This study aimed to identify theoretical issues related to an epistemology of metacognition in learning and writing to locate pedagogical strategies that could lead to enhanced writing skills. The ultimate goal was to make recommendations to inform course design and tertiary teaching practice in the preservice teacher education field.

This study of metacognition and academic writing was explored in the context of a praxis inquiry process of learning in two compulsory education units of a Bachelor of Education course. An examination of the role of metacognition as a part of learning in a praxis inquiry, reflective practitioner model of preservice teacher education aimed to advance knowledge of how preservice teachers could develop their thinking skills to enhance writing.

Conclusions from the data obtained suggest that metacognition is embedded within the cognitive and social constructivist nature of praxis inquiry learning. In this process of learning, preservice teachers develop conceptual understandings about the teaching and learning process from individual inquiry, based upon direct experiences in the social contexts of school and university classrooms. Preservice teachers generate and research their own questions to construct and expand their cognitive learning by connecting theory to practice. This process aims to develop transformations in the learner to become discerning future educators. This type of learning is consistent with the literature, which identifies metacognition as strongly associated with experiential, cognitive and social constructivist theories of learning. These theories are characterised by the importance of the individual's role in facilitating knowledge construction and generative learning through environmental influences (Dewey 1933; Piaget 1953; Freire 1970; Vygotsky 1978; Flavell 1985; Kolb 1984; Jonassen, Peck & Wilson 1999; Baylor 2002; Bruner 2004). The significant aspect of both cognitive and social constructivism is that they are based on the epistemological belief that the individual constructs knowledge from his or her experience to create and expand their learning.

The findings from the analysis of participant data from both cohorts of participant group, preservice teachers and their teacher educators, identified two significant themes concerning the aims of this study. First, an epistemology relating to the concept of metacognition is problematic. Defining and understanding the term 'metacognition' is complex. Second, pedagogical practices identified as conducive to developing preservice teachers' metacognitive and writing skills comprise an eclectic mix of cognitive and social constructivist methods aligned with 'evaluativist' pedagogy (Khun & Dean 2004).

5.2 An epistemology of metacognition

This study identified a general epistemology of metacognition in the literature which accepts that metacognition relates to the monitoring of cognition and the regulation of cognition (Brown 1980, 1982; Winne 1995; Pintrich 2000; Zimmerman 2001) and that behavioural aspects, such as self-awareness and self-regulation, can impact on performance in a range of areas (Boekaerts 1996). These elements of metacognition are based on Flavell's (1976) definition.

However, participant data from this study of metacognition revealed a general difficulty experienced by both preservice teachers and lecturer/tutors in articulating a succinct definition of metacognition. Evidence emerged of an elusive aspect to the term that was not consistent with Flavell's (1976) definition, nor with the commonly accepted term, 'thinking about thinking'. Participant language described metacognition using terms such as 'bigger', 'beyond the cognitive' and 'beyond cognition', which had connotations of metacognition exhibiting a complexity at the cognitive level that was not easily described. This was interpreted as relating to higher-order thinking skills. This elusive element in participant responses also generated questions as to why the term was generally proving problematic to define. 'Was it simply a lack of sufficient study of the concept, or something related to a complexity that has not been sufficiently addressed in the literature?'

The emergence of this elusive aspect of metacognition diverged somewhat from the current literature. Despite an additional search of literature with the specific intention of identifying what the source of this elusive factor might be (sub-chapter 4.4), no satisfactory answers were found. What did emerge from this additional review of the literature was that authors such as Schunk (2008), Dinsmore et al. (2008) and Georgiades (2004) also noted difficulties associated with definitions of metacognition in many studies.

Conclusions drawn from the analysis of data in this study identified that metacognition is associated with higher-order thinking. This suggests that it can be generalised that there is a need for an increased understanding of the 'meta' component of metacognition. This insight contributes information that supports studies by Georgiades (2004) and Brown (1987), who identified that studies on metacognition had focused on the cognitive aspects of the term without sufficient attention to the 'meta' component and its meaning. This finding also contributes further information to studies of the difficulties associated with definitions of metacognition by Dinsmore et al. (2008), Schunk (2008) and Georgiades (2004). Further study into the 'meta' factor in metacognition may help illuminate how metacognition is defined and understood using larger samples. However, the questions we are left with are, 'Is a definition of metacognition that emerged from a study of memory in children still applicable to adults?' and, 'Why were some participants finding it difficult to explain their understanding of the term?' Further research into participant understanding of metacognition as a construct is recommended to determine whether this elusive factor emerges using a larger participant sample.

A major insight gained from data responses within both groups in this study is that the term metacognition is used to mean ‘thinking about thinking’ without a clear understanding of what this entailed. This uncertainty among participants supports findings by Dinsmore et al. (2008), who found that studies on metacognition had used the term loosely, based on an assumed understanding of what metacognition means. The data from both cohorts of participant group in this study identified there were complexities surrounding the concept and its use. Findings from this study indicate further study of metacognition is required to increase understanding of the concept within the teaching and learning process. Metacognition needs to be understood as a concept and a skill for its potential to impact on the enhancement of writing skills and learning in general.

5.3 Pedagogical practices: Metacognition, praxis inquiry and academic writing

This study aimed to contribute knowledge to pedagogy related to metacognition, learning and writing in praxis inquiry. In the absence of an alternative definition, this study used Flavell’s (1976) definition of metacognition. The two characteristics of this definition, cognitive knowledge and regulation of cognition, were used to investigate the notion of metacognition as a process that could impact positively on learning and writing in a praxis inquiry framework. The benefit of using this definition of metacognition was that the self-regulatory included in the definition, could potentially impact on preservice teachers’ capacity to develop autonomy and agency in the enhancement of writing skills.

Findings from the analysis of data using these two characteristics revealed that there is potential for metacognition to assist preservice teachers in working towards the goal of writing improvement. This is dependent upon the writer having a knowledge about what constitutes a high standard of writing in assessment rubrics. This is related to the knowledge factor in Flavell’s (1976) definition. Additionally, simply having an awareness that writing requires improvement does not mean the learner has the capacity to regulate, or take action, to improve writing. The data revealed that this also required that preservice teachers possess both the cognitive knowledge of what constitutes a high standard of writing and the skills to regulate this knowledge, for the enhancement of writing. A significant finding from this study is that the knowledge associated with what constitutes a high standard of writing is specifically related to the theorising genre of writing in praxis inquiry. Furthermore, while a knowledge of this genre is required, the regulatory function in metacognition is related to the skill of cognitive analysis by the participant while processing theory and practice within praxis inquiry learning.

This information provides an important insight into pedagogy, namely that the facilitation of metacognitive skills has the potential to enhance writing skills in the praxis inquiry process of learning. Such pedagogy is related to a knowledge of the academic genre associated with evaluativist methods. This finding is consistent to some degree with studies by Khun and Dean (2004) and Negretti (2012) on genre. The theorising genre in praxis inquiry was considered by teacher educators to be that in which a high

standard of writing was demonstrated. Both knowledge of and facility with this theorising genre of writing were required by preservice teachers to be metacognitive in their learning for high standards of writing.

This information relating to the theorising genre of writing represents a significant insight into how metacognition and praxis inquiry are connected and could potentially lead to the enhancement of academic writing skills. This helps to answer the main research question, ‘What is the connection between metacognition and academic writing in a praxis inquiry model of first-year preservice teacher education in two compulsory education units in the Bachelor of Education at one Australian university?’

The data strongly suggest there is a connection between cognitive analysis and reflection skills in praxis inquiry learning. This data identified a hierarchy of thinking skills in the writing genres of the praxis inquiry protocol that represent incremental thinking and writing genres, from descriptive to theorising. The theorising genre was associated with ‘higher-order’ thinking skills. This hierarchy also represented a difference between surface and deep learning as theoretical constructs. A hierarchy of reflection was also identified for the capacity to analyse learning for the theorising genre. Such reflection related to the capacity to reflect at a dialectical level within theorising about learning

As a pedagogy of writing, engaging with the praxis inquiry protocol was found to have the potential to develop thinking skills simultaneously with the writing process. As such, it is reasonable to conclude that the development of preservice teachers’ facility with cognitive analysis during the reflective process of the theorising genre of writing in praxis inquiry, has the potential to impact positively on writing skill. This is considered a contribution to knowledge in the field of metacognition and academic writing in preservice teacher education.

While the literature and data identified that metacognition belongs within the cognitive constructivist paradigm of learning, evidence from both participant cohorts revealed the development of the thinking skills associated with cognitive analysis requires facilitation. Preservice teachers required external assistance to facilitate their ability to cognitively analyse their experiences in order to achieve high standards of writing and depth of learning. It can be generalised that this requires a pedagogy with a strong focus on the development of analytical skills. These skills are generally known to be associated with the realm of higher-order thinking skills. However, data from this study suggest that constructivist methods alone do not necessarily achieve the desired outcomes in terms of these higher order thinking skills for academic writing. The preservice teacher data highlighted that they were novices in all facets of praxis inquiry learning and writing, and in need of support. The lecturer/tutor data revealed they were using scaffolding (Vygotsky 1978) as a mechanism to assist preservice teachers, acknowledging the need to nurture preservice teachers’ learning.

The data findings identified a need for the development of the linguistic discourse associated with understanding concepts such as metacognition, praxis inquiry and, more generally, the discourse associated with a knowledge of the disciplinary content in these units of study, to support the capacity to analyse

learning. Pedagogical strategies identified in the lecturer/tutor data to support preservice teachers' thinking and writing skills, particularly the theorising genre, required pedagogy described as 'explicit teaching' by teacher educators. This finding contributes further to studies of metacognition and writing, such as that of Khun and Dean (2004), who define metacognition as the development of skilled thinking that enables qualities of discrimination and choices to be made from a framework of evidence and argument. These choices are described as evaluativist. 'An evaluativist epistemology provides the intellectual basis for judging one idea as better than another, a basis more powerful than mere personal preference' (p. 271).

Teacher educators in this study identified developmental factors as a consideration in preservice teachers' capacity to write in the theorising genre of the praxis inquiry protocol. This developmental factor resonates with studies by Woodward-Kron (2002; 2004; 2008), who identified improvements in preservice teachers' writing skills made over a three-year period based on longitudinal methods.

The teacher educator data identified dilemmas for their practice in transitioning preservice teacher learning using constructivist principles of experiential inquiry learning. The data identified that cognitive analysis of experience in praxis inquiry learning required support from external sources. This was consistent with Vygotsky's (1978) socio-cognitive theory, the linguistic perspective of literacy development of Gee (1989, 1991) and Ivanič (1998), and the visible and guided practice of Hattie (2009). Strategies identified by the lecturer/tutor cohort included scaffolding preservice teacher learning through modelling; demonstration; mentoring; and visible, explicit teaching. This finding helps answer the research sub-question on the role of purposeful coaching in the facilitation of metacognitive abilities in the writing process.

This information also connects findings from this study to the literature indicating that metacognitive skills need to be explicitly taught and emphasising the importance of the individual's explicit awareness of this use, either from a learning perspective, or as a teaching tool. Data analysis of preservice teachers' use of metacognitive skills in sub-chapter 4.5 identified evidence of preservice teachers' use of metacognitive skills to monitor and regulate their writing, but without an explicit consciousness of this. This insight suggests that pedagogy that makes metacognition explicit has the potential to enhance learning and writing. As such, these findings align with studies of metacognition by a range of authors—including Wilson and Bai (2010), McAlpine et al. (1999), Maclellan (2004), Moon (2008), Woodward-Kron (2002; 2004; 2008); Kuhn and Dean (2004); Hammann (2005); and Reiff and Bawarshi (2011)—who emphasise the importance of the individual's explicit awareness of the use metacognitive skills. The data identified the role of the tertiary teacher educator as a highly significant factor in facilitating analytical skills in the development of learning and writing in the theorising genre.

In answer to the sub-question, 'What role can Information Communication Technologies (ICT) play in facilitating metacognitive skills to improve writing?', the data identified the key benefits of ICT as complementing the research-based approach to learning and teaching in praxis inquiry. The data findings identified ICT as a valuable tool for investigative learning, composition of writing, and communication.

Preservice teacher data revealed that ICT facilitated evaluative thinking skills through the research process for assignment work. The editing functions enabled the enhancement or regulation of writing skills in the technical sphere (grammar, spelling, fluency and composition).

Ultimately, however, the data indicates the benefits of ICT related to how teacher educators and preservice teachers use the particular ICT tools to enhance learning tasks for particular objectives. In relation to a pedagogy of academic writing, the data identified that WebCT provided instructional tools to develop a knowledge of research writing genres. Models of writing exemplars were provided to assist preservice teachers with assessment tasks. This contributed to scaffolding their learning of the research process and associated writing genres.

As a pedagogical tool, online collaborative learning was identified as beneficial for developing preservice teachers' linguistic discourse associated with acquisition of the disciplinary discourse knowledge for writing. Data revealed some evidence of curriculum thinking tools, such as mind maps and graphic organisers, being used by preservice teachers and teacher educators, particularly in the planning phase of writing composition.

However, it can be concluded that the critical issue in the use of ICT and metacognition relates to the type of learning task and the theory of learning adopted by course designers and tertiary educators for preservice teacher learning. The question of relevance to this thesis is, 'How can ICT be used to develop analytical skills using metacognition, for the development of high standards of academic writing?' The data suggest strategies such as questioning and collaborative discussion benefit the development of these skills. The data also revealed preservice teachers were taking the lead in the use of ICT to support their learning. This indicates a need for teacher educator professional development to embrace the full range of benefits ICT can offer to the development of analytical thinking skills. Further research into this area is required to investigate the potential of metacognition and the use of ICT tools to enhance the theorising genre of writing.

Based on to Flavell's definition, conclusions can be drawn that the relationship between metacognition and the role of ICT relates to the user having both the knowledge of how particular ICT tools can support academic tasks, and the skills at the cognitive and technical levels to regulate that knowledge for the fulfilment of learning goals.

Finally, this study has argued that the use of metacognition, as it relates to Flavell's elements of knowledge and the regulation of knowledge, has the potential to enhance the academic writing skills of preservice teachers in a praxis inquiry approach to teacher education in a first-year Bachelor of Education course.

The findings have identified that analytical and reflective skills are fundamental to the production of high standards of writing. The thinking processes associated with analysis and reflection have been found to lie within a hierarchy of thinking that translates to deep learning about theories and practices in literacy

education. However, there needs to be a conscious understanding of metacognition as a concept, as well as a process, for its use to support the deep learning required for high standards of academic writing. This requires professional development of academic teaching staff.

The contextual environments of both university and primary school classrooms, where writing content is drawn from, provide the linguistic discourse associated with cognitive and social learning. Language and thought are inextricably connected in the development of the epistemological, structural and cultural conventions that underpin academic writing.

Pedagogy conducive to the development of metacognition and academic writing skills in preservice teacher education is found to lie within the theoretical learning constructs that underpin praxis inquiry learning—namely, cognitivism and social constructivism. Metacognition is embedded within the learning and writing process. Experiential learning provides the platform for the cognitive and social development of preservice teachers. However, a significant finding is the importance and role of teacher educators in facilitating the learning of preservice teachers, who found themselves novice learners in almost all facets of praxis inquiry learning and academic writing tasks. A dichotomy of epistemology ensued, with cognitive constructivist learning proving insufficient. The support of socially guided and mediated experience from school mentor teachers, academic teaching staff and peers is also required to complement constructivist learning. Scaffolding of preservice teacher learning is required to support writing development in the first year of university. Confidence, emotional and self-efficacy issues are also significantly associated with academic writing and learning through a constructivist process. These need to be acknowledged by academic teaching staff to dispel notions that preservice teachers come to university with the prerequisite knowledge of and skills in academic writing.

Pedagogical practices identified as having the potential to develop academic writing skills using metacognition include modelling and demonstration of high standards of academic writing that displays reflective and analytical skills by teacher educators. This requires visible guided instruction. Collaborative pedagogy, where group tasks in university classes with a focus on the linguistic discourse of disciplinary knowledge use of metacognition as a learning lens, could contribute to enhanced writing.

Formative assessment, in which writing tasks are considered constructivist learning experiences, is suggested. Academic writing needs to be understood as a process that involves drafting, conferencing and redrafting based upon feedback. Learning the requisite skills inherent in the different genres of writing is best undertaken within the context of the author's writing. Increased opportunities for revision of assessed drafts based upon feedback would lead to improved standards. This has implications for university class sizes and assessment policies and the professional development of teaching staff. Handing in a written assessment, with a final mark allocated, does not necessarily allow the writer to develop their writing skills. Nor does it engender a sense of enjoyment of writing, with the current literature highlighting that many students dislike writing and the associated emotional stress. The focus on the final product, without

taking account of the quality of learning during the writing process, defeats the purpose of why we write. Formative assessment and use of metacognitive skills may contribute to academic writing being viewed a skill that can be learned, thus enhancing confidence and writer identity.

This study has found that academic writing is a developmental process that requires sufficient epistemological knowledge for reflection, including dialogic analysis, to synthesise theory and practice and develop individual questions about education. Metacognition as a cognitive skill has the potential to contribute positively in this process of praxis inquiry learning for the development of discerning educators.

This information has value for tertiary educators, particularly as 21st century learning requires educators who can instil a sense of joy in learning for students who regularly use technology to inquire into all manner of topics. Teaching and learning metacognitive skills is, perhaps, more important than ever in preservice teacher education in preparation for these learners. Metacognitive skills within constructivist inquiry learning can provide agency to the learner so that they can exercise informed critical and reflective thinking. The ‘death of writing’ has been greatly exaggerated and high standards of writing remain one of society’s most valued skills, providing access to social benefits. It can be inferred that metacognition as a concept and skill has the potential to contribute to both enhanced academic writing and discerning educators prepared for 21st century learning.

5.4 Limitations

Using a qualitative methodology, this study has primarily sought to explore and identify features of metacognition that could assist learners to develop high standards of academic writing in preservice teacher education. While this methodology provided rich data, in hindsight it would have been beneficial to have collected samples of written assessment tasks from the preservice teachers interviewed. This would have provided additional information about writing performance to support comparison of reported difficulties in analysis to actual outcomes.

Given the praxis nature of learning in these two units of study, a longitudinal study over a period of the full four years of the Bachelor of Education might have provided greater insights into how preservice teacher academic writing develops in praxis inquiry units.

As this study was gathering information about metacognition and the benefits that this could potentially have on academic writing performance, inferences can only be drawn based on data which is representative of the sample studied.

A further difficulty was that the qualitative nature of this study did not fit within the quantitative framework of most studies on metacognition. This created difficulty positioning this study in a field in which the majority of research has been in the assessment of metacognition, and not in the sphere of the lived experience of preservice teachers and their lecturers in preservice teacher education.

From an empiricist's perspective, this could be interpreted as a limitation because this study attempts to study a cognitive construct through a qualitative methodology. However, the literature reflects uncertainty in definitions of metacognition which creates difficulty for research. This suggests there is value in the use of qualitative methodology to identify areas that may be explored further using quantitative or mixed methods.

5.5 Implications and further recommendations

This study has practical as well as theoretical implications. The results highlight areas of interest that could contribute further to the field of metacognition, as well as strategies to enhance academic learning and writing skills. These may serve to inform policy and course construction in preservice teacher education but are also considered applicable to other higher education fields that incorporate theoretical and practical learning in field placements.

What has been discovered from this study is a relationship between metacognition and high standards of academic writing. This correlates with a hierarchical aspect to thinking skills, such as higher-order thinking; analysis, synthesis and reflection. Further investigation into development and use of metacognitive skills and higher-order thinking in writing genres could contribute additional insights into how these skills may lead to higher standards of writing.

Further investigation is required to explain what is meant by the prefix 'meta' in metacognition, and how this might correspond to concepts related to hierarchical thinking at the cognitive level. Given insufficient discussion of this component of metacognition in the literature, further study might unravel some of the confusion, and help to explain the elusive factor identified in this study.

The literature review also identified a need to find appropriate methodologies for investigating metacognition. Difficulty was encountered with assessment measures in rubrics trying to assess analysis, considered an inherent aspect of metacognition. This indicates a need for further study of assessment instruments that correlate with the component of metacognition being assessed.

There were four main areas of pedagogy where further research using Flavell's (1976) model of the definition of metacognition, would be of benefit to the field of preservice teacher education.

First, the term metacognition needs to be better understood. This investigation into metacognition and academic writing began with the common view that metacognition meant 'thinking about thinking'. The confusion in defining metacognition in the literature makes it difficult to research. An important insight is that further studies to better define metacognition are required. Questions arising include, 'Is there a need to revisit and reconsider whether the definition provided by Flavell and Brown in the 1970s and 80s is still the most relevant one, given their work on metacognition originated from studies on metamemory in children?' A greater focus on the prefix 'meta' in the study of metacognition in future studies may provide insight into

the elusive factor identified in this study and confusion surrounding the term in the literature. Would this elusive factor arise in participant understanding of metacognition with a larger sample?

Second, the use of a conscious and visible pedagogical approach to metacognition and genre knowledge is required. A longer-term investigation into the development of metacognition for developing thinking processes to write in the theorising genre could provide valuable information. This would require a focus on the effects of instructional guidance on cognitive analysis, and the monitoring and regulation of skills to determine the impact this has on the standard of academic writing.

Third, further investigation into the use of a process model of the development of metacognition and academic writing skills is recommended. This would require the integration of metacognitive skills into a formative assessment process, using self-assessment, peer and teacher educator feedback throughout a drafting process.

Fourth, further research incorporating metacognitive skills into praxis inquiry, using collaborative academic writing tasks with a specific focus on the linguistic discourse, could also be of benefit to the field of teacher education. An investigation utilising online collaborative forums could provide greater insight into how the use of digital technology can be used to develop analytical skills. This is required for the preparation of future educators to engage in greater self-regulation of learning.

Finally, governments are calling for an improvement in the literacy skills of preservice teachers; therefore, adequate resourcing and professional development of academic staff is required. This is crucial for the individual mentoring and monitoring of preservice teacher writing. Research focusing on tertiary educator professional development in the use of metacognition, and the development of high standards of academic writing, would help identify how a targeted approach to a pedagogy of academic writing skills can impact on the development of writing skills.

5.6 Contribution to research

This study has identified complexities surrounding understandings of metacognition. The term ‘thinking about thinking’ is used widely but loosely to describe the concept, without the consequent development of a sophisticated understanding of the cognitive complexity of metacognition as a concept and skill for learning.

A deeper understanding of metacognition as a concept and skill for learning is required by both preservice teachers and teacher educators to benefit learning. In accord with Flavell’s (1976) definition, metacognition requires an understanding of both the task, and the skill required before it can be internalised cognitively for self-regulation. A heightened consciousness of metacognition within reflection in praxis inquiry learning, through visible pedagogy in the development of analytical skills to write in the theorising genre, has that potential to contribute to production of discerning educators and high standards of writing.

This study has identified that while metacognition and praxis inquiry belong within the constructivist paradigm of learning, metacognition for high standards of writing requires explicit, guided instruction. This information extends knowledge in the field of metacognition and academic writing in preservice teacher education that can be generalised to inform tertiary teaching practice, course design and the professional development of tertiary educators in the preservice teacher sector, or more generally in higher education courses that incorporate professional practice.

5.7 Autobiographical statement

Undertaking this study has led to transformations at the personal and professional level of the researcher's education. This provides a richer understanding of ontological, epistemological and technical issues related to first-year preservice teacher education.

At the technical level, a deeper understanding of qualitative research implementation has occurred. The development of academic writing skills in the genre required for producing a thesis has been a significant learning experience. This has also developed a deeper appreciation and understanding of the complexities involved in the research process itself. This enriched experience will be advantageous in further work in the tertiary sector as teacher educator and researcher.

Finally, this study has identified many areas for further investigation, as well as areas of significance, which has stimulated my interest in extending my work in the field of metacognition and tertiary writing skills through contributions to publications and conference presentations.

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6. Appendices

- A. Interview schedule – Preservice teacher participants
- B. Interview schedule – Lecturer/Tutor participants
- C. Data analysis axial coding – Preservice teacher participants
- D. Coding: Individual preservice teacher participant data – Subject A
- E. Coding: Individual preservice teacher participant data – Subject B
- F. Axial coding – Lecturer/Tutor participants
- G. Praxis inquiry protocol
- H. Unit 1 assessment summary
- I. Unit 2 assessment summary
- J. Example of scaffolded support material for research assessment task Unit 2

Appendix A. Interview schedule – Preservice teacher participants

- Q1. Please comment on how competent you feel writing academic assignments.
- Q2. What aspects of writing do you feel successful with?
- Q3. What elements do you find difficult?
- Q4. What strategies do you use to help you when you are planning and writing academic assignment tasks?
- Q5. As part of your studies in the Units 1 and Unit 2, the term ‘praxis inquiry’ is used to refer to reflective practice. Please indicate:
- (a) What is your understanding of this term?
- Q6. Describe your experience of making connections between the theory and practice when you are writing assignments.
- Q7. Metacognition is a term sometimes used in teacher- education classes. Please indicate:
- (a) if you have ever heard of this term,
 - (b) if you have heard of this term, please explain what you understand it to mean.
- Q8. When you are writing, do you have an awareness of being metacognitive?
- Q9. Are you aware of any metacognitive strategies that might assist you with academic writing? If so, please indicate what these strategies are.
- Q10. What challenges have you experienced in your first year of university with academic writing?
- Q11. What else would you like to add in regard to your experiences of academic writing in these units of study?
- Q12. Information Communication Technologies (ICT) are used as part of your university studies and when you are completing academic writing assessment tasks. This research is exploring the role of information technologies in thinking and writing. Could you please describe:
- (a) what ICT you use
 - (b) how the use of the particular technology contributes to the enhancement of your academic writing
 - (c) how the use of ICT may contribute to your thinking metacognitively about your academic writing.
- Q13. As this research is about metacognition and the academic writing process, the issue of how language and thought are connected with academic writing is being explored.

- (a) Is English the dominant language that you speak?
 - (b) Are you multilingual? If you are multilingual:
 - what language/s do you speak at home?
 - are you aware of any difficulties you may be experiencing with academic writing in regard to feedback from lecturers in regard to grammar, syntax and fluency?
 - (c) Language and thought are inextricably connected.
 - Are you aware of how your bi-lingualism/multi-lingualism impacts upon your thinking when you are writing academic tasks?
 - Do you think in English or your mother tongue and are you aware of any translating that you may be doing in the process of writing?
 - Are you aware of any issues in regard to thinking metacognitively as a result of your multi-lingualism?
- Q14 Assessment tasks in the Units 1 and 2 require that you reflect upon practice and think about theories of literacy development. Do these assessment tasks assist you in your ability to think metacognitively when you document your learning? If so, can you please describe your experience?
- Q15. Do you think the assessment tasks in these units have challenged your thinking and academic writing skills?
- Q16 What is your understanding of ‘critical thinking’, ‘analytical thinking’ and ‘reflective thinking’?
- Q17. Assessment rubrics indicate that high marks require analytical skills. Please describe your overall experience of being analytical in the written assessment tasks you have completed and the relationship with thinking metacognitively in this process.

Appendix B. Interview schedule – Lecturer/Tutor participants

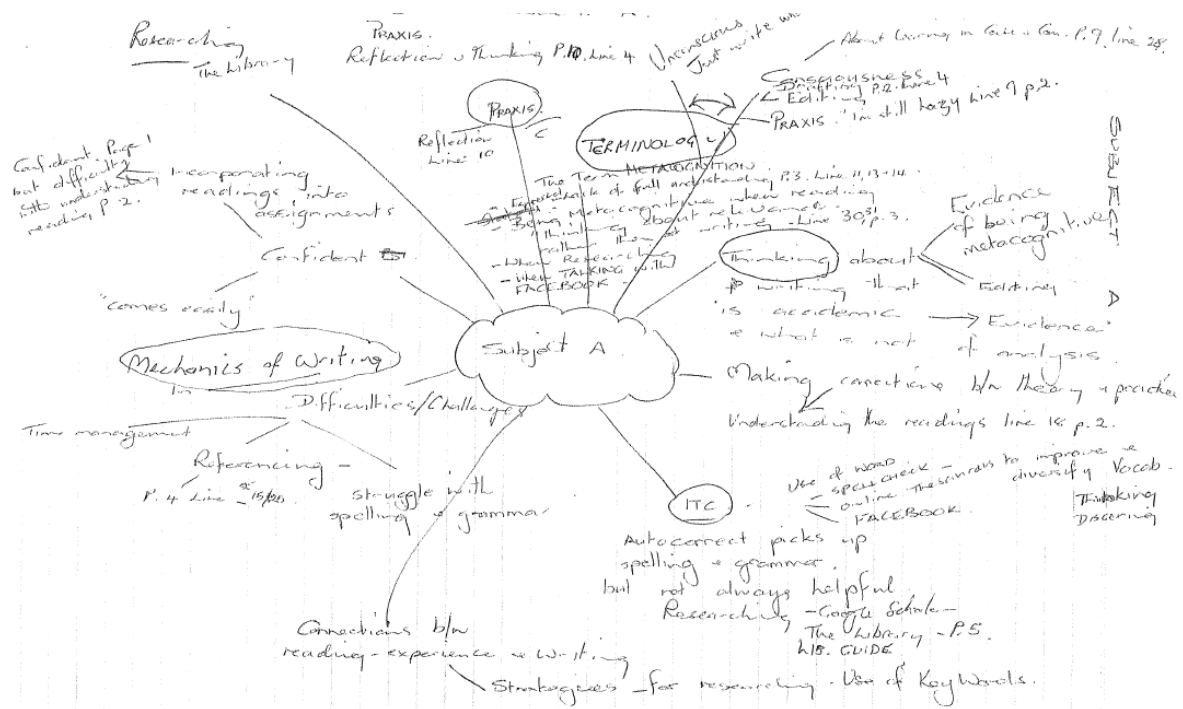
- Q1. As a lecturer/Tutor in the Bachelor of Education Units 1 and 2, a ‘praxis inquiry’ approach is used and written assessment tasks require that students reflect on theory and practice.
- (a) What are the benefits of this approach?
 - (b) What are the challenges for you as a lecturer/tutor?
 - (c) What challenges can you identify that your students experience with this approach?
- Q2. The praxis inquiry protocol involves practical theorising on the part of preservice teachers enrolled in these units in which the school partnership placement is an integral part of their study.
- (a) In written assessment tasks, how effectively do you think preservice teachers are able to display practical theorising?
 - (b) In your view, what strengths do they display?
 - (c) What challenges can you identify that your students experience in this process?
- Q3. Metacognition is a term sometimes used in teacher education courses such as this.
- (a) Please explain what your understanding of this term is.
 - (b) Do you think your students display metacognitive skills in written assignments?
 - (c) If so, please describe this.
- Q4. In your opinion, what role does metacognition play in assisting students to develop their academic writing skills?
- Q5. Can you identify any pedagogical strategies that you use to develop your students’ metacognitive skills as part of your teaching repertoire? If so, could you please outline these.
- Q6. Do you think that there is a role for purposeful coaching in the facilitation of metacognitive skills? What suggestions can you provide?
- Q7. In your view, are there any general assumptions that are made about the academic writing skills that preservice teacher education students bring in their first year of university.
- Q8. What issues do you think relate to the concept of metacognitive thinking in relation to academic writing?
- Q9. When marking your students’ reflective writing assessment tasks, what do you think are the features of a high standard of academic writing? Could you please describe these?
- Q10. What else would you like to add to the discussion about metacognitive thinking and academic writing?

- Q11. Are you aware of the information communication technologies that preservice teachers use in the development of their academic writing? If so:
- (a) what are these?
 - (b) in your view, how do these enhance academic writing?
- Q12. Are you aware of any specific software that is available to enhance preservice teachers' thinking skills in the process of theorising from practice and the documentation of this in academic writing? If so:
- (a) do your preservice teachers utilise this software and do you think this enhances the quality of their academic writing?
 - (b) what information communication technologies do you use as part of your teaching repertoire to assist students to develop their thinking skills in these units of study?
- Q13. As this research is about the connection between metacognition and the academic writing process, the issue of language and thought is being explored. Therefore, are you aware of any of your preservice teachers who are multilingual? If so, could you please comment on:
- (a) any literacy issues that are evident in academic writing such as grammar, syntax, fluency
 - (b) any issues that may relate to metacognitive thinking as a result of literacy competency
 - (c) any issues that arise from cultural and linguistic diversity.
- Q14. Assessment tasks in units 1. and 2. require students to reflect, theorise and investigate literacy practices from classroom experience. Could you please comment on?
- (a) How these assessment tasks contribute towards the development of preservice teacher's capacity to think metacognitively.
 - (b) The teaching strategies that are being used to develop preservice teacher's thinking skills as part of the academic writing process.
- Q15. Assessment rubrics define high standards of writing to encompass analysis. Can you describe your experience of preservice teachers' demonstration of this skill?
- Q16. What is your view of the role of metacognition in the development of analytical skills?
- Q17. Can you suggest any other assessment tasks that you think could contribute to assisting preservice teachers' capacity to develop their thinking and academic writing skills?

Appendix C. Data analysis axial coding – Preservice teacher participants



Appendix D. Coding: Individual preservice teacher participant data – Subject A



SUBJECT A.

~~Intention~~

Themes - Conscious & Unconscious -
- lines 1-6 p. 4.

Structural elements of writing -
- Use of ICT -

Then Term 'Praxis'

TERMINOLOGY -

"still large"

I kind of get it as practical inquiry -

Reflecting on what's happening

instead of just what's in the text -

talking you can experience & putting it in a journal -

Making connections b/w theory & practice

- the term Metacognition

Issue - Understanding the term p. 3 line 11 13 & 14.

Metacognition - when reading thinking

when researching thinking "what's relevant to what I'm learning" line

* THE IMPORTANCE
of the RESEARCH
STAGE.

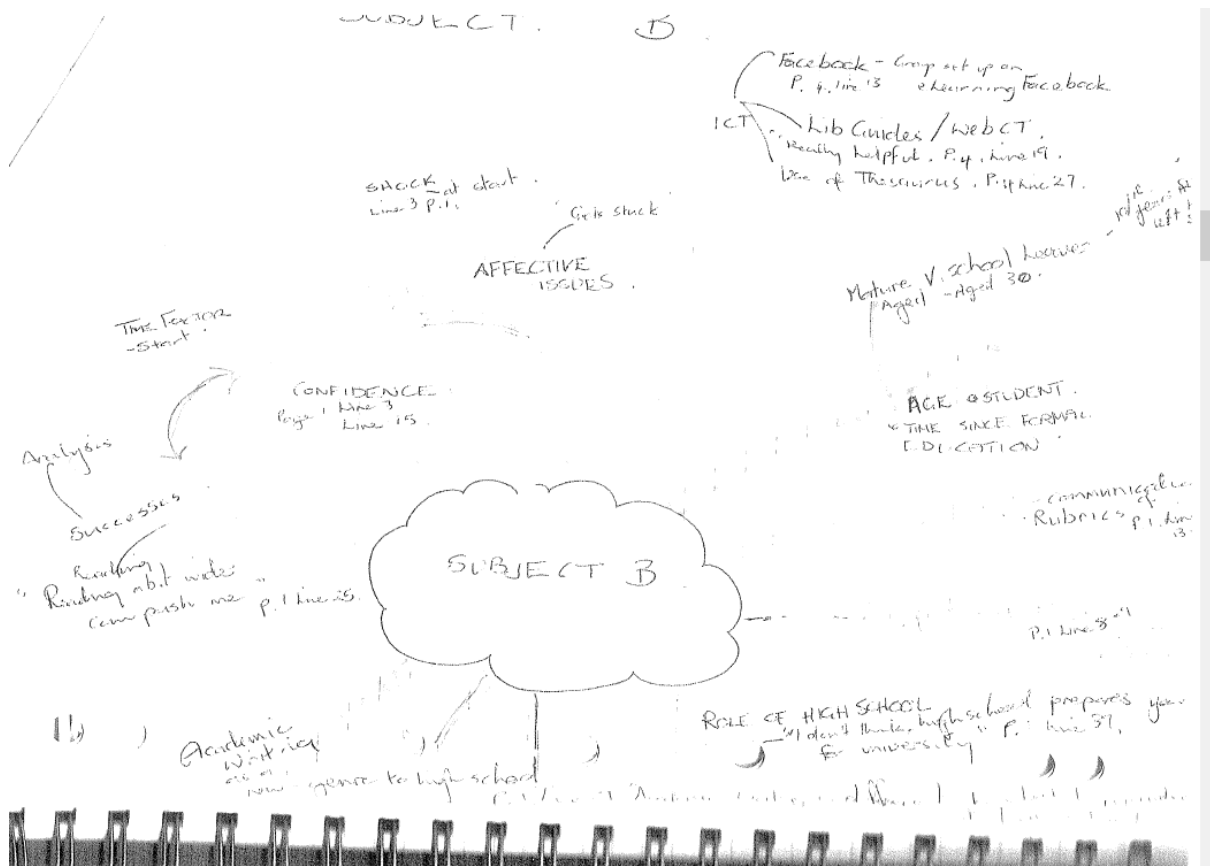
- "When I'm researching I kind of ask questions" * The importance of questions p. 3.

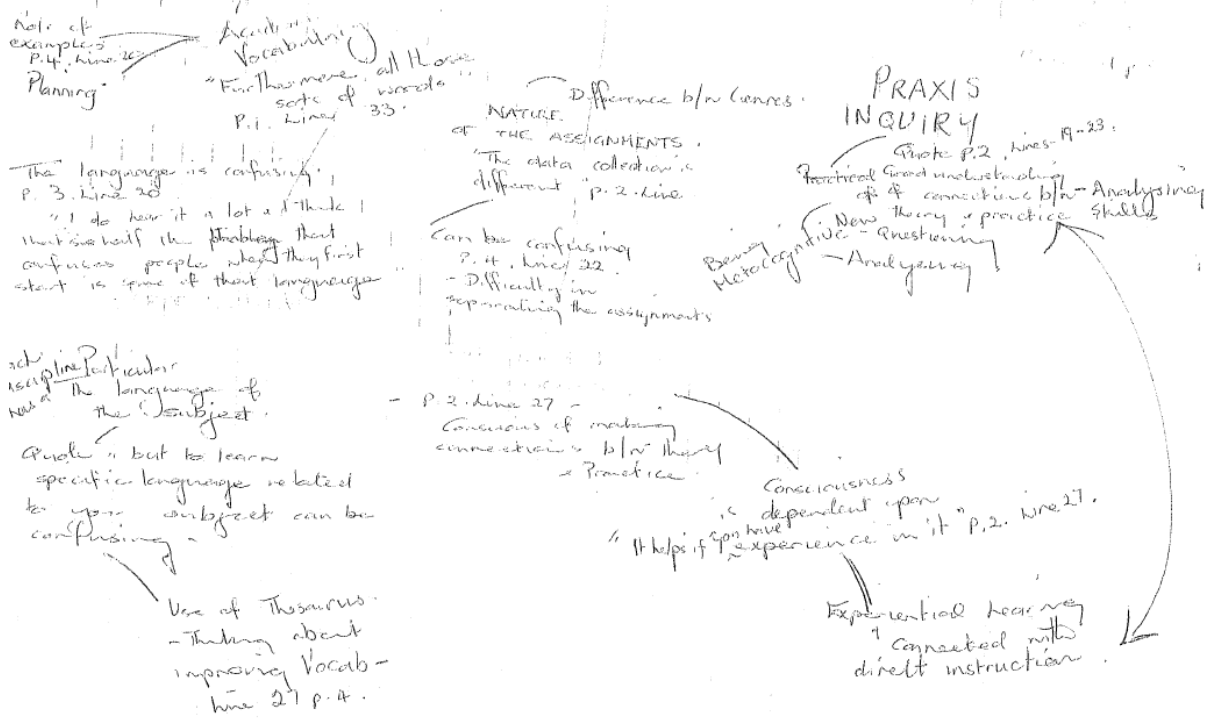
University is a new experience in such a potential
confusion about expectation & understanding
assignments line 36 p. 4.

ICT - Use of Facebook to share ^{support} ideas & examples

TEACHING STRATEGIES - ↑ TALKING to Page 8. lines 5-7
- Think

Appendix E. Coding: Individual preservice teacher participant data – Subject B





SUBJECT 3. SUMMARY ANALYSIS

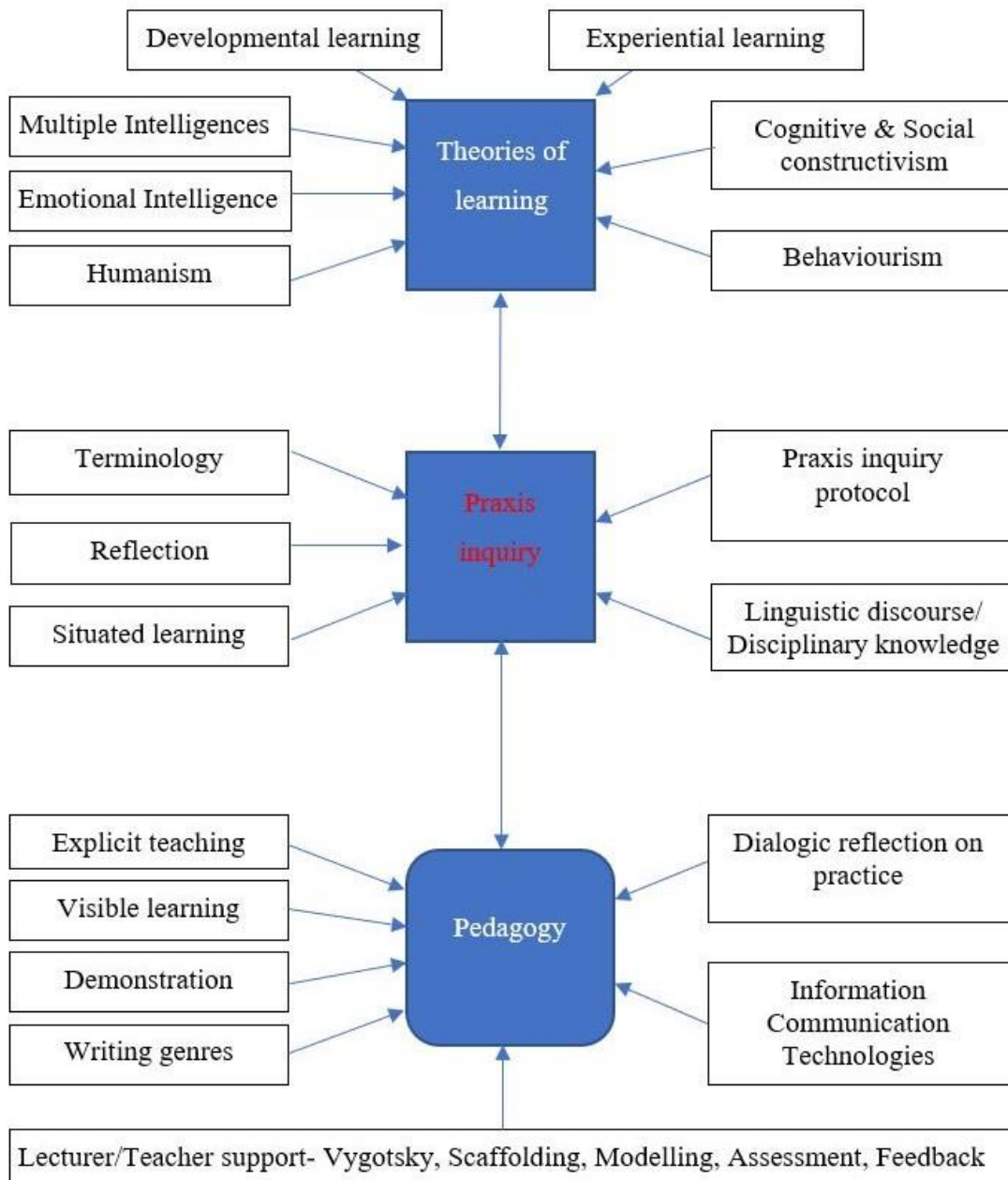
Metacognition -

- As a practice within teaching
- When Reading - "I dissect" p. 3, line 29.
↓ line 30 page 6. Complexity of the recordings
Challenging thinking
- When - Editing - writing p. 3, line 30
- Through questioning - line 31.
- Through analysis - line 32/33.
- The role of discussion - e-learning Facebook.
- Relationships b/n. analysis & metacognition
P. 6, line 12.

Relationship with Critical

- Depth of understanding - Connecting
- R/p b/n analysis & ability to criticise
- R/p b/n. critical analytical in depth of understand.

Appendix F. Axial coding – Lecturer/Tutor participants



Appendix G. Praxis inquiry protocol

Four Challenge and Opportunity:

The challenge in "Understanding Learning" this semester is to gain a deeper appreciation about learners and learning in a primary school setting (in relation to literacy development) — we will explore this as we work with each other in schools and at university.

Over the semester your task will be to reflect in order to generate and investigate questions about yourself as a year one pre-service teacher and your understanding of literacy pedagogy.

The Praxis Inquiry Model will be used to assist you in this process.

This model involves the following:

Praxis:

1. Practice, as distinguished from theory; application or use, of knowledge or skills.
2. Accepted practice.
3. A set of examples for practice.

Inquiry:

1. A seeking or request for truth, information, or knowledge.
2. An investigation, as into an incident.
3. The act of inquiring or of seeking information.
4. A question; query.

Four Dimensions of Praxis Inquiry Protocol

1. Practice Described
2. Practice Explained
3. Practice Theorized
4. Practice Changed

Praxis Inquiry = Investigation into practice

Praxis Inquiry = Practice + Theory

The Partnership Project Experience

The unit of study will begin with inquiry into the Early Years (Literacy) Program. The explanatory resources, teaching and learning strategies throughout the course will be introduced in response to questions you will develop from your shared research.

Understanding Learning will be a hands-on active class where you will work in teams in a Praxis Inquiry Classroom Setting.

It will be extremely difficult to successfully complete this subject without taking an active role in debriefing sessions at the school following the classroom experience.

The experience will comprise of 8 sessions. Each session will be 2 hours in the classroom. A 30 minute debrief session will follow with your tutor.

The purpose of the debrief is to explore theories and practices that contribute to Literacy development in a classroom.

DEBRIEF SESSIONS: Allow you to:

- Question, share and discuss your experience.
- Generate some inquiry questions for further investigation through researching some readings.
- Document your learning via The Praxis Inquiry Booklet.
- Share the artefacts you are collecting.

We will need to work together to ensure that we value and respect what each of us can offer.

Appendix H. Unit 1

Learning Outcomes

On successful completion of this unit, students are expected to be able to:

1. Focus on the implementation of diversity in classrooms in relation to pedagogical approaches;
2. Focus on the range of pedagogies which are employed to support learning and develop an understanding of educational contexts;
3. Make connections between Project Partnership experiences and a range of theories/approaches of learning; and
4. Actively participate in Project Partnership experiences and engage in reflexive practices.

Graduate capabilities

Problem solve in a range of settings	3
Locate, critically evaluate, manage and use written, numerical and electronic information	3
Communicate in a variety of contexts and modes	3
Work both autonomously and collaboratively	3
Work in an environmentally, socially and culturally responsible manner	3

Assessment summary

The assessment for this unit is as follows:

1. Satisfactory School Based Journal and Mentor Report (These hurdle tasks are based on your first Semester school experience)	Due	Wk 1
2. Case Writing and Commentary	30% Due	Wk 5
3. Digital Portfolio and Presentation including Praxis Inquiry Booklet	70 % Due	Wk 12

Assignments are to be submitted to your tutor only via WebCT. Digital Portfolios to be presented and files to be submitted to your lecturers via USB, DVD, CD-ROM.

General Grading Guide:

Assignments will be graded using the university-wide system of HD, D, C, P or N. The descriptions of each of these gradings is as follows, but please note that assessment is a reflection of your lecturer's honest opinion of the completeness of your submitted work. The comments provided by your lecturer are intended to give you feedback upon which you can then reflect as you monitor your own professional development.

A (80–100%) High Distinction Outstanding level of achievement, demonstrating wide reading and an ability to conceptualise and to link the theoretical concepts addressed with the topic area, an original analysis of the topic and related material, a clear, logical and creative approach to exploration of the topic and an exceptional command of expression, argument and structure.
B (70–79%) Distinction High level of achievement demonstrating wide reading, a clear and logical analysis of the topic in light of that reading and theoretical concepts involved, well written, well argued, well structured, with a reasonable depth of insight and evidence of originality of thinking.
C (60–69%) Credit Sound pass, demonstrating more than just the basic reading, identification of the key aspects relevant to the topic with some critical evaluation of those aspects, but primarily descriptive of the literature rather than evaluative with some insight but little originality of thinking.
D (50–59%) Pass Pass, demonstrating that the student has read and understood basic references, has focused his/her discussion on the topic given and has offered relevant comment on the issues under consideration, limited insight, limited ability to employ theoretical concepts to the topic, poorly written, poorly organised and problems exist with the logic of arguments.
N Fail Unsatisfactory level of achievement as it fails to: a) Keep to the set topic; b) Demonstrate adequate reading; c) Reference sources adequately, and/or d) Present a coherent or relevant perspective.

Appendix I. Unit 2 assessment summary

Assessment 1: Research question & Literature (30%). 1000 words. Friday 16 th August			
Criteria		Comment:	Mark
A (2 marks)	Identified a Literacy question using an appreciative framework		
B (2 marks)	Identified three relevant questions Categorised (1x T, 1x O, 1xE)		
C (2 marks)	Explained context and why issue was pertinent		
D (5 marks)	Strategies for research explained – observation schedules, student work samples, and one short staff member interview (could be part of a group interview)		
E (10 marks)	Summarises existing knowledge from a range of sources		
F (9 marks)	Identifies main arguments – shows links to issue with connections and differences		
E (essential)	Meets criteria & is tertiary standard.	Y / N	
Total (/30)			

Assessment 2: Data Collection/Report of Findings (40%). 1200 words. Due Friday 20 th September. (Week nine)							
		N (0-50)	Pass (50-59)	Credit (60-69)	Distinction (70-79)	High Dist. (80-100)	Comment
	Criteria:	Does not meet criteria	Meets criterion in a basic way	Meets criterion in adequate way	Meets criterion to a high level	Meets criterion at a very high level	
A (5 marks)	Explains methods of data collection						
C (5 marks)	Presents the data in relevant and appropriate ways						
D (5 marks)	Puts the data collection into context						
E (15marks)	Overview of findings with quality, breadth and depth, of data collected						
B (5 marks)	Appendices includes the list of questions and other relevant artefacts. This is not counted in the word limit						
F	<i>Essential: Meets criteria and is of a tertiary standard</i>	Pass/Fail					Grade:

Assessment 3: Personal Theories and Presentation (30%) 800 words due on day of last lecture. Presentation 5 mins.							
		N (0-50)	Pass (50-59)	Credit (60-69)	Distinction (70-79)	High Dist. (80-100)	Comment
	Criteria:	Does not meet criteria	Meets criterion in a basic way	Meets criterion in adequate way	Meets criterion to a high level	Meets criterion at a very high level	
A (2.5 marks)	Organised: uses sub-headings & links argument to the issue What do you think now?						
B (2.5 marks)	Uses range of sources, the literature, the PI experiences, to connect, link and discuss the research question. (literature, findings, PP staff)						
C (2.5 marks)	Uses range of sources to connect, link & discuss (literature, findings, PP staff)						
D (2.5 marks)	Connects PP school to Literacy						
E (10 marks)	Draws conclusions, recommendations, new questions Research design – how could it improve?						
F (10 marks)	Presentation Using your essay notes as a prompt present a creative, individual presentation of up to 5 minutes summarising your overall research.						
G	<i>Essential: Meets criteria and is of a tertiary standard</i>	Yes/No – Pass Fail.					Grade:

Appendix J. Example of scaffolded support material for research assessment task Unit 2

Layout for research report

Introduction (~~plan already submitted~~)

Identify your issue that is related to your partnership school. Explain:

- How it connects with the teaching of literacy and language in your partnership school
- Why you chose the issue. Why it is an important issue to research
- What kinds of questions you are going to research

Review of literature (~~submitted with report~~)

What does the literature say about your issue?

In your report use direct quotes and link this to the arguments you are trying to present. Try not to quote big chunks. Instead, attempt to paraphrase the intellectual ideas you are presented with. You **must** reference the source you are paraphrasing from.

You must include a bibliography (use the Harvard method)

Make sure you make clear connections between your writing and the literature you refer to. Are there areas in the literature that shed light on the question you raised? Alternatively, does the literature raise concerns for you? Why?

Data collection

Explain the methods of data collection. You need to use a variety of methods to collect your data, but at least one interview should be used with someone in your partnership school (e.g. mentor, principal, specialist).

For interviews, make sure you have planned your questions before you interview the participant. Ensure that your questions directly relate to the issue. Take field notes while in your partnership school and use these when writing up the report. Include your list of questions and field notes in the appendix of the report.

You need to outline why you chose particular methods of data collection. Think about how you can record the data and present it within the report. Don't forget to include numbers and labels for any graphs and tables.

Data analysis

Use subheadings to organise your ideas. Ensure that you make use of facts rather than opinions when incorporating the data into your writing and arguments. Examine how teachers, administrators and students have responded to the issue you are investigating. How is this response tied to the teaching of literacy and language in your partnership school?

Ensure that you relate back to your original question when analysing your data.

Always tie your writing back to the original questions you raised.