Science and Mathematics Education Centre

Science Teachers' Conceptualisation of Professional Reflective Practice: A Reconstruction of the Impact of Pre-Service Interaction with Lecturing Staff

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made.

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university.

Signature: ....

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ABSTRACT

This study explores the formative basis of the professional reflective practice of in-service science teachers through their reconstruction of their pre-service interaction with lecturing staff. The study reports through the voice of graduates of the Bachelor of Science/Bachelor of Teaching double degree program of Avondale College, NSW who are currently practising in the classroom setting. Through these narratives the study focuses on mechanisms for the development of professional reflective modalities; and the levels of coherence between lecturers' actual practice of reflective, critical thinking and in-service teacher's conceptualisation of professional reflection that informs the development of their present professional reflective aptitudes, understandings and practices.

Teacher participants report a gradual process of the development of their reflective practice in their initial training. This development lacked any consistent pattern amongst the cohort. A significant increase in the frequency and level of reflection occurred subsequent to their first major practicum, which also saw their first major engagement of mentoring by academic staff. Participants reported that other training activities and processes associated with reflective practice were substantially abandoned in practice once they left the course. The study reports a strong linkage of deep reflective activities and high personal connection with academic staff. Academics who significantly engaged their students cognitively, emotionally and spiritually also engaged their students in a participative community that involved them in meaningful dialogue. These relationships exhibit an innate contagion of modelling practice; a relatively unintentional and automatic mimicking and convergence of the practices of another. The voice of participating teachers reported in this study that the degree of personal connection with academic staff appears to be the central significant factor on the development of reflective practice in their undergraduate years.

Participants in this study noted the significance of the mentor-mentee relationship in building repertoires of professional practice. Active modelling by academic staff was reported by teacher participants in the transmission of ethical values, lifestyle standards, and reflective practices. Most participants in this study reported a positive

demonstration of reflective practice by those lecturers they identified as being significant in their development as a person and as an emerging professional teacher.

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

'The irony of life is that it is lived forward but understood backward'
<div align="right">*Søren Kierkegaard (cited in Loughran 2002, p. 42)*</div>

1.1 Background of the Study.

A central question for those involved in the training of professional teachers is how does an institution

> *'prepare its students for the specific skills needed to perform the functions they must enact, while also preparing them to become the kinds of human beings – morally, experimentally, intellectually – to whom others are ready to entrust the performance of those functions?'* (Shulman, 2006, p. x).

Professions, such as teaching, that involve considerable internship experience as part of the formative training process focus on skill exploration and enhancement.

Students, like the professionals they aspire to be, struggle with questions evaluating their skills development for performing learning activities in their practice of the art of teaching. This process of questioning and evaluating is central to the teaching identity of each student. Teaching identity is a mix of performance-practice skills, theoretical frameworks, personal and professional reflection.

Schön (1983, 1987) emphasizes action-reflection pedagogies and the reconstructive function of practice for professionals such as teachers. Schön places at the centre of education of professionals the building of capacity in students to reflect and to develop throughout the professional's life the ability for continued learning and problem solving through reflection-in-action and reflection-on-action.

Early in the teacher empowerment movement linkages were made (Giroux, 1985) between effective changes in schooling practices, critical self-reflection (Shor, 1980) (Sparks-Langer & Colton, 1991) and dialogue (Gitlin, 1990; Gitlin & Price, 1992). Evaluation of the 'relationship between teaching intentions and practices that point to

"living contradictions"' (Whitehead & Lomax, 1987, p. 183) by teachers is central to the development of a 'thoughtful, self-directed professional' (Colton & Sparks-Langer, 1992, p. 155). Bright argues that reflective practice is 'the process which underlies all forms of high professional competence' (Bright, 1996, p. 166).

Holland, Clift, and Veal (1992) reflect on the 'balkanization' that exists between the worlds of the pre-service and in-service teacher, and the significant absence of linkages between these two worlds. Yet the development of a professional and their subsequent practice is a continuous one. Professional reflective activity (Clift, Holland, & Veal, 1990) has been noted as a central connection between these two worlds (Holland et al., 1992).

While, for practising teachers, much of the art of teaching is performed intuitively, and is not directly available for immediate recall (Yinger, 1986) the act of articulating processes and voice by supervising teachers has been observed as linking the conscious reflection of being an 'intelligently professional teacher' with 'learning to become such a professional' (Tomlinson, 1995, p. 184).

Concurrent with the considerable interest in teaching and learning in the tertiary sector (D'Andrea & Gosling, 2001) in the last two decades the recent literature on teacher education is replete with references to 'reflective professionals' engaging in 'critical reflection'. While ill defined (Hatton & Smith, 1995), the modern literature on reflective professional practice is prolific, commencing with the classic work of Dewey (1933). Dewey and later writers generally saw reflective practice as an active, persistent and careful consideration of the basic assumptions and conclusions one holds in one's direct experiences that inform future action (Whitton, Sinclair, Barker, Nanlohy, & Norsworthy, 2004).

Within the current critical tradition, research is validated in practitioners' self-understandings where the conditions of free and open dialogue operate (Carr & Kemmis, 1986). Professional competence is hence directly linked to a capacity to reflect and voice. Beasley (1981) describes professionals engaged in the act of reflecting on practice and consequently transforming their conceptualisations and actions as 'reflexive spectators'.

Baird (1991) and Knights (1985) in reviewing practical and effective stimuli to the development of teacher's reflective practice, both comment on the effectiveness of discussion and dialogue.

Osterman and Kottkamp (1993, 2004) place reflective practice, while personal, solidly in a collaborative and developmental setting, '[it is] neither a solitary nor meditative process … [it is] a challenging, demanding, and often trying process that is most successful as a collaborative effort' (2004, p. 19).

Nias (1992) also notes the efficacy of systematic reflection when undertaken in dialogue with others. Reflective practice then involves not just a reflection, it involves the transformation of professional values and actions of the individual professional and those they interact with (Ashcroft, 1992). 'Reflection on experience with subsequent action is the pathway to renewal' (York-Barr, Sommers, Ghere, & Montie, 2006).

It has long been known that traditional pre-service training has found the values of trainee professionals highly resistant to change (Hogben & Lawson, 1984) and the theoretical constructs they were exposed to were not put into practice (Argyris & Schön, 1974). Qualities such as open-mindedness, responsibility and wholeheartedness (Zeichner & Teitelbaum, 1982) and skills such as the ability to communicate, exchange ideas, engage in self assessment and teamwork (Ashcroft, 1992) appear to be precursors to the development of reflective practice.

Teacher education programs, both pre-service and in-service, often state that they are based on a reflective professional model (Furlong, Whitty, Barrett, Barton, & Miles, 1994). Lynch (2000), a critic of reflective practice, notes the centrality given to reflective practice in teacher education with the comment that reflection has become 'an academic virtue and source of privileged knowledge' (p. 26). Increasingly teacher education programs have given a central role to reflective practice as an important aspect of teacher formation (Griffins, 2000).

Clarke's (1995) study of factors that encourage or impede reflection by pre-service science teachers suggests that the nature of reflective practice in the teaching profession differs from that practised in the professions Schön based his works on. The complexity of extended, interwoven incidents across multiple contexts along

with problematic mentor relationships in teaching adds to the difficulties of exploring the nature of reflection within teaching (Calderhead & Shorrock, 1997). Grossman (1992) suggests that the impact of staff involved in the professional training of pre-service teachers may be more substantial than previously recognised.

It is evident that the most influential factors in shaping a professional teacher's practice are staff involved in professional training, supervising teachers, and peers (Calderhead & Shorrock, 1997). It has been reported that over time the influence of the staff involved in pre-service training diminishes, while the influence of fellow professionals increases (Guyton & McIntyre, 1990). The students taught also are influential (Knowles & Cole, 1994).

This research explores the genesis of the issues and trends in influence identified by Grossman (1992), and Calderhead & Sharrock (1997), specifically applied to the effects of staff involved in undergraduate professional training on pre-service science teachers' reflective practices.

1.2 Purpose of the Study

The purpose of the research was to identify, through a reconstructed understanding of the formative basis of teachers' professional practice, those elements within the complexity of the tertiary pre-service learning environment (Francis, 1997) that are perceived to impact on the development of in-service science teachers' reflective professional practice.

In particular, the study examined from the voice of practising science teachers:

- How professional reflective practices are developed during the pre-service experiences of science teachers, and whether that development is effective?

- How in-service teachers' subsequent development of reflective professional practice is affected by:

    - Interactions with pre-service lecturing staff, and

    - The perception of pre-service lecturing staff's practice of reflective critical thinking by science teaching graduates.

1.3 Significance of the Study

There is a growing body of educational research and literature that explores the forces that impact and shape student learning (e.g., Ballantyne, Bain, & Packer, 1997). Of particular interest to me, as an educator and administrator including past service as Academic Registrar in an Australian private Higher Education Provider (HEP) and currently as a Principal in a private K-12 school, are the experiences within a tertiary institution that assist pre-service teachers in the development and enhancement of their emerging professional reflective understanding (Wright, 2009). In particular, I have an interest in how students learn from interactions with lecturing staff in their major area of study.

Personal significance aside, this problem is worthy of investigation due to possible long-term benefits to professional training and practice for teachers and tertiary professional training pedagogy. Significant resources, both in pre-service training and in-service professional development, are expended specifically to develop professional reflective understanding. As noted by Mueller, (2003) the 'complexity involved in initiating beginning professionals into [reflective] practices requires further research attention' (p. 67).

The lack of time for critical reflective thinking by many practising professional teachers is well known (Kane, Maw, & Chimwayange, 2006; Moon, 2000). If the observations I have made personally during my years of teaching have validity any enhancement to professional reflective understanding will have significant consequences on the quality of teaching practice and student understanding.

Given that the impacts of pre-service training, and the aptitudes and attitudes developed during the training, are foundational to the practice of teaching during the life of a professional, the issues at the heart of the educational problem have long-term consequences. By focusing on pre-service professionals-in-training stage of the teacher's life for this research, I hoped to expose participants in the study to the potentialities and practice of personal critical thinking as a professional, enhancing their own understanding of how they learn and how their understanding and practice can be enhanced through critical reflection (Clark, 1988). This intentional nature of the research evidences a strong grounding in critical theory methodology.

Lecturers involved may also have been made more aware of how explicit their intentions and the realities of their practice are in reflective interactions with the mentored students. In a small way, this study also aimed to add to what has been perceived as an evidence base that supports reflective practice, something that has been noted to be deficit in the literature (White, Fook, & Gardner, 2006), particularly research about outcomes. Research on pre-service teachers has traditionally focused on their actions, rather than their 'views and considerations' (Pedro, 2001, p. 20). Pedro (2001) particularly notes that

> *'very little research has been conducted about how education students perceive the process of reflection, and how they come to understand themselves as reflective practitioners' (p. 20).*

This research has significance in attempting to add to this body of knowledge.

The immense impact of professional development and experience lecturers in particular have in mentoring and shaping the conceptualisation of professional reflective practice makes this tension one of immense significance, especially when many are in danger of losing currency in their own classroom based teaching experience. Many students, conversely, have recent vicarious classroom perspectives, a thirteen plus years in the 'apprenticeship of observation' (Lortie, 1975, p. 61) and have a strong sense of the impacts of professional practice on their own learning. They also often experience dismay and dissonance as they discover that

> *'learning to teach is a much more complex and sophisticated process than was expected ... [and are] ... often frustrated and disquieted by the uncertainties and ambiguities of real professional learning' (Beattie, 1997, p. 115).*

Growth in understanding is a desired and significant outcome in the learning experiences of the educational process, as one 'learns to learn' (Carr & Claxton, 2002, p. 9). The varying roles and backgrounds of the participants may well reveal differentiation in the rates and scope of growth and change in understanding and practice, informing the issues raised as identified by Grossman (1992), and Calderhead and Sharrock (1997).

DeMulder and Rigsby (2003) reflect on the lack of documentation in the research on reflective practice of actual teacher experience and voice. As this research was focused around hearing the voices of teachers, the study added to this documentation and also makes a contribution towards the reported dissonance in alignment evident between what is said of reflective practice in research and what is done in teaching (Marcos, Migel, & Tillema, 2009).

Future teaching performance is evidenced by the propensity of pre-service teachers to reflect on the results of their actions and to realistically make assessment of the future implications of these actions (MacKinnon & Erickson, 1988). The identification of characteristics and relationships that build this propensity and capacity may assist in enhancing future teacher education program delivery. Mueller and Skamp (2003) also observe the 'critical need to investigate if and how teacher educators themselves engage in continuous reflection to advance or improve their teaching practice' (p. 429).

Having spent a considerable proportion of my time as an educator in institutions that significantly invest in values education and give significant emphasis on teachers' modelling of education and service, I see significance in the development of reflective practice, especially given its documented linkages to values education (Taylor, 1998) and the relationship of those linkages have to initial teacher education (Reynolds, 1999). Rothwell and Ghelipter (2003) note the need for further research on the role of the lecturer in facilitating reflective learning.

The research also had significance to me personally. During employment as a senior teacher and administrator in the secondary school sector in both the private and public sector, in two countries, I have observed that there is significant variation in the aptitude and attitude of teaching staff to the exercise of reflective personal professional understanding. As I anecdotally observed staff I considered to exhibit high levels of reflective personal professional understanding, I noted that there was a high co-relation to their on going interest in professional development and in improving their pedagogical practice. Allied with this I noted a strong level of interest in, and interaction with, their students as individuals.

In 2004, I participated as a teacher-researcher in a project that explored with students what made sense in classroom learning in a New Zealand secondary school (Kane,

Maw, & Chimwayange, 2006). Participation in the project dramatically altered my perspectives on students as learners; opened new vistas to me as a professional regarding the differentiation between learning, achievement and understanding; and demonstrated the power a respectful dialogue and 'active interrelationship' (Suttle, 1983, p. 42) between teacher and student can have on the development of understanding.

During the last few years, I have closely interacted with tertiary students undergoing training in a range of professions. In particular, I have interacted with undergraduates commencing pre-service teaching courses, as my two children and spouse have been enrolled in such courses. In these interactions, I have noted similar patterns of interaction and development that I noted in the secondary school sector. In particular, the role of lecturers as professional role models and the influence of student's interaction with them in shaping and developing emerging professional aptitudes and attitudes has been evident at an anecdotal level. The research may have significance for individual graduates participating as the research is intentional in seeking to alter developing teaching practice and effect a change in the roles and attitudes of participants.

Nationally in Australian tertiary education there is a renewed interest in, and emphasis on, the role of excellent teaching practice by lecturing staff. While there is significant investment through the Carrick Institute on recognition of excellent pedagogy through awards and grants, there is little research on the impact of tertiary teaching practices on teachers in training. As a former member of senior administration in a HEP that has a rich and long history of professional teacher training, I have an interest in exploring in a more systematic manner the linkages I have already observed in a casual manner.

For Avondale College, Adventist Schools Australia, and the key staff in these organisations involved in teacher education and staff development this research has significance in independently reporting on graduates' recollections regarding the development of a core element in their professional development. Implications from the study for the teaching and learning undergraduate environment at Avondale College are significant. Some of these implications relate to the faith-based nature and culture of a denominationally operated tertiary institution. As Avondale College

is one of many tertiary institutions operated by the Seventh-day Adventist Church that train teachers, the issues of significance for Avondale College may also be of importance for the wider tertiary teacher training institutions of the church.

My personal interest in the development of excellent reflective professional understanding is enhanced by my present role as a Principal of a K-12 school. The coincidence of my professional background, my participation in the New Zealand project, my family members recent enrolments in teacher education courses, my present role as an educational leader, all provided personal significance for this research.

The process of working on my doctoral studies also has given me many moments to reflect, not just on the nature of my own reflective practice, but on the process of the course completion and the research experience itself as a reflective learning experience (Johnson, 2001; Johnson-Leslie, 2009). As a highly choleric individual, I have found my personal journey of discovery regarding reflective practice both challenging and rewarding. As an individual educated predominately in a positivist framework, I found engagement in qualitative research a rewarding and novel experience.

1.4 Overview of Methodology.

The research is informed through a critical theory research framework. Critical theory, given its transformational agenda, has a strong praxis research base, with consequential research methodologies that in turn impact practice. The stress on empowerment has seen a strong emphasis on participant and practitioner research.

With a transformative, political intention to emancipate and redress inequities the critical theory paradigm seeks to effect change to the status quo. Any knowledge counted as of value is a reflection of the socially constructed interests at play (Habermas, 1973, cited in Shulman, 1997).

Methodologies used in this research reflect a more individualised, idiographic foundation. The methodologies used are qualitative in nature, with an emphasis that focuses on understanding the 'way in which the individual creates, modifies and interprets the world in which he or she finds himself or herself' (Cohen, Manion, & Morrison, 2007, p. 8).

This research built on the existing methodologies used in qualitative studies of reflective practice: namely, interviews with participants, or analysis of written textual materials (White, Fook, & Gardner, 2006). The research primarily used qualitative research methods, building on dialogue, correspondence and partnership between the researcher and the participants, seeking to inform the relationships from the participant's perspective. With an emphasis on description and explanation, interaction with the in-service teachers involved the recording of personal experience, introspection and interviews by the participants and through interactions with the researcher using email correspondence.

Participants

The study involved those graduates from the Bachelor of Science/Bachelor of Teaching program and the Bachelor of Education (Primary) (KLA Science or Mathematics) program delivered at Avondale College, New South Wales. Avondale College as a private higher education provider has been offering tertiary courses since 1892. The courses offered have been oriented towards professional training primarily in the fields of education, business, nursing and theology. Since the 1950's, undergraduate courses, initially in affiliation with the University of London and Pacific Union College (California), were offered. Since 1974, Avondale has offered its own courses with Australian accreditation, including masters and doctoral programs of study introduced during the last decade.

Avondale graduates typically give the highest ratings for their tertiary experience and quality of teaching, employable generic skills and overall student satisfaction. A high staff-to-student ratio also contributes to reported overall student satisfaction with the educational experience (Evered, 2007).

In sampling graduates for interview, preferential selection was given to graduates who are currently practising as science teachers in the Adventist Schools (Australia) system. The potential sample size was relatively small, with less than 60 graduates from the BSc/BTch program in the last 15 years, 25 secondary schools operating in the Adventist Schools (Australia) system, and not all teachers in the system being graduates from Avondale College, and not all graduates being employed in the Adventist Schools (Australia) school system.

Data collection and analysis

The interviews with available graduates occurred in a face-to-face setting. Interviews, with the consent of participants, were taped in either video and/or audio format. Subsequent to the individual interviews, cohorts of graduates in a locale were interviewed to elicit the enhanced dialogue exchanges in the dynamics of a group. Graduates had the opportunity to review and reflect on their interviews and to comment further; either in person or via e-mail correspondence.

The research design sought to capture what graduates' voice about their pre-service and subsequent reflective practices and the impacts that the modelling of these practices by their undergraduate lecturers had on the development of their own professional practice. The graduates' voice revealed the conceptions, beliefs and thinking that support their practice. Their voices also provided, in a small way, a response for the request for an articulation of voice from participants in teacher training (Mueller & Skamp, 2003). The research here has an 'enunciative function' (Deeny & Chambers, 2004, p. 137). Individual and graduate-focus group interviews, documentation based on feedback from records of interview, and stimulated recall interviews provided multiple sources for the triangulation of data.

Initial interviews with individual graduates provided graduates with an opportunity to talk about reflective practice and the ways they have experienced and understand it. They also were asked to identify those barriers and aids in their personal professional journey of reflective practice.

Group interviews (and individual interviews) provided an opportunity to stimulate recall of lecturers and their individual contributions to the development of individual teacher's construction of what constitutes reflective practice in their own professional life.

The use of fictitious names preserved participant confidentiality. Descriptions were edited to remove identifying elements. Participants were given copies of interviews for collaboration on intent and accuracy.

The sequences of interviews served both as a primary data collection device and as a means of permitting teachers to critically interrogate their own practice (Kane, Maw, & Chimwayange, 2006).

1.5 Overview of the Thesis.

This thesis consists of six chapters followed by a references section and several appendices.

The first chapter contains a brief overview providing a background to the study, an outline of why the study is significant, and a summation of the methodology. The second chapter comprehensively reviews the literature relating to previous research in the areas of mentoring of in-service teachers, reflective practice in education with specific reference to the research questions that are the focus of this thesis.

Chapter Three outlines the methodology used in the study and its implementation. It contains the research questions and describes the qualitative methods used in the study. Chapter Four reports on the results of the qualitative data analysis, enabling the voices of the participants to articulate the key themes derived from the literature. Chapter Five is a discussion of the findings centred about the key research questions.

Chapter Six presents a summary of the major findings of the study and presents a range of possible avenues for future research arising from the study. The references and the appendices follow this chapter.

CHAPTER 2

LITERATURE REVIEW

'… teaching essentially involves an active interrelationship between teachers and students, not merely the transference of information or instructions from teachers to students … [and] while many enjoyable moments in the classroom are not instances of good teaching, all instances of good teaching are enjoyable events. The best device to persuade a … teacher that … getting students to reflect critically really works is by exhibiting or describing the amount of enjoyment, insight and self-satisfaction that results from teaching methods which involve an open, non-defensive exchange between the educators and students over the relevance and merit of fundamental beliefs and values. The beauty of such an approach is that more often than not everyone comes out of the dialogue the better – both the teacher and students have had to reflect critically upon beliefs and values. It is not often in this world that one can do good, be responsible and at the same time enjoy it.'

Bruce B. Suttle (1983, pp. 42-43)

'An unexamined life is not worth living'

Socrates

2.1 Introduction.

There has been prolific publication of popular, professional and scholarly monographs and articles regarding both reflective practice and mentoring, particularly since the 1980's. This chapter reviews this large body of literature, particularly as it relates to educational practice. The review commences with a broad overview of reflective practice in pre-service education, especially within relationships of co-engagement and mentoring.

The overview is followed by a review of the literature from the last three decades relating to mentoring, with a particular emphasis on the place of mentor roles and the effects of synergetic mentors in relation to pre-service teachers during their initial professional training. The changing emphasis in the literature is noted, especially as it relates to the impacts of teacher educators and the mentoring of pre-service teachers. The movement from transmission and guidance, through to partnership, and then the active construction of knowledge and co-learning reflects the broader movements within teacher education.

A discussion of the literature on the reflective mentor notes the characteristics and research relating to effective mentoring of reflective practice, and leads into the review of the literature regarding reflective practice. The classical models of reflective practice arising from the works of Dewey and Schön are outlined along with a discussion of key elements of reflective practice and issues relating to the definition of the concept. An integration of the disparate perspectives of reflective practice is given through an extended outline of the core, common focuses identified within the literature.

The literature review then focuses specifically on the literature relating to the interface of reflective practice with teacher education prior to integrating the literature relating to the twin concepts examined within this research: mentoring and reflective practice.

2.2 Overview.

Teacher education programs have over the last three decades given increasing emphasis to reflective teaching. Weshah (2007) links the interest of teacher educators in reflective practice with the changes in cognitive psychology and the increasing dominance of constructivist theory over the last three decades.

While teacher education programs espouse a number of aims (Calderhead & Gates, 1993) and use a range of tools such as action research, reflective journals, coaching etc., there is general concurrence in the field that the placement of the ideas about reflective practice into practice is difficult. Calderhead (1993) identifies the associated issues and dilemmas for teacher educators. These concerns centre about the broader question of how reflection is developed and nurtured within the complex processes (Loughran, 1996) of professional development associated with teaching and learning.

Hatton and Smith's (1995) review of literature on the development of reflective practice in pre-service teachers focuses on written forms of evidence. The study concludes that final year students show clear evidence of reflection in their written work. The majority of evidence involved descriptive reflection, followed by dialogic reflection, with very few documented incidences of critical reflection evident. Hatton and Smith's study of Sydney University pre-service teachers also emphasises the

importance of having 'others [peers and academic staff] to facilitate reflection' (p. 15), especially 'the important other' (p. 16).

It is evident that teacher educators have high expectations of reflective practice in pre-service teachers while it appears that some lengthy periods of time are often required for levels of reflection to develop (Calderhead & Gates, 1993). Reflection emphasises understanding by means of learning through questioning and investigation (Smyth, 1992 cited by Loughran, 2002). There does appear in the literature to be a consensus that there is a developmental process in becoming reflective (Loughran, 1996; Pultorak, 1996; Steffy, Wolfe, Pasch, & Enz, 2000).

Lived experiences, vicarious and observed, are powerful influences on the formation of beliefs, values and practice. Mentoring 'provides an informed, experiential foundation on which to advocate and commit to expanding the practice of reflection beyond [ones] self' (York-Barr, et al., 2006, p. 20).

We do not learn significantly from experience, but from processing experience (Arin-Krupp, 1982). Significant others, such as mentors, provide hope and optimism for our own practice, through their experience (Block, 2002).

Co-engagement in reflection is highly supportive of the process of reflective practice (York-Barr, et al., 2006). Dewey saw reflection occurring in the context of community (Rodgers, 2002). Quality relationships, connection and associated emotional states are key determinants of the quality of reflective practice (Ellinor & Gerard, 1998). Relational trust is a core condition to foster reflective practice (Bryk, Camburn, & Louis, 1999; Osterman & Kottkamp, 1993).

For pre-service teachers, lecturing staff are key relationships of trust as they commence their professional training. For those new to reflective practices, guidance and structure positively support the process, especially in the development of critical reflection (Dinkelman, 2000; Spalding & Wilson, 2002; Yost, Sentner, & Forlenza-Bailey, 2000). Reiman (1999), drawing on Vygotsky, created a reflective framework that portrayed knowledge construction in reflective practice as a co-creation through interaction with others; particularly a 'capable other' in 'guided reflection'. The mentorship of lecturing staff as the 'capable other' deeply imprints a model of

professional practice that has life-long learning and professional development impacts.

2.2 Mentoring

Mentors, those 'experienced and trusted counsellors … who guide and advise', (Hawkridge, 2003, p. 15) have been important in education since classical times when Mentor assisted Telemachus, son of Ulysses and Penelope. Martin (1996) observes that mentoring is a complex and multi-faceted task, with no simple prescriptive guides, rather being undergirded by a set of fundamental principles. Cain (2009) observes that a range of reviews of mentoring note the idiosyncratic nature of mentoring and the evident contradiction between the research literature which focuses on the ideal and benefits and the case studies literature which emphasise the complexities and challenges.

Improving the initial experiences of pre-service and novice teachers has been an area of interest in educational literature (Ingersoll, 2001) for the last three decades (Gilles & Wilson, 2004), due largely to the costs associated with very high attrition rates associated with this period of a teacher's life-cycle and the consequential adverse effects on student engagement and achievement, especially in challenging socio-economic areas (Darling-Hammond, 2003). Mentoring has received particular emphasis in the North American sphere (Hawkridge, 2003).

Mentoring accelerates professional competence (Darling-Hammond, 2003) as well as positively improving retention in the profession. Gilles and Wilson (2004) note that mentors are defined by the act of mentoring, rather than by any particular set of characteristics, with the role of mentors varying from program to program.

Levinson, Darrow, Klein, Lecinson, and McJee's (1978) early study detailed that a major variable in maturing as an adjusted human adult was the formation of a relationship with a mentor. Cobane (2005) outlines the equal importance of mentors and intense mentoring in an undergraduate education as one develops the foundations of their professional career. Palmer (1998) places a focus on the 'who' in teacher education; self-awareness, and one's interrelationships in 'one's learning journey' (Pavlovich, 2007, p. 282). Maclean and White (2007) link the process of the formation of a teaching identity with the mentor-mentee relationship.

Teachers are the primary factor in student learning and achievement gains (Darling-Hammond & Youngs, 2002). Mentoring that occurs between an experienced practitioner and an emerging teacher is the most important variable (Huling, 2006) in inducting teachers purposefully and effectively into the profession (Basile, 2006; Wang, 2001), with consequences for student achievement (Wong, 2004), teacher retention and teacher effectiveness (Wong, 2003).

The degree of teacher learning and collaboration is significantly impacted on by the culture of an educational institution (Basile, 2006). Beijaard, Stellingwerf and Verloop (1997) observe that the quality of relationship one has with one's students, including the willingness to act as a role model, is a prerequisite for professional growth. Le Cornu (2005) notes the trend in the literature on mentoring for pre-service teachers towards an increasing emphasis to conceptualise mentoring in terms of collaborative and collegial relationships, including peer mentoring within the context of learning communities.

Mentor roles

Schien (1978) describes a mentor as: a coach; a positive role model; a developer of talent; opener of doors; protector; or sponsor. Galvez-Hjornvik (1986) speaks of a mentor as a trusted guide, counsellor and teacher-guardian. Borko (1986) expands on the teaching role of a mentor describing the role in terms of a colleague teacher, helping teacher, peer or support teacher. A mentor utilise his/her experience as a practitioner to guide the development of the inexperienced (Goldberry, 1998). As masters of the craft of teaching they bring their empathetic and personable understanding to the role (Zimpher & Grossman, 1992). Daloz (1986) proposes three core activities in mentoring: supporting; challenging; and visioning.

Jacobi (1991) in reviewing the literature on mentoring identified five key components: a focus on life-long development; one or more of role modelling, providing direct assistance, and emotio-psychological support; a reciprocity of relationship; personal rapport; and a contribution of expertise by the mentor. Koch and Johnson (2000) outline the imparting of wisdom, knowledge, encouragement and assistance in skill development as key mentor roles.

Yeomans and Samson (1994) describe three dimensions in a mentor's role: the structural dimension where the mentor prepares the way for the student by assisting

as a planner, organiser, negotiator, and inductor; the supportive dimension where the nature of the mentor-mentee relationship is created through the roles of host, friend and counsellor; and the professional dimension where the mentors act as trainers, educators and assessors. Mee-Lee and Bush (2003) noted four characteristics that positively contribute to successful mentoring: understanding and empathy; accessibility to students; good communication skills; and enthusiasm.

Cain (2009) observes that the expectations of mentors, linked to their strong nurturing natures, is often very high, leading to disappointment in their inability to meet their own internalised expectations. There is within the literature on mentoring a strong differentiation between apprenticeship approaches to mentoring and those studies that emphasise the development of reflective practice.

Effects on synergetic mentors

Mentorship implies a sense of reciprocity in relationship, contributing to the professional development of both the mentor (Holloway, 2001; Tatel, 1996; Wollman-Bonilla, 1997) and the mentee (Vonk, 1994). Farnsworth and Morris, (1996) report that in highly effective mentor-mentee relationships with high levels of synergy the mentors admit that they learned as much, if not more, from the mentees as the mentees learned from them.

Mentoring stimulates reflective practice and introspection about teaching in mentors (Ganser, 1996; Tatel, 1996), leading to rejuvenation, increased collaboration with others (Davies, Brady, Rodger, & Wall, 1999; Inch & McVarish, 2003), increased knowledge of subject matter, personal enjoyment and learning new ideas and techniques. The changes (Clinard & Ariav, 1995, 1997) reported by mentoring staff positively impact on their own teaching.

Relational and ethical supports are important elements in mentoring (Adey, 1997) along with open-mindedness, reflectiveness, empathy, creativity, listening skills and a helping attitude (Klausmeier, 1994; Vonk, 1994).

Teacher-educators and mentors

As in most creative acts the mentoring role is somewhat ambiguous, lacking precision and clarity (Harris, 1998), especially for those involved whose primary role can be defined in terms of other responsibilities such as research, course

development, lecturing and associated duties of undergraduate academic staff, that occur in a context that is rapidly changing (Elliot, 1998). While there is a wealth of literature regarding the teaching beliefs and practices of university lecturers, it has been reported (Kane, Sandretto, & Heath, 2002) that much of the research is unconfirmed by direct observation of what they do in practice.

Linkages with pre-service mentors from tertiary training institutions in the initial years of teaching are seen as beneficial (Basile, 2006) as is promoting collaborative learning opportunities in the workplace – building a life-long perspective on professional development. Flores (2006) notes the difficulties with the obstacle of distance between schools and the training institution, however she also notes the benefits of partnerships between schools and the initial training institution.

Flores (2006) along with Lieberman and Miller (1990) reflects on the role of teacher educators and the fostering of collaborative engagement partnerships with schools, bringing together teacher educators, mentors and teachers. Huling (2006b) suggests a causal linkage between support, especially through mentorship, and the emerging professional's ability to deal with the challenges of teaching and their development of positive emotions regarding their experiences.

It has been observed that methods used in teaching pre-service teachers have a greater impact on the pre-service teachers' thinking about professional practice than the content being taught (Berry & Loughran, 2002; Russell, 1997). Pre-service and initial in-service relationships and experiences are critical in the formation and development of teachers' attitudes, views, practices and understanding of self as a professional (Flores, 2001; Tickle, 1994). Along with induction and in-service education and training, the pre-service professional programs and experiences are described as the 'triple-I continuum' of teacher professional development (Bolam, 1987, p. 755).

The increased emphasis on narrative (Clandinin & Connelly, 1995), reflection (Russell, 1997) and practical knowledge assists pre-service teachers in reconceptualising their own learning experiences (Hamilton, 2002), attitudes and beliefs. Novice teachers, at the conclusion of their initial training, bring 'an enviable resource of intellectual capability' (Tickle, 2000, p. 2) to their new professional life.

The dispositional development of pre-service teachers has not received the same priority or emphasis in teacher education programs as the concentration on knowledge and skill development (Raths, 2001). In reviewing the dispositions of educational mentors Johnson and Reiman (2006) notes that teaching is 'built on cognitive constructs in the moral and reflective domains' (p.147). Mentoring not only includes dispositions and values, conceptual and theoretical understandings, and the skills for implementing the practice (Odell, 2006), it requires a significant investment of preparation and time (Odell, 1990) and is a difficult role to successfully implement (Zeek & Walker, 2006).

Mentoring pre-service teachers

There is a rich literature on mentor relationships for beginning in-service teachers that highlights the importance of such relationships when professional practice, attitudes and skills are in their genesis. Mentors have been described as 'support providers' (Wood & Waarich-Fishman, 2006), with a core role of encouraging the emerging professional to reflect and apply what has been learned from the present to future practice (Moir & Gless, 2001). Villani (2002) relates the quality of early teacher development to the act of the developing teacher continually collecting evidence about their teaching and reflecting on this to self-assess their practices and plan for future application as they move from concerns about mastery and day-to-day survival to more reflective teaching practices (Ingersoll & Thomas, 2004).

Novice teachers, in their own voice, when describing their emergence into the teaching profession, often do so in negative terms (Flores, 2006; Huling, 2006b), affirming the need for more pro-active support mechanisms such as mentoring. Peer collegiality and mentoring are key factors in determining whether these formative experiences are seen by the individual teacher as a positive or negative one (Huling, 2006b).

Alerby and Elídóttir (2003), Dawson (2003), and Oberg (1989) in the concept of 'space' draw attention to the need for 'times and places for [contemplation] of what it means to be educators in [that] situation' (Oberg, 1989, p. 63) and the

> *'challenge facing educators … to create the necessary conditions to*
> *foster the kind of contemplative silence that nourishes the creative*

impulse lying at the heart of all significant learning and living'
(Dawson, 2003, p. 33).

Annzul and Ely (1988) extend this in their observation that

'the reflective practitioner makes a space. And while that space gives
no guarantees, it allows us to think again, to do again, and slowly, to
breach the stagnant moat between what most of us do and what most of
us know we should do' (p. 27).

Ghaye (2000c) notes that the learning that arises from reflective practice 'needs to be given the chance to breathe and emerge' (p. 109). West and Milan (2001) note the role of a mentor (coach) in creating a psychological space that enables the mentee to stand back from the immediate workplace in order to focus and reflect on their roles, tasks and experiences.

Yendol-Hoppey and Dana (2006) in a case study use the metaphor of a gardener where the mentor encourages the protégé to assume the role of teacher rather than that of the student, in order to cultivate 'the stance of a professional engaged in learning about her own practice' (p. 113). Yendol-Hoppey and Dana (2006) link this activity with efficacy. Efficacious people perceive events as learning opportunities (Garmstom, Lipton, & Kaiser, 1998).

The ability and openness to forums that provide exploration, expression of confidence, and the raising of questions are built on dialogue, relationship and a sense of ownership of the learning experiences. Conversations about teaching are important for the development of teachers' professional knowledge (Wang & Odell, 2002) and are assumed to help mentees to teach in a manner consistent with curriculum standards (Austin & Fraser-Abder, 1995). Mueller (2003) notes that it is 'essential that teacher educators find ways to initiate discussion with their teacher candidates who usually have very different beliefs about teaching' (p. 67). Grossman, Hammerness, and McDonald (2009) note the centrality in tertiary professional training of 'eliciting student thinking during interactive teaching' (p. 280). These relationships and conversations offer the opportunities to develop a deeper understanding of subject matter and make better classroom representation of subject material (Feiman-Nemser & Parker, 1990). The level of elaboration

(examples, reasons) within such conversations has been used as a means of measuring the degree to which the conversations are reflective in nature (Wang, Odell, & Strong, 2006).

In the early 1980's the emphasis in the literature for mentors was on assisting mentees to solve problems and to reduce stress. Based around the interpersonal skills, mentors sought to be empathetic and builders of self-esteem and confidence in the mentee (Odell, 2006). This mentor role was one of a transmitting guide (Feiman-Nemser & Parker, 1992). It has been noted (Cochran-Smith & Lytle, 1999) that the mentoring relationship assists the reproduction of the existing culture and practice of teaching, while reflective thinking is a 'possible avenue for changes to the culture of teaching' (Sparkes, 1991, p. 17).

During the late 1980's the emphasis in the literature moved to having educational mentors learning about the art of teaching from their mentees. In this the mentors served as educational companions (Feiman-Nemser & Parker, 1992), helping mentees through conversations about teaching and learning (Wildman, Magliaro, Niles, & Niles, 1992) to examine, reflect and learn about their teaching. Concurrently, tertiary institutions increasingly encouraged partnership programs enabling pre-service students to engage more fully in practical school experiences. Educational mentoring was extended to pre-service students from the process of induction for beginning teachers.

The literature of the late 1990's displayed an emphasis on mentors moving beyond the transmission of traditional teaching skills towards a focus on active construction of knowledge and associated elements of the educational reform movement (Odell & Huling, 2000). Mentoring here aided connecting exploration, inquiry, discourse, and personal experiences to the context of real life (Wang & Odell, 2002). As noted by Le Cornu (2005), the emphasis on co-learning and co-construction of knowledge in mentoring situations 'challenges the traditional hierarchical relationship dynamics by positioning the participants differently' (p. 358).

Tang and Choi (2005) note the significant changes in the educational literature on mentoring as it moved from a humanistic basis of helping novices through emotional support and professional socialisation in a hierarchical relationship, to a perspective of mentoring as a means of achieving educational change via pre-service teachers as

change agents. The orientation of mentoring also has altered from a focus on professional development to a more student achievement orientation.

The published research on educational mentoring reflects strongly on school based mentoring, with less material on tertiary based mentoring programs for in-service teachers. Only a minority of tertiary lecturers have ever received formal teacher training or learn little about instructional strategies and associated learning theories (Ballantyne, Bain, & Packer, 1999; Louie, Stackman, Drevdahl, & Purdy, 2002). Consequently, individual lecturers' pedagogical practices are generally based on their personal beliefs and cultural norms (Johnston, 1996). Many lecturers anticipating students will follow their leading (Petersen-Perlman, O'Brian, Carlson, & Hilsen, 1999), present knowledge-transmission rich presentations (Kolitch & Dean, 1999), avoid student-centred instruction (Felder & Brent, 1996) and are adverse to teaching and learning modes that give undergraduate students free interaction with them (Louie, et al., 2002), preferring broadcasting modalities (Ballantyne, Bain, & Packer, 1999).

Teacher-educators by comparison often have formal teaching qualifications and experience. As such they often have a vicarious and theoretical knowledge of the range of teaching strategies and learning theories. Many also directly observe current pedagogy in their research or practicum liaison roles. The role of teacher educators as mentors or coaches is seen as being critical (Basile, Olson, & Nathenson-Mejía, 2003).

The literature on mentoring has increasingly given emphasis to the reciprocity involved in mentoring (Gillies & Wilson, 2004), with Zachary (2000) reporting on the stimulation of mentors emotionally and intellectually as a result of their involvement with mentees. Zachary (2000) also reports that the questions raised in the dialogue between mentor and mentee cause mentors to become more introspective as they gain new perspectives and knowledge as a result of their interaction. A commonly reported outcome of the mentor-mentee relationship is the opportunities and promptings for 'critically reflective' (Zachary, 2000, p. 162) moments for the mentor.

The reflective mentor

Teaching is a collegial act, one of inquiry and reflection (Kroll, 2005). Dynamic mentoring, with a capacity to cope with change, also involves reflective practice (Basile, 2006). Chapman (2008, p. 46) discusses the work of 'the reflective mentor' supporting 'learner-intentional reflection'. Building on Klob's (1984) four stages in his transformational learning model: concrete experience; reflective observation; abstract conceptualisation; and active experimentation Chapman (2008) proposed that there were also stages in reflective mentor development.

Schön (1988) uses the term 'instructional supervision' and 'reflective supervision' to describe 'any activity that supports, guides, or encourages teachers in their reflective teaching' (p. 19), including in-service training. Schön describes mentoring as a form of coaching 'through advice, criticism, description, demonstration, and questioning, one person helps another learn to practice reflective teaching in the process of the doing' (p. 19).

For Schön modelling reflective practice through mentoring is a core supervision activity. Schön's work (1987) on coaching (mentoring) was developed as an exemplar of the epistemology of practice outlined in his earlier (1983) work (Sprinthall, Reiman, & Thies-Sprintall, 1996), providing the core contemporary linkage in the literature between reflective practices and mentoring.

Using the imagery of a 'Hall of Mirrors' Schön notes that the act of demonstrating reflective practice 'in the very process of trying to help the other learn to do it'. This reciprocal, educative informing Schön notes contributes to 'healing the breach between research and practice that has long plagued schools of education' (Schön, 1983, p. 29). As a helper the mentor becomes one 'who is sensitive to the issues and concerns of becoming a science teacher' (MacKinnon & Erickson, 1988, p. 118).

Kember and McKay (1996) note the place of reflective practice in enabling lecturers to perceive the assumptions their teaching is based upon. Teaching practice, rather than the discipline the lecturer is associated with, informs their teaching knowledge (Cranton, 1994). The lecturer's own experience as a student, role models and feedback received add to the sources used to inform practice (Boice, 1996). Self-reflection (Mezirow, 1991), articulation (Posner, Strike, Hewson, & Gertzog, 1982)

and discourse regarding teaching enable lecturing staff to revise their idiosyncratic assumptions and myths (Louie, et al., 2002) about teaching.

McIntyre (1993) proposes that reflective practice for experienced educators such as teacher education lecturing staff is central as a means of learning because much of their daily practice is automated or intuitive and they need to deliberatively articulate their understandings, assumptions and practices. Likening such staff to Schön's expert practitioners (Schön, 1983), McIntyre notes that experienced educators have a greater capacity than novices to learn through reflection on their experience.

Linder, Leonard-McIntyre, Marshall, and Nchodu (1997) reporting on the use of senior undergraduate physics students as tutors for first year undergraduates using a reflective coaching methodology notes the importance of 'coach[ing] to continually interchange perspectives' between tutors and their coach in a counselling-like context. The academic coach in this setting became 'metalearning inducers' (p. 829) and bona-fide role models.

Costa (2006) comments on the impact on the genesis and encouragement of reflection in individuals when reflection is implicit in an institution's values, policies and practices. The role of adults in not only facilitating the making of meaning in the learning process but by serving as 'models of reflection' enables 'experiences to be meaningful and [enable the] acquisition of [the] humility of continuous learning' (Costa, 2006, p. xviii), with the potential to 'awaken and rouse to life functions which are in the stage of maturing, which lie in the zone of proximal development' (Vygotsky, 1956, p. 273).

In the initiation of the mentoring of reflective practice, Schön (1988) observes that the mentor not only helps and encourages, but also 'provokes' (p. 22) the other to reflect on their own practice. In order to achieve this, there is a need for the mentor to reach beyond their own zone into the sphere of interaction with the mentee, or as Schön expresses it as 'to get to the inner relationships [one] must always pass through the outer one' (p. 22).

This process is not one of comfort and routine. Central to reflective practice is surprise, puzzlement and confusion. Associated with these emotions are often 'vulnerability, anxiety, and defensiveness' as well as a sense of things 'being out of

control' (Schön, 1988, p. 22). Palmer (1999) articulates this in his description of the art of teaching as 'a daily exercise in vulnerability' (p. 7). The personal and professional growth that this involves is essential for effective mentor support, as 'a practitioner cannot support another in growing if they are not growing themselves' (Bolton, 1999, p. 196).

Such emotions and states of being can be alien in an institution such as a university where knowledge and answers so often dominate. Where 'answers', 'correct responses', 'security in thinking', 'sets of assumptions', 'systems' and 'mastery' (Schön, 1988, pp. 22-23) are the expectation and norm, the practice of reflection invites an openness to 'not-knowing' as one seeks to develop an understanding and the possibilities of new approaches. The dominance of the paradigmatic or logico-scientific modes of knowing (Bruner, 1966) in the tertiary sector contrasts with the 'humanness of teaching which involves making sense of contradictions and dilemmas; wrestling with ideas and methods; interacting with students and colleagues; and juggling the demands of teaching in an increasingly crowded portfolio of professional responsibilities' (Ballantyne, Bain, & Packer, 1997, p. xix).

The risks involved require a degree of 'self-confidence that develops from self-awareness and self-appreciation' (Schön, 1988, p. 23). Not all individuals find it easy to find their own voice as they participate in reflection (Canning, 1991; Costa & Kallick, 2000). For the mentee, the mentor can provide such a place for a voice to be found and a climate for experimentation and subsequent mistakes encouraged, dialogued, and perceived as departure points for discovery and growth.

Authentic dialogue is a major tool for learning in the development of reflective practice (Larrivee, 2005). Mueller (2003) observes that 'shifting thinking about teaching often begins with dialogue and teacher education programs offer sites where oral and written reflections on learning to teach can and should begin' (p. 67). Ryken (2004, p. 121) describes this as the paradox between the 'being' and 'doing' of teaching. Fielding (1999) proposes that the inclusion of students' voice positions them as 'agents in the process of transformative learning' (p. 22).

This climate of discovery and experience based learning also provides space for celebration (Yendol-Hoppy & Dana, 2006). Storrs, Putsche, and Taylor's (2008) study of American undergraduates found that students expected a transmission-

based, formal and hierarchical mentor relationship with academic staff, and were pleasantly surprised by a more informal, relational approach by academics.

Mentorship in this context contains three component tasks (Schön, 1988): making sense of the substantive issue at hand; entering into the mentee's ways of thinking and understanding; and minimising any defensiveness. These tasks find their way in a relationship – where the mentor collaboratively joins the mentee in their own reflection-in-action, illustrating for the mentee what reflective practice is, and displaying intellectual empathy (MacKinnon & Erickson, 1988). Even early critics of Schön such as Gilliss (1988) and Fenstermacher (1987, 1988) admire and praise the 'masters of the profession coach[ing] the neophytes in a one-to-one relationship' (Gilliss, 1988, p. 48).

Hayes (1999) observes that professional practice occurs in the relational climate of 'mutual recognition' (Hooks, 1994, p. 13) in which the practice occurs. Le Cornu (2005, p. 359) argues for a 'mentoring attitude' as caring mentors bring commitment to this relational climate.

Schön (1987) provides three types of coaching or mentor models. The first is one of modelling or imitation, where instruction and listening, demonstrating and imitating dominate. The second is more exploratory and analytical, where the mentor and mentee share in 'joint experimentation' – practising, testing and assessing the mentee's methods of problem framing and solving novel situations. The third is the 'Hall of Mirrors' where the mentor exemplifies the craft the mentee is attempting to acquire. Young, Bullough, Draper, Smith, and Erickson (2005) note three similar patterns of mentoring based on the manner of relationship and communication: responsive; interactive; and directive.

Schön (1987) also notes that mentees who are more successful in joining their mentor in reflective practice demonstrate three characteristics: they recognise logical inconsistencies; they dislike incongruity and inconsistency; and they readily test their assumptions through observable data. Additionally, learning something new and radical, being inclined towards cognitive risk taking, challenges them. Their errors do not disappoint them; rather they are seen as puzzles to be solved. As noted by Phillion and Connelly (2004), 'certainty goes down as experiential knowledge goes up' (p. 468).

In mentoring Schön (1988) contrasts the transference of knowledge to the transformation of understanding. Sarton (1961) in her novel about a university lecturer in her first year of lecturing comments on this when in a moment of realization the character acknowledges that 'knowing something and teaching it are as different as dreaming and waking' (p. 44). The engagement of a transformation of experience is the desired outcome of the reflective mentor relationship. Bell (2001) observes that 'collegial and developmental activities involving observation encourage shared critical reflection on real-life teaching experiences – and can lead to transformation of both perspective and practice' (p. 29).

The mentor, through repeatedly experiencing the modality of reflective transformation becomes a 'builder of repertoire rather than accumulators of procedures and methods' (Schön, 1988, p. 26), a co-researcher with the mentee (Schön, 1988). As 'co-learners in a process of discovery' (Kochan & Trimble, 2000, p. 21) supporting 'opportunity, dialogue, enthusiasm and change' (Mullen & Lick, 1999, p. 11) demonstrate synergistic co-mentoring. This extends classical professional education beyond teaching with explanation and understanding (Shulman, 1988). In attending, honouring and respecting the mentee's reasoning and understanding a sincere interchange of ideas is enabled, opening issues to question and debate (Kilbourn, 1988).

Such a 'conversation of instruction' (Green, 1968) or 'respectful dialogue' (Kane, Maw, & Chimwayange, 2006) builds the potentiality of the creation of thoughtful learning, 'wisdom and awakening' (Gehrke, 1988, p. 193) and some degree of convergence of meaning and mutuality (Lander & English, 2000) in a developing, reciprocative learning process (Hoban, 2000) where the emphasis is not on what is being learnt, but also on 'how can I assist someone else's learning?' (Le Cornu, 2005, p. 359).

2.3 Reflective Practice

Reflection, as deliberative thought, 'thinking what one is doing', can be seen as an inherent intellectual activity for all teachers (Calderhead & Gates, 1993; Donahue, 2005; Grimmett & Erickson, 1988; Zeichner & Liston, 1996), is at the centre of professional practice in teaching (Holm & Horn, 2003; Schön, 1987), as the major modern attempt at interactive professional development (Sprinthall, Reiman, &

Thies-Sprinthall, 1996). Cheetham and Chivers (1996) place reflection as a core, essential element of professional development. Gelter (2003) however, observes the relative lack of spontaneous or deliberative reflective practices amongst teachers.

Deliberative reflection emphasises the discovery and evaluation of personal meaning within the educational setting (Wellington & Austin, 1996). Harada (2001) describes reflective practice as being

> *'about developing self-knowledge, the ability to see through teaching situations and understanding the meaning of what is happening. Engaging in the process of reflection is about admitting that practice can always be improved in some way' (p. 13).*

Foucault (quoted in Watson & Wilcox, 2000) proposed that individuals are effectively constituted by their practices, and to understand ourselves we need to understand the practices that shape our lives. The quality of the professionals' thinking and resultant behaviour effectively defines a 'teacher' (Weiss & Weiss, 2001). Ovens and Tinning (2009) note that reflection is mediated by the context in which the individual is situated.

Additionally, for educators, as a thought process reflection seeks understanding of teaching and learning and future improvement to practice (York-Barr et al., 2006). These goals are also a major goal for teacher education programmes (Darling-Hammond, 1995; Hoban, 2000; Loughran, 1996) as well as in the broader undergraduate body (Barnett, 1997).

Educational researchers now generally emphasize a common goal of developing pre-service teachers who will become reflective practitioners – that is, practitioners who will recognise the value of regularly 'critiquing their pedagogical practices' (Mueller & Skamp, 2003, p. 429). 'At the core of reflective learning there is a critical dimension, an ability and willingness to search for a deeper understanding than might be available at first sight' (Chambers, Burchell, & Gully, 2009, p. 35).

Tsangaridou and Seidentop (1995) comment on the acceptance within education of the value of reflection a priori. Betts (2004) describes the notion of reflective practice as akin to a 'kind of theological dogma' (p. 242). Clegg (1999, pp. 170-171) parallels the 'empowerment and joy' arising from the adoption of reflective practice in

education to the emotions and activism of the early feminist movement. She also notes the development of reflective practice 'under circumstances that severely circumscribe the empowerment of the individual practitioner' (p. 172). Beaty (1998) notes that novel experiences encourage reflection. Pedro (2005) observes that reflective practice is one educational reform (Ghaye, 2005) that has become widely adopted by educational communities.

Lucas (1991) defined reflection as 'systematic and open enquiry into one's teaching to understand it better and be more effective' (p. 27). Giroux (1988) identifies reflection as central to teacher's intellectual work. Donahue (2005) links reflective practice to a hopeful, optimistic stance towards the possibilities of teaching. Smith (2008) links the creation of an intellectual and emotional space through reflective practice to coherence between practice and theories, both private and public (Griffiths & Tann, 1992).

Boud, Keogh, and Walker (1985b) describe the process of reflection as an 'activity in which people recapture their experience, think about it, mull it over and evaluate it' (p. 19). Reflective practice could generically be seen as 'the processes involved in exploring experience as a means of enhancing understanding' (Kuit, Reay, & Freeman, 2001, p. 130).

Reflective practice literature draws on a long tradition, back to Classical Greece and the ancient writers (Schön, 1988; York-Barr, et al., 2006) with two writers, Dewey and Schön, dominating the commentary in the twentieth century. The 1990's and the last decade have seen a diversity of contributions as the literature on reflective practice has developed in range and scope. The literature on reflective practice particularly emphasised self-reflection, personal reflective writing and critiques (Ghaye, 2005). Related areas such as action research and transformative learning in a wide array of professions (White, Fook, & Gardner, 2006) also extensively use the concepts of critical reflection and reflective practice.

The bulk of the diverse literature is educational in its focus, with a specific focus on the application to professional practice and training. The journal literature on reflective practice is strong in the western world, particularly in the United Kingdom and Australia (Drevdahl, Stackman, Purdy, & Louie, 2002). The literature has given extensive analysis of the concept of reflective practice (Zeichner, 1999). Zeichner

and Liston (1987) observe that much of the literature has underlying assumptions of teacher liberation, permitting educators 'to exercise their judgement on the content and processes of their work' (p. 24). This concept of liberation is furthered in the social reconstructionist perspective where reflective practice addresses the moral and social aspects of education and is seen as 'a political act that either contributes towards or hinders the realization of a more just and humane society' (Zeichner & Liston, 1996, p. 59).

Dewey's model of reflective practice

Dewey (1910) referred to reflection as the 'active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends' (p. 6).

For Dewey reflective thinking provided freedom from 'impulsive [and] routine activity' enabling educators to act in a 'deliberate and intentional fashion' (Dewey, 1933, p. 17). Reflection then can be seen as active, persistent, and careful (Donahue, 2005). Dewey linked reflection to the teacher's experiences of surprises, problems and dilemmas and the transformation of this state into one of coherent clarity (Dewey, 1933).

In Dewey's model of 'inquiry' (reflective practice) there were five distinct stages associated with facing a perplexing situation. The first of these was 'suggestions' or 'insights' where one anticipates possible solution(s), in 'a kind of dramatic rehearsal' (Poblete, 1999, p. 4). The second stage transfers the direct experience of the difficulty into an intellectual problem to be solved. Loughran (2006) describes this phase as 'a situation that attracts attention … is curious or puzzling … something that invites further consideration beyond that which might initially have been anticipated' (p. 45). In this stage the context and conditions that surround the problem are clarified.

The third phase in Dewey's model is the development of a hypothesis as the initial suggestions are modified and expanded. The hypothesis initiates and guides observation. In the fourth phase reasoning takes place as the hypothesis is mentally elaborated. In the fifth phase the hypothesis is verified (or falsified) by testing. The model is based on deliberative thinking to solve problems so as to improve future actions as well as address the initial situation. Loughran (2006) notes that these five

phases together comprise reflection, with any one being the initiator of the process, although the 'problem' phase is often cited in the literature as the initiating phase.

Reflecting the Progressive Era of the early twentieth century Dewey's perspective on reflective practice emphasised rationality and scientific thinking within the context of social experience (Waks, 1999), and is learnt by doing. Dewey also brought to reflective practice the import of attitudes of open-mindedness, responsibility and wholeheartedness. Dewey's approach was built on by others drawing from research and rationally based knowledge bases (Cruickshank, 1987; Wildman & Niles, 1987), with an emphasis on technical knowledge. More recent works drawing on Dewey, such as Loughran's (1996) monographic study of pre-service education at Monash University through the modelling of reflective practice, utilize tighter structures such as Dewey's model of the reflective process, to provide

> *'reliable and verifiable instances of reflection [enabling reflection] to be recognized and documented in ways which might be more discernable than the larger more complex groupings described by Schön (1983)' (Loughran, 1996, p. 21).*

Schön's model of reflective practice

Schön (1983, 1987) developed the concept of reflective practice with an emphasis on context and experiential knowledge with his concepts of 'reflection-in-action' and 'reflection-on-action'. While the four elements (trigger, frame, reframe, plan) of his model parallel Dewey's elements, Schön is at pains to dissuade any 'formulaic or algorithmic rendering' of reflective practice (Clarke, 1998, p. 49). Schön promoted artistry in education with his emphasis on practitioner generated, intuitive knowledge derived from experience. Experimentation, framing and reframing the problem, and consequential reflective conversation are core elements in the search for 'an epistemology of practice' (Schön, 1983, p. 49). The resultant creative adaption, reflective analysis, willingness to review beliefs and values, frame and enliven teaching practice (Ballantyne, Bain, & Packer, 1997; Samuelowicz & Bain, 1992).

Schön's approach, challenging a positivistic understanding of the world, finds congruence with elements of critical theory, 'affirm[ing] the importance of experiential and interconnected ways of knowing the world' (Fook, 1996, pp. 4-5).

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Schön (1987) saw reflective practice as a 'dialogue of thinking and doing through which one becomes more skillful' (p. 31).

Schön's conceptualisation, as a counter to the prevailing focus on behaviourism and reductive approaches to teacher education, gave space for the artistic and moral dimensions of teaching (Noddings, 1988). Reflective practice has been seen as a 'counter discourse' to 'ensconced technicist views' (Smyth, 1989, p. 2), with strong constructivist underpinnings (Kinsella, 2006). Reflective practitioners continually learn, primarily through their experiences; these experiences being reconstructed through reflection (Larrivee, 2008a).

Schön's emphasis on practice and experience was derived from his deep dissatisfaction with the lack of relevant reform and research in the American tertiary schools of professional education (Shulman, 1988). The rapid adoption of reflective practice in education can then be paralleled to the protracted and public conflict, criticism and pressure regarding the profession of teaching and also the role of universities (Quicke, 1996). It also is a recognition that the real world dilemmas in professions 'do not lend themselves to neat solutions' (Larrivee, 2008a, p. 88).

For Schön professional knowledge has a rigour centred in the fusion of the action of doing and thinking, is often intuitive or tacit (Polanyi, 1962) in nature and is often difficult to articulate (Kilbourn, 1988). Moon (2000) notes that for educators expertise is demonstrated by outcomes rather than underlying knowledge with 'action is what counts' (p. 55) along with understanding and interpretation of complex situations. Professional preparation for the 'uncertainty, uniqueness, and conflict' (Schön, 1987, p. 41) of the pedagogical moment of necessity combines the technical rationality and rigour of systematic knowledge with the 'artistry of reflection-in-action' (Schön, 1987, p. xii). Schön's notion of artistry is paralleled by van Manen's later conceptualisation of 'pedagogical tact' (Sumsion, 1997, p. 12).

White, Fook, and Gardner (2006) note that the 'tacit dimension has tended to be constructed as in some way unknowable' and the complexity of processes by which such understandings are formulated are 'seriously underexplored [especially] in policy initiatives' (p. xii). Griffiths and Tann (1992) observe that reflection-in-action is likely to be personal and private, while reflection-on-action is likely to be interpersonal and collegial in nature.

Schön's concepts are derived and illustrated primarily from the context of the training of professionals. Moving beyond the instrumental and rational into the more 'indeterminate zones of practice' (Schön, 1987, p. 25) that are central to professional practice is a major challenge for academic staff in higher education who seek to shape the developing professionalism of pre-service teachers. Reflective practice

> *'entails voluntarily and willingly taking responsibility for considering personal actions … considering alternatives, taking action to improve practice throughout their professional career' (Larrivee, 2008a, p. 88).*

The centrality of professional practice and development units in education courses in Australia, with their associated periods of practicum reflect the importance of 'learning by doing' in ensuring that aspiring professionals are apt and proficient to a certain level in classroom practice, and that they are beneficially exposed to the practices of more senior practitioners. They are

> *'initiated into the traditions of a community of practitioners and the practice world they inhabit. He learns their conventions, constraints, languages, and appreciative systems, their repertoire of exemplars, systematic knowledge, and patters of knowing-in-action' (Schön, 1987, pp. 36-37).*

As Clarke (1998) notes, Schön's examples (1983, 1987) used to illustrate his ideas are derived from the reflective practices of experienced practitioners, not from the experiences of pre-service practitioners. His examples also are typically single session interactions, not as for most teachers, in the context of durable, sustained interactions. Newman (1999) parallels Schön's use of examples with Wittgenstein's.

The concept of artistry (Schön, 1983, 1987) is a useful metaphor (Hunt, 2006) in that it encapsulates the fluid nature of professional teaching, denoting the non-routine nature of the process of learning, and acknowledging the importance of the workmanship and craft (Milne, 2004) of the practitioner. It incorporates attributes of understanding, wisdom and integrity in 'the uncertainties of the living and experiencing that is … teaching' (Goodfellow, 2000, p. 26). As a 'personal awareness discovery process' (Larrivee, 2000, p. 296) the process of becoming a reflective practitioner cannot be a prescription, rather there are identifiable practices

and actions identified with the practice. Larrivee (2000) identifies three essential practices: making time for reflection; questioning the status quo; and perpetually problem solving.

Uhrich (2009) in her hierarchy of reflective practice in physical education draws together in Figure 1 the concepts of reflection-in action and reflection-on-action in an effort to outline a 'systematic means to develop reflective practice with teacher candidates' and to 'delineate those reflective techniques important for teacher candidates to learn, in a logical and sequential manner' (p. 504).
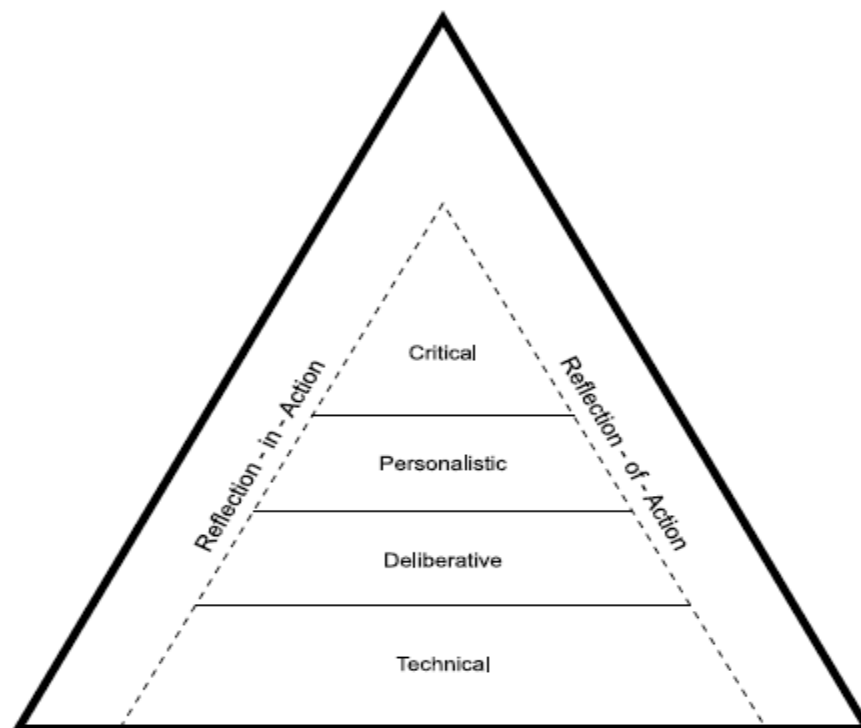
FIGURE 1. THE HIERARCHY OF REFLECTIVE PRACTICE IN TEACHER EDUCATION (UHRICH, 2009)

Schön's model has significantly shaped subsequent literature and conceptualisations regarding reflective practice. Erlandson and Beach (2008) observe that Schön's model has generated considerable literature and debate, quickly leading to the emergence of critiques, augmentations and competing models (Handel & Lauvås, 1987). As the discussions have matured, postmodern and practice oriented addendums have also proliferated. The openness and dynamic nature of the development of reflective practice has been seen as linked to the theoretical openness and ambiguity of Schön's model (Erlandson & Beach, 2008).

Clegg (2000) notes the apparent 'aporias and a lack of specificity in Schön's work' (p. 451). Lesnick (2005) and Ferraro (2000) among others, have argued for a more contextual approach to Schön's model that integrates Dewey's focus on 'moral, situational aspects of teaching (Ferraro, 2000, p. 1) and greater use of collaborative teacher inquiry (Lesnick, 2005). Greenwood (1993) criticises Schön's model for its failure to explicitly recognise the importance of reflection-before-action. Rømer (2003, p. 85) notes 'an ambivalence of form and content' even within Schön's works. Erlandson and Beach (2008, p. 410) note the parallel development of 'reflection as theoretical inclusion' and 'reflection as open exploration' in Schön's model.

Elements of reflective practice

The cyclic or spiral nature of reflective processes has been observed or implied by many writers (Loughran, 1996; Rodgers, 2002; Osterman & Kottkamp, 2004; Jay & Johnson, 2002; York-Barr et al., 2006). In each commentary, action is informed by deliberative thinking that is a precursor to learning. Complex conversations, internal and external, and interactions inform the process. As adult learners, teachers in training seldom engage in a linear learning process (Even, 1987). This complex process orientation can be seen in Lasley's (1992) description of reflection as 'an intellectually active, critical, and extending process' (p. 26).

Educators often commence reflection from a concern regarding problems on a practical or technical level, with less arising from socio-political or moral-ethical levels (van Manen, 1977). Loughran (1996) notes that pre-service teachers who reflect on issues beyond the technical are likely to be reflecting through the full reflective cyclic process. Carr and Kemmis (1986, pp. 208-9) emphasise 'critical pedagogic thinking' that challenges the assumptions, practices and outcomes of the classroom and beyond. For Kemmis (1985) and Smyth (1989) reflective practice is linked to 'infusing action' (Smyth, 1989, p. 3) that is participatory, collaborative and emancipatory.

Smyth (1989) and Emery (1996) outline four reflective forms of action: describing (What do I do?); informing (What does this mean? What are the pedagogical principles behind what I do?); Confronting (How did I come to be like this? What are my assumptions, values, and beliefs about teaching? Whose interests are served by my practice?); and reconstructing (How might I do things differently?).

Ghaye and Ghaye (1998) building on Schön's work, outline ten principles of reflective practice which engage participants in: reflective conversations that have the potential to disturb their professional identity; interrogation of experiences; a reflective turn - returning to examine taken-for-granted values, professional values and understandings; describing, explaining and justifying practices; viewing professional situations problematically; creating knowledge of interest to self and others; asking probing and challenging questions; decoding a symbolic landscape such as school culture; linking theory and practice as a creative process; and socially constructing ways of knowing.

Johns (2000) suggests ten perspectives of reflective practice: commitment, contradiction, conflict, challenge and support, catharsis, creation, connection, caring, congruence, and constructing personal knowing in practice. Johns develops this in describing a practitioner of reflective practice as being 'open and curious about her practice; why are things as they are?' (pp. 37-38).

Definitions of reflective practice

Defining what constitutes reflective practice is somewhat problematic (Hatton & Smith, 1995; Rodgers, 2002; Sumsion, 1997; White, Fook, & Gardner, 2006). Suttle's (1983) metaphor of 'breeds' with 'occasions for both hybrids and mongrels' (p. 39) is apt. Issitt (2000) observes that 'the flexibility of reflective practice leaves it open to appropriation by different stakeholders' (p. 121), leading to what Smyth (1992) categorised as 'a kind of conceptual colonization in which terms like reflection have become such an integral part of the educational jargon that not to be using them is to run the real risk of being out of educational fashion' (p. 286). Fendler (2003, p. 17) uses the descriptor of 'treacle' to refer to the use of the term. Emslie (2009) notes the lack of a consistent understanding of what constitutes reflective practice. Pedro (2001) notes that multiple meanings and usages leads to 'educational puzzlement' (p. 31) but does find 'agreement in the literature that reflection in teacher education is a special form of thought' (p. 31).

Ghaye and Lillyman (2000) state that 'reflective practice stands for a collection of intentions, processes and outcomes' (p. xv) reflecting the variety of theoretical bases and purposes it is used in the literature. Ecclestone (1996), Hatton and Smith (1995), and Korthagen and Wubbels (1995), express concerns that the variety of meanings

attached to the term 'reflective practice' risk it becoming a meaningless term (Sumsion, 1997), vacuated of meaning (Ovens, 1999). Clegg (2000) notes that 'reflective practice [is] taking on the veneer of educational orthodoxy' (p. 451).

McCormack (2001) embraces this encompassing scope of reflective practice as 'a collection of strategies used as a mechanism to encourage teacher growth' (p. 6). The definition of what constitutes reflective practice also varies according to the aspect of learning being emphasised (White, Fook, & Gardner, 2006). Husu, Toom, and Patrikainen (2008) see reflective practice as 'fully recognising the ambivalent relationships between a teacher's perception (of a situation) and the realities' (p. 39). Luttrell (2000) conceives being reflective as maintaining multiple, even paradoxical, 'elements and emotions in teaching' (Husu, Toom, & Patrikainen, 2008, p. 39).

Bulpitt and Martin (2005) in their study of a cohort of second year pastoral counselling students found that these students clearly articulated a shared meaning of reflection that encapsulated the major characteristics and elements that the varying standardly quoted definitions shared. Additionally, participants comprehended how reflective practice specifically applied to their proposed professional setting.

Loughran (2002) in commenting on the varied definitions and meanings of reflective practice notes the centrality of notion of a problem to the concept:

> *'the … puzzling, curious, or perplexing situation. What that problem is, the way it is framed and (hopefully) reframed, is an important aspect of understanding the nature of reflection and the value of reflective practice' (p. 33).*

Parsons and Stephenson (2005) observe that one consistent element of all definitions of reflective practice involving pre-service teachers is

> *'the notion that students have to be aware of and able to monitor their own thinking, understanding and knowledge about teaching in order to be a reflective practitioner' (p. 97).*

Newell (1996) notes the combination of 'experience with analysis of beliefs about those experiences' (p. 568) in reflective practice. Bengtsson (1995) notes that reflection

> *'means some phenomenon is subjected to thorough consideration, that thought dwells a longer period of time on an object to get a better and deeper understanding of it'* (p. 27).

Sumsion (1997) further distils the common element in all notions of reflective practice in her definition as 'a search for meaning … a deliberate act, undertaken with the intent of enhancing understanding' (p. 23). Johns (2004) refers to reflective practice having 'the intention of learning through our thinking to develop new insights or perceptions of self and to shift the way we view and feel about the world' (p. 10). Rolfe (1996) describes this as 'turning experience into knowledge' (p. 28).

In their early review articles Zeichner (1986) and Tom (1985) both note the shared language in the literature regarding reflection and reflective practice and the common assumption that reflective practice is a worthwhile activity leading to improved educational outcomes. Evans (2002) notes that there is an occurrence of both attitudinal development and functional development; modifying attitudes and teaching practices. Hatton and Smith (1995) describe it as 'deliberate thinking about action with a view to its improvement' (p. 34). Barnett, O'Mahony and Matthews, (2004) note the centrality of self-evaluation in many definitions of reflective practice.

Calderhead (1989) commented that the terms used 'disguise a vast number of conceptual variations' (p. 2). Newman (1999) observed that 'we should reject the certainty of any one meaning implied by the single term reflective practice' (p. 158). Schön noted that reflective practice arises from being in 'the indeterminate zones of practice, specifically ambiguity, uniqueness and value conflict' (Bleakley, 2000, p. 15).

Huston and Clift (1990) observe that definitions of reflective practice are strongly influenced by western culture, with an emphasis on problem solving, analysis and rationality in the context of objectivity and emotional detachment. Valli (1993) commenting on this reflects on the paucity of emphasis on intuition and emotions in the literature on reflective practice. Sumison's (1997) review of studies of student teachers' reflective practice noted a significant number of studies that gave emphasis to a reductionist approach to reflection. The last decade has seen a partial redress of this emphasis (Ghaye, 2007; Raelin, 2001).

The strong emergence of reflective practice in education during the 1990's reflects a reaction to the simplistic, technical perspectives that dominated the profession in the 1980's (Sparks-Langer & Colton, 1991). White, Fook, and Gardner (2006) note the varied usages, from popular through to derogatory, of the term. They also attempt to summarise the common elements of the major definitions of reflective practice: a process of examining assumptions embedded in actions or experience; a linking of these assumptions with many different origins; a review and re-evaluation of these according to relevant criteria; and a reworking of concepts and practice based on this re-evaluation.

Ovens (1999) notes the 'complexity and multiplicity of ways of representing the field of reflection' (p. 5). In his review of the literature, he groups readings into one of three readings of the conceptualisation of reflection. The classical conceptualisation focuses on the problem of clarification. Dewey, van Manen and Schön are core writers in this conceptualisation. Ovens associates the commentary in the literature on definition and describing of reflection with the classical conceptualisation, giving rise to the numerous studies on how students reflect and the increased specificity and atomisation of the concept. This conceptualisation also assigns value to the concept of reflection a priori.

Secondly, Ovens presents an ideological reading of the literature on reflection, with recent interest being a reaction to the failures of positivist forms of research, giving prominence to the holistic and complex nature of the act of teaching. His final form of reading the literature is principled reading that focuses on the philosophical and/or political traditions and positions underlying the approach to reflection.

Reynolds and Vince (2004) observe that by its nature reflective practice is an individualistic and predominately personal learning activity and learning in pre-service courses include building 'new personal meanings' (Salmon, 1988, p. 14). Le Riche (1998) describes this idiosyncratic account of reflective practice as one that 'involves the practitioner in a continuous internal dialogue in which the relationship between the professional self and the personal self is kept alive and thought about' (p. 34).

Mezirow (1990) describes an interpretation of experience that involves the 'critique of assumptions upon which our beliefs have been built' (p. 1). Glazer, Abbott and

Harris (2004) reflect this as they refer to reflection as a natural, organic, process of active self-evaluation.

Grimmit (1988) categorises the various underlying meanings of reflection and reflective practice. The initial category represents reflection as 'thoughtfulness about action' (p. 11), conscious, deliberate action applying research findings or educational theory to practice. Teaching subsequently is viewed as technical or mechanistic in nature. The second category considers educational events in context, with deliberation and choice from competing educational alternatives for action. The third category sees the educator appreciating, or apprehending practice, enabling the reorganisation of reconstruction of experience. This category draws on a constructivist view of knowledge, with reflective practice being 'a process in which teachers structure and restructure their personal, practical knowledge' (Grimmit, 1988, p. 12).

Reflective practice then involves the reconstruction of experience (MacKinnon & Erickson, 1988), enabling new meaning and significance to be identified (Emslie, 2009). Loughran (1996) also notes the utility of reflective practice in encouraging educators to perceive 'problems in new and different' (p. 4) perspectives. Sumison (1997) observes that embedded in each variant of meaning of reflective practice are different epistemological perspectives that need clarification.

Schön's conception of reflective practice is closely linked to Grimmit's latter category, where reflection is a reconstruction of experience for 'the purposes of apprehending practice settings in problematic ways' (Grimmit, 1988, p. 13). Schön focuses on how educators 'generate professional knowledge in and appreciate problematic features of action settings' (ibid). This perspective, reflecting the paradigm shift from the 'deep-seated literalism and concretism of educational practice … [associated] with post-Enlightenment positivism' (Bleakley, 2000, p. 15) is the perspective undertaken in this study.

Calderhead and Gates (1993) drew attention to the complex nature of the 'reflection involved in learning to teach' (pp. 8-9). Cognitive skills are required as well as values, attitudes and beliefs. The associated processes focus on the analysis and development of experience; a major contrast to traditional academic learning undergraduates are familiar with. For pre-service teachers the ability to master a

descriptive vocabulary to describe practice leads on to making more explicit their underlying beliefs and to make more explicit the linkages to public knowledge and theories.

Valli (1993) distinguishes between a more technical, instrumentalist reflective orientation to teaching and a deliberative and dialectical mode of reflection. The latter modality informs, rather than directs, practice. Raines and Shadiow (1995) describe reflection as 'thinking both about and beyond the doing' (p. 274).

Kroeger, Burton, Comarata, Combs, Hamm and Hopkins (2004) associate critical practice with students looking at their life experiences and examining the underlying assumptions and beliefs that drive their thinking and why their experiences influence thought and action (Vande Hey-Klefstad, 2006).

Reflection is personally grounded and is used to 'apprehend and transform experience' (Valli, 1993, p. 13). Edwards-Groves and Gray (2008) differentiate three levels of reflective thinking: descriptive/technical reflection; dialogic reflection; and critical analytic reflection. As well as being related to purposes and function, these levels reinforce the context dependency of the learning environments and the relationship of educational practice to normative issues relating to the purpose and goals of schooling. A strong developmental perspective is linked strongly also to the connectedness of the personal construction of meaning in becoming a teacher; the development of the 'effective teaching personality' (Clift, Huston, & McCarthy, 1992).

Here the dialectical modality of reflection emphasises the personal construction of meaning in becoming a teacher with personal knowledge transforming and reconstructing experience. Transformation in the dialectic orientation advocates political liberation (Wellington & Austin, 1996). Action is informed by deliberation of competing views or transformed by reconstructing personal experience. Reflective practice moves beyond 'benign introspection' (Woolgar, 1988, p. 22) through the 'promise of transformation, hope and creativity' (White, Fook, & Gardner, 2006, p. xiii) offered by the time taken to re-examine and re-experience our inner struggles 'over competing values, practices and social relations' (White, Fook, & Gardner, 2006, p. xiii). These stages or levels are present in most outlines of reflective

practice: commencing with a descriptive level; to a more reflective level; through to a transformational level (White, Fook, & Gardner, 2006).

Henderson (1989) characterises reflective practice by: the ethics of caring which includes meaningful, honest communication through dialogue with students and cooperative practice; the constructivist approach to teaching with students being active participants during the learning process that takes account of past experiences and personal requirements; and artistic problem solving. Ovens and Tinnings (2009) observe that reflection is 'constituted in and through discourse', being acquired as it is 'enacted as part of the discursive contexts in which student teachers find themselves' (p. 6).

Husu, Toom, and Patrikainen (2008) differentiate between the cool reflective system characterised by 'complex spatiotemporal and episodic representation and thought' (Metcalfe & Mischel, 1999, p. 4) and the hot reflective system, characterised by quick, often emotional, teacher response. The cool system is a coherent cognitive narrative, that is goal oriented.

While there are varying definitions and meanings of reflective practice in the literature, the notion of reflective practice has utility if its use is contextualised and related underlying assumptions are made explicit. The variety of uses reflects the impartial viewpoint of each of the individual perspectives (Sumsion, 1997). The emphasis on the role of analytical thought in reflection in the literature has gradually been enhanced through an increasing articulation of reflection as a holistic process (Sumsion, 1997).

As Michelson (1996) observes the notion of reflection 'is a spatial metaphor, by definition it involves positionality and point of view. The angle of reflection … determines … what can be seen' (p. 447).

Levels of reflective practice
Kember, Jones, Loke, McKay, Sinclair, Tse, Webb, Wong, Wong and Yueng (1999) differentiated three types of reflective individuals: non-reflectors (inclusive of habitual action, thoughtful action and introspection); reflectors (involving reflection on content and process); and critical reflectors who reflect on the premises involved in the situation.

Habitual action, in a professional setting such as teaching, is seen to occur 'when a procedure is followed without significant thought about it' (Kember, et al., 2008, p. 373). Novices, such as pre-service teachers 'can behave non-reflectively by rigidly following the steps of procedures they have been taught' (p. 373). Significantly, what is lacking is any attempt to understand underlying concepts or theories that may apply.

The category of understanding incorporates a level of deep learning approaches. Lacking however is reflection, or relationship to 'personal experiences or real-life applications' (p. 373). The reflection category, however, 'takes a concept and considers it in relation to personal experiences' (p. 373). It is this application of theory, 'interpreted in relationship to personal experiences' (p. 374) that differentiates the reflection category from the understanding category.

Kember et al., (2008) label their highest category of reflection as critical reflection, deriving their conception from Mezirow's (1991) 'premise reflection' category. This category 'implies undergoing a transformation of perspective' (Kember et al., 2008, p. 374) subsequent to a conscious recognition and alteration to one's underlying presuppositions and prior learnings.

Kember et al. (1999) also developed seven categories, in four tiers, for reflective thinking: on the base tier is habitual action; on the second tier is introspection and thoughtful action; on the third tier is content reflection, process reflection and, content and process reflection; on the last tier is premise reflection. King and Kitchener (1994) also differentiate seven levels based on the understandings of knowledge: from absolute through to systematic evaluation and inquiry. Kember et al., (2008) revised their earlier seven categories, seeing them as 'too fine-grained' (p. 372), to 'four scales: habitual action/non-reflection, understanding, reflection, and critical reflection.

Surbeck, Han and Moyer (1991) in reporting that the nature of the stimulus to reflect impacts on the quality of the reflection, identified three levels of reflection: reacting such as commenting on feelings; elaborating where one's reactions are compared to other experiences; and contemplating, where the focus is on constructive personal insights, problems or difficulties. The natures of the initial stimulus as well as

feedback are strong determinants of the extent to which an individual reaches the contemplation level of reflection.

Van Manen (1977), based on Habermas' (1973) previous work, links the positivist, hermeneutic-phenomenological, and critical epistemologies to three levels of reflection: the technical, practical and critical. Sumsion (1997) notes that these levels are 'differentiated by the focus, rather than the process, of reflection' (p. 10). Van Manen's work gives some specific and practical guidance on reflective practice, and reinforces the analytical perspectives regarding reflection that dominated the 1990's literature. Gore and Zeicher (1991) criticize the implied hierarchy within van Manen's levels.

No matter what basis for a schema it is assumed by most writers on reflective practice that there are lower and higher order stages or levels that can be differentiated. It is also implicit in most schemas that these stages or levels are developmental in nature. Samuels and Betts (2007) observe that often reflective practice at undergraduate level is subject to 'routinization' and does not impact on the quality of reflection or developmental progression of the pre-service teacher's reflections.

Larrivee (2008a) places the various definitions of reflective practice on a continuum containing three levels of reflection: an initial level with a focus on generally episodic teaching functions, actions or skills; a second level that considers the rationale and theory for current practice; and a higher level where ethical, social and political consequences and ultimate purposes of teaching are examined. While all levels involve reflective practice there are associated layers of quality and significance. Larrivee, (2008a) links commonly used terminology to these three levels: surface reflection; pedagogical reflection, and critical reflection. Uhrich's (2009) levels: technical, deliberative, personalistic, and critical focus on the beginning steps of reflective practice for teachers, giving skills and then moving onto the internalised and cognitive levels of reflection.

Integrating perspectives of reflective practice
The tensions between the various worldviews underlying the different definitions of reflective practice are most clearly seen in the differentiations between the oft-cited orientations of Dewey (1933) and Schön (1983, 1987). Fendler (2003) makes the

observation that 'the meaning of reflective practice is riddled with tensions between Schön's notion of practitioner-based intuition, on one hand, and Dewey's notion of rational and scientific thinking on the other hand' (p. 19).

These tensions are often disguised by attempts to integrate elements of both orientations (York-Barr, et al., 2006). Fendler (2003) and Shulman (1988) note that both orientations lend themselves to social reconstruction and the redress of inequities, with the orientations being in tension, not mutually dichotomous.

Loughran (2006) notes the importance in addressing reflection of incorporating both Dewey's notion of problem and Schön's concepts of framing and re-framing. Ghayne (2006) and Loughran (2006) both allude to the complex nature of reflective thought and the associated notion of 'problem'. Sumsion (1997) argues that Dewey's model of reflective practice is an 'interplay of analytical, intuitive and emotional processes' (p. 6) which Schön expresses as improvisation and problem solving in the process of constructing personal meaning. Both Dewey and Schön extend reflection beyond the analytical tradition (Tremmel, 1993), with Schön providing more explicit language that highlights the situation-individual interaction.

Eraut (1995) observes that the nature of reflective practice involves multiple processes that are capable of different interpretations and uses an analytical perspective to criticize inconsistencies in Schön's concepts, especially in his use of language and time dimensions. Chambers, Burchell and Gully (2009) note that the practice and literature on reflective practice has moved from a 'mechanistic and functional' model to one that emphasises the 'implicit and the intuitive' (p. 35).

Fendler (2003) in her critique analyses the different perspectives through the lens of Foucaultain genealogy to emphasise the complexities, historical and discursive, of the concept of reflective practice. Commencing with Cartesian rationality and the associated concept of 'self-awareness' (p. 18) she links reflective practice to the concepts of rationality and responsibility, often reducing reflection thinking to a formalisation in instrumental terms. Dewey's conceptualisation of reflection is portrayed as a 'triumph of reason and science over instinct and impulse' (p. 18). Schön's conception is described as an advocacy for 'practice-based common knowledge and a rejection of scientific or intellectual knowledge' that is distant from practice.

Focuses of reflective practice

Some common elements of reflective practice have been identified (York-Barr, et al., 2006) such as the need to intentionally find or create spaces to pause; the predisposition to an openness of perspective and emotion, described by Webb (1995) as having a consideration of changing one's viewpoints and letting go of the need or desire to win; the openness of heart with an awareness of the other, relationships, and alternative perspectives; the genuine questioning of practice through inquiry; deliberate, active, conscious processing of thoughts about goals, beliefs and practices. The resultant deepened understanding leads to action. It is this active nature of this complex process that provides the link to the enhancement of learning (Bright, 1996).

Drawing largely from their experiential and contextual knowledge base, reflective practitioners find 'it impossible to disentangle knowing from doing' (Webb, 1995, p. 71). Schön (1983) describes this tacit, internally generated knowledge as 'knowing is in our action' (p. 9). Kinchloe (2004) in describing six types of knowledge that inform educational practice acknowledges the process by which it is generated by describing this knowledge as 'reflective-synthetic knowledge' (pp. 62-64).

Zeicher and Liston (1996) identified five basis or focuses for reflection: academic, social efficiency, developmentalist, social reconstructionist, and generic. The academic focuses on subject matter and student learning; the social efficiency focuses on the alignment and use of research findings in the classroom; the developmentalist focuses on students' thinking and understanding; the social reconstructionist focus on teaching as a political act and on social conditions; while the generic focuses on the benefit of reflection without specific focus on the topic of reflection. Zeicher and Liston's varieties reflect differing traditions of reform in North American education (Tabachnick & Zeichner, 1991)

The differing frameworks and classifications of reflective practice can be seen as being derived from different underlying interests (Weiss & Louden, 1989). Choices regarding efficiency and effectiveness in classrooms underlie technological reflection; the resolution of problems in the regular context of teaching underlie practical reflection; choices that involve personal meanings, assumptions and judgements underlie personal reflection; and questions relating to social, political and

ethical contexts underlie critical reflection (Knowles, 1993). These can be seen as different dimensions of reflection rather than a hierarchical set of levels.

Fish, Twinn, and Purr (1991) focusing on the artistry of professionalism in teaching propose a 'four strands of reflection' (p. 22) model: the factual, the retrospective, the sub-stratum and the connective strands. The factual strand is descriptive, and drawing on procedural knowledge reconstructs practice. The retrospective critiques practice holistically. The sub-stratum strand uses propositional knowledge to critically analyse practice and personal theory. The connective strand relates the present to the future.

Boyd and Fales (1983) define reflection from a more personal orientation. Reflection is 'the process of creating and clarifying the meaning of experience in terms of self (self in relation to self and self in relation to the world) where the outcome is a changed conceptual perspective' (p. 101). Reflection for Boyd and Fales occurs in stages: inner discomfort; clarification of the concern; openness to information, observation and a variety of perspectives; resolution or integration and creative synthesis; establishing continuity; and deciding to act on the reflective processes. Gore and Zeichner (1991) note that most teachers use personal orientation reflection rather than a critical enquiry approach. Zeichner and Teitelbaum (1992) argue that a critical inquiry approach is ethically more justifiable as it permits the emergence of more mature concerns than the more survival oriented personalized approach.

Drawing on the work of Grimmett and Erickson (1988) Loughran (1996) notes that the literature on reflective practice can be categorized in three groupings: reflection as 'thoughtfulness about action; reflection as 'deliberating among competing views of 'good teaching''; and reflection as 'reconstructing experience' (pp. 6-7). Schön's focus on practitioners generating professional knowledge in the setting of experienced action gave a significant impetus to and interest in reflective practice in the last three decades, especially on pre-service education programs.

Reflective quality is a concept that brings a psychological orientation to the concept of reflective practice. During an undergraduate education students typically move from dualistic to relativistic modalities of thinking (Perry, 1970) enabling the exploration of tentative and tenuous dialogue between theory and practice rather than focusing on 'instrumental problem-solving made rigorous by the application of

scientific theory or technique' (Schön, 1983, p. 21). Reflective practice as a learning conversation (Harri-Augstein & Thomas, 1991) assists the novice move toward a more expert practitioner role (Butler, 1996).

Brookfield (1995) describes reflective practice through the metaphors of 'stance and dance' (p. 42). Stance is linked to inquiry, a more constant formation that is open to further investigation. Dance represents experimentation and risk, 'modifying practice while moving to fluctuating and sometimes contrary rhythms' (Larrivee, 2000, p. 295). Day (1993) emphasises the importance of confrontation in reflection.

Ross (1990) in her definition of reflective practice ties the ability to make rational choices after consideration with the responsibility for those choices. Reflection, re-framing, and action are linked. Zeichner and Liston (1996) describe reflective practice as 'a way of being as a teacher' (p. 9). Johns (2005) also describes reflective practice as a 'way of being' and 'a process of mutual realization' (p. 71). Reflection, unlike analysis, involves the self and a changed perspective involves a change to self (Hunt, 2001; Warin, Maddock, Pell & Hargreaves, 2006). Headberg (2009) identifies observing, being and listening as focuses for reflective practice. Senge (1990) described reflective practice as a 'creative tension' (p. 150) between one's current reality and where one wants to be.

Goodman (1984) describes three ways of thinking: routine, rational and intuitive. He links reflective thinking to the integration of rational and intuitive cognitive processes. Danielson (2008) describes four ways of thinking that can framework and foster growth in the conceptualisation of reflective decision-making. Danielson uses reflective decision-making as a bridge between the art and science of teaching. Imel (1989) describes reflective practice in terms of the integration of thought and action with reflection.

> *'Reflective practice is a mode that integrates or links thought and action with reflection. It involves thinking about and critically analysing one's actions with the goal of improving one's professional practice. Engaging in reflective practice requires individuals to assume the perspective of an external observer in order to identify the assumptions and feelings underlying their practice and then to*

speculate about how these assumptions and feelings affect practice'
(Imel, 1992, p. 1).

Canning (1990) notes that reflection is essentially an intra-personal process through which personal and profession growth occur (Sikes & Aspinwall, 1990). Brookfield (1992) describes the paradoxical nature of this growth as 'significant learning generally involves fluctuating episodes of anxiety-producing self-scrutiny and energy-inducing leaps forward in ability and understanding' (p. 12).

Danielson (1996) reports that many educators identify the ability to reflect accurately from classroom practice and to learn from that reflection to improve future practice as the mark of a true professional. Reflective practice has been a crucial characteristic marker of a quality teacher (Dewey, 1933; Porter & Brophy, 1988) and reflective practitioners have been linked to improved ability to make sense, and improvement, of learning experiences (Osterman & Kottkamp, 2004; Reiman & Thies-Sprinthall, 1993). Reflective practice also is critical in successfully engaging learners (Schön, 1991). Reflective practitioners also exhibit high commitment to their own professional practice (Zeichner & Liston, 1996), being continually aroused by curiosity about some aspect of teaching practice (Clarke, 1995).

Teacher education and reflective practice
Teacher training in tertiary institutions seeks to instil a professional praxis based on technical skills, moral and ethical integrity and in 'developing sustainable ways to remain informed about their teaching and their profession' (Edwards-Groves & Gray, 2008). It is experience and engagement in ongoing, focused reflection that is at the core of this praxis (Alger, 2006). Reflective practice enables 'pre-service teachers to continuously think about and reframe their professional self throughout their career … refram[ing] the questions and issues their profession needs to address in changing times and circumstances' (Edwards-Groves & Gray, 2008, p. 85). In this sense, reflective practice is closely linked to the processes of nurturing renewal in education (Ferrace, 2002).

While the aim of the various course activities and related assessment tasks in contemporary teacher training is for pre-service teachers to critically view their own teaching so as to understand and learn from it, Valli (1997) notes that one should not

assume that the range of activities (Zeichner, 1986) and practical experiences will ensure that reflective practice occurs, even when the necessary tools and approaches are explicitly provided. Ovens and Tinning (2009) observe that as students move through their teacher education programs they experience varieties of reflection that have different underlying bases.

Larrivee (2008a) notes a growing consensus in the literature on the structures of mediation required to promote reflective thinking, especially higher order reflective thinking. Current understanding is that 'without carefully constructed guidance, novices seem unable to integrate and apply learned pedagogy to enhance their practice' (Larrivee, 2008a, p. 96).

Webb (1995) describes this guidance in terms of hermeneutics, the act of 'bringing to understanding' (p. 72) or interpretation. Korthagen and Vasalos (2005) note the importance of the support of another if one is to have the development of a 'growth competence' (p. 48).

LaBoskey's research (1993) supports the importance of attitudes to reflective practice, especially Dewey's trio of open-mindedness, responsibility and wholeheartedness. These attitudes may be more critical to the process of reflective practice than other elements in the process (Loughran, 1996).

The ability of pre-service students to critically reflect at the higher levels per se has been questioned by some (Griffiths, 2000). Conversely, Gardner (2001) saw a high interest in, and an awareness of reflective practice and self-awareness, in a cohort of graduating social workers. Husu, Toom, and Patrikainen (2008) found that pre-service teachers are 'capable of using various kinds of reflection when analysing their teaching practices' (p. 49) as did Wilson (2005). Shoffner's study (2008) of pre-service teachers' weblogs found evidence of their understanding of reflection and an internalisation of reflective concepts. Pasch (1995) noted that reflective practice could be taught and learnt by pre-service teachers. Ovens and Tinnings (2009) conclude that studies have confirmed the ability of students to demonstrate reflection when it is required.

Others see reflective practice as having a limited role in any initial teacher education program (McIntyre, 1993). For others, it is central to teacher education (Loughran,

1996). The lack of agreement on what reflective practice is and how it may be developed makes it difficult for teacher educators to concur regarding the development of reflective professionals in training (Loughran, 1996; Russell, 2005).

The need for training institutions to support and provide various opportunities for pre-service students to engage in meaningful and authentic dialogue (I'Anson, Rodrigues & Wilson, 2003), collaborative activities, and critical analysis for sustainable reflection is noted (Edwards-Groves & Gray, 2008). Holt-Reynolds (1991) notes the importance of the effects of pre-service teachers' forms of reflection on their decisions and notes how 'vital it is that … teacher educators develop … 'elegant and respectful' … ways of overhearing and of [patterns of] participating in their internal dialogues and thus in the decision-making processes that are the results of pre-service teachers' discourses of reflection' (p. 14).

Reflection is a professional attribute that requires learning and practice (Hart, 1992). Sustained and supported participation in the process of reflection is believed to lead to the development of a reflective disposition (Smith, 2008). Hoban (2000) outlines the emphasis on pre-service teachers reflecting about what they learn. He outlines an approach that focuses on reflection on the relationship between teaching and learning in their classes with an emphasis on 'how they learn, how they are taught, or how they interact' in a more systems oriented manner. The approach draws from McCutcheon and Jung for a form of reflection that is a 'systematic inquiry that is collective, collaborative, self-reflective, critical, and undertaken by participants of the inquiry … [for] the understanding of practice and the articulation of a rationale or philosophy of practice' (McCutcheon & Jung, 1990, p. 148). The need for a reflexive framework to guide pre-service teachers was demonstrated in their study.

MacKinnon and Erickson (1992) also noted that pre-service teachers separate the knowledge gained in their courses from practice and their experiences of learning to teach. They suggest that there is a need to nurture 'particular dispositions for inquiry' (p. 200). Gilliss (1988) notes that the same lack of connect with theory and research exists for experienced teachers when encountering dilemmas. LaBoskey (1993) suggests that the particular propensities and initial abilities of the pre-service teacher who is an 'Alert Novice' give them the impetus to engage in internally engendered reflective practice, especially given their desire to know. It is noted by LaBoskey

(1993) that 'an understanding of emotional states and traits becomes critical to reflective teacher education' (p. 32).

Ottesen (2007) describes three modes of reflection in pre-service teachers: reflection as induction, learning the appropriate and legitimate 'how's' of teaching; reflection as concept development; and reflection as imagined practice enabling the transcendence of present constraints of practice.

Valli (1992; 1993) draws attention to the importance of the content of reflection for pre-service teachers as well as predominant emphasis on the general processes of reflection. Judgements regarding the quality of reflection support the concept of a developmental process in becoming reflective (Calderhead & Gates, 1993). McIntyre (1993) acknowledges that while many of the techniques used in teacher education increase pre-service teachers' awareness of their practice, this awareness is largely technical in nature, leaving a gap in the development of reflective practice regarding ethical and political contexts of practice.

Pedro's (2005) study of pre-service teachers' understandings of reflective practice noted that the notions of reflection were introduced to them within the teacher education course, and that the mentorship of practicum teachers and of lecturing staff were central to these understandings. The relationship with individual lecturers and the perceived relevance of course content also were noted as being of importance. Pedro concluded that the process of reflection was socially determined, derived, renewed and renegotiated in ongoing dialogue with significant others. Russell (2005) notes that while pre-service teachers are urged to engage in reflective practice they receive little help in developing specific skills or in the way of personal models of reflective practice.

Gray's (2006) study of the relevance of reflective practice pre-service primary teachers at Charles Sturt University to the real world of teaching explored the connectivity students made between their beliefs, values and attitudes towards reflective practice and their participation in the course. During the course, pre-service teachers engaged in various reflection activities, modes and approaches. From the voice of the students it was evident that there was no clarity or consistency in the pre-service students' conception of what reflective practice was, and explicit support was required as they engaged and learnt about reflective practice. The pre-service

teachers associated reflective practice with recounting what had occurred, with the recounting being predominately in written form. As written work was linked to assessment students often adapted the reflections to the perceived expectations of the lecturer, casting doubt on them as an authentic, genuine expression of reflective practice. The linkage to assessment met with strong antipathy by the sampled pre-service teachers. The students valued talking about teaching experience with others, preferring verbal forms of reflection. The study concluded that a substantial minority of pre-service teachers 'do not connect 'reflection' to their own or others' professional practice in an authentic way' (Edwards-Groves & Gray, 2008, p. 97). For these students reflective practice became an artefact of the course.

Leat (1995) and Loughran (1996) report on the context for beginning teachers and focus their attention more on technical levels of reflection that relate to the immediate classroom context and the mechanics of teaching. Leat's (1995) research reports an increased frequency of critical reflection occurring with experienced teachers. This shift parallels the shift from concern about self to concern about their pupils that has been observed during teacher training courses (Fuller, 1969). Loughran (1996) links this shift to the 'development of a preparedness to reflect' (p. 88).

Leung and Kember (2003) identified the need for students to understand the nature of reflection and its relationship to deep-learning (Chapman, Ramondt, & Smiley, 2005). As pre-service teachers have fostered in them the capacity to seek understanding of the broader context of situations and to find underlying principles and meanings in their activities they develop their foundations for critical reflective thinking (Ellis & Kiely, 2000). Samuels and Betts (2007) note the need for the 'intervention and support of another' (pp. 271-272) through scaffolding, dialogue and modelling in order for movement to deeper levels of reflection.

Bold and Hutton (2007) note that engaging students in the critical review and reflection on each other's experiences establishes a community of enquiry. Ghaye and Ghaye (1998) place such an engagement in dialogue, 'the reflective conversation', as the dominant medium used in the profession of teaching by 'which practitioners question the assumptions, values and beliefs that guide their work' (Bold & Hutton, 2007, p. 25). Strong-Wilson (2006) argues for some of these

discussions and dialogues to be 'public' in nature in order to use memory to stimulate personal reflection.

Lucas (1996) notes the reflective practice of a teacher making the transition after graduation as 'experiencing of experience, his own and his pupils' (p. 23). The need for courage and the significant impact of socialisation on reflective practice are indicative of the setting for teacher-educators.

Loughran (1996) proposes that

> *'to value reflection most likely requires teaching experiences that challenge the individual beyond just coping with classroom management or control. There needs to be a focus on the pedagogy which transcends the transmission of factual information' (p. 51).*

In his own teaching of reflective practice to trainee teachers Loughran (1996) relied primarily on active modelling, avoiding definitions and theoretical outlines, leaving 'the development of understanding to the individual … rely[ing] on modelling as the most important form of teaching about reflection' (p. 52).

Emslie (2009), from a social work lecturing stance, argues that one does not need to tell students what reflective practice is, rather the lecturer

> *'is to foster, facilitate and mentor students' active participation in reflective practice as a regular activity throughout their study … I get them to do it, and often' (p. 418).*

Russell (2005) draws on the advice of a student who shared 'talk far less about reflection and becoming a critically reflective practitioner' (p. 201). The implication was teaching the skills of how to reflect, and model critical reflection.

The dominance for pre-service teachers of valuing reflective practice for practical applications, in concrete forms does not diminish its validity within teacher education programs. Goodman (1984), in the context of linking the theory of reflection to practice, calls for teacher educators to examine the focus of reflection, the process of reflective thinking, and the attitudes necessary for reflective

individuals. Loughran (1996) notes that for the cohort of students he interviewed the value of reflection was as a tool to analyse their own teaching …

> *'it gives them the confidence to test their hypotheses about their teaching and their students' learning. They are able to think about what they are doing and why, and reason through their problems so that their pedagogy is more appropriate to any given situation' (p. 50).*

Reflective skills assist in the integration of knowledge and skills from the compartmentalised world that often is associated with undergraduate thinking (Alison, 1997), assisting in the ability to 'see what they do not see' (White, Fook, & Gardner, 2006, p. xii).

Van Manen (1991) notes that reflection has different time dimensions in his discussion of anticipatory reflection, where a problem situation is framed before it occurs. Wilson (2008) refers to anticipatory reflection as reflection-on-the-future. Eraut (1995) takes the concept of anticipatory reflection to develop Schön's categories with reflection-for-action. Eraut's redefinitions have linked reflection-in-action to context; reflection-on-action to focus, and reflection-for-action to purpose (Husu, Toom, & Patrikainen, 2008).

Anticipatory reflection gives a 'greater sense of purpose to the teaching' (Loughran, 1996, p. 110). Loughran (1996) also notes retrospective reflection, where situations are looked back upon; and contemporaneous reflection that occurs during the pedagogical experience. Retrospective reflection enhances contemporaneous reflection (Loughran, 1996). It is noteworthy that each of these types of reflection requires the exercise of different skills and framing abilities (Loughran, 1996).

Tann (1993) and Knowles (1993) detail the impact of writing on the development of reflective practice. Tann (1993) identified a developmental pattern in pre-service students as they moved from partial descriptions and unsubstantiated judgements towards a more frank, open-minded description that incorporated linkages between their private theories and public theories and evidences. The acquisition of an appropriate vocabulary for discussing practice is seen as a valuable skill in assisting teachers to make progress in their reflective development (Calderhead & Gates, 1993).

Loughran (1996) notes the wide range of tools (e.g. seminars, journals, video-taping) that can be used to guide the development of reflection. Loughran (1996) drawing from Dewey (1933) details five phases or steps in reflection: suggestions; problem; hypothesis; reasoning; and testing. Loughran does not see a necessary sequential order to these phases in the process of reflection; he does see a reflective cyclic patterning in these thinking steps. This cyclic process occurs in a context of a 'developing pedagogy' (Loughran, 1996, p. 22) and changes in the use of levels of reflection and reflection skills over time implying a developmental model of reflective practice in pre-service teachers as they move towards becoming an autonomous learner (D'Andrea & Gosling, 2001).

LaBoskey (1993) notes that pre-service teachers do not enter teacher education programs as blank slates, rather they bring with them many conceptions and experiences as observers of teaching and learning (Loughran, 1996). These conceptions and experiences shape their perspectives and beliefs about teaching, creating 'deeply ingrained attitudes and beliefs (Brownlee, Purdie, & Boulton-Lewis, 2001; Griffin, 2003, p. 207). Amobi (2003) notes that developing a personal system of educational beliefs is an ongoing reflective activity, however his study of pre-service students' beliefs detailed 'the preponderance of the occurrence of [unsolicited] self-knowledge recollections as a premise for observations' (p. 358).

LaBoskey classifies these perspectives on a continuum from common sense to pedagogical thinking. One of the initial challenges in teacher education programs then, is to give experiences and programs that encourage students to challenge and reflect on their existing preconceptions and perspectives (Gorodetsky & Barack, 2004). For LaBoskey reflection in the pre-service educational context is 'an effort to transform any naïve or problematic conceptions about teaching and learning held by entering students into those more conducive to pedagogical thinking' (p. 27).

 His study of pre-service teacher education derives four elements (impetus; act of reflection; new comprehensions; and solve problems of practice) to reflective practice, akin to those described by Schön. 'Re-framing' or 'new comprehensions' are seen as the most critical for pre-service teachers as they reflect on their practice.

It has been reported in the literature (Loughran, 1996; Oberg, 1990) pre-service teachers concerns and emphasis do shift from the more empirical and concrete to the

more phenomenological. Fisher, Fox and Paille (1996) and Larrivee (2008b) note that most pre-service teachers remain at a descriptive level of reflective practice, despite interventions and scaffolding.

Hatton and Smith (1995) link a base of experience and knowledge with an engagement in evaluative analysis, implying that pre-service teachers are not ready developmentally for this form of reflection. Pultorak (1993) supports the notion that reflection is a developmental process for beginning teachers.

Larrivee (2008b) notes the consensus in the literature that pre-service teachers can be assisted to higher levels with the use of 'multi-faceted and strategically constructed interventions … within an emotionally supportive learning climate' (p. 345). Richert (1987) notes that pre-service teachers' 'preconceptions about reflection – what it is, how it may be useful, its relation to learning – all influence how teacher think about their work' (p. 176).

Hamlin (2004) notes that early field experiences strengthen the reflective practices of pre-service teachers, and she also notes that these students 'are capable of and inclined to engage in reflective practices that encompass issues of social justice and ethics' (p. 168). This engagement has the capacity to be 'reflection at multiple levels' and 'complex levels' (p. 177) and appears to be 'enhanced through structured writing of critical incident analysis' (p. 177). Hamlin (2004) argues that

> *'by defining and valuing students' initial social justice orientation during their early field experiences, there is enhanced potential for their maintaining that reflective focus or revisiting it once they have regained confidence in their status as teachers' (pp. 170-171).*

Norsworthy (2008), in her doctoral study of pre-service teachers in New Zealand, noted that pre-service 'teachers understanding of the nature of education is critical to the way they experience the coursework within initial teacher education' (p. i). Their perspective initially is often technocratic; education is to be acquired, a commodity; teacher education suppling the skills and techniques for the telling that is teaching. As education becomes a process of growth, with a focus on whom the teacher is, a more professional and reflexive lens is employed. The technocratic lens sees

reflection as 'a task to be completed,' in contrast to the professional lens where 'reflection becomes an iterative process for improving practice' (p. ii).

Boud, Keogh, and Walker (1985b) also note the complex interrelated and interactive connectedness of feelings and cognition in the reflective process. Boud, Keogh, and Walker in addressing the emotive aspect of reflective practice simplify their model of reflective practice to three elements: recall salient events in detail; attending to emotions associated with those events; and re-examining and evaluating experience based on intent and knowledge. One then incorporates the newly constructed or re-framed knowledge.

McLean (1999) acknowledges the need for a more holistic perspective of the teacher 'thinking and acting in complex, contextual, and emotional ways' (p. 67), as does Leitch and Day (2000). Parsons and Stephenson (2005) note the need to include 'thoughts, feelings and tacit concerns' (p. 96) as well as the more observable behaviours in the process of learning reflective practice. Undergraduates in Bulpitt and Martin's study (2005) linked reflection to related processes such as thinking, spirituality and personality. Korthagen and Vasalos (2005) speak of the promotion of 'core qualities' that appear to be linked to one's capacity for 'core reflection'.

The rich literature on reflective practice has significantly impacted the vocations of nursing, social work (Huotari, 2003; White, Fook, & Gardner, 2006), ministry (Carroll, 1986) and education. Within education, there has been a particular emphasis on the place of reflective practice in pre-service teacher education (Loughran, 2002 ; York-Barr, et al., 2006.). Underlying the literature on reflective practice is the desire to grow and learn, to work in collaboration and community with others and to connect with, contribute and serve others (York-Barr, et al., 2006.) and to achieve movement towards a 'harmony of deed and purpose' (Loughran, 1996, p. 63).

Pedro (2006) notes that novice teachers can reflect, especially using the verbal modality in conversation with a mentor. She notes the need for novices to be in situations where they are able to contribute and cooperate in order to reflect, inquire and goal set. Richardson (1990b) argues that reflective models harmonise with the holistic perspective that teachers hold as they think and act within the teaching context.

Self-reflections on one's own developing professional experiences and context have particular relevance to educators, who often operate in relative isolation from colleagues in the classroom during the actual act of teaching, although collaborative teaching developments are increasing (Bell, 2001). Such self-reflection underlies the development of understanding or 'personal knowledge' (Polanyi, 1962). Hunt (2001) uses the metaphors of re-mapping or shifting shadows to denote the messy and painful reality of moving one's boundaries in Schön's swampy lowlands of professional practice.

> *'Reflective practice, particularly critical reflection, is at times personally threatening, discomforting and accompanied by 'feelings of anxiety, confusion, stress, hurt … self-doubt and loss of competence' (Stuart, 2001, p. 174).*

Fook et al., (2000) notes that reflection can require the exposure of 'doubts, fears, uncertainty' and require students to produce 'material which may reflect negatively on their performance' (p. 230).

Reflection can in itself be a problematic experience, even distressing, requiring disengagement (Bulpitt & Martin, 2005). A participant in the same study described the reflective process as at times cathartic, an experience leading to acceptance. The potential personal demands and the tendency for initial practitioners to be masochistic in their analysis (Dadds, 1993) highlight the benefits of a mentor-mentee relationship for empathetic, understanding support and balance.

While there are those individuals who are 'seemingly innate reflective practitioners' (York-Barr, et al., 2006, p. xxii) who grow, develop and reflect despite surrounding environmental and cultural conditions, they tend to be 'positive deviants' (Sternin, 2002; Sternin & Choo, 2000). Grushka, McLeod, and Reynolds (2005) reflect on the evaluation of the quality of student reflection. Parsons and Stephenson (2005) observe that many in-service teachers only reflect at a shallow, descriptive level.

There is a general consensus that professionals can be educated to develop deliberative reflective practice (Risko, Vukelich, Roskos, & Chapman, 2002) rather than operating on the basis of intuition (Atkinson & Claxton, 2000). Boud, Keogh, and Walker (1985b) note the place of 'working with' recaptured experience in

learning reflective practice. In doing so they note that 'the capacity to reflect is developed at different stages in different people' (p. 19).

Schön (1988) adds a codicil to his discussion of reflective practice and coaching that notes that the context in which pre-service education occurs often has an epistemology, institutional context, divisions of space and time, culture, status system, curriculum and a learning and teaching structure that mitigates against the exercise of reflective practice. He advocates the impact of the individual academic to challenge the 'normal cynicism' of the institutional world. Even in such an environment, while

> *'extraordinarily difficult [one can] take the time to listen ... register surprise, become curious, and do the detective work that may lead to insight ... to follow the puzzles, difficulties, and possibilities suggested by the spontaneous responses of a [novice]' (Schön, 1988, p. 27).*

Cole (1997) and Markham (1999) also notes the numerous inter-personal, intra-personal and organisational elements that serve as impediments to reflective practice.

Reflective practice is that which takes a professional beyond statable rules and knowledge, providing a basis for understanding and reciprocity of dialogue between practitioners. As such, it is essential in the building of communities of learning where there are convergences of meaning.

2.4 Mentoring and Reflective Practice in Pre-Service Education Programs.

As Schön's work on reflective practice impacted the content and delivery of teacher education programs, there was a growing focus on the value of deliberative development of reflective practice in pre-service teachers (Clarke, 1988). While the bulk of the literature emphasises issues associated with students and reflective practice, there is far less published regarding how one is to teach or transmit the practice (Fisher, 2003). Increasingly during the last decade reflective practice has become 'the major model for continuing professional development in higher education' (Clegg, 2000, p. 452).

A number of authors in the late 1980's began to note the impact of mentoring on the development of reflective practice in pre-service teachers (Richert, 1990; Valli,

1989) and calls for the need for mentorship in teacher education programs continues (Mueller & Skamp, 2003). Chambers, Burchell, and Gully (2009) observe that 'a core concept underpinning the understanding of reflective learning is the significance of the student lifeworld, and the … prominence to this in deepening student learning' (p. 36).

Joyce and Showers (1995) noted that 'most people can make very few changes in their behaviour, however well-intentioned they are' (p. 6). Harada (2001), commenting on this, notes that improvements in learning seldom occur 'without companionship, help in reflective practice, and collaborative instruction on fresh teaching strategies' (p. 13). Hudson (2007) observes that there is a paucity of evidence that the traditional mentors in Australian pre-service courses, experienced teachers supervising practicums, encourage mentees to think critically. This places greater import to the impact of lecturer-student mentor-mentee relationships.

Ussher (2001) reviewing reflection in a practicum setting notes the difficulties in getting pre-service teachers to move beyond the 'natural and nominal barriers to reform and progress in education' (p. 7). Improved practices, reflective practice, and collaborative mentoring are inextricably intertwined, akin to the metaphor of a 'piecing a quilt' (Spalding, Wilson, & Sandidge, 2000) – the end product of a process that involves design, serendipity, experience and knowledge.

Valli (1989) noted the difficulty in altering established practices in teacher education, with the lack of congruence of modelling with content and concepts being taught being a major factor that limited the learning of pre-service teachers. Goodlad (1990) notes that many teacher education programs did not model reflective practice or place students in contexts during their field experiences that foster reflective practice.

Weiss and Weiss (2001) note that unless there is a coherence of reflective practice between lecturers' practice, organisational culture in schools and teacher training institutions, success in embedding reflective practice in pre-service teachers would be limited. Loughran (2002) notes 'if learning through practice matters, then reflection on practice is crucial, and teacher preparation is the obvious place for it to be initiated and nurtured' (p. 42).

One teacher educator has observed 'if [teachers] must analyse their own teaching and what it means to children's learning, then we teacher educators need to support and facilitate the growth of reflective, critical analysis … in student teachers' (Davis, 2004, p. 57). This involves a combination of nurture and example (Harrison, 2004).

Gunstone (1993, cited by Loughran, 1996) noted the need for lecturing staff to reflect on how they modelled educational practice to their students. Ross and Hannay (1986) advocated that the 'university classroom must become … a laboratory where such practices are modelled, experienced, and reflected upon' (p. 9).

Reflective practice then 'needs to be an integral component in the curriculum' (Loughran, 1996) for pre-service teachers, rather than presented as 'an isolated event or process' (Loughran, 1996). Beattie (1997) comments that

> *'if we are to educate reflective practitioners, we ourselves must be reflective about our practices, must model and make explicit the processes of inquiry, and must show the connections between theory and practice in our own lives' (pp. 124-125).*

Chambers, Burchell, and Gully (2009) make the observation that conceptual or theoretical frameworks

> *'provide a window on the experience of the student or learner … [and] … offer tutors and facilitators a basis for reflecting on their own practice, in the search for ways of supporting reflective learning that can contribute significantly to the flourishing of students and practitioners' (p. 36).*

Academic staff modelling reflective practice assists in-service teachers 'to see, experience, and construct an understanding of the nature of reflection from teaching and learning episodes in which they are active participants' (Loughran, 1996, p. 15).

Bulpitt and Martin (2005) note the concerns their undergraduates had about their preparedness to reflect. It was noted that the early stages of reflection students seek clear boundaries, rules and parameters to aid their reflective practice. As a cumulative process, reflective practice draws from the stores of practice knowledge held by the professional. Boud, Keogh, and Walker (1985b) term this as 'association'

with prior experiences. Schön (1985) describes the practitioner of reflection-in-action relying on a repertoire of images of contexts and actions.

Novices such as pre-service teachers do not have a wide range of experiences to draw on, making the initial experiences of reflective practice daunting, uncharted experiences. Johns (1994) advocated a structured introduction to reflective practice under the tutelage of an expert. Ross (2002) observes that pre-service teachers and their supervising teachers on practicum participating in a deliberative mentoring program mutually observe improvements in the quality of teaching outcomes. A similar transferability of these results to the tertiary setting is implied in the research. Clayton and Ash (2005) report on the beneficial outcomes of reflective practices in multiple collaborative and supportive contexts with fellow academics and with students. Van Gyn (1996) observes that there are higher rates of success in reflective practice where there is collaboration, compared to solo efforts to effect practice. McLean and Whalley (2004) note the effectiveness of a 'co-supervision' model of reflective dialogue in the in-service training of nursing professionals. Barnett (1995) notes that reflection is the catalyst for developing a mentee's autonomy and expertise in problem solving.

Lecturers that model reflective practice invite in-service teachers to

> *'experience the development of professional practice by being part of that learning about practice', 'involved in experiencing and understanding the processes which shape the planning, implementation and reviewing of pedagogy, they need to hear what the teacher is thinking' (Loughran, 1996, pp. 15-17).*

Involvement in this invitation facilitates vicarious understanding of the processes of reflective practice to be understood and valued by the mentor lecturer and the mentee in-service teacher. Where both in-service teachers and lecturers participate in reflective practice there is by implication a relationship and reciprocity of learning (Hamilton, 1998; Hutchinson, 1998; Mueller & Skamp, 2003). Golby and Appleby (1995) note the centrality of 'discussion, challenge and support' in such a 'critical friendship' (Bell, 2001, p. 36).

Holt-Reynolds (1991) discusses the importance of 'standing close by' pre-service teachers and 'listening for awhile', 'discovering their voices and roles as teachers' (pp. 15-16) in order to participate and access the inner dialogues of pre-service students, and through that relationship facilitating a more public, external dialogue, and so help influence the on-going discourse. Basile, Olson, and Nathenson-Mejía (2003) describe the shared role as 'ask[ing] thoughtful questions, suggest[ing] resources, and facilitat[ing] problem solving … stretch[ing] their thinking beyond their own practice and their own questions' (p. 300).

The loci of learning are important: 'who is doing the learning really matters and is directly related to where the effective reflective practice occurs' (Loughran, 2002, p. 38). If reflective practice 'is embedded in what might be described as a beginning point in the development of professional knowledge' (Loughran, 2002, p. 38) the power of understanding upon on-going practice as the tacit is made explicit is a major one. Professional knowledge is developed from and through 'real experiences and reconstructed through interactions between learners' (Loughran, 2002, p. 41). Emery (1996) and Mather and Henley (1998) outline the importance in these reflective interactions for a conversational format between academic and the pre-service teacher.

> *'Orally responding to teacher candidates' reflections requires teacher educators to actively engage in reflective practice and creates a relationship with their students based on meaningful pedagogical conversations' (Mueller & Skamp 2003, p. 429).*

Modelling also involves the display and sharing of the attitudes that are precursors to reflection (LaBoskey, 1993). Loughran (1996) notes the close linkage of the appearance of precursor attitudes and the use of the reflective cycle by pre-service teachers. These attitudes can be educated, rather than trained (Loughran, 1996). One approach is by 'inquiring and challenging the … attitudes and reflective processes … in the context of learning about teaching' for both the in-service teacher and the lecturer (Loughran, 1996, p. 18).

Schön (1987) outlines three forms of modelling. Each form is derived from the method the student learns from their mentor's practice. Schön uses coaching as the

metaphor to describe the learning processes used in each of these methods. The 'follow me' form sees experienced mentors demonstrating and outlining their repertoire of skills and knowledge for their mentees. Mentees imitate, practice and discuss the repertoires experienced. The 'joint experimentation' approach encourages the mentee to take the initiative and lead in reflection. The mentor advises through commentary and guidance regarding the inquiry and possible alternatives. The 'hall of mirrors' formulation involves the mentee experiencing 'what it means to be a learner in the practice situation' (Loughran, 1996, p. 16). The mentee through this experience can then reflect on the possible experiences of learners that are under their tutelage.

Ryle (1967) noted that one only begins to learn when one goes beyond what they have taught and begin teaching themselves. Heirdsfield, Walker, Walsh and Wilss (2008) note the power of mentoring as a learning experience upon the mentors.

Loughran, 1996) strongly argues for 'consistency between a teacher educator's teaching practice and his or her supervisory practice' (p. 16). Loughran's work is predicated around the concept that the teacher educator needs to 'practice what [one] teach[es]' (Loughran, 1996) and that pre-service teachers learn 'by reconsidering one's understandings through deeds, thoughts and actions' (p. 25). Kosnik (2001) places this mutuality as an imperative for academic staff,

> *'we do not think of it as a process that will also change and enrich us. However, we must be enriched by it if we are to prosper in this demanding profession. If we are to help our students develop we too must develop' (p. 66).*

Loughran draws on Dewey's stages and uses the process of reflective practice to make connections between the lecturer's modelling and the pre-service teachers' active engagement with reflective practice in their learning. By contrast, this study utilises notions from Schön's conceptions of reflective practice to make the same connection between mentoring and the genesis of reflective practice in the pre-service teacher through the lens of context and relationship.

In the connection between mentoring and active learning of reflective practice, Loughran (1996) observes the importance of a range of matters in the process: the

with-holding of judgement to develop mutual trust and respect as learners; the creation of feelings of safety to genuinely express understandings and views; shaping the teaching event as 'questions, scenarios, problems and concerns … impact on learning' (pp. 25-28); the use of a range of teaching strategies appropriate to the situation and student so as to enhance the learning and the reconsideration of understanding; the facilitation of risk-taking and vulnerability for the lecturer so that they are challenged through their own involvement in the teaching and learning experiences. Onwuegbuzie, Witcher, Collins, Filer, Wiedmaier, and Moore (2007) also note many of these features in students' perceptions of characteristics of effective college teachers. Nolan and Hillkirk (1991) concluded in their study of the effects of a reflective coaching program with veteran teachers that the coaching process not only changed teachers' pedagogical behaviours but positively increased teacher reflection and critical self analysis.

Kosnik (2001) emphasises the need to integrate throughout the curriculum delivery and pedagogy of a teacher education program reflective practice in a structured manner, as well as personal modelling, thus enabling scaffolding as she mentored students in their development of the necessary skills and attitudes. She notes how the re-development of an undergraduate course along these lines revealed to her 'the superficiality of my understandings of reflective practice' (p. 68). For the pre-service teacher the learning process is an encounter that seeks integration between the student's own lifeworld and the knowledge in theory and practice being experienced (Ekebergh, 2009). As understanding developed, the role between lecturer and students became more akin to collaborators (Kosnik, 2001) in the context of 'lifeworld didactics' (Ekebergh, 2009, p. 52), teaching to support the student's learning processes. Glazer, Abbott, and Harris (2004) elaborate on this by noting that 'collaboration … becomes the nexus of teachers' professional development and reflection' (p. 34). Chak (2006) observes that being 'open-minded and collaborating with peers [are] key mediating factors for engaging in this [reflective] practice' (p. 56).

Such collaboration and involvement of academic staff address two of Zeichner's (1996; Fendler, 2003) four critiques of how reflective practice undermine their intended purposes for teachers (the privilege of university research over teacher research; the emphasis on teaching techniques and classroom management; disregard

of the social and institutional context of teaching; and individual reflection rather than collaborative sharing).

For the reflective lecturer, 'reconsidering past experiences is an important shaping factor in planning for future teaching and learning experiences' (Loughran, 1996, p. 28). Davis (2004) notes the major impact on student teachers of the modelling they have observed from teachers in their own vicarious experiences as students. This dynamic interconnection and accessibility between the lecturer's understandings, perceptions, ideas and learnings, with those of their students' is the context of reflective practice within teacher education. Loughran (1996) describes the 'explicit act of modelling' (p. 40) where he 'demonstrates that I purposefully reflected on my own practice and that this would show, by example, something of the processes involved for me' (p. 40). Weshah (2007) notes the need for pre-service teachers to 'see their teacher educators as reflective practitioners' to 'help them address the paradox in their own learning about practice' (p. 309).

Loughran (1996) explicitly expands on the complexity of the teaching and learning milieu and the importance of deliberative modelling to pre-service teachers, and engaging them in conversations of the mind, 'thinking aloud' (Weshah, 2007, p. 309):

> *'teaching and learning are interconnected through a dynamic system in which one continually influences the other. To appreciate this interplay 'in action' is difficult as the ideas, perceptions, reactions and recognition of anticipated and unanticipated learning outcomes ebb and flow in response to the stimuli which prompt the thinking. It is fundamental to my view of modelling that this thinking during teaching is overtly demonstrated for my students if they are to fully appreciate the complex nature of learning about teaching; even more so if they are to seriously consider their own practice in relation to my modelling' (Loughran, 1996, pp. 28-29).*

Korthagen and Russell (1995) reinforce this need for genuine modelling by linking it to the lecturer's personal professional growth '[our] professional practice cannot

evolve unless we apply to our own practices the perspectives we recommend to others' (p. 107).

Listening to, conversations with, and mentoring of, in-service teachers 'inform[s] and transform[s]' (Mueller & Skamp, 2003, p. 438) the teaching of teacher educators. Reflective practice 'focuses on a willingness to engage in constant self-appraisal and development (O'Keefe & Tait, 2004, p. 29).

Such interactions require courage (Bolton, 2005) and commitment (Carlgren, 1996) as the process of reflective practice 'inevitably leads to assaults on emotions (Larrivee, 2008a) and requires teacher educators to move beyond 'non-invasive' (Inch & McVarish, 2003, p. 4) or 'comfortable collaboration' (Day, 1998, p. 264) as they promote constructive 'tension, uncertainty and dissonance [to help] developing teachers see the multiple dimensions of dilemmas and consequently choose from a wider range of options' (Larrivee, 2008a).

Brubacher, Case and Reagan (1994) note that the process of reflection involves time, experience and some 'wear and tear' around the edges. Palmer (1997) describes this state of vulnerability 'as we try to connect ourselves and our subjects with our students, we make ourselves, as well as our subject, vulnerable to indifference, judgement and ridicule' (p. 19). Sparrow (2009) observes that 'emotional states affect evaluative judgements' (p. 568) reinforcing Boud and Walker's (1998) comment that 'reflection is not solely a cognitive process; emotions are central to all learning' (p.194).

Convery (1998) observe that the support of others is needed if individuals are to develop constructive, self-critical reflection. He argues that reflective practice in teaching necessitates a social, collaborative approach rather than an introspective individualistic approach.

A demonstration of modelling (Alger, 2006) reinforces a range of learning elements involved (Loughran, 1996): the complexity of teaching, that results of teaching are not always those planned for, that confidence is built, repetition and time is needed for the importance of reflective practice to become established, and that solutions and answers may not present following reflection. Roth, Lawless, and Masciotro (2002) note the lack of reflection-in-action in teaching due to the pressures of time and

propose Spielraum, room to maneuver, as a more appropriate construct for the practice of teaching.

Bolton, (2005) notes that the facilitation of reflective practice lacks certainty, being analogous to handling a 'box of unpredictable fireworks' (p. 275) with the direction or manner of explosion being unknown. Active, dynamic engagement is the closest to certainty in the processes. Reid and O'Donohue (2004) describe it as 'education for creativity, innovativeness, adaptability, ease with difference and comfortableness with change … education for instability' (p. 561). Reflective practice, as a form of critical learning, is 'implicit and intuitive in nature, and general and contextual in scope and object' (Ng & Tan, 2009, p. 40; Tan, 2008).

Dinkleman (2003) makes the observation that effective promotion of reflective practice

> *'stems from the role of modelling in teaching … the medium of instruction, typically established in large part by the manner and activity of the teacher, is a large part of what is taught … students learn reflection from watching their teachers reflect' (p. 11).*

Cook-Sather (2008a) notes the mutual impact on reflective practices regarding teaching and learning by the full inclusion of student voice within the mentoring role. Beattie (1997) also notes the potential transformation of mentor's understandings through this process:

> *'when we enter into authentic relationships with our student teachers, and create real learning communities in our classrooms, when we enter into partnerships with teachers in the field and work with them to develop their voice and understandings, these situation provide us with opportunities to reform and transform our own understandings' (p. 125).*

Mueller and Skamp (2003) observe that many teacher education lecturers have no 'script' (White, 1988) from which they know how to nurture reflective practice. Bolton (2005) observes that some senior practitioners use defensive reasoning and

behaviours because 'their sense of themselves in their role is too uncertain for them to lay it open to enquiry' (p. 275).

Penny, Harley, and Jessop (1996) note the oft-present power imbalance in mentor-mentee relationships. Lyons (2006) observes that many university lecturers have demonstrated a 'long-standing antipathy to [lecturers] engaged in interrogating their own teaching practices' (p. 155).

What is important, however, is that teacher educators begin by participating in pedagogical conversations with their students that require them to reflect on teaching and on learning' (Mueller & Skamp, 2003, p. 429). Catt and Eke (1995) note the importance of discourse and conversation, especially the informal, to the learning situation. Lessing (1986) describes these conversations as being 'kindly friends from another culture … enabl[ing] us to look at our culture with dispassionate eyes' (p. 37), helping each other to think about what and how we think (Beattie, 1997, p. 123).

Andrews, Garrison, and Magnusson (1996) in their research on teaching excellence in the tertiary sector found that 'excellent teachers use self-reflection to develop a model for teaching within a particular context; they then attempt to 'live the model,' and be authentic to and congruent with their model' (p. 87). McAlpine and Weston (2000) reported that exemplary tertiary teachers described 'reflection as a mechanism for the improvement and development of teaching' (p. 382).

In a study of teacher educators, Amobi (2005) noted a wide variety of metaphors used to describe reflective teaching. One academic educator (Newton, 2004) has described the process of learning to reflect and model reflection as analogous to a journey progressing with potholes, hills, and stops for breaks. Cardona (2005) added the metaphor of a bus journey, including being held up in traffic.

The use of active modelling of reflection on practice provides pre-service teachers with 'an opportunity to accept or reject the use of reflection in their own practice'. Reflective practice 'may be used to shape learning about teaching, and teaching practice' (Loughran, 1996, pp. 46-47) as both lecturer and student are on a 'reciprocal, interactive' (Weiss & Weiss, 2001, p. 130) 'search for understanding' (Loughran, 1996, p. 52). Kochan and Trimble (2000) in such a setting describes the

mentor as no longer 'served as a font of perfect knowledge, but rather became a co-learner in a process of discovery' (p. 21). Weshah (2007) notes that

> *'for prospective teachers to learn that collaborative interaction with collegues is a critical part of the teaching career, they need to see evidence of such collaboration in their preservice programs' (pp. 309-310).*

Habermas (1981) in describing reflection based on critical theory spoke of the generation of emancipatoric knowledge. Active modelling aids in the generation of such knowledge. Mentors not only teach through demonstration, dialogue and a multitude of other strategies reflective skills, practices and attitudes; they also teach 'where and, how the reflective process should enter the life of teaching' (van Manen, 1995, pp. 40, 42) – a knowledge van Manen describes as 'pedagogical thoughtfulness and tact' that develops as they 'make connections that resonate within them' (Ryken, 2004, p. 111).

White (2006) uses the metaphor of 'trickster' to denote a 'boundary crosser … exposing new distinctions, making the usual strange', 'shak[ing] up language and received ideas' (pp. 21-22). White notes that such a role may be crucial for critical reflective practice, particularly where there is the presence of powerful cultures in organisations and professions. The 'trickster' role defends 'the openness of … conversation against all those temptations and real threats that seek closure' (Bernstein, 1983, pp. 204-5), encouraging and fostering a climate with an openness to Socratic self-questioning and dialogue (Turnbull & Mullins, 2007). This openness is central in assisting the mentor in keeping in perspective the ever-present gap between the 'theory in use' by emerging professionals and 'espoused theories' (Schön, 1991).

Modelling reflection also influences the perspective of pre-service teachers attitudes and practices towards the three reflective instances: anticipatory, contemporaneous and retrospective reflection (Loughran, 1996). The development of reflective practice in pre-service teachers is complex, however there are indicators that the degree of comfort with contemporaneous reflection may be related to their repertoire of classroom experiences (Loughran, 1996).

Gore and Zeichner (1991) sought through productive relationships with pre-service teachers to see if a reflective self-study would facilitate critical reflection in their student teachers. Their self-study, in the context of a term's action research project, is reported to have promoted a mutual growth of reflective practice in the lecturer and in the cohort of pre-service teachers. Dinkelman (2003) also reports 'a relationship with a mentor was crucial if [they were] to explore critically reflective issues together' as 'learning partners' (Ramsey, 2005, p. 292) in a 'real connection with … clients' (Schön, 1983 cited in Pietroni, 1992, p. 15).

 MaKinster, Barab, Harwood, and Andersen (2006) observe that support for in-service teachers' reflective practice can be exhibited in different social contexts such as web-supported learning communities as well as in a face-to-face context.

Reflective practice in relationship is a motivational and empowering process (Clegg, 1999) that responds to our needs for competence, autonomy and relatedness (Osterman & Kottkamp, 2004). Empowerment arises from the communication and collaboration involved. The learning then that arises from reflective practice

> *'is all about making use of existing awareness and creating awareness if and where necessary; and as it is about providing confrontation with conceptual frameworks, beliefs, assumptions, needs and emotions [leading] to new conceptual frameworks for interpretation of experience while providing safety in which to explore and reflect' (Stroobants, 2009, p. 11; Stroobants, Chambers and Clarke, 2007 p. 56),*

thus participating individuals 'are able to weave a complex web of connections between themselves, their subjects, and their students, so that students can learn to weave a world for themselves' (Palmer, 1999, p. 2).

2.5 Summary.

The modern literature on mentoring and reflective practice is extensive, reflecting the variability and broadness of meanings and worldviews associated with these concepts. Within the variability and ambiguity relating to these concepts evident in

the literature there is strong majority congruence on the utility of the dual concepts in education, especially for the improvement of educational outcomes.

The literature on mentoring arises from disparate origins and has no strong central conceptual focus or individual who has shaped subsequent discussion and debate. In the training and development of professionals, such as teachers, there is agreement that context, community and in particular the influence of significant others, impact greatly on one's developing sense of professional self and in one's concepts and belief structures. For pre-service teachers, academic staff are primary significant others, moulding their emergent professional lives as they are inducted into the teaching profession (Basile, 2006; Basile, Olson, & Nathenson-Mejía, 2003; Huling, 2006; Wang, 2001).

In particular, mentoring by academic staff, especially teacher educators, is closely related to the underlying precedent conditions necessary for the effective development of reflective practice (Costa, 2006; Wang & Odell, 2002).

Dewey (1910, 1933) and Schön (1983, 1987) dominate the discussion of reflective practice in the modern and post-modern era. Their notions have shaped the debate and development of the literature and reflect the trends and conceptualisations dominant in their time. Schön's conception has particularly impacted and resonated with teacher education and education in the last 20 years, arising to prominence in conjunction with the educational reform and critical theory movements of the late 1980's and early 1990's.

Schön's writings on mentoring and his emphasis on practice, experience and the tacit, provide a useful co-joining of the two concepts of mentoring and reflective practice in teacher training. The impact of mentor-mentee relationships and an authentic demonstration of reflective practice on the subsequent life cycle of the professional teacher, along with their development of core beliefs about teaching and learning, and their practice of critical reflection are commented upon in the literature, as are discussions of the risks, difficulties and challenges of such modelling and dialogue.

> *'Schön explains that learning to become a professional requires*
> *learning to think like a teacher … and this is something that students*

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have little idea about, at least to start with, since they do not have much of a repertoire of experience. Schön proposes that a dialogue between coach and student is needed for learning to occur. He develops a ladder of reflection to guide the coach and student through stages in his example of coaching students how to do ...

- *Stage 1: Action e.g. designing a building*

- *Stage 2. Description of the design*

- *Stage 3. Reflection on description of design*

- *Stage 4 Reflection on reflection on description of design.*

The role of the coach is then to take students through these stages, and in particular the last reflective stage, with the aim that the student will learn to think and act in the manner of an expert practitioner' (Hughes, 2009, p. 453).

Within the literature there is a preponderance of theoretical and generalised studies of the concepts, illustrated through a strong field of self-studies. There is evidence of a strong consensus emphasis in the literature on the utility and foundational benefits of a proactive, reciprocal, collaborative interaction and meaningful dialogue between academic staff and pre-service teachers within a mentor-mentee relationship.

This chapter has reviewed what is a disparate and prolific literature on reflective practice and mentoring. While extensive, the literature of these two concepts, especially that subset relating to the education of pre-service teachers, reports very limited qualitative research directly examining the genesis and development of reflective practice in pre-service teachers. Such research is derived from the voices of undergraduate students.

This thesis specifically adds to the body of knowledge in this area of education by directly reporting the voice of pre-service teachers through the recollections and re-conceptualisations of recently graduated teachers. The research participants' voices

are mediated through the lens of reflective and professional practice and experience, providing research data filter that is unique in the reviewed literature.

Chapter Three provides an outline of the methodological considerations and framework utilised in this study. It also provides details of the participant cohorts interviewed during the study.

CHAPTER 3

METHODOLOGY

'There are three things extremely hard:
steel, a diamond, and to know one's self'

<div align="right">Benjamin Franklin quoted by Miller (2003)</div>

3.1 Introduction.

Informed by a critical theory research framework this research utilises qualitative methodologies, with a focus on eliciting understandings of how individual teachers create and interpret their professional world. The research's foundational building blocks are derived through semi-structured dialogues between the participants and the researcher. This interaction, with an emphasis on individualised, idiographic description and explanation, records the teachers' introspection regarding their experiences as an undergraduate teacher in training.

The research is also informed by the methodological framework of symbolic interaction, an approach that is frequently used for studying lived experiences (Prus, 1996). As a theoretical tradition symbolic interaction examines the

> *'ways in which people make sense of their life-situations and the ways*
> *in which they go about their activities, in conjunction with others, on a*
> *day to day basis' (Pedro, 2001, p. 12).*

As this research focuses on elements of communication, language and interrelationships, the symbolic interaction framework facilitates the engagement of 'participants' construction of meaning' (Pedro, 2001, p. 13). The voice of teachers' voice is the primary means by which their meanings and understandings are interpreted. As discussed in Chapter Two, there are very few studies that give voice to the reflective practice experiences of pre-service teachers or examine through the teachers' lenses the genesis and development of reflective practice during their teacher training.

The centrality of participant voice within the interview dialogues reinforces the transformational, emancipatory agenda undergirding this critical theory research. The

interviews as the primary data collection device drew heavily of the traditions of narrative inquiry and enabled the participating teachers to critically interrogate their own practice. The chapter commences with a review of narrative inquiry as the research approach enabling reflection-on-practice.

The chapter then details the research questions and the methodological considerations and research design employed to address these questions. The details of the participant sample, ethical considerations, and qualitative data collection are also outlined in this chapter.

3.2 Narrative Inquiry.

Narrative inquiry (Clandinin & Connelly, 2000) enables the telling and analysis of educators' stories (Bal, 1997). Through narratives personal experiences and history are valued enabling sense to be made of our professional lives, including aspects of our teaching and learning (Gartner, Latham, & Merritt, 1996). As educational research has increasingly given emphasis on the learner and why they think they are doing it (Ramsden, 1992) and the social context in which the activity occurs, narrative enquiry has been increasingly used as a tool to 'tap into the tacit knowledge embedded' (Gartner, et al., 1996, p. 2) in others' experience.

Giving visibility to the thought patterns of practitioners the narrative inquiry process engages teachers in intentional reflection on their actions and opens up conversations with their fellow processionals (Lyons & LaBosky, 2002). Smith and Squire (2007) observed a cyclic process interaction between narrative inquiry and reflective practice, 'as we reflected on our experiences stories emerged, and while telling these stories, we reflected on our lives' (p. 375). Polkinghorne (1997) developed this linkage further by noting that the meaning of narratives 'flow from the researcher's reflections on them' (cited in McCarthy, 2008, p. 11)

Sumsion (1997) also notes the close linkages between the narrative orientation and reflective practice in the literature. Bruner (1985) observes that 'narrative is concerned with the explication of human intentions in the context of action' (p. 100).

Mitchell (1981) adds that story is 'a mode of knowledge emerging from action' (p. x). This makes narrative inquiry especially suitable as a mode of expression for knowledge that is generated from action (Carter, 1993). Sarbin (1986) observes that

'human beings think, perceive, imagine, and make moral choices according to narrative structures' (p. 8).

Polkinghorne (1997) sees narrative discourse as being a reporting of interrelated human activities, providing opportunity for the development of a unified story through 'emplotment' (Polkinghorne, 1997, p. 10) cited in McCarthy (2008). Richardson (1990a) observes that a narrative is 'contextually embedded' and 'connections between events is the meaning' (p. 13) of a narrative.

This study uses narrative enquiry as conceptualised by Beattie (1995) ...

> *'to describe and represent the human relations and interactions inherent in the complex acts of teaching and learning, and to validate their multiple realities and many dimensions. It allows us to acknowledge that educators know their situations in general, social and shared ways and also in unique and personal ways, thus validating the interconnectedness of the past, the present, the future, the personal, and the professional' (p. 19).*

Narrative opportunities make explicit the attitudes, beliefs and epistemological foundations about teaching, providing a connection between what is already known and what has to be learnt (Beattie, 2000). In reconstructing and retelling, 'story is the very stuff of teaching, the landscape within which we live as teachers and researchers, and within which the work of teachers can be seen as making sense' (Elbaz, 1991, p. 3.) and translating our 'knowing into telling' (White, 1989, p. 1). Craig (2009) observes that narrative is 'how teachers hold and express their knowledge' (p. 108). Bolton (2006) writes how narratives can gently support professionals in examining their own (and others') practice as the narrative shapes a creation 'of order and security out of a chaotic world' (p. 204). In this sense, reflective thinking echoes Lyons (1998) conception of 'a threading together of experience, of making connections' (p. 113).

The open-endedness, complexity and creativity of narrative practices (Smith, 2008) facilitate the gathering and representation of the voice of teachers – those who know most about the phenomena of teaching (Doyle, 1997). Personal constructs 'access the

impact of … experiences on the thinking of teachers in preparation (Knowles, 1993, p. 70).

As a mirror, they enable the origins of the personal perspectives and practices of pre-service teachers to be displayed (Knowles, 1993). The reflective practice of narrative retelling 'both refigure(s) the past and create(s) purpose in the future' (Connelly & Clandinin, 1990, p. 24), inviting and nurturing reflection (Knowles & Holt-Reynolds, 1991) and connectedness (Smith, 2008). Van Manen (1994, p. 162) notes that reflection on experience aids an understanding of good pedagogical practice in the present and as a practical guide for the future.

The reconstructed and recalled narrative uniquely gives an explanation of behaviour as it emphasizes the interpretations people place on their own experiences – providing a window into their subjective reality, assumptions and beliefs (Beynon, 1985) and grounds the context of the experience, while also asserting the complexities of the reality. As a mirror, the reconstructed narrative may not always be well illuminated. It may be

> *'a dark mirror, a cracked mirror, a looking glass through which we may enter into … what? A mirror that is distant, or cloudy, a mirror that reflects other worlds, or that does not reflect but refracts or defracts' (Kemp, 2001, p. 348).*

The retelling, in a semi-structured interview, is a sharing of private mental constructs (Knowles, 1993). Such dialogue as a 'living experience of inquiry within and between people' (Issacs, 1999, p. 9), creates a 'pedagogy of engagement' (Briton, 1996, pp. 69-70) enabling fresh understandings, insights and connections to be made and articulated. Such constructions of remembered experiences form shape because of their initial power (Carter, 1993).

Narratives, stories, retelling of cases serve as powerful vignettes of teaching development (Kilbourn, 1988) enabling reflection-on-action. Schön (1983) noted the role of narrative in his reference to 'reflective conversation'. The 'reflective conversation is at the heart of the process of reflecting-on-practice' (Ghaye, 2000a, 2000b, p. 7).

As an insight into reflective practice the 'reflective conversation' (Yinger, 1990) provides a 'responsive interchange between thinking and acting' (Loughran, 1996, p. 57) and the 'possibility of exploring the interactive relationship between our thinking and action' (Crawford, Dickinson, & Leitmann, 2002, p. 175).

This research as an exploration is a 'possibility'. In reality a process of an interview of approximately one hour in length is only briefly and somewhat shallowly explore the deeper issues and processes of professional identify formation for each participant. While the framework of interview questions provides an accounting of this, self-transparency is a treasure that is not frequently mined within such a small window of reflection.

This research then, is only a partial and incomplete insight, akin to what the Apostle Paul described as 'now we see through a glass, darkly' (1 Corinthians 13:12). His description concludes with the adage that 'now I know in part; but then shall I know even as I am known'. In this research the accounting by recollection, through the act of a single interview, lends to the reality that we know only 'in part' and that that knowledge is closely intertwined with the participants' partial and incomplete knowledge of their self – in particular their professional self.

In reconstructing the teachers' experiences, I represent their voices through both my interpretative comment and in direct quotes taken from transcriptions of interviews with them. 'The telling, reconstructing and reflecting on stories of professional practice is not a simple matter of reconsideration but a complex web of meanings within relationships and understandings of the artistry of that practice' (Goodfellow, 2000, p. 40). These narrative accounts and explorations of the accounts give occasion to construct such knowledge of the practice (Lyons, 1998). In telling our stories and the emergence of our practice, 'we come to understand our own understanding of ourselves as reflective practitioners (Watson & Wilcox, 2000, p. 59).

The nature and quality of the data derived through this research process is then reflective of the journey within the research process of the participants' growth in their self-awareness and understanding of their professional life as reflective practitioners. As the researcher is an integral participant in this journey of growth, the degree to which all participants are by definition opaque to themselves reinforces the complexity noted by Chambers (2003, pp. 403-4) that it is 'The 'narrative itself,

and reflections upon the narrative …[that]… appear to facilitate understanding and generate new knowledge' (Chambers, 2003, pp. 403-4).

Studying one's own tertiary training through the process of reflection makes the experience one of experiential education (Joplin, 1995) where the

> *'systemat[ic] collect[ion of] evidence from their practice, allow[s] them to rethink and potentially open themselves to new interpretations and to create different strategies for educating students' (Hamilton & Pinnegar, 1998, p. 1).*

The acts of framing and reframing, core characteristics in the process of reflective practice (Russell & Munby, 1991), involves changes in the way events, practices and dilemmas are perceived. Emery's (1996) study of oral dialogues with teachers found that all teachers involved demonstrated reflective practice at a range of levels using the narrative modality. The early intervention in career training 'can promote the kind of self-awareness that allows prospective teachers to hear and listen to their own voices' (Larrivee, 2008a, p. 96).

Our particular idiosyncratic experiences and reflections are actually examples of 'a wider structural problem or cultural contradiction' (Brookfield, 1995, p. 219). Clarke (1998) observes that reflective practice in pre-service teachers tends not to be episodic or tied to specific incidents, especially given the status of development of their appreciate systems, but appears to be evidenced in the development of long-term thematic renderings of reflection. Here Hudson's (2002) concept of 'holding complexity' while 'searching for meaning' denotes the essence of teaching as a reflective practice.

As an analysis this study seeks to provide an interpretivist insight into teaching and learning through the contexts and processes described by the participants. While their 'multi-voicedness' (Admiraal & Wubbels, 2005, p. 327) is subject to analysis, this research seeks to assist them in providing a medium for the portrayal of their re-conceptualisations. As Boud, Keogh, and Walker, (1985b) note, as participants return to experience their memories play a role in their reflective cycle. As suggested by Willis (1999), this study replicates aspects of the reflective practice cycle through practitioners

> *'giving attention to the purposeful activities which make up their practice ... and then examin[ing] them to see to what extent the activities that actually occurred were what they planned' (p. 91).*

The study then provides a critique of the activities in the light of the literature, the observations of the participants, and through the lens of the researcher.

As an expressive, interpretative approach, the participants' direct experiences are named through their perceptions. Merleau-Ponty (1974) describes perceptions as not giving precise knowledge like geometry, rather truths like 'presences' creating an 'awareness and awakeness' (p. 198) of one's experienced world. As Beattie (2001), in her narrative inquiry into the perspectives of pre-service teachers, states:

> *'For prospective teachers, it is imperative that they develop their own authentic voices at the outset of their professional education, that they acknowledge the value of being influenced but not overwhelmed by the voices of others, and that they learn ways to allow multiple voices to be heard in the educational arena. As they work to create classroom and school communities where their own students learn to become full participants, these teachers continually develop their abilities to rescript and enact new narratives of student-teacher relationships, of teacher–teacher relationships, and of classroom-school and community relationships. With such effort, these teachers create conditions for their own ongoing learning and for the continuous creation and recreation of the narratives they tell and enact in their lives' (p. 73).*

3.3 The Research Questions

Watson and Wilcox (2000) ask the question, 'How do professionals, especially novices, learn to reflect and create a repertoire of responses to deal with complex human problems' (p. 58)?

Loughran (1996) posed as his first focus of research 'What issues or concerns prompted his students to reflect?' (p. 57). Gardner (2001), a Social Work educator asked, 'Do student welfare workers develop the capacity to reflect and develop awareness of their own attitudes and values?' Hatton and Smith (1995) in their

review article ask a series of questions relating to the effectiveness of teacher education programs in demonstrating evidence of reflective practice in pre-service teachers.

Teacher educators seek in their training courses to provide experiences, settings, information and skills to prepare the in-service teacher for their career. For the contemporary teacher, the development of disposition for, and practice of reflective thinking is a core professional process.

For teacher education, how practitioners begin the abstract process of reflecting on practice is a key question. In particular this study focuses on:

- How professional reflective practices are developed during the pre-service experiences of science teachers?

- How in-service teachers' subsequent development of reflective professional practice is affected by:

    - Interactions with pre-service lecturers?

    - The perception of pre-service lecturers' practice of reflective critical thinking by science teaching graduates?

In the context of the various forces that impact and shape student learning, this study seeks to explore those experiences and relationships within a tertiary institution that assist pre-service teachers to develop and enhance their emerging professional reflective understanding.

In particular, the research focuses on how students learn from the interactions with lecturing staff, both in teacher education and in their major discipline area(s) of study; how that relationship impacts on the development of understanding and serves as a professional role model, shaping and developing the emerging professional aptitudes and attitudes of the student.

The study explores the relationship between lecturers' personal level of reflective practice and their ongoing interest in professional development and improving their pedagogical practice, and the impact of these tertiary teaching practices in pre-service teachers.

3.4 Methodological Considerations

Drawing on the interpretative paradigm that focuses on an understanding of the subjective world as experienced by the individual, the research seeks to develop theoretical constructs from the individual's conceptualisation of the emerging professional world that surrounds them. Meanings, intentions and interpretations of meanings by the interacting participants inform the research (Shulman, 1997) and inform the complexity of reality. With an epistemological base of personal, subjective and unique social construction (Shulman, 1997) reality is a cogitative construct.

The focus of this study is an exploration and understanding of the voice of graduates' providing meanings to their pre-service experiences and is rooted in a naturalistic, qualitative research methodology, within a reflexive interpretive framework.

> *'Rather than a linear process that seeks causal determination and prediction, critical reflective interpretation requires a process that seeks critical reflection about the illumination and understanding of all phases – describing the experience, enquiring into that experience as well as the examination of that enquiry and interpretation process itself' (Norsworthy, 2008 p, 85).*

As common methods used in similar research have an individualised, idiographic foundation, a major methodological consideration in the research is the seeking for a common language base so the observed phenomena for participants in the research can share commonality in the articulation of their mental construction. As a piece of qualitative research, this study is focused on understanding the meanings and worlds (Delmont, 1992) of the participants' individual experiences.

The research is intentional in seeking to positively alter developing teaching practice and effect a change in the roles and attitudes of both lecturers and pre-service teachers. As such, the research is also informed through a critical theory framework. Informed by my previous participation in research that demonstrated the power of respectful dialogue, student voice, and the impact of relationships between a teacher and students on the development of understanding and reflective practice (Kane,

Maw, & Chimwayange, 2006), the research questions draw heavily on critical theory assumptions.

Critical, reflexive inquiry enables the research to 'maintain a sense of 'complication or tension' and not seek resolution' (Norsworthy, 2008, p. 86) reflecting the 'ambivalent and ambiguous' (p. 86) character of education. This small-scale qualitative study uses qualitative research methods, building on dialogue and partnership between the researcher and the participants. This collaboration and the establishment of a meaningful dialogue build on the foundational understanding that conversation and understanding in the natural setting of participants reveal the world experienced (Anderson & Arsenault, 1998).

3.5 Research Design

As researcher, I sought to understand, and construct meaning out of the experiences and responses shared through the participants' voice. Through their voices I sought to gain an entry and insight 'into their conceptual world of reflection' (Otienoh, 2009, p. 480). In this sense, the research sought a dynamic representation that 'explicity locates the author in the text' (Tierney, 2002, p. 385).

In the research, there was a 'double hermeneutic at work' (Usher, 1996) as participants interpreted their own reflective experiences during the interviews I interpreted their experiences in the context of the research questions.

My research questions are similar in focus to Norsworthy (2008) who examined them through the lens of a teacher-educator in her self-study. This study seeks to examine analogous foci through the lens of the participants in teacher education – the pre-service teacher. Norsworthy's key research question was 'what does pre-service course work within an initial teacher education program contribute to the development of the reflective professional? Sub-questions then focused on 'What factors are perceived to inhibit pre-service teachers being reflective? And What factors are perceived to nurture pre-service teachers being reflective?' (p. 72).

My research questions as explored through the means of a set of interview questions that were used a guide in the subsequent semi-structured interviews. An initial set of interview questions was developed and refined in consultation with my supervisor. To enhance the analysis of the data, the questions were reviewed and then ordered

into broad themes, as informed by the literature review. The broad themes identified were:

- The meaning of reflective practice to the individual participant;

- The nature and status of reflective practice in the professional life of the participant;

- The broad impacts of the learning experiences of the context of the teacher training on the participant's personal perspectives regarding reflective practice;

- Environmental considerations that fostered and encouraged the development and expression of the distinct predispositions and skills for reflective practice;

- The identification of developmental phases or stages in reflective practice for pre-service teachers;

- Identification and description of pre-service reflective practice activities;

- The perceptions of participants regarding lecturers' development and enhancement of participants' disposition towards reflective practice; and

- Recollections of interactions, impacts, and roles of mentoring on the teaching practices.

The two sets of interview guides, teacher participants and lecturer, were redesigned and reworded to ensure that there was a strong congruence of themes and questions. This mapping exercise provided an opportunity to review and reflect on the research tools' congruence with the primary research questions and the issues raised within the review of the literature.

In the mapping of the questions, the broad theme being investigated was firstly outlined, and then within each theme the relevant sub-set of questions was listed. The similarities and points of differentiation between the final two sets of question guides are outlined in the following Table 3.1.

Differentiation or similarity for each question was noted within the other column. As is evident in Table, most questions are worded identically for each set of participants:

with any differentiation being minor, such as a change of tense within the question, focusing on the past rather than the present; or a change in the object of the question, from the teacher participant to the lecturer participant.

Table 3.1

Similarities and Differences in the Student and Lecturer Question Guides.

Student	Lecturer
What does reflective practice mean to the individual?	*Identical theme*
What does reflective practice mean to you?	*Identical questions*
Do you have a metaphor for your definition?	
Give an example of a time you have engaged in reflective practice	
How does the individual see the status of their present reflective practice?	*Identical theme*
Describe the process you regularly use to critically analyse your teaching?	*Identical questions*
How do you involve your peers in professional dialogue regarding your teaching practice?	
Have there been any specific episodes or experiences that have given you pause to stop and reflect on your role as a teacher?	
What broad impacts did the 'Avondale experience' of professional training have on teacher's personal perspectives regarding reflective practice?	*Identical theme*
	Change of focus in questions to student
	Change of tense in questions to present
As a professional teacher what were the most significant and influential factors in the	For students what are the most significant and influential factors in the 'Avondale

'Avondale experience' that have contributed to your development as a professional teacher? Were there specific skills or opportunities that were meaningful for you at Avondale that facilitated your reflection on your development as a professional?	experience' that have contributed to their development as a professional teacher? What specific skills or opportunities are meaningful at Avondale that facilitate students' reflection on their development as a professional?
Were distinct predispositions and skills for reflective practice fostered and encouraged?	*Identical theme* *Change of tense to present in questions.* *Change of focus to lecturer in questions.*
In what ways was Avondale a supportive and healthy learning environment for the development and expression of reflective professional practices and attitudes?	In what ways is Avondale a supportive and healthy learning environment for the development and expression of reflective professional practices and attitudes?
What characteristics and conditions did lecturers bring that enhanced the development of a disposition and capacity to reflect?	What characteristics and conditions do you as a lecturer bring that enhances the development of a disposition and capacity to reflect in students?
Was there a climate of trust, respect and non-defensive openness by lecturing staff at Avondale? How was this engendered?	Is there a climate of trust, respect and non-defensive openness towards students by lecturing staff at Avondale? How is this engendered?
Did lecturing staff exhibit and develop a supportive and collaborative culture with students? How was professional collegiality, collaboration and a sense of professional community developed or articulated during your training as a teacher?	How do lecturing staff exhibit and develop a supportive and collaborative culture with students? How is professional collegiality, collaboration and a sense of professional community developed or articulated during students' training as teachers?

Is there identifiable development in reflective practice for pre-service teachers?	*Identical theme with change of focus to elicit lecturer perspective*
Can you identify specific phases in your development of reflective practice at Avondale?	Can you identify specific phases in the development of reflective practice by pre-service teachers at Avondale?
What metaphors characterise the reflective thinking of the pre-service teacher? How are these different from those of you as an experienced teacher?	What metaphors characterise the reflective thinking of the pre-service teacher? How are these different from those of an experienced teacher?
What types of reflective practice activities did undergraduate science teachers encounter?	*Identical theme*
Can you describe any particular interaction or observation of Avondale's academic staff that gave you cause to pause and consider their modelling of professional reflection?	*Identical questions*
The undergraduate reflective practice environment can have a task orientation or a relational orientation. How would you describe the orientation of the reflective practice environment you experienced at Avondale?	
What are the perceptions of graduates regarding lecturing staff's development and enhancement of their disposition towards reflective practice?	*Identical theme* *Change in question of tense to present.*
Can you share with me some examples of classes at Avondale that incorporated the	Can you share with me some examples of classes at Avondale that incorporate the

modelling of reflective practice?	modelling of reflective practice?
Do lecturers at Avondale give a unified, institutional perspective on reflective practice?	Do lecturers at Avondale give a unified, institutional perspective on reflective practice?
Were there any limiting factors you experienced that did not help you to be reflective?	Were there any limiting factors you observe that do not help students to be reflective?
The literature comments on the importance of collaboration, dialogue and discussion in the development and transformation of professional concepts, values and actions. Can you recall specific, salient instances in your training that transformed you professionally as a reflective practitioner?	The literature comments on the importance of collaboration, dialogue and discussion in the development and transformation of professional concepts, values and actions. Can you recall specific, salient instances in teacher training at Avondale that transform students professionally as a reflective practitioner?
What are the recollections regarding mentoring?	*Identical theme with change of focus to elicit lecturer perspective on their mentoring role.*
How did you see good teaching modelled at Avondale?	How do you see good teaching being modelled to students at Avondale?
What phrases or metaphors would you use as analogous to the mentoring given by lecturers at Avondale?	What phrases or metaphors would you use as analogous to the mentoring given by lecturers at Avondale?
Can you describe a time when your mentor 'provoked' you to reflect on your own practice?	Can you describe a time when a student you mentored 'provoked' you to reflect on your own practice/

Looking back on your training at Avondale, can you comment on significant relationships with lecturing staff that significantly contributed to your development as a professional teacher?	Looking back on the teacher training at Avondale, can you comment on significant relationships involving lecturing staff that significantly contributed to student development?
What is the impact of mentoring on the teaching practices of science teachers?	*Identical theme* *Change of focus in questions to elicit lecturer perspective*
What lessons have you learnt from your lecturers' mentoring styles that have impacted on you as a professional, and how do you use these lessons in your mentoring of others?	What lessons do you seek to impart in your mentoring styles that impact on students as a emerging professionals, and how do you use these lessons in your mentoring of students?
Has the mentoring given to you by Avondale lecturers developed your own insights into your teaching, enabling you to view your classroom through a second and different professional lens?	

While the voice of graduates served as the primary data source, the data were clarified and given additional validity by the interrogation of the voices of lecturers from the Faculties of Science and Education. The researcher's interpretation in the light of the literature combined with the two other data sources effectively provided a triangulation for the data sets used in the research.

3.6 Participant Sample and Sampling Procedure

A listing of graduates from the various teacher-education courses associated with the Science and Mathematics Faculty at Avondale College since 1970 was constructed. These courses included: the Diploma of Science Teaching (1970-1975); Bachelor of Education with a major in Science, Mathematics, Biological Science, Physics, or

Chemistry (1976-1996); Bachelor of Science – Secondary with a major in Physics, Mathematics, or Biological Science (1997-1999); and the Bachelor of Science/Bachelor of Teaching and Bachelor of Science/Bachelor of Teaching (Honours) joint degree programs (2000 - 2008). Over 200 graduates from these courses were identified.

From these graduates, the subset of those teachers currently in the secondary school sector of the Adventist Schools (Australia) system was identified. Twenty five secondary schools in this school system were identified. Fifteen of these schools had Avondale College graduates from the last 17 years employed as Science teachers. In addition to classroom teachers, administrators in the schools and associated system offices who were graduates from the identified courses were identified. An additional graduate employed in an Adventist primary school was interviewed. In total, matches with 22 graduates from the last 17 years were made.

All identified graduates working for Adventist Schools (Australia) were asked if they were willing to participate in the study. Eighteen of the identified graduates were willing to participate, of whom 17 were interviewed. One graduate was unable to be interviewed due to logistical difficulties. The remaining four identified graduates did not respond to the invitation or were unavailable when the site visit was made.

One participant that was interviewed graduated from the Bachelor of Science course at Avondale and subsequently did a post-graduate entry course in education in another institution. Another participant completed a primary education degree at Avondale with a KLA in Science and currently teaches upper primary/junior high school students.

The characteristics of the teacher participants are outlined below in Table 3.2.

Table 3.2

Teacher Participants

Pseudonym	Sex	Degree	Major	Year
Ava	F	BSc/BTch	Biological Science	2004
Benjamin	M	BEd (Science)	Biological Science	1992
Charlotte	F	BSc/BTch (Distinction)	Biological Science	2006
Chloe	F	BEd (Primary) (Honours)	Science KLA	2006
Ella	F	BSc/BTch (Distinction)	Biological Science	2005
Emily	F	BEd (PDPHE)	Biological Science	1999
Ethan	M	BSc/BTch (Honours)	Physics	2005
Isabella	F	BSc/BTch	Biological Science	2007
Joshua	M	BSc/BTch (Honours)	Chemistry	2000
Lachlan	M	BEd (Science)	Mathematics	1996
Noah	M	BSc/BTch	Physics	2006
Olivia	F	BSc	Biological Science	2003
Riley	M	BSc/BTch (Distinction)	Chemistry	2007
Samuel	M	BSc/BTch	Biological Science	2002
Sienna	F	BSc/BTch (Credit)	Biological Science	2004
Sophie	F	BEd (Science)	Chemistry	1996
William	M	BSc/BTch	Mathematics	2004

The participating teachers were almost equally divided on gender lines, with eight males and nine females participating. Teachers who had graduated since 2000 were over-represented in the group, with all but three of 17 teachers being graduates in the last nine years. This over-representation is indicative of an issue of non-retention of experienced subject specialist classroom teaching staff generally within the Adventist Schools (Australia) institutions.

The subject discipline the participant teachers had majored in also was distributed amongst the available majors on offer. Two graduates majored in Mathematics; two in Physics; three in Chemistry; and nine in the Biological Sciences. The high numbers of participants in the Biological Sciences is representative of the enrolments in that major in comparison to other majors. The cohort exhibited an over-representation of students who had demonstrated outstanding academic prowess during the course of their studies. Seven of the teachers had graduated with either an honours degree or with the appellation of distinction or credit attached to their award.

All lecturers in the Faculty of Science and Mathematics and the Faculty of Education who directly interact with secondary science pre-service teachers were also invited to participate in a separate series of interviews. All 11 lecturers approached accepted the invitation to participate and were interviewed.

Table 3.3

Lecturer Participants

Pseudonym	Sex	Faculty	Position
Alexander	M	Science and Mathematics	Senior Lecturer
Amelia	F	Education	Senior Lecturer
Cooper	M	Science and Mathematics	Associate Professor
Daniel	M	Science and Mathematics	Senior Lecturer
Jack	M	Education	Senior Lecturer/Dean
James	M	Education	Lecturer
Liam	M	Science and Mathematics	Senior Lecturer/Dean
Mia	F	Science and Mathematics	Lecturer
Oliver	M	Education	Senior Lecturer
Ryan	M	Science and Mathematics	Senior Lecturer
Thomas	M	Education	Lecturer

Participating lecturers were divided as equally as possible between the two faculties represented, with five participating from the Faculty of Education, and six from the Faculty of Science and Mathematics. The gross gender imbalance represents the gender composition generally within the faculties, especially in the Faculty of Science and Mathematics. The predominance of senior academic staff, with eight participants being at Senior Lecturer or Associate Professor level, reflects the longevity of tenure at Avondale, depth of experience, and qualifications held by staff at Avondale generally. The Deans of both faculties were included in the participant group to enable a broader institutional perspective to be given. The majority of participants would have been lecturers in these faculties for the duration of the period the teacher participants were trained at Avondale College. Two lecturers, Jack and Mia are also alumni of the science teaching course at Avondale College.

3.7 Ethical Considerations

The standard procedures for obtaining consent were reinforced through the processes related to gaining ethical approval from two institutions: Curtin University of Technology; and Avondale College.

Confidentiality and anonymity

All participants were informed that the research data would be treated with confidentiality and that I would, as researcher, be the only person to access it. As outlined in the Consent Form (Appendix A) and the Patient Information Sheet (Appendix B) participants were informed that identifiers would be removed and anonymity would be achieved through the use of pseudonyms. By personally carrying out the interviews this confidentiality and anonymity was reinforced.

Pseudonyms have been used when citing participants' comments to assist in the preservation of anonymity. Pseudonyms were assigned randomly to both participant listings (teacher and lecturer) from the listing of most popular given names for births in NSW for 2008. The names assigned retained the gender orientation of participants.

Informed consent

Participants were informed of the purpose, aims and study parameters in printed form prior to interview. Each participant was presented with the Consent Form (Appendix A), Participant Information Sheet (Appendix B), and the plain English Research

Summary and Aims (Appendix C) prior to each interview, usually by email prior to my visit. Participants read the content of these documents and verbal assurance of their understanding of what was entailed and the implications of participating in the study was elicited. After this, each participant willing to participate voluntarily signed the Consent Form.

3.8 Researcher Subjectivity

As this study focuses on the perceptions, experiences and recollections of teachers on their experiences and understandings of reflective practice and mentoring in an undergraduate teacher education course, subjectivity issues permeate the study. In the use of a symbolic interaction framework to analyse the data, subjectivity is integral in the research process. Ellis (1991) suggests that the introspection regarding the subjective elements of such research has utility for 'understanding the lived experiences of emotions' (p. 23) participants share. As such it can generate interpretative data that otherwise would be neglected.

One cannot enter the re-lived experiences of participants without experiencing affective experiences. The research experience has also involved considerable development of me as a reflective practitioner. By acknowledging the subjectivity and attempting to capture it through the interview process, the research processes 'we evoke a conversation through which we come to know others and ourselves and the position from which they speak' (Pedro, 2001, p. 24). As such, subjective elements inform the reconstruction of participants lived experiences in this research.

3.9 Qualitative Data Collection

As the researcher I was the major instrument for the collection and analysis of the data. Individual interviews were held with each participant, conducted in a private room at the site of their workplace, or in three cases at their home. An interview guide (see appendices D & E) was used and the interviews were video and audio recorded. The interview guide facilitated the 'guided conversation' (O'Connor, Hyde, & Treacy, 2003) of the interview.

The research design sought to capture what the graduates voiced about their pre-service and subsequent in-service reflective practices, and the impacts that the

modelling of these practices by their undergraduate lecturers had on the development of their own professional practice.

The text derived from the interview transcripts provided a rich field of research data and also evidenced the teachers' own critical interrogation of their emerging and present practice (Kane, Maw & Chimwayange, 2006). The research questions provided a framework for an interview template that was supplied to each participant prior to interview, providing an opportunity for reflective consideration of the issues raised and to aid the process of recollection.

The use of the interview guide afforded flexibility for the interviewer and assisted in the retention of the voice of the participants in their reconstructions and accounting of their experiences. Sufficient time was given for the participants to voice their thoughts, emotions, beliefs and perspectives and make connections between these. In the process of making these explicit, they were encouraged to find their voice. Interviews were conducted for a period of up to an hour in duration.

The venue was chosen to minimize any inequality in power relationships between the participants and the researcher. The conversational style of interview was designed to elicit trust and confidence as well as model elements of reflective mentoring and reflective practices, facilitating an exploration of their experiences as pre-service teachers or lecturers. A differentiation in power relationships during the interview process can be subject to greater equality of status through the development and enhancement of reciprocity (Schostak, 2002). The research design deliberatively seeks the development of an open, trusting dialogue relationship in the research to enhance reciprocity.

The structure and depth of the interviews enabled the participants to articulate issues that were of significance to them within their own frames of reference. Voiced research, as a form of practitioner research, enables those 'previously excluded, muted, or silenced by dominant structures and discourses' (Smyth, 1999, p. 74) to be heard. To assist this, all participants were given an initial set of questions (see appendices D & E) and the research information sheet (see appendix B) in advance of the interview. All but two participants had this material well in advance of the interview visit. This enabled participants to reflect and give prior consideration to their responses. The guiding questions gave points of focus for the interview, with

the time given to interviews providing opportunity to explore issues raised within the interview.

Interviews were recorded by video and by voice recorder. Recording minimised any tendency by the researcher to unconsciously select data, and aided in the preservation of the participant voice. The taping also aided in the accuracy, accessibility and insightfulness of the data (Veal, et al., 1989).

Participants were supplied electronic copies of the recording for verification and an invitation to suggest changes or additional data. Once interviews were transcribed, copies of the transcripts were also supplied to participants for verification and comment. Transcripts were then edited to provide pseudonyms to participants and schools in order to protect the identity of participants. To aid freedom of comment, participants were informed of the anonymization process prior to interview.

Interviews that are semi-structured require the researcher to be honest in the construction and utilisation of follow-up questions, ensuring that they do not follow a line of investigation that has not been disclosed. Given that those engaged in critical research cannot be certain of the path their enquiry may take (Hart, 2001) there is a requirement in the design that the researcher and the participants be willing to engage in negotiation. Such negotiation reinforces the dialogue, trust and reciprocity in the research relationship, empowering the participants in the research (Schostak, 2002). The researcher is also a complete participant in the interview processes (Hitchcock & Hughes, 1995).

All interviews were held during the period of August to October 2009. Contact was also maintained with the participants by email during this period. The data collected for each participant were securely filed in a locked cabinet in the researcher's study. Data collection included DVD's and CD's of the video and audio files as well as subsequent transcription records of the interviews. A duplicate (password protected), electronic set of data, was held separately for security.

3.10 Preparation and Analysis of Qualitative Data

Data consisted primarily of audio and video recordings of semi-structured interviews. The semi-structured interviews were akin to conversations with a number of focuses – nested about the questions outlined in the interview guide. Transcriptions of these

interviews were analysed following their transcription. Themes emerged from the repeated reading and re-reading and analysis of the data, with issues subsumed within each theme.

Weshah (2007) notes that 'reflection is a way of thinking which resides in the mind of the individual, so it is difficult to observe' (p. 309). The repeated reading and re-reading of the transcripts and viewing and listening of interview tapes assisted in the identification of the participants' reflections.

The authenticity and validity of the data collected was reinforced by the supply of interview audio and transcripts to participants for review, comment and correction. Copies of the chapters relating to analysis and findings, and discussion were also supplied to participants to give additional transparency and authenticity to their voices.

All interviews were transcribed verbatim, and these data were then used and reviewed for patterns and regularities. As patterns and regularities were noted in the initial interviews a set of categories or themes were formulated. Coding of the transcriptions then commenced based on this initial set of thematic categories. For this study, the search for themes utilized a similar approach to Lee and Loughran (2000), where a theme 'was a concern which prompted student teachers to reflect on their classroom practice … [or] … a perspective student teachers adopted in framing or reframing pedagogical issues' (p. 75). For this study, the themes and issues were framed in the context of the broad research questions this study sought to address, rather than the narrower classroom practice or pedagogical issues Lee and Loughran were examining.

Kember, et al., (2008), working with written reflections, noted the difficulty in codifying components of a work, and recommend that any coding of level of reflection should be performed on a complete work. They used four categories of reflection: habitual action/non-reflection; understanding; reflection; critical reflection (p. 372). It was noted that intermediate categories could occur (p. 379). The categories of level of reflection used by Kember, et al, (2008) were adopted in this research when assigning levels of reflection.

Kember, et al., (2008) 'recommend[ed] that the normal procedure in assessing the level of reflection is to examine the whole paper to find the highest level of reflection' (p. 372). This approach is seen as 'consistent with the most common approach to allocating categories in qualitative research' (Kember, et al., 2008, p. 372). As the transcripts were reviewed and the taped interviews were replayed to elicit an understanding of the issues, concerns and ideas expressed through the participants' recollections, a revision and refining of the coding schema occurred. Transcripts were then reviewed against this final coding schema.

Given the importance of voice in this study the primary source of the scripts of the participants was given primacy in the subsequent description and discussion of these themes. The voice of the teachers was given pre-eminence in the analysis of the scripts, with the voice of lecturers providing another lens through which further informed their voice. Descriptive recollections of the participants are blended with the analysis of them, enabling the highlighting of specific elements that are relevant to the development and fostering of reflective practice in the life of the pre-service teacher.

Given that the semi-structured interview questions were already broadly framed around the research questions, the selection of voices to be heard within the interpretation and analysis stage of this study was placed into a sequence that had already been selected by the nature of the research process. In this manner the research process, agendas and timelines had constrained the voices of participants. Care then had to be taken in choosing the words used from the transcripts to as closely represent the participants' voices, their constructions of meanings and the subtleties of the nuances of meaning they gave.

To aid this, where meaning was not obviously and directly stated, sufficient of the transcription was given to provide contextualisation for the quotation given. As the researcher, I was very aware that I was selecting the words, the examples to be included in the analysis. Where possible, in interpreting a particular research insight, there was a deliberative attempt to give a range of participants' voice. Often, even when there was clear congruence of perspective from the participants, the range of voices used permitted nuances of meaning to be expressed directly, rather than primarily through the interpretive lens of the researcher. Any participant with a

unique, conflicting, or differing perspective on a particular research question being examined was deliberatively included, even if that perspective was idiosyncratic. Of particular concern was a deliberative attempt by the research to ensure that the full range of participants had representation of their voice within the study.

As researcher I was very aware that in such a vast and detailed mine of data as is gathered in hours of interview, that only a small selection of the voices expressed can be directly included in the narrative detailed in this study. Decisions of inclusion related primarily to the relevance of expressed participant voice to the particulars of the research question being analysed.

Relevance, so readily is dominated by the interpretative lens of the researcher, is also compounded by the reality that some participants were more articulate in their expression of voice. Here the reading, re-reading and re-listening to the full range of voices of all participants was of utility. This, along with the process of codification provided some mitigation against the unequal power relationship between the researcher and the participants in the analysis of the data. A deliberative consciousness of this inequality made the research process one of questioning for the researcher, where there was a continual review of the data to reduce the exploitation of participant voice. This awareness may have lead to an over-representation of divergent or tangential perspectives voiced by the participants.

The interpolation of participant voice and interpretation embeds into the analysis both the determinations of relevance by the researcher and the representation of the range and scope of voice on that research question by the participants. As such the following two chapters of voices, interpretation and discussion are a complex mix of the methodological issues of re-inscription. In this mix however, the researcher has deliberatively sought to authentically give precedence to those perspectives highlighted by the participants through their voice, mediated as they are by the pre-existing framework of the research questions, and the post-analysis within the researcher's discussion.

3.11 Summary.

The analysis of the interview data presented in this thesis is this researcher's attempt to authentically interpret the narrative and insights shared through the participants'

voices. Of primary concern has been the valuing and preservation of the participants' voices. The interpretivist paradigm perspective used enabled an appreciation of the richness and variety of the experiences of the participants.

The semi-structured interview guide was developed and refined to produce comparable data across both the teacher and lecturer participants. The semi-structured nature of the guide permitted the formation of new questions and probes, enabling clarification and a more through understanding of initial answers. The questions were derived following the literature review, enabling the issues surrounding the research questions to be explored.

Questions were designed to permit teachers and lecturers to answer fully within a standard teaching session (40-55 minutes). The nature of the questions were sufficiently broad to permit participants to raise new perspectives and to obtain rich descriptions to be voiced by the participants.

The methodology employed involved an exploration of the participants' lived professional experiences and perceptions within the specific context of their undergraduate training at Avondale College (Deaver & McAuliffe, 2009). Chapter Four reports on the data collected in the interviews and provides an analysis of the interview transcripts.

CHAPTER 4

VOICES AND INTERPRETATION

'Most people are poor at self-evaluation and many of us have to work hard to achieve the self-awareness needed to change practice. Reflection is not an activity to be underestimated'.

(Hughes, 2009, p. 451)

4.1 Introduction.

This chapter presents the voices of the participants as they relate to the broad themes identified in Chapter Three. In listening to the articulated voices of the participants one is able to grasp fragmentary insights and data, however, one must note that given the time elapsed since the recollected events occurred, one 'may not capture the context within that snippet occurs' (Norsworthy, 2008, p. 92).

This chapter commences with a brief overview of the context for the teaching of reflective practice at Avondale College during the period under study. To assist in placing the voices within context, the voices of the Science teachers are interspersed with the voices of Avondale lecturers.

In presenting the perspectives of the participant teachers, this chapter presents an extended narrative of their voices, interpolated with the voices of their lecturers and with a structure provided by an interpretative commentary by the researcher. The participants are quoted extensively to deepen our understandings of their perspectives. This interpretation is informed through the lens of the literature and is structured in the light of the emerging broad themes identified earlier in Chapter Three.

This chapter utilises the critical theory paradigm when interpreting the voices of the participants. Compared to the technical and hermeneutic knowledge preoccupations of the positivistic and interpretative paradigms (Gage, 1989, cited in Shulman, 1997) the critical theory paradigm moves from an understanding of what is observed and experienced to an 'explicitly prescriptive and normative … view of what should [be]' (Shulman, 1997).

Having a transformative, political intention to emancipate and redress inequities (Bohman, 2010), the critical theory paradigm seeks to effect change to the status quo. Rooted in Marxist origins, the powers (social and positional) of an advocate of knowledge determines the validity of the knowledge (Shulman, 1997). The knowledge counted as of value, is a reflection of the socially constructed interests at play. (Habermas, 1972, cited in Shulman, 1997)

Critical theory, given its transformational agenda, then has a strong praxis research base, with consequential unique research methodologies that in turn impact practice. The stress on empowerment within the critical theory paradigm is reflected in the strong emphasis on voicing participant based perspectives in this chapter.

Since Habermas (1973) there has been a strong orientation towards self-refection in modernist critical theory. Habermas (1996) and Bohman (1991) outline a dual perspective for social inquiry, where 'empirical descriptions of the social context and practical proposals for social change' (Bohman, 2010).

This chapter then provides 'neither trans-perspectival objectivity nor a theoretical meta-perspective' (Bohman, 2010), but rather a 'range of possible practical perspectives that knowledgeable and reflective social agents are capable of taking up and employing practically in their social activity' (Bohman, 2010). This is primarily done through the voice of the research participants, enabling an understanding of the lived experiences of real people in context' (Seiler, n.d.).

4.2 Reflective Practice at Avondale College

Avondale College has a long history of teacher training, primarily to meet the needs of the school system of the Seventh-day Adventist church in Australia and New Zealand. During the last few decades the teacher training intake at Avondale has expanded, with many of its graduates now teaching in other public and private schools.

While there has always been a strong emphasis on values transmission, faith development and Christian philosophy within teacher training at Avondale College, graduates for many years were strongly grounded in the social efficiency approach to teaching, with its strong emphasis on 'the development of specific and observable skills' (Pedro, 2001, p. 30).

As already noted in Chapter Two, reflective practice has increasingly become a feature of undergraduate teacher education programs in Australia particularly during the last two decades. Under the leadership of a new Dean of Education, Dr Peter Beamish, action research became introduced into the undergraduate education program under the lectureship of Dr Wilf Reiger from 1995-2005. A more integrated emphasis on reflective practice in the undergraduate teacher training courses did not occur until the middle of the first decade of the new millennium. The emphasis on teacher training now included reflective thought about the 'behaviour and the context in which learning occurs' (Pedro, 2001, p. 30), moving pre-service teachers to be thoughtful and intelligently considerate of their own professional practice, 'rather than followers of prescription or routines' (Pedro, 2001, p. 32).

As previously noted, these changes coincided with the broader growing impacts of constructivism and social reconstructionist traditions within teacher education and increasing debate about the validity of the technical-rational model of teacher education. Avondale's Faculty of Education, reflective of the generally conservative nature of the sponsoring church organisation, took cognizance, adopted and integrated elements of these broader educational movements a little later than some other educational training institutions in Australia who made moves of change in the late 1980's and significantly in the early 1990's.

The 1980's and early 1990's were times of significant and difficult change for the Seventh-day Adventist church and tertiary educational system in Australia, with major theological, sociological and cultural challenges (Patrick, 2008). The ever present tensions between revision, and stability; reform and reaction; change and tradition were evident in all aspects of church institutional and thought environments (Hook, 1998). Avondale College (Chamberlain, 2008), including the Education Faculty, were at the vortex of much of these pressures. Understandably, most changes were slowly and carefully introduced, especially external changes that reflected 'the midst of a revolution in the way they [teacher educators] perceived the nature of teaching and teacher education' (Pedro, 2001, p. 38).

4.3 The Meaning of Reflective Practice to the Individual Participant.

Norsworthy (2008) observes that 'one's conceptual understanding of the nature and process of reflection is itself a mirroring of one's worldview, and within that worldview, of one's epistemology and consequential vision of teaching and role of education' (p. 9).

The initial questions in the interviews gave an opportunity for engagement in conversation regarding what constituted reflective practice for the participants, and from that an opportunity to explore the meaning of reflective practice through analogous activities or a metaphor.

Predo (2001) notes that 'definitions are the basis on which individuals explain their understandings of a particular concept' (p. 104). For a concept such as reflective practice, which has already been noted as having a maze and complex of different puzzling hues in meaning, an understanding of what participants conceptualise it as being is of importance.

For some of the teachers, there was ambivalence regarding what constituted reflective practice. For Sienna, an experienced Head of Science for a large, metropolitan school, there was an open admission of a lack of knowledge of the term as she made assumptions regarding what constituted reflective practice:

> *I'm not sure that I know. I just assumed it was us reflecting on what we*
> *do, is that? I don't know.*

Others, while expressing some hesitancy regarding the technical usage of the term, clearly understood the foundational meanings associated with reflective practice. Emily an experienced teacher expressed it as:

> *I'm not 100% sure, I'm just thinking it's to do with reflecting on stuff*
> *that you've done. So like say for example you do a class and then you*
> *go back and have a look and see what went well, what didn't go well,*
> *what you can improve.*

William, a teacher with some five experience of teaching, while somewhat hesitant regarding the technical term 'reflective practice' also captured the essence of the

term, while noting that currency with educational language was not a priority for him:

> *It would have be when you finish teaching, you look back and determine what did and didn't work and from that, look at trying to see if there is any changes you'd make, if you'd go about doing again in the next year or the next class. What I'd say would be what I assume that reflective practice is. You don't keep up with much of the language much in these.*

Riley, a teacher in his second year of teaching, highlighted reflective thought about pedagogical practices, improvements to teaching practice and seeking an ideal 'optimum practice':

> *Thinking about the way that you teach and ways you can improve it, things you do well, things you do bad, ways to make sure that you're hitting the optimum practice, I guess.*

Isabella, another recent graduate, also highlighted reflective practice as a mental activity, a thought process:

> *Just being able to reflect on how – I think it's in the mind as well as it might be reflection that you've made on paper.*

Charlotte, a new teacher in her second year of teaching, was clearly familiar with the concept of reflective practice and articulated clearly its linkages to effective learning and the pursuit of improvement in teaching practice:

> *'Reflective practice' means to me thinking about your teaching when you teach and assessing whether it was effective for learning, whether it was interesting, could it have been done differently, what worked well, what didn't work well - so reflecting on your teaching practicing, are you spending too much time in one area or should you be dedicating more time to another area in your field.*

Lachlan, an experienced deputy principal, was quick to apply the concept of reflective practice to the pragmatics of reviewing units or time periods. Taking a very

pragmatic approach Lachlan articulated a common perspective of the participating teachers, in describing the process of reflection as being opportunistic, or not routine:

Probably the first thing that jumps to me is where I will take an opportunity at some stage throughout the year, or preferably throughout each unit to have a look and see how well my unit was taught, or at worst to step back at the end of the year and say how did I think the year went.

Joshua, an experienced and very methodical Head of Science noted for his systematic approach to documentation and curriculum development, drew out the linkages between reflective practice and the experience of teaching with his succinct comment *'it's hard to reflect until you've actually done the teaching isn't it?'* Joshua, like most teacher participants, strongly linked reflective practice to seeking an improvement in teaching practice. He also noted the role of reflection-in-action,

You can ... do [it] as you're going through the class, you're constantly looking around and thinking "how is this going, maybe I need to make some modifications."

Like many of the teachers, Joshua noted the pressures of time mitigating against reflective practice. However, unlike most participants, he evidenced a systematic approach to reflection, so as to ensure a change in his teaching practices:

You sit back and you think about what you've done, how it went, how you might do it better next time ... but I guess things are very busy while you're teaching, and during the school day and so it's maybe best done when you sit down at the end of the day and think about how things went, and what you're going to do tomorrow, and how you're going to do it differently next year.

Chloe, a graduate of three years, was one of the few participants to reflect in her definition on the importance of students as a reference point for reflection and, from there adjusting one's teaching to the characteristics of a particular cohort. Chloe, co-incidentally, also was the only participant to have a primary education teacher training background.

I guess just taking the time after you've taught something to work out a way to do it better or to have a look at what's being done and where the kids are at and to take it from there to improve their knowledge. It's all one thing to teach something but if it's not working and you keep doing it the same way, it's still not going to work and I guess that can be from one year to the next or it can still be with one group of kids where you sort of get a test back and you go okay, well that whole section they really didn't get, we need to go back and teach it, to try in different ways and just reflecting on what has worked and what hasn't worked.

Samuel, an experienced teacher in a large school, also notes the role of student interaction within the ambit of reflection:

Yeah it essentially means just thinking about the way you teach, thinking about what you teach, thinking about interacting with students and reflecting on how you can improve it.

By contrast, Benjamin, the most experienced of the participating teachers, akin to most participants, placed reflection in the context of the teacher, linking the practice to 'self', 'self-analysis', 'your own set of schema', 'your own experience', 'in the duration of your own career':

Reflective practice I think is something which is critical self-analysis in a way. You look at what you've been doing and you say okay am I as a teacher doing the correcting or not according to your own set of schema. So and your own set of schema is built up from obviously your own experience and the experience of others who you have worked with in the duration of your career.

It is evident from Benjamin's comments, along with the other participating secondary teachers, that reflective practice for them is a process that occurs for the teacher, in the teacher's context, for the improvement of the teacher's practice. The object of the process for almost all participants is the teacher. The reoccurrence of the first person pronouns in the definitions and descriptions of reflective practice reinforce this orientation toward the concept. This professional-centred, first person

articulation of reflective practice can be seen in the definitions provided by Ethan, Olivia, Ella, Noah and Ava.

I guess to think about what you're doing after you've done it and change what you've been doing, based on the bad and good things you've done - things you picked up. (Ethan)

Okay it means thinking about what you've done and improving what you're going to do, using what you thought about what you've done. (Olivia)

Well, probably it relates better to me being a teacher and being able to look at what I do and reflect on what I do well and what things I can do better and thinking about how I can improve. (Ella)

To me it means that I do something think about what I did and how I can improve it in the future. (Noah)

Well I think reflective means looking back on what you have done and maybe writing down things that you can change during, and change the lesson for the year or whatever like, so just looking back and seeing your weaknesses and your strengths I would say. (Ava)

This personalisation of reflective practice, while a characteristic of a process internal to one's mind and being, where 'reflection is a significant human act during which people remember their experiences, think and evaluate them' (Loughran, 1996, p. 3). paraphrased by Ersözlü and Arslan (2009, p. 684), it is noteworthy that the context in which that reflection is framed for all but two of the teacher participants is that of their practice, not one framed in terms of the actual object of the broader educational process – the students in the classroom and the improvement of their engagement and understandings. The child-centeredness of primary training compared to the subject-centeredness of secondary education may provide an explanation for the form of this framing.

For the lecturing staff at Avondale College there is a clear, and not unexpected, distinction between the articulation of what reflective practice is in the Education and the Science and Mathematics faculties.

The Science and Mathematics lecturers are tentative and unsure of how to technically define reflective practice. Even some of those who come with an education background are tentative and articulate uncertainty regarding what constitutes reflective practice. Ryan, a Mathematics lecturer who brings with him a high school teaching background demonstrates this uncertainty when asked to provide a definition of reflective practice, *'Not too sure... to be honest'*. This uncertainty on how to define reflective practice however does not reflect a lack of operational understanding or expression of the concept, as illustrated by the response from Alexander, a senior Biological science lecturer:

> *Um... reflective practice to me without an education degree, ah, I guess doesn't mean a great deal, just being a, a straight scientist, but I understand the concept. Um … because I was doing some problem based learning stuff with my students and I was getting them to keep learning journals and reflect on what they were learning. So I guess reflective practices really thinking back about either your learning experience or your teaching experience, assessing it, seeing what you could get more out of it or whatever.*

Rather, the Science and Mathematics lecturers appears to have a tentative approach in what is seen primarily a concept from the domain of educational theory, rather than the more familiar domain of the sciences.

Cooper, a former high school teacher, who has been a long-standing lecturer and researcher in the Science and Mathematics Faculty at Avondale College, while expressing some initial tentativeness in responding to the invitation to define reflective practice, responds solidly, drawing out the pattern of reflective thought over time and its linkages to role and professionalism. Honesty, true examining, and honest self-questioning are central to his conceptualisation of reflective practice, reflecting Dewey's (1933) seminal pre-conditional attitudes of open-mindedness, responsibility and wholeheartedness:

It means, I think, the opportunity for a teacher to be able to analyze, not necessarily the day after they've been teaching, but over a period of time to analyze how they perceive their role being and how successful they think they've been, what aspects of their practice they think they could be improve upon. In fact not to be afraid to examine themselves to really ask honest questions of themselves. I think reflective practice is being a true examiner, or at least as true as possible, examiner of yourself to measure yourself against...or not be afraid to measure yourself against professional standards, and then to develop strategies to try and improve to meet those professional standards. So it's taking time out to examine yourself to think about how you think you're going as a professional.

Cooper's response resonates with Johns' (2004) observation that 'the more reflective I am after the event the more reflective I become within practice itself' (p. 2). As Cooper is consistently identified by the teacher participants as a positive example of reflective practice and mentoring by lecturing staff at Avondale he exemplifies in his response that 'reflecting-on-experience fosters … reflection-in-action' (Emslie, 2009, p. 420).

Mia, a relatively new lecturer, herself a science teaching graduate from Avondale College, reflects the general focus on students by the Science and Mathematics lecturers in their responses. Like Chloe in her student-focused definition, Mia locates the engagement of students in the learning process as a key effectiveness indicator in the process of reflection:

Reflective practice to me means looking back on how a lesson went and getting a general impression as to whether or not the students got what I was trying to say, how I said it ah, how much interaction there was, ah, whether it came across easily or not so easily. So in a nut shell, reflective practice is to me is how did, how did a lesson go and did students engage with the material.

Oliver, a senior lecturer with years of experience as a science teacher and as an academic specialising in science teaching methods also brings the student as a central

focus in the act of reflective practice. In addition, Oliver locates reflective practice within a research informed context:

It means that I make sure that I'm informed about the nature of the task, research that has been involved in developing procedures that relate to the task. It involves me in actually thinking about these connections. It involves my use of procedures that one, are consistent with research, are consistent with my personality, are consistent with the task that I have at hand and are consistent with the clients that I have, my students. So in other words I tailor the process to meet their needs, to meet their style and to meet the communication that goes on between us. But it's informed practice.

Interestingly, those Education lecturers who specialise in pedagogy by contrast, provided very succinct and mostly pragmatic settings when providing their definitions of reflective practice.

Reflective practice, I always think of you're improving the way you do things by asking yourselves questions. (James)

Reflective practice would involve a student sitting down, I'll give you a real life situation, a student sitting down at the end of the day, going over or reflecting on their day in the classroom and how it went. Now that might actually be, at the end of the day if you're a primary school teacher or at the end of a lesson if you have the time before you start the next one. But spending a little bit of time critically analyzing what you did in that classroom and what worked and what didn't work and how you might change it for the next time. (Thomas)

Even senior, very experienced Education academics like Jack, are typical of the Education lecturers who couch their definitions in pragmatic terms where improvements to practice takes precedence in reflective practice.

I suppose reflective practice for me is when any educator, whether they be a pre-service teacher or a lecturer or anybody, actually has time when they stop from time to time in their practice, when they stop and

consider how it is all going. And for me, I tend to get, because I teach the practitioner based research module here in the fourth years, well we get them to do their proposal in their third year, where I present the whole idea of reflective practice to them I suppose I have adopted a little bit a dumbed down model in some ways that I know can work for pre-service teachers, in that reflected practice can be, considering how you think it has gone, it can be anecdotal in terms of the evidence that supports it. But for me, I actually like it when students or teachers purposely go about some sort of more structured reflective practice because I think ultimately when the anecdotal stuff happens it can be heavily influenced by our bias. So that is really what it is; just stopping and pausing and thinking back over a learning sequence and sort of saying how did that go and more particularly, the more structured reflective practice, what data could I actually rely on to give me better indications of how it went so that I can be informed for next time.

Jack and Cooper, typify the differentiation between the perspectives expressed by the participating respective Education and Science and Mathematics academics. The Education Faculty academics adopt a more pragmatic, operational focus in their definitions, where primarily an improvement in pedagogical practice is sought; while the Science and Mathematics Faculty academics provide a more introspective, person-developmental focus in their definitions. Science teachers in training at Avondale College, experience and draw from both these emphases.

Griffiths and Tann (1992) note that 'the divide between theory and practice, is in effect, a divide between personal and public theories … personal theories are sometimes known as 'theory-in-action' (Schön), or as 'metaphors'' (p. 76). Eliciting metaphors or analogies from the participants expanded the definitions of reflective practice and assisted in grasping the personal theories existent in practice. Most participants found this activity one of the most difficult parts of the data collection process. This difficulty was aptly expressed by Benjamin when he stated:

'I'm a science teacher so metaphors don't come lightly to me'.

Interestingly, three of the Education lecturers used the metaphor of a car to illustrate what reflective practice is. For all these, the process was an incremental one; learning the basics, coping with novel situations, and then tweaking the processes. For all, except Jack, the developmental process centred on skill acquisition and risk avoidance. For Jack, a concern of relevance to the teachers' students is central to the concept:

And I think that it is a bit like driving your car, where the road that you're on is constantly turning to either the left or the right. And if you're not in a position of constantly re-evaluating, you will ultimately drive off the road and you will become very divergent from where the kids are all travelling. And for that reason, I really see it as being a response mechanism to the reality that is now. That is what I see it being: a bit like driving as the road turns. You've got to turn with it. And it is amazing how many teachers have a model where they say 'Stuff where the road is going. I'm going here and it is your job as students to come with me'. And those students look at that teacher and go 'But sir, you're not even on the road'. 'I don't care.' It is a bit like that. (Jack)

I suppose driving a car. You learn all the basics. You learn when to push the accelerator and learn to push the brake and all that kind of stuff but after a while it becomes natural for you and you will learn different things later on in terms of situations will present themselves which you've never experienced before and you learn to tweak it so that you avoid that particular issue. I suppose that's the best one I could come up with. (Thomas)

Maybe when you're driving, you might start off by using a map, and you just follow what someone else has shown you, and you always go the same way that someone else has shown you. Then as you become your own driver perhaps, you might start experimenting with different ways that you can get home, maybe because they're more fun or they're faster. Then you no longer really use the atlas at all. You're just sort of going by instinct and doing what makes you happy. (James)

The pragmatic, skill development, efficiency and risk avoidance emphasis of these Education lecturers is replicated in the responses given by a large number of the teacher participants.

I guess it's fine-tuning - if you had a vehicle you'd be fine-tuning it so it worked, and worked well and functioned well. … [Optimising the performance of it] and making sure it's reliable, it works well and everyone's happy. (Charlotte)

Oh, a bit more like driving a car, I guess. When you start out, you do things slowly and in order and you think carefully about what you do. With a bit of practice, you stop thinking about it and things become a little bit more automatic and then with more experience you actually start breaking some of the rules to make things quicker. Instead of going from second gear to third, to fourth, you may rev it a bit higher and then jump straight to fifth or you might down-shift in a different pattern to what you've been taught. Even though it may not be the way you're specifically supposed to do it, it actually makes things quicker and smoother and works better in particular situations. I guess it's like that. You start out with a prescribed way of doing things and then you find ways of tweaking that, that make the process a bit smoother and a bit more efficient. (Riley)

It's like striving to be better each time, it's like climbing a mountain, you hopefully improve your practice every single new challenge, every single new year, a new term, hopefully you've improved upon what you've done last time, so I guess I see reflective practice a bit like scaling to new heights. (Joshua)

Yeah. I suppose it would be the - I'm trying to think of the - the trainer analysing his techniques for training. Like for instance if he was a horse trainer, he would analyse what he's actually doing with the horse saying okay well is this actually helping the horse or not. Is that getting close to a metaphor? (Benjamin)

Interestingly, Benjamin, the earliest graduate, whose initial training preceded the formal incorporation of reflective practice in the undergraduate curriculum, through the metaphor of horse training uses a social reconstructionalist, utilitarian perspective. Analysis for Benjamin utilises the utility for the student (the horse) as the core criteria of effectiveness.

The dominance of the pragmatics of the classroom and coping with the realities of day-to-day teaching practice for some participants dominated their discussion of reflective practice. The metaphor became one of survival, not one of intentional, critical self-analysis:

> *For me, I don't know that I necessarily have a metaphor particularly for it, but I suppose it's just improving on things. You know like you're actually, the first probably three years you're just trying to tread water, you know [Survival] … you're just trying to tread water and get the marking done and get the essentials done that you're expected to do and then I guess now we can actually start to learn to swim rather than, do you know what I mean? You know we're actually working on the stroke rather than treading water … [but you know you'll never walk on water]… I mean it's always, I guess, going to be hard work but yeah you can kind of get better at what you're doing rather than, yeah so it's kind of like swimming I suppose, you can know how to swim but do you really know how to swim fast? That would probably be how I feel sometimes … [And when] you first start you need the lifeguard to jump in occasionally. (Sienna)*

> *I guess a long walk somewhere, maybe I'll sit down and de-clutter and sort out what things are important, what things aren't … hopefully you only take what you need to start with. Well actually that's not a bad metaphor, because with your reflective practice to get your own information, but you also get information from so many other people and the quicker you learn that a lot of what's might have worked for them, that's not going to work for you, so sort through the stuff and some might think maybe I can personalise that and afterwards say well,*

we put that in place. I just don't see how that works for me at the
moment. (Ethan)

For these teachers, issues of coping and survival are paramount. Emslie (2009) notes that novices especially find it particularly difficult to reflect when their primary investment is in 'demonstrating competence and capability' (p. 420). Kaminski (2003) concludes that reflection is essential in moving teachers beyond levels of technical rationality. This is particularly challenging for teachers such as Sienna and Ethan who are now primarily focused on day-to-day issues. 'The way reflection is conceptualised, written about, and taught by professors may not grasp the reality and complexity of the ways reflection is a lived experience' (Wong, 2009, p. 175).

Cole (1997) observes that overall teacher educators have not always helped teachers be reflective practitioners – this observation is compounded when a teacher is in survival modality, with the potential to confirm Zeichner's (1986) observation that: '… the pedagogical methods and content knowledge introduced to students in campus courses have little influence on the subsequent actions of students in classrooms even during initial training' (p. 142).

Wong (2009) notes that: 'the experiences of reflection for our students that we observed as we taught seemed to have a great deal to do with questions of identity, as a struggle to understand self as [professional], and the desire to create a narrative understanding of self and others' (p. 183).

For Sienna and Ethan questions of competence, survival of daily pressures, struggles to clarify and accept roles all coalesce in pressures that appear to minimise the occurrence of routine reflective practice in their professional experiences.

For other teachers, like Ava, the experience of reflective practice becomes more than the acquisition of a skill, it is a dynamic interchange, for her on the court of basketball, as well as a conscious internal thought process. It involves self-dialogue, and dialogue with others, with significant others having a major impact.

I would say like the first thing that pops to my head really for reflective
practice would be learning a new skill as a sport for me, I love
basketball, so initially you can bounce the ball and whatever else but
you've got to learn skills to become better and good at the game. So

then you get people commenting on how you bounce the ball or you run crookedly. So and then you take on what they have to say and I think whether you, it depends on what your personality is, you either agree or disagree and change or you just go no, I'm just going to do it my way and do it like that. So I would say that my metaphor would be like basketball. For me I usually listen to … If the person is credible for example if someone's being playing for more years than me and I can see they've succeeded on the court, then I'd take their advice more than, and put it towards my game than a person that was, I don't know, green and painful. So yeah it depends on who's giving you feedback for that reflective practice too whether you take it on. (Ava)

For Chloe and William reflective practice is a learning process; for Chloe one that involves change, for William one of self-realization as one learns from the experiences one reflects and learns from.

The first thing that did come into my mind was the quote that I heard once that stupidity is doing the same thing over and over again and expecting different results. So it's making those changes and those things that are necessary that if one thing doesn't work you need to change it and keep trying different things to make it work. If you're trying the same thing over and over again and it's not working, you end up banging your head against a brick wall. (Chloe)

Probably more of a journey, you're going for a walk and you're starting off just trying to get from one point to the other and as you get more experienced you just can start to appreciate what's happening and you can start to learn from the experiences that you've had and improve them. (William)

Hughes (2009) commenting on this, notes the differentiation from the habitual practice of many: 'Reflective practice is more than a process for capturing professional knowledge, it is also about learning and change. A change in practice provides the evidence that learning has taken place, but habitual practice is often hard to shift' (p. 451).

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Describing a deliberate effort to systematically address issues of modelling and teaching reflective practice to undergraduate professionals Wong (2009) and his fellow lecturers came to 'recognise that reflection was not only a difficult concept to apply … but indeed, to practice reflection was a difficult way of being' (p. 182). For the lecturers in the Science and Mathematics Faculty, this 'difficulty of being' in practice is expressed through their metaphors.

Mia, noting the methodological frameworks and analytical basis of early undergraduate Science units, observes that over time, the step-by-step, replicate world becomes a teaching and learning world of an artform:

> *I actually give an example to my students when they write, ah, answers for me in tests. They can, they've just done one in the last hour. I can say, ok you can do a paint by numbers answer or you can, or you can write me a Renoir, so I suppose in a, in a sense I see learning and teaching as yes, a science you follow this step, this step but it does say become an art form over time.*

Liam, a very experienced senior lecturer, notes in his observation that teaching and learning has an uncertainty in its manifestations, and that one's reflections on one's lecturing can equally be moments of elation and transport, and moments of questioning disquiet:

> *A useful reflective practice metaphor for me, I actually employ this on a regular basis, is to imagine myself in a vacant seat at the back of the room listening to myself and at times, that enables me to walk out with a warm glow saying that was pretty good. That was hot stuff; these kids are getting great value for money. At other times, it forces me to walk out thinking stuff. That didn't work. Why didn't it?*

Cooper uses two illustrations for the process of reflective practice. The first involves an analogy to travel. In this analogy, Cooper centres the analogy on himself, his enjoyment, comfort and security – and in his journaling of the experience the focus is on resolution of tensions, improved practice, for the next occasion of travel.

I mean another analogy would be after I had been to Munich last year, my wife came with me, and I suppose you could just say travel as an analogy. I wrote down after we'd been there the things that I'd learnt from being in Munich, both professionally but also in terms of travel. So I find travelling is a great opportunity to be reflective because you think to yourself well what did I do wrong this time that put me on edge or decreased my security level. I made a list of those things. And so travel experience, being reflective about that, asking yourself what heightened my enjoyment, what lowered my enjoyment of this travel experience and then make some notes and try and resolve some of those tensions next time you travel.

In his second analogy Cooper, in an extended reflection, draws upon an experience in designing and redesigning an experiment for students. In contrast to his first analogy, in this analogy the focus is strongly on enriching the experience of the student. Placing himself now in the perspective of a science teacher, Cooper redefines reflective practice as:

It says is there another way of approaching this which will enhance the learning opportunities of the student?

I don't know whether this is an analogy, but certainly when you tried an experiment for the first time, I'm thinking now from the point of view of the science teacher, you don't … initially when you do an experiment, usually you tend to set an experiment with set procedures, and then you ask yourself would it be possible to depart from these procedures to enrich the experience of the students. And of course reflective practice does that kind of thing. It says is there another way of approaching this which will enhance the learning opportunities of the student and that has happened to me a number of times in my own practice … for example in the preparation of tin oxide, the set procedure for doing this says that you should end up with a white product. This is the reaction of nitric acid with tin and it says you should end with a white product with tin four oxide. Well we've always ended up with a buff colour, yellow coloured.

That got me thinking now why is this the case. And so it got me digging back into the historical literature. So when I first set the experiment for the students it was a set procedure, but the fact that we got a product that was different to what the literature said we should get forced me back into the history. And so I got back to Berzelius and I discovered that he also got a buff yellow coloured product. John Davy who was the brother of Sir Humphrey Davy also got a yellow product. But the literature still says you should get a white product.

So this led to me to completely redesign the experiment and to give the students some access to the history of science and the process and then to not do the experiment as a recipe, but to do it more like an investigation. And then it's interesting that when the x-ray defection machine was developed you can analyse tin oxide using x-ray diffraction and so I built that into the experiment as well.

So what was a simple procedure for an experiment has now evolved into a much more enquiry approach to ... investigative approach to the problem and using history and philosophy of science. So reflective practice has resulted in that.

Cooper, in this analogy based on his practice, draws out the process orientation of reflective practice, a process that evolves and develops over time. In this analogy, a problem instigates a learning process that departs from experiment replication, through to an investigatory and philosophy of science exploration. At the centre of the analogy is a focus on the student and the enhancement of the learning opportunity for the student. In his two analogies, Cooper draws together the complexity of the multi-focal nature of reflective practice for the participants: with a focus on self and student; on improvement and change; and on arriving at solutions to problems and living with paradoxes.

It is evident through the stated ambivalence in the voices of the Science teachers, that a common pragmatic, operational focus exists in their conceptualisation of reflective practice. It is noteworthy that their definitional, conceptual focus of reflective practice related to their individual improvement of practice, their self as a

professional; their metaphoric explorations focused on practical improvements for their students. While their expressed articulations are idiosyncratic, the seeking of a pragmatic, operational improvement of practice, and their pragmatic focus on improved outcomes for their students, the conceptualisation of experienced teachers has strong congruence to that expressed by their lecturers.

4.4 The Nature and Status of Reflective Practice in the Professional Life of the Individual Participant.

Building on the conceptualisation of reflective practice held by the participants in this study was their disclosure of the nature of their current reflective practice in their professional life as a science teacher. Typically, the teachers reported ongoing reflective practice, predominately of an unstructured, non-routine and informal nature, as Emily, Ethan, Joshua, Charlotte, Benjamin and Samuel observe:

I do it all the time, I think after a class 'Oh, that went well' or 'That didn't go well, what should I do next.' It's all the time, I don't know, in my head just trying to get things better. (Emily)

I don't have scheduled reflection time, but I guess when you're teachers, you never stop looking of ways to engage things better and how to do this, here, so you're forever processing what's happened here and how do our turn the situation into what I need to be ... [I have inner conversations with myself] ... and when you get frustrated and afterwards, out a tirade with others makes you feel better. (Ethan)

I guess we've just ... it's a new school term started just this week, and so in the holidays I was looking at a couple of topics that I'd just finished teaching and I was thinking "how am I going to do that next year" so as soon as I've finished a topic, even as I'm going through a topic, I'm continually thinking about next year, and what I'm going to do in that topic. (Joshua)

Mostly informally ... it's thinking about lessons afterwards. So where at college where we wrote down a reflection after we did a prac teaching, now it's more informal looking at it and thinking about it in

that regard. It does require you to be really honest with yourself. If it didn't work then you've got to try something different. So I guess for me it's probably a daily or a weekly thing or a unit thing that you go: okay, how did this unit go? How did the classroom atmosphere, how did all of that go? But it's really a personal thing. It's not something we put pen to paper with. At the moment I probably would say that for me I probably don't analyze it probably as much as what should be done because of time. Time is a major constraint, maybe more time than you possibly could, at this stage. (Charlotte)

You sit down and look at what they've [other teachers] been doing in comparison to what you've done and say "oh yeah well I'm on the right tracks I think" or "hang on I'm not doing anything like what they're doing" so that I think is the reflective practice as far as my own definition of it ... So there's some voices inside my head probably constantly saying "you could've done that better, you could've made it more engaging for the kid" or "could've made it more easier for them to pick up on." So they're the conversations in my head ... I don't write a lot of notes for myself. It tends to be, when I get to the class or I'm looking at it when I'm preparing for a week or two ahead, I'll see the topic and I will tend to remember how it went last time, previous years. If there's anything that sticks to my mind and how it went and how I could either fix those problems or how I thought I'd do something different, do it again. I don't like writing lots of notes, so I tend to be more sort of do it, don't make much note of it anytime, I don't write a lot of notes, so it tends to be more, when you come back to that time again, a year later, it's the memory recall of what went ... If there's something I remember doing the previous time that I remember that worked well, so I'm going to go straight with this one to being with. (Benjamin)

I can't nail down exact time, because it's just something that ticks through my brain. How could I do that better? When I have a bad class I'm just going well what went wrong, how could I improve that,

what could I do to make that work better? And so I guess it's just my brain ticking over often when on the drive home after a day of work, got a half hour drive home, so there's plenty of time just to think about what happened today, what could I improve, what could I do? Even when you have those really successful moments, you then go yeah alright that worked, wonder why that worked and just try and analyze what's going on, so it's very much an internal thing, not a formal process that I do. (Samuel)

Joshua reported that student survey responses at the conclusion of a unit also provided a catalyst for reflecting on how concepts, information and skills in a unit were presented. Charlotte openly articulates a common response that time constraints and pressures affect negatively the level of formal, structured reflection.

Ethan's observation that *'you're forever processing what's happened here and how do you turn the situation into what I need to be'* is typical of teacher's description of the continuous nature of their reflection-for action, reflection-in-action, and reflection-on-action. Many of the participants noted that they were continually, always teachers – dialoguing, contemplating and planning their practice. This deliberative, thought pattern for the Science graduates from Avondale was largely internal and unstructured, as observed by Samuel, *'I can't nail down exact time, because it's just something that ticks through my brain. How could I do that better?'* The reflective practice also highly idiosyncratic and personal in nature as noted by Charlotte, *'it's really a personal thing'*. Both Charlotte's and Samuel's observations are characteristic of the lack of external, or written documentation regarding the practice of reflection by the teacher participants.

Teachers in one school reported a principal initiated action research activity associated with the annual personal review and professional development process that assisted them in consciously engaging in professional reflection. The participants from this school and those who were actively participating in documentation associated with a probationary teacher-mentor relationship were the only participants who reported a semi-structured approach to their current reflective practice.

Only one teacher participant reported a regular, structured (and written) program of reflection. Isabella, a probationary teacher while attributing this to her 'categorical' personality trait, observed that the 'forced paperwork' at Avondale College relating to reflective practice was foundational to the 'do it in your head' approach of the practising teacher:

> *This is literally my diary. There's so much stuff in that there. At the end of every day I write down what I've done each lesson and if something worked particularly well I would dog ear the pages and color it in bright red so I'd remember like it was a technique or behavior management that worked really well ... I guess you write on unit plans at the end as well, on what worked well and what didn't. I'm a very categorical person. If I've got a method that works, I'll often use it again and again but just with each unit, so pretty much each unit is a reflection that influences the next one. For example, if I say booklets worked well in mathematics then I'll do booklets next time, that kind of thing.*

> *There was so much paperwork that you did in Avondale that you really don't do in the real world, let's face it. I think that's good; I think that's good to be forced to do more paperwork than necessary. Say at the end of your practice for example, there was a section on reflection and there was a section on lesson plans, I think that was really good. Now, I don't do lesson plans anymore, I just use the unit plans. Having gone through that more detailed structure, I think a lot of it you just do in your head now but I think if we hadn't have done that actual paperwork, I don't think we could do it in our head as easily.*

Riley and Sienna typify other participants in reporting that documentation associated with the review of unit plans and programs, form for them an opportunity for their most systematic, self-reported form of reflective practice:

> *I think a lot of it goes on in my head, so it's not something I formally write down, but every year that I've taught I have written units and programs and I make changes to those every year. So no one year that*

I've taught have I taught the same thing in the same way. I'm always experimenting, so yeah … for me it's adding things to my unit plans, changing unit plans, deleting things, so yeah, I guess that's the way I formalize it in my unit plans. (Riley)

I have a section in each of my units that I teach and just before, like at the end of each unit I actually write a few things down of things that went well, things that need to be changed, all that kind of stuff, so the next time I teach it I can actually fix it before I start because otherwise it doesn't happen so, I mean I've only just really started doing that in the last couple of years. The first couple of years I didn't have time to look at my programs let alone fix them. (Sienna)

In expanding on the internal dialogue regarding his practice, *'I think a lot of it (reflective practice) goes on in my head'* Riley relates the dialogue to the needs of students, and notes that his reflective practice is strongly biased towards reflection-in-action:

It happens every class. I get to the end of it and I guess I have found as I've gone along that each class is different and you have to incorporate that into your planning as well. So you can have beautiful unit plans, which might work well for one class; try it on another class and it just won't work at all. So even in my day book planning, because I teach two grade eight classes, yeah, two grade eights, two grade nines, I have to think about how I'm going to do it differently and even though I'm teaching the same topic I might do it differently for different classes. So yeah, I guess I just go through student personalities, their learning styles and I think about what would work best for them. Some kids like the hands on, some kids would prefer to sit at a desk and problem-solve, so yeah.

This focus on students and student learning by Riley is reiterated by a number of the teacher participants. Noah and Benjamin explicitly state this focus when they respond:

First of all I would think about how the students responded to the lesson that would probably be my first thought. (Noah)

So there's some voices inside my head probably constantly saying "you could've done that better, you could've made it more engaging for the kid" or "could've made it more easier for them to pick up on." So they're the conversations in my head. (Benjamin)

Even when a participant's description of their reflective practice does not explicitly note anything but habitual action and 'trial and error', there is a strong focus on seeking improvement in practice and student focusedness:

I wouldn't go so far as to say I've ever had a recipe, it's been more like trial and error with some useful things to try along the way, but I guess the challenge of teaching is that there's no classroom that would use a recipe anyway, so any reflection I'd be looking back and no I couldn't use the same thing as you did and it worked really well, particularly or if I had a terrible unit it could just be some other factors, I could do exactly the same thing with another group and it may work. So I guess for me it's been, it's always trial and error, and will always continue to be. But I'll have a bigger bank of options to pick from and a better idea of what may or may not work in the future. (Lachlan)

In describing her routine reflective practice, Chloe articulates her practice totally around the student's participation and understanding of learning, and her interaction with students in that context. Like Riley there is a focus on reflection-in-action, however Chloe also displays a strong engagement with reflection-on-action:

It's something that tends to happen when I'm marking tests and assignments and when I'm talking to my kids. Like as you go along, as I was saying, marking tests or assignments and you get these whole sections that a lot of the kids are getting wrong so you sort of have to go back and go well how did I teach that and what have they missed? What sort of pieces are missing? Even just talking to the kids, you can sit down and have a conversation for half a lesson about some of the different concepts and you can see really quickly who understands and

who doesn't and where they're at, so just to spend a bit of time just talking with the kids and getting an idea in my head of where their understanding is and compare that to where I think they should be at. Then to sort of go and sit back and talk to some other teachers who I know have taught the same things before you know, going back, my deputy principal was the year seven teacher. So if there was something that I don't understand I'll go back to him and say well how did you do this? Or a year six teacher would say well how would you do this? Sort of asking a few different people or getting on the phone to someone doing a similar thing and sort of just getting ideas from other people, reading it, looking it up in books, just gathering ideas of what I need to do.

Ethan notes that for him professional development times are a strong catalyst for reflective thinking. As a probationary teacher, the validation of practice, and the openness to other's practice are important elements of reflection:

The best times for reflective practice are when doing professional development sessions and I sit there thinking oh, so somebody else doing, well I'm doing that, great or you go, oh that's an idea, I wonder where I can work that in or they give you an insight and you go, oh that's how I can do that. And so, yeah so that's possibly when I get the most time for reflection, at professional development.

Conversations, mostly with other professionals or students, were reported to be another major source of professional reflective practice. These conversations, as reported, were all informal, unplanned and serendipitous in nature, and are often focused around partnerships, and communities of collegiality, as described by Samuel, Emily, Ava and Ella:

My preference is just to sit down in the staff room on the couch and just chat about things and sometimes it's difficult, because that's a lengthy process and you don't always cover a lot of ground, but sometimes it's really valuable and important. For me it's just as a group of two or three people just talking whether it's sometimes you get an opportunity

on the weekend, go out with some colleagues and you're just chatting to them about teaching and about your profession and that's for me where I find it most valuable at work. (Samuel)

I live with one of the teachers as well so I usually vent to her and stuff. So I don't know, yeah, and I guess I just, I don't know it's just all the time how the kids react is how I base whether it was a success or not and I just in my head think 'Well can't do that again. (Emily)

I tend to talk a lot. I tend to talk a lot to the people that I'm teaching with and bounce ideas off them so at the moment I talk a lot to my … Well it doesn't have to necessarily be a teacher, I talk a lot to my mum because she kind of gives a different perspective, she's not from a teaching profession, she can give a different perspective on my practices because I tend to think if you go to a teacher, they tend to be a little bit biased towards you because they know other things about how to teach and whatever else. So I think I like to get feedback from a wide range of people. (Ava)

I live with one of the teachers as well so I usually vent to her and stuff. So I don't know, yeah, and I guess I just, I don't know it's just all the time how the kids react is how I base whether it was a success or not and I just in my head think 'Well can't do that again. (Emily)

I'm always asking questions. So yeah, just at the start of the year I'll ask other teachers what things worked really well for them in those classes and if I notice that there's particular activities the kids don't like to get engaged in, I'll ask other teachers what they do. So yeah, I learn from them as well.

Charlotte drew a contrast to her current practice with her practice when training as a teacher. For her, with the constraints of daily teaching, the focus is now on informal, constant, honest reflections without the structured, written reflections of teacher training days:

It's thinking about lessons afterwards. So where at college where we wrote down a reflection after we did a prac teaching, now it's more informal looking at it and thinking about it in that regard. It does require you to be really honest with yourself. If it didn't work then you've got to try something different. So I guess for me it's probably a daily or a weekly thing or a unit thing that you go: okay, how did this unit go? How did the classroom atmosphere, how did all of that go? But it's really a personal thing. It's not something we put pen to paper with. At the moment I probably would say that for me I probably don't analyze it probably as much as what should be done because of time. Time is a major constraint, maybe more time than you possibly could, at this stage.

The constraints and demands of daily teaching drew Ethan back to his earlier metaphor of an overfull backpack on a bush walk. With an overfull backpack on a demanding walk, reflection is ethereal, but unrealised because of the daily temporal requirements of teaching. Classroom teaching being, as expressed by Ethan, a place of reflection denied:

The metaphor of the backpack being too full was possibly the best metaphor. It's just too hard, so reflection is like this ethereal, you'd love to be able to sit by the river, sort out your backpack and then, at times, go and do what you know you should do properly. So being able to pinpoint aha moments, if I have had them, they have just being so temporal, you just rush and go, oh yeah this worked and keep going ... And even to get yourself into the cognitive state to do reflection, you're just always going tick, tick, tick, these are the next things I need to do ... the immediate is important, but that's just the nature when you've got 30 people staring at you – they're kind of important.

Galvez-Martin (2003) observes that 'the reflectivity achieved by pre-service teachers by the end of their programs is being lost after their first entry years as teachers' (p. 2). From the voice of the participants what is largely lost is the structured, written reflective practices, increasingly replaced by conversations, internal to one's self, and with one's communities of collegiality.

These conversations are student focused, seeking improvements in student outcomes, student engagement, and student understanding. This contrasts with the focus noted earlier in this chapter as the participants sought to define reflective practice in their terms, where the focal lens was on them as individuals and improving their performance.

No evidence arose from the voices of the teacher participants that could attribute any teachers' reluctance to reflect due to a lack of experience in reflective thinking as described by Moon and Boullon (1997) who argue that some teachers' 'prior experience of training courses … does not require them to engage in active thinking about teaching nor to question their practices and beliefs' (Otienoh, 2009, p. 480).

It is noteworthy that the pattern of current reflective practice amongst the teacher participants is exhibited also by the lecturer participants.

> *I often then sit down at the end of an instructional period and I do reflect back and say well how did that go? And I will make some notes then and there to myself if I really feel like something needs to be changed radically, but I probably do my major review when I get the student evaluations at the end of each semester. Then I think back over the semester myself. I talk to the students and ask them point blank what they think and that is a period of reflection. The other thing too I might add is that if you have an active interest in an area and you're reading a lot and you're intellectually stimulated by it you are constantly looking for ways to up the ante. (Jack)*

> *It's a very informal process ah, the, you ask about the processes that I regularly use to critically analyze my teaching. Umm. As I said, I think it's, think it's an informal process. I don't think at the end of every lecture I sit down with a pro forma and I go, I tick boxes, I don't do that. Ah, but I suppose I do somewhat subconsciously and the things I look for as I've mentioned already are, you know, did I blab on too much, ah, did I come to the point, were students engaged, were they interested, did I put enough variety in my teaching? Ah, were there*

enough questions, those kind of hooks if you like, for critically analyzing how I've gone or my reflective practice. (Mia)

I don't sit down and write it all down after a big class but there are things that stick in your brain that you go either next class or next year when I teach that topic again, I will change it and they form a basis of your, those thoughts form a basis of your rethinking for the next year or the next class with that group. There've been a couple of things that I did last year in my second year class which I wanted to further enhance this year and so when I started with the outline again for this year I then rewrote it to reflect that particular change that I wanted, and can I tell you it was successful to some part, but if I was here next year again I would be further modifying it you know. It's like you've got this idea that you start to run with and it didn't quite work the way you thought it would and so you go okay I'm just going to tweak it again next year to make it more effective and what you think is going to be more effective. (Thomas)

One lecturer, Cooper, noted the reflection regarding teaching approaches and philosophy associated with the five-yearly accreditation cycle. Many lecturers noted the student evaluation questionnaire completed at the end of each unit as a catalyst for reflection on their pedagogical effectiveness. Some subjects that are taught involve a necessary component of communication and dialogue that engenders reflective thought. This is particularly so when a new subject is taught, or new staff are involved in the lecturing series. One Science and Mathematics lecturer, Daniel, noted the impact of a reflective diary his students are required to keep on his own reflective practice on content and laboratory activities.

The other thing which I'm incorporating this year is with most of the labs that they do and with most of the assignments that they do they do a diary a reflective diary. So that they let me know how the prac went whether they thought it was of use to them and then from those I can assess whether I'm going to use that prac again. So they've been a big thing this year, those reflective diaries. Because I can think of an assignment as really wonderful and at the end of the day they might say

they got nothing from it or something that's small in a prac they might think is really valuable and I've never seen that.

Daniel also noted the generally collegial climate within the College and with other institutions that facilitates informal and formal dialogue and opportunities for consequential reflection on practice.

Peer support there definitely is in that it's an open door to most of the officers around here. So if I have a content-based question I just go and talk to the people who they need to talk to about that. With assessments as I said it's more just opening up someone's door and saying have you tried this before? Has it worked for you? We also have external assessments and we usually have a subject moderated. For me it's often Newcastle Uni one of the lecturers up there and they give a very formal assessment of how they think you've been assessing students and content of subjects. So that would be a very formal way and once again that gives me a reflection on how the subject's going how it meets with other tertiary institutions and they're also very invaluable. They always say whether there's an area that they're covering that they think these students at Avondale should be covering. It just lets you know when you get those reports back whether you're on par with what other tertiary institutions are doing. So that's also on how well you're assessing as well and your assessment tasks.

Within the Education Faculty there are natural content occasions where reflective practice is taught to students. These can also be opportunities for the lecturing staff involved to reflect on their own practice. James' description of one of these lectures provides a vignette of a typical status of reflection amongst the participating lecturing staff in this study:

This morning I did a lecture, I'm actually, reflective practice, I use two words to sum up what I teach in first year pedagogy second semester, it's all based on reflective practice. So the students, I no longer see myself as the content deliverer but also more than that, giving the students an opportunity to engage, to plan for an activity, to actually

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teach the activity and then to review on the activity. So I'm really setting up experiences for my students. So this morning I did a session on theatre sports and they were having to get engaged in all different roles. So definitely throughout that experience I was reflecting on practice while I was teaching, going okay, I did have my plan where I was going to do these seven activities, but I didn't do one through seven this morning. Reflecting on the practice as I was going, I realized, hey, this is taking a bit too long; I don't think they're going to enjoy this from what I've seen for the first activity, so I skipped over steps three and four and went straight to steps six, seven and eight. So that would be an example of a time when I reflected on the practice and then after the class on my way back to the lecture, or after all my lectures, I think to myself, how did that go? What would I do differently next year? So I reflected twice, I guess, this morning ... I try to ask, I try to put myself in the shoes of my students. I want obviously what I'm teaching them to be relevant and make a difference when they start teaching. So I guess I ask myself, if I was a student preparing to be a teacher, would I have found that class to be beneficial? So I'm just constantly asking my questions about how effectively I felt as though I was being heard, how well I engaged the students. I'm just constantly asking myself questions and critiquing myself. It gets to the point when you're constantly reflecting on yourself that you can hardly enjoy someone else's presentation or a church service because you're so much in the habit of asking yourself questions that you see yourself as like a tutorial marker even in other forums. So it definitely does become a habit and I think that's the one thing that does make good teachers.

Alexander, a senior Science lecturer, observes the style and motivation for his reflections as he describes the nature of his current reflective practice:

It's not something I think about all the time ... the thing for me that I love is to see the understanding in the students eyes when I'm teaching. The 'penny drop' moment, sort of thing, when they, they get what I'm trying to say. And so if I was trying to reflect on my teaching practice

or experience I'd look for those moments. And they're the moments I try and work towards in a lecture. Actually getting the students to comprehend and I see that they're comprehending ... so, whatever I can do to recreate those moments and very often it just happens by itself. Often it is [serendipitous]. But that's what I'm after. I hate to walk out of a lecture with everyone not understanding what I'm talking about. So I want at least a few of them to have that, that little glint in their eye, 'oh', I understand what he's talking about or where this fits in. So that's, that's what I'm after. I don't do any formal post analysis. I do do some contemplation occasionally. Umm, I think to myself, I won't use that joke again 'cause no one laughed. So, scratch that out of the margin. No that's not right, I don't actually write the jokes down the margin. Umm, but I do kinda think to myself umm, how can I make this better. How can I get that understanding across better and, yeah go on.

Oliver, another senior lecturer, notes the centrality of reflection-in-action in the lecturing modality, while also noting the dynamic of the pedagogical moment:

It happens all the time. Reflective practice, if I'm dealing with undergraduates as I do for some of my work. Reflective practice goes on in the classroom, listening to questions, answers that they give to questions. I'm weighing up where they're at. I'm reading their body language and I'm altering delivery in response to what I see. Slowing it down, speeding it up, jumping across things if I find that they're already ahead of me, going back and reiterating things if I see that they're not understanding. So that the reflective process is going on all the time when you're teaching and the reflective process is going on when I'm actually interacting with students one on one in their research. Again it's the same sort of thing. You're making judgment calls about where they're at and what is appropriate for them in the next step. The background to that is that a lot of the things that I've read have been internalized. They've become a part of me. That body of knowledge that I have is within and therefore I don't need to reflect on it so much in an overt way because it becomes a part of any

response that I make. It's automated if you like into this fabric that is a part of mind and memory.

Oliver notes the importance of a student-centric perspective and active communication and listening in the critical analysis of his teaching. His observations regarding tutors in his subject area highlights the importance of intra and inter-personal skills in the communication and relational aspects of eliciting and giving feedback that fosters a culture and climate conducive to critical analysis of one's teaching.

It's dialogue, and I listen, I hear what the students say. I particularly look at what they write. I had somebody taking tutorials for me a couple of years ago. Competent, they knew the work, they were well versed in being able to use the criteria for assessment but they had an unfortunate personality manner that didn't gel with the students and they came across as being austere, distant, authoritarian, and the kids really didn't get it and they wrote all sorts of comments in their reports that they fill out at the end of each semester. I kept him on one more year but I gave him detailed guidelines on communication to try and have him communicate with them a little better. It didn't work and we, at the end of that time, used the services of another person the next year. I was hoping he'd grow into the task but he didn't. The new lady is wonderful. She's sensitive, she listens, she responds, and the kids love her, so there you go.

The pressures of a high workload, the constraints of time, and the lack of systematic external drivers to support reflective practice characterise both the participant teachers and lecturers in this study. The informal, haphazard and idiosyncratic nature of the reflective practices within the academic community at Avondale College is characterized by the following comments from a range of lecturing staff.

We don't go seeking critique, or I don't go seek critique (Thomas).

We don't have here any sort of real systematic … we talk about it, we certainly have informal chats about what works and what doesn't work … I constantly am putting my own practices up for their review (Jack).

Again, it's an informal process. Ah, I will come out of a lecture and I'll think, 'ah, that was terrible, that went really bad'. So I'll go to a colleague, usually Alexander, who's got lots of experience at, in teaching, or James, and I'll go, I'll sort of vent a little bit. They'll help me reflect both on the context and realizing that it's a two-way interaction that it's not always about how I'm coming across, it's about how the students are feeling at that time. So that helps me feel better about myself I guess. But it does also give them opportunity to say to me, oh well look, perhaps next time you can have a little quiz up front, so they make suggestions about making improvements, ah, so yes there is dialogue about, that (Mia).

Now that is something that we probably don't do as much as we'd like. What is against us of course are time pressures. It's enough for me to find time to get to my classes. It's quite a different matter to invite Alexander along just to listen when he has so many things he needs to do himself. That's our big problem. We hear each other in colloquia … We do hear each other occasionally in team taught subjects where we feel, I think, remarkably free to make comments and suggestions to each other. That does happen. And comments are heard receptively rather than threateningly, certainly in our area. I try to listen to myself. The other thing that I try and do is expose myself to very good lecturers. If I hear of a good lecturer, I will go out of my way to listen to them (Liam).

The pragmatic and generally unstructured nature of the current reflective practice by the participants in this study mirrors their definitions and metaphors of what constitutes reflective practice. This strong congruity is also reflected in both the practice of teacher and lecturer participants.

Most reported reflection was internal to the individual, undocumented, and focused on reflection-in-action and reflection-on-action. While practice is highly

idiosyncratic it was also evident that collegial relationships and communities of collegiality were essential elements in supporting and fostering conversations external to self that engendered opportunities for informal professional dialogue and reflection.

It is also evident that there are minimal, and for many participants, no institutional or structural frameworks reported that deliberatively foster or elicit structured forms of professional reflective practice. For most of the lecturer participants at Avondale College and for the science teacher participants from Adventist Schools Australia reflective practices, while strongly embedded in their professional lives, are not currently consciously and deliberatively embedded, rather they are informal and serendipitous in their manifestations.

4.5 The Broad Impacts of the Learning Experiences of the Context of the Teacher Training on the Participant's Personal Perspectives Regarding Reflective Practice.

As the teacher participants were requested to reconceptualise their experience at Avondale College as a whole and comment on that particular context's impact on their personal perspectives regarding reflective practice, their responses were often couched in other layers of meaning that the institutional training had for them.

Avondale College is a denominational tertiary institution and a small number of the teacher participants commented on the impact that the deeply embedded spiritual life in the institution shaped and influenced in them. Ethan in his comments linked the two broad impacts the context of his teacher training for him through the relationship faculty had exhibited while he was at Avondale. Spirituality was noted on an institutional and personal level and was allied with the personal interest academic staff took in their students, inside and outside the formal classroom setting.

> *One would be the spirituality of the faculty and their personal spirituality and their interest in your spirituality and that and that leads to the second; they are actually interested in their students. So in terms of that, Avondale experience actually in the classroom and the interactions with the faculty outside the classroom, that perhaps is possibly the most valuable lessons I've seen in modeling what good*

faith and intellectual pursuit or academic pursuit can look like. But doing it in such a way that it's actually human enough that you can relate to people and take an interest in them.

For Ethan, relationships of meaning allied with the modelling of *'faith and intellectual pursuit'* by academic staff were key elements of the Avondale context that aided him during his teacher training in the development of reflective practice. Sienna expresses this link of relationship with lecturers and spirituality in terms of her maturation and maturing as a person in her Christian walk, coming from a small, conservative, regional town and a broader, more diverse world at Avondale College, before experiencing independence in a different cultural setting in New Zealand during her first professional positing. For many students like Sienna, tertiary training also included a transition to adulthood and independence. For Sienna, she is unsure that the linkage she makes is connected to her personal reflective practice development, however it helped her on her own personal journey of development through the years at Avondale College.

I think the spiritual aspect of Avondale, yeah I think that really helped me because I came from Murwillumbah, it was a small country area, church was very, reasonably conservative, you know, it's come a long way, it's actually pretty good there now, yeah but like going to Avondale and having that kind of experience. Like I don't think I ever really experienced God that much before then. You know, you'd get the one-off when you went to big camp or whatever, but you didn't really get it all the time, so I think that was good to have before I started teaching because if I had of ended up in New Zealand like that, without that, I don't know what would have happened, so that aspect of it, I know it's not really classes and stuff but that probably was something that I value. Probably there's heaps of aspects to the lecturers and stuff, which is really good. Like if I didn't know what on earth I was doing, like it was really easy to go to them and just talk to them or whatever, you know if you needed help, yeah, so that was kind of good, that's what I, I don't know if that helps my reflective practice, it helped me through Avondale. It didn't really help my reflective practice.

A number of the teacher participants specifically differentiated on the types of thinking that were fostered and developed in the different faculties. Recollecting the teaching and learning environments they consistently observed that the Science and Mathematics Faculty proactively instilled, inculcated and developed their critical thinking abilities.

As Samuel recollects:

> *All of my science at Avondale helped me on the road to be a critical thinker … it's the thinking process that I've learnt from the science department that's influenced me probably the most coming into teaching.*

Riley noted that teaching of discipline content was as required as was the Education Faculty's teaching of content and portfolio construction, including the incorporation of '*review into the program*'. He observes that '*like most things at university it had a bit of a sense of being very artificial*'. Teaching practicums and entry into the classroom however, brings the skills and knowledge taught into context and relevance. However, as Riley wryly observes, the constraints of time mitigate against the adoption of structured, documented reflection.

> *I guess we were given all the content that's required. From the teaching side of things, the Education Department, I mean they certainly gave us all the content that you're supposed to know and sort of taught us how to build up a portfolio of what you're doing and build areas for review into your program and all that kind of thing. But like most things at university it had a bit of a sense of being very artificial. Once it hit the field in your teaching practicums and once you get out of college and try to use the stuff, you find that, as great as it is, there's just not really time to sit down and write for an hour about how you felt and viewed the teaching work. You just tuck it away in your mind, what worked, what didn't, and leave it for the next time.*

Jack, a senior Education lecturer, observes the realities of time constraints that impact on pre-service teachers' capacity to reflect.

The students don't do as much reflection on an actual day to day basis as what they probably need to do, simply because of the pace of their lives … when you have those sort of lives combined with the other stuff they fit in you actually end up with a reasonably pressured lifestyle. And I actually think that mitigates against reflection. Many of them in their undergraduate course are really happy just to get the job done.

Ava builds on Riley's comments regarding discipline content. She notes the excellence of the subject knowledge content given in the Science and Mathematics Faculty. A significant number of participants, like Ava, noted the rigour of the degree and the high expectations of content and conceptual mastery for science teaching, often contrasting it with the relative priority they gave to what is recollected as the less demanding Education Faculty subjects.

I think for me Avondale really did sit me in good stead for knowledge, like getting the knowledge so I can teach … we were taught a lot of the theoretical things. Science at college was probably one of the most rigorous degrees you could do and I really got extended. Professionally I wouldn't, being honest I wouldn't, I don't think the education degree side of things really did help me develop … I guess I would say the education subjects for me I found a little bit slow and a little bit of a waste of time to use up my time at college in a productive way. So that, and that's something that it's not, I wouldn't say it was just my opinion, I've talked to a lot of my friends and we've had big discussions about education subjects and it's a good thing to a certain extent but the amount that I did at college, I don't think it was the right type of education. Like we didn't get taught how to time manage properly and how … Just the nuts and bolts, we weren't taught the nuts and bolts.

The most common recollection of the context of the teacher training that impacted on participants' personal perspectives regarding reflective practice related to characteristics, positive relationships and interactions with lecturing staff. Isabella noted that the size of Avondale College and the consequential student: staff ratio facilitated the level of interaction experienced.

Because itself is a small institution I think it's good because you can interact well with your lecturers.

In particular, participants highlighted the significance of the lecturers' support, enthusiasm and accessibility. This interaction extended beyond the classroom and the sharing on an incidental and informal level impacted students deeply, as noted by Charlotte:

Undoubtedly it would be the lecturers and it's not so much their formal lectures; it's the incidental chats that you have with them that really, really help and support you.

Emily, in recollecting her training at Avondale College, cannot recall specific classes or content, however she distinctly recalls the support structure, assistance, advice and encouragement given by College staff. She also notes that this positive interaction continues after graduation through the continued, active networking that occurs:

I honestly can't remember set classes and what they've taught me but I know that, like the lecturers were always, if I needed to, there to talk to them about the assessment or the prac that I've just done or anything like that, so they were supportive and they did offer advice and helped me with improving things or saying what went well ... I wouldn't say it's necessarily the whole content of Avondale, I would say it's the lecturers and stuff like that, the support structure that they did have.

You go to Avondale and it's great, I loved it, I could go there to do my training again but then you get out into the real world and you think 'Oh, my goodness, this is nothing like ...' even like prac teaching, it's nothing like prac teaching, it's nothing like all those things. It's good to ... I think Avondale works best in that now you've got networking that you can do ... it's just a great way to network and be able to [have support].

Olivia, in reviewing this supportive and assistance dimension to the student-lecturer relationships, comments on the work ethic and dedication of lecturing staff in the Science and Mathematics Faculty. In doing so, she captures a sense of modelling

occurring and this, combined with a sense of their engagement in the classroom, recollects being inspired by them:

> *I had particularly hard working lecturers in science and watching them and the way they taught me inspired me to want to be like them a bit. I can think of particular individuals who were there late at night before exams and that sort of thing where me and a few others would be asking them questions and I'm thinking oh man it's 8 o'clock at night, what are they doing here? Haven't they got a family sort of thing, and so their own modeling. There was a certain presence that certain lecturers had in the classroom that was very engaging and that also inspired me.*

Benjamin, in his recollections, applies the interaction with staff beyond the context of training for the profession of teaching. He notes that an ethos of service, a passion and dedication was evident in most of the cohort of lecturers he experienced. He notes that this was not universal at Avondale; there were some academic staff that did not have a passion for young people or for their profession. The general recollection however enthuses a positive recollection that '*the lecturers whom I encountered were dedicated individuals who were living a life of service so in essence that is caught and taught*' – another allusion to the effectiveness of modelling that went well beyond the realm of professional training.

> *Well I think it applies not just to teaching but it applies to life. When you get to know individuals, you can quickly make an assessment yourself whether they are sane, insane, balanced, unbalanced or other. So the Avondale experience in the broad sense, not to say that there weren't any insane individuals there because obviously there were but in the broader sense it was most looking like the sound people with relatively good intentions who were acting out their belief which is a life of service. So you know the whole, I think at Avondale motto is something along the lines of service anyway and so here is a group of people who have dedicated their lives to service and they lived it out. In the main I can say that was true about Avondale in my own experience. The lecturers whom I encountered were dedicated*

individuals who were living a life of service so in essence that is caught and taught business. It wasn't necessarily taught but it was certainly caught by me in my time with them. Again [they were] just passionately involved with young people because that's a challenge in itself. There were other staff there obviously who for whatever reason and I'm not going to be here to judge or certainly don't hold anything against them, but they weren't really passionately involved in either vocation. They were there for a job and as a pathway to something else and they've since moved on.

Many of the participants followed through the theme of contagious learning, with the lecturers inspiring, or effectively challenging them. As developing educators, the teacher participants often recollected how, as pre-service teachers, they perceived pedagogical methods being displayed and excellence of teaching occurring as the lecturers presented to them.

I think the lecturers themselves and the way they conducted their classes and the way they challenged us to think creatively about how we taught, and even my science lecturers, they all inspired me, yeah, and gave me enthusiasm for science. Yeah, so that's something in my teaching, I still look back at how they taught me and try to incorporate that into my own teaching. (Ella)

I was exposed to a whole different range of science lecturers and science teachers and I was able to go okay that didn't work for me, I really liked that person's style of what they did and to pick out what I appreciated about what lecturers did and sort of go okay that didn't work and I could see why that won't work and why I won't do that. (Chloe)

I guess seeing some of the lecturers there, you get to see, even though it's not really a big institution, you got to see quite a variety of lecturers and the way that they interact with students, the way that they teach, and especially some of those in the science faculty that you get to be taught by them for a few years, you get to see quite varied ways of

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presenting content and teaching and helping students through problems. So I guess the most significant influential were the, there was a couple of my chemistry lecturers who were particularly, in my view, particularly good educators ... I guess some of the opportunities that I got, which probably weren't the normal situation, but there were opportunities for me to work with a nursing bridging course and work as a tutor for some of the younger students; they gave me a good chance to sort of put some of these things that I'd seen into practice and actually start trying to use them. I guess that gave me an opportunity to actually grasp the meaning out of this whole practice before you actually hit the classroom and see some of the discrepancies that do exist between the content, what you're supposed to do and how it actually works (Riley)

4.6 Environmental Considerations that Fostered and Encouraged the Development and Expression of the Distinct Predispositions and Skills for Reflective Practice.

The teacher participants in identifying elements of the Avondale College environment that fostered the development and expression of the skills and predispositions for reflective practice expressed some difficulty in recollecting specific elements that contributed to their 'reflective landscape' (Golubich, 1997). Riley expressed it well when he commented:

I don't know if there were very many specific skills that were explicitly taught. Certainly they were modeled well by individual lecturers and modeled very poorly by others, but I can't really recall any specific skills that we were really taught.

Ethan expressed a common thread when he observed that education subjects, skills and content were not the priority for many science pre-service teachers, as their preoccupation was their science subjects, particularly their majors.

The downside of a background with disciplined focus is that I've come to realize that I wasn't really focused on teaching when I studying, I was more focusing on physics, which I have found to be a problem.

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Because in those days, some of the things that my more teaching focused peers were doing and thinking about, I was too busy writing physics assignments. So perhaps I could have done a lot more reflection and sitting back and going yeah that's a good idea.

It is interesting that Ethan in retrospect now sees the disadvantage this has been to his teaching, but affirms that nothing that he can see would have altered his perspective at that time. Only praxis has altered his priorities.

Benjamin noted that one Education subject focused his attention on issues related to reflective practice and provided a skill set that subsequent reflective practice could build on:

One of the subjects we did was psychology so we probably put that experience down, ... going through when we're in situations or briefly analyzing your response and your feelings to certain situations I think although not directly related to actual teaching practice at the time, enabled me to I suppose have those skills of reflective practice more as I started if that makes sense.

For all teacher participants, the major consideration that developed in them skills and predispositions for reflection were the practicums. Avondale College has traditionally allocated significantly more time to block practical experiences than many other teacher training institutions. From the voices of the teacher participants, the practicum placements were positive and major contributors in their development as reflective practitioners as well as becoming skilled at the art of teaching per se. They placed particular emphasis on the practicums in the third and fourth years of training. Isabella, Ava, Benjamin and Samuel are typical of the participating teachers as they voice the centrality of the practicum to the learning to teach experience:

Most of your teaching you learn on the job ... there's so many things you probably learn at Avondale that you're probably going to forget when you're teaching ... the most important part of actually learning to teach was the practicum. (Isabella)

… [In] third or fourth year, you probably need a little bit more time at a school to understand what's going on … the practical experience, going out and spending time there, I think that was very beneficial. (Ava)

Certainly the thing, which helped me, the most in my teaching as well as my teacher training was those periods of time when we would have to go out and be at the cold face. (Benjamin)

Probably the greatest opportunity would have been the prac experience … you're actually in there doing it in the classroom and for me the confrontation of this is what teaching involves was the reality that made me start to think about what does it mean to be a teacher, what does it mean to be a good teacher? So that was probably the biggest influence I'd say. (Samuel)

Lachlan and Ella observed that the practicum experience also enabled the building of bridges for networking with practising teachers, networks that continue to contribute to his development as a professional through the mentoring those professional contacts have enabled:

Definitely had some great practice teaching opportunities … I don't think I would have been able to develop the way I had without the four years worth of prac teaching, rather than doing maybe 3 years of a BA and then teaching at the end … it's also meant that I was able to work under people who I now work with and that's facilitated an ongoing mentoring process. (Lachlan)

Again, all the pracs, the whole practicum process of having a mentor teacher and developing units of work with your mentor teacher. Things like that have helped, gave me a good foundation for what I do now. Then I guess a lot of role modeling in our lectures, education lectures, yeah, that really helped to give me ideas on how I could run my own classroom. (Ella)

Some of the assessment activities and documentation required in association with the practicum experience were seen by some of the participants as valuable in practising and fostering reflection, as expressed by Ella:

I think the whole prac teaching process was really helpful in getting us to think about the classroom and the issues and they did encourage reflection. When we taught lessons there would be a section for us to review our own classes and make suggestions on how we could improve, so that was important to my reflection, and I still do that. I guess I'm a paperwork person so I don't mind documenting and doing all the planning, so that's come really naturally to me, that whole process. (Ella)

The other thing that I really appreciate is when we did our professional development we put our folder together, they look through it, they don't just mark it. We have an interview with them and we sit down, we chat, we debrief, and that is really, really valuable as well … valuable because if you've had a good experience you can talk about it or if there's been a situation at school then you can discuss it with your lecturers or just generally just chatting about the experience: was this normal or was this unique? The kids - different situations that you're facing because it's new to you and how you - I guess like a toolbox and out of the toolbox what tools do I have to manage to cope to deal with each of these different situations. (Charlotte)

A range of the participating teachers, in their recollections, strongly voiced the value of dialogue with lecturing staff, both during their on-site visit to the school and in the practicum debriefs subsequent to the placement. Avondale College has ensured that an Education Faculty staff member makes contact, usually on-site, during the practicum. The value of these visits was noted in terms not only of support and communication, but in prompting pre-service teachers to reflect on their practice. This process, allied with the post-practicum de-brief was identified as a powerful tool in prompting reflective practice. Chloe voices the power of this process as she describes the debrief lecturer, 'provoking' her as she prompts Chloe with questions,

with the reflection generation being reinforced by Oliver, an academic who operated within a constructivist, developmental model:

Well I guess when we're talking about reflecting on the things we do I'd have to say it would be [the lecturer's] responses to our prac folders and things that we handed in: because she was always very teacher, 'But why did you do that? What are you going to change next time?' That constant questioning as to, just because that was what the teacher told me to do wasn't a good enough reason but the actual, the questioning of why. I think also probably Oliver. He was very constructive with the way he looked at things and kids are developing along this road and it sort of gave us a lot of scope in thinking about where kids are at and what stage they're at. It wasn't they've got it or they haven't but how are you going to move them to the next stage and it sort of provides a lot of thinking about okay they're here, how do I get them to take that next step and then how do I get them to take that next step? So you've got to be constantly aware of where they're at otherwise you can't help them to take that next step. (Chloe)

The student focused nature of the promptings Chloe articulates in this description reflects the focus and perspectives consistently modelled by these two education lecturers. Modelling by lecturers is seen as a core, deliberative action by the Dean of the Education Faculty;

The role that lecturers play in modeling what it is to be a professional educator is a very significant thing. And I know that since I have come in as dean we've changed very much the tack. And I walk into the first year students and actually say to them, so I suppose a significant thing is the general approach we have in the faculty in that I go into them and say 'You're no longer a student. You are now a teacher in training. I expect you to act like a teacher and think like a teacher and become mature, as a teacher needs to be. And if you don't want to do that, leave.' And I've certainly had some parents ringing up pretty annoyed because they have had their student who has turned up at college after the first day and says 'I'm not sure if I want to be a teacher' when they

spent the last six months getting them to come to college. But I think that approach, getting the students to identify from day one that they are a professional in training, is a very important step because we get them symbolically to cross the line from being a student into being a professional. And that then gives us a framework to hang the rest of the course off, that is, you are a professional in training. And I quite literally stand there and shake their hands and say 'Welcome to the profession'. I think that approach is really important. I think the staff that do a pretty good job as educators and model their trade to the students is a very significant thing.

Oliver, an Education Senior Lecturer, emphasises the creation of a collegial, relational environment where the pre-service teacher feels comfortable, an environment where:

The risk of internalizing and making mistakes is minimized. I mean let me put it this way, because of that environment, the kids are willing to take risks, they're willing to let you, metaphorically, see under their skirts. I think that that kind of environment is really important if you're going to ask kids to take the risk of revealing to another person the way they really think about a particular subject, topic, skill, interaction or whatever. If there's any sort of impediment, uncomfortable nature, they're not going to be willing to do that. They'll be self-protective and exclude you and all you'll see is what they think you want. So relationship is incredibly important in terms of professional development. Comfort.

Amelia, another Education Senior Lecturer, also places relationships as essential to building self-confidence as an individual. For her, commitment to social justice and equity are core to teaching, and commitment requires valuing of self and others. Amelia sees these as necessary environmental pre-conditions for reflection:

Its relationships, I think it's the way that we can inspire; the way that we can raise their self-esteem. These are not professional things. I think that relationships are the things that really make the difference.

They can learn all the factors, strategies and skills, but if we can help them develop a commitment to children, a commitment to social justice and equity. A commitment to doing your best and understanding of the importance of and a commitment to valuing kids and helping children realize that they are valued. One of the things that I do in my classes, somewhere I work it in where I actually remind the kids they themselves are of such value and why, because Jesus Christ came to die for them. I say to them, maybe some of you have never had this said to you, but you are of huge value and you don't you dare put yourselves down and don't you dare think that you're not worth anything; and don't you dare think that life is not worth living, because you have so much and you are of such value and if I can do that with them, and they can impart that to their students.

The second element identified by the Dean of the Education Faculty corresponds with the voice of the teacher participants who identified the practicum as central to their development as reflective practitioners:

… Another really significant thing at Avondale as I think about it is the integrated nature of our practical experience because students very early in the course after six months being here go out on a practicum. And they actually identify with what is the reality of being a professional early. And we have students who come back and say 'Mate, I'm going to be a teacher. I loved it.' Others come back and pull out of teaching. Not many, but some do. So they're the, as I would say, are the foundational things. I actually think though that our core structure is pretty good, it helps, but I'm not going to say that it is necessarily the most significant thing. It is much more the attitude and ethos of the course, the people who teach it, combined by an early practicum experience that is then replicated throughout their course. Those are the things that are at the foundation.

Science and Mathematics Faculty lecturers also identified relationships as important elements of the Avondale experience:

I think the most singularly important factor would be the close mentoring and the friendship that exists between students and lecturers. (Liam)

Like Ethan and Sienna, Cooper identified the impact of spiritual reflection on the maturation of the professional as a reflective practitioner. Cooper does so in an integrative manner, linking spiritual reflection, presentation activities in class, questioning in laboratory classes amongst other things. He also notes the personal attributes students bring to reflective practice. Like Amelia he stresses the building of confidence and security:

Well I think their opportunities ... there's a significant number of students that are involved in the Festival of Faith programs, for example. Now this is not directly related to their teaching practice but I think it filters back, just as I've said before. They get opportunity to reflect about spiritual things and I think that filters down into reflection about their professional practice. I think too the fact they've got to think through their oral presentations, that has an impact on reflective practice. I'm trying to think on other measures. There are questions, for example, we give them opportunity to reflect upon the results of their experimental results. I mean I particularly force the children into reflecting on the results that they get from an experiment. Because what students tend to do is they just tend to write down the results of an experiment, answer the calculation questions and then leave it at that. But I like to get them to think about the impact of that result on some of the broader ideas in chemistry. So, for example, I might say what does this ... what do the results of this experiment tell you about metal coordination chemistry and the ease with which it happens in a certain oxidation state? So I try and ask them more general questions, get them to reflect on the actual calculation they've done in the broader context of chemistry. That I think encourages them to be more professional in the way they reflect about their practice in the classroom for example.

I think to be reflective you really do need some personal attributes. And one of those is to be secure enough in yourself to be able to examine yourself. And to be able to step back as it were. If you're very insecure as an individual, I think you find it much more difficult to do that. If you have insecurities of any kind it tends to not enable you I think to be as reflective as you might be and again I think helping students to develop self awareness, confidence in themselves, is one of the attributes they do develop here at Avondale. Again, largely I think, not largely, but partly through the spiritual foundations provided. Hopefully students leave Avondale feeling more secure in the big scheme of things and that is one thing I think that helps them to be reflective.

Creation of a safe place to express oneself, to explore and grow is deeply embedded in the learning environment as conceptualized by the Science and Mathematics participating lecturers. They actively seek to '*provide a foundation for some security*' in order to provide opportunities for reflection and maturation. As expressed by Cooper:

I do think it does help students be more reflective if they have learnt to be secure in themselves. I mean people talk about self-esteem, I'm not too keen on that word, but feeling secure enough in yourself to be able to step outside of yourself and say what am I doing that's working, what am I doing that's not working. To be able to step outside of yourself I think you've got to be secure to do that. So I think that's a quality that we do try and engender here at Avondale. As I said there's always room for improvement.

… To my teaching of chemistry I bring a historical and philosophical perspective. And to be reflective you've got to have some awareness of what history and philosophy are I think, that's my personal thing I bring. And epistemology, the way knowledge grows. So I do bring that perspective. I also bring a strong spiritual perspective. So not every class, but often I will begin my class with a prayer and I'll specifically focus on helping particular individuals with their assignments or if

there's strength to be given for people to understand the particular concept we are about to encounter. So I try and not only talk about spiritual things but talk about chemistry as well. Again to provide a foundation for some security. That security giving an opportunity I think to be reflective. The other thing is to try and encourage...I try and encourage students to be open about the discipline which we're working through so that not all the answers are there. So I try and encourage students to think that chemists don't have the answers to all things and that theories are not always watertight and that there are holes in this model, there are holes in that model. Encouraging them to examine the models encourages them to step outside of the...as it were, to reflect on it. What is it about the model that measures with evidence and what it is about the model that doesn't measure with the evidence? I think that's very important because that teaches us them to do the same thing with their practice. To ask - What is it about my model of practice that's working? What it is about my model of practice that's not working?

Noah observed the positive impact on him and his development of such a nurturing environment:

The classes were obviously a gift because they gave me the tools and the extracurricular gave me the chance for me to put them in to practice. Whilst I was in a very nurturing environment that's why it was interesting.

Amelia, a teacher participant, summarized the contextual climate and environment at Avondale College for the development of reflective practice as:

We were encouraged to be honest, but also to be positive, so to talk about what we did well as well as the things we could improve on, that was encouraged. Giving things a go was another attitude, so we were encouraged to experiment and then reflect on that.

The participants generally report the environment created by these factors as supportive. One Education lecturer describes how those supports impact on their reflection as pre-service teachers.

In terms of how that supportive environment impacts on their reflection though is an interesting thing. We encourage students not necessarily to be conformist. So when you are telling students to go out there and teach in a professional environment but don't necessarily just follow the lead of what other professionals are doing but ... get out and try, set a bit of a precedent and show them how to do it. That actually takes a fair bit of bravery to do that sort of thing and I think that we support our students in using their own initiative ... you have to separate idealism from reality in such a way that the students are still really encouraged to expend the energy to innovate. By the time we get them when they are 18 they have already, at least two thirds of them are conformist. And trying to reinvigorate the last aspect of Anderson and Krathwohl's revision of Bloom's taxonomy, which is the creative one, is extremely difficult. So we know that one of the biggest influences on how they teach as teachers when they enter the profession is the way they were taught in school and not the university degree they go through. So for that reason, while we're here we are all about trying to get them to reflect on their own practice against their own ideals of what they'd like to be like and what they think teachers should be like ... So I actually think when it comes to reflective practice I really think that you get to a stage where your reflection decreases dramatically because you think you know it all. And I think that younger people are in a much better position to be more reactive. (Jack)

The Dean of the Education Faculty noted the same factors as the teacher participants in noting the degree of individualised feedback and interaction students have with lecturers, *'which facilitates them thinking more about things, whether it is their tutorial topic or their performance in a particular thing'* He also notes that the Christian ethos also predicates a proactivity regarding reflection on certain matters,

> *'The Christian ethos of the place is such that we require our students to be very proactive when it comes to reflecting over particular spiritual matters like integrating faith and learning'*

The Dean also observes that such factors

> *Don't happen by chance, they've got to be planned. And we really ask students to think carefully about how they do it and then reflect over how it went. And that could be everything from the practicum, as we've talked about, but also throughout other aspects of their course.*

As described there are significant, deliberatively planned and fostered factors in the institutional culture and environment of Avondale College that encourage the development and expression of reflective practices. These contextual factors are described by participants as being significant in their development as individuals and professionals during their time of training at Avondale College.

4.7 Identification of Developmental Phases or Stages in Reflective Practice for Pre-Service Teachers.

All participants described the development of reflective practice during the pre-service years as a gradual process, akin to evolution or osmosis. There were some significant accelerations or movements in development that were identified as correlating to practicum experiences.

The initial significant movement occurred after the first practicum placement, as described by James, a lecturer in pedagogical methods: *'there's a massive leap after the first six months, after their first prac teaching, that's a pivotal turning point.'* Participating teachers also identified this phase of development. The third and fourth years of practicums also saw a marked increase in scale and depth of reflective practice as the pre-service teachers had extended practicums, neared appointment as novice professionals, and were encouraged through less tightly structured reflective assessment scaffolds.

Amelia describes her maturation through Avondale and as a novice teacher in these terms:

Each year, my first year on prac it was all about achieving the A and I learnt that, yeah, I guess I started to realize then that it's not about getting an A, it's about considering all the factors surrounding your classes you teach and an A for a standard class or a lesson for one class won't work so well for another, and I think as I taught more classes I realized that. You've got to consider much more than having a, being perfectly organized and having a fantastic lesson plan and a worksheet prepared; it's a lot more than that. I think it just grew gradually. When I first came [to Avondale], for me, there was always the rights and wrongs. I'd just come out of school. I was used to, well, I worked hard at school to get that A and once I got that A, I'd achieved everything. I guess I still had that attitude in my first year at college, that there was an A standard and once you'd achieved that, that was it, and I guess I have learnt, and I learnt as I went along, that there's always things you can do to grow and to develop and there's not really an A standard, there's just growing as a person and as you get older you extend out, so there's no real ultimate level that you get to. Yeah, so I think my ideas about teaching and what it would be like were very different from when I graduated to where I am now. I do see that it is different and I realize that in five years' time teaching will be different and I'll be growing and developing in other areas. So I guess for me reflection is continual and on going. You're always going to find ways to improve.

As many in the cohort of participating teachers were high academic achievers like Amelia, who entered teacher training straight from the senior years of high school her description is typical, rather than atypical of the cohort studied.

Outside of the practicum experiences no other single developmental catalyst or stage was self-identified by the participants.

4.8 Identification and Description of Pre-Service Reflective Practice Activities.

Most teacher participants found difficulty recalling, without prompting, any specific pre-service activities relating to reflective practice outside of the teaching practicum.

After consideration recall was made by the teacher participants of a range of assessment tasks and activities that required or impacted upon reflective practice.

The activities and assessment requirements associated with the practicums dominated teachers' recollections. Assessment tasks were often judged by participants as being artefacts of the course requirements, to be completed to expectations in order to achieve course progression. The voicing of this by teachers resonates with the findings of Gray's (2006) study of Charles Stuart University pre-service teachers. Riley articulates this approach:

> *We had the teaching portfolios which for the most part you sort of tried to keep a record of what you were doing during the teaching practicum and how things went, how could you improve, and this kind of thing. By your fourth year you actually got quite good at writing nice pieces of fiction about what you did ... you did actually learn quite a bit about them, but you'd try to write something your lecturer would like to read and at least hope they read some of it.*

Some teachers expressed ambivalence towards the utility of the reflective activities that were incorporated into the teacher-training program.

> *I guess it was meaningful and it helped, do you know what I mean? As in we sort of had to write a reflection after some of our lessons and stuff, and like a major reflection at the end but I don't really remember reflecting on, or giving us skills to reflect on when we got out, do you know what I mean? Like I don't really remember doing anything with that so I don't know whether that's a good thing or a bad thing. (Sienna)*

Others found that the processes associated with the construction of portfolios and other associated activities related to practicums generative of reflective thinking:

> *With the prac experience when you have to put together a portfolio, and inevitably you're reflecting - you're thinking about what you've done and how you've done it and it makes you think. The more times that you come back to it, the more times that you see it and you think about*

it, that you are able to evaluate it critically. Prac folder was an opportunity to do that. (Charlotte)

A small number of teachers commented that these structured activities were useful and continued to be a source of reflection as they moved through the initial years of teaching. One participant noted that only the pressures of time hinder the continuance of such structured reflective practices:

I think that the learning guides we were required to keep or make up as the case may have been [and these] were of use. I have occasionally returned those notes and looked at them when I've had a spare moment and gone I faced the same on my first year [teaching] than my third year of teaching. How did I view it then and what was the comment on my experienced teacher? I have done that on occasion I think that they were useful and if I wasn't teaching so many subjects I would love to do the same thing again. But I think it just comes down to a sheer number of hours in the day. (Noah)

While action research is a major activity for the final year pre-service teachers only one teacher participant, Sienna, noted it, and did so in a non-affirmative manner:

We did a subject on action research and to be honest with you whatever I did for action research really was not very beneficial because I don't even remember it. (Sienna)

There was unanimity amongst the participant teachers who readily recollected activities associated with reflective practice at Avondale College that the most meaningful activity involved the debriefings after practicums, especially if the debrief involved sharing with peers.

I think also in the classroom when you come back and you're talking to your peers, peers are amazing, and to talk to them about their experiences and how they've dealt with things or unique things and sharing, is really, really good. (Charlotte)

But probably the thing that was more meaningful was one of our lecturers ... got his students after our second or third year practicum to sit down in small tutorial groups and actually discuss as a group and with each other very specific things about our practicum: what did we feel worked, overall our strengths and weaknesses, and then he sort of broke those down into much smaller, finer questions, and eventually got us to the point where we realized, here's the things that I really do need to improve on and here's the things I've done well on and how do we move everything towards the better end of the spectrum. I found that process of carving out a chunk of time to sit down with other people who were at the same sort of level a very useful one, because it also forced some of the more optimistic students to recognize that they did have a few weaknesses and it forced those of us who are a bit more pessimistic and likely to focus on the areas for improvement to recognize that there were actually quite a few areas of strength as well. (Riley)

I think though that it was probably the structured debriefs that were required ... the facilitator required that you write out some of those reflections so the weekly debrief would be the mentor summarizing teacher to say where are we up to what are we doing? That ability just to talk about with somebody which was only what was required and which I may not have done so much I think that has been very helpful. (Noah)

Noah, in his interview, shared that unless these activities associated with reflective practice were assessed and compulsory, he may not have actively participated. The structure, and the association with assessment, consequently gained for him the benefits of reflective practice. Even highly pragmatic and cynical participants such as Riley noted the benefits of the guided reflective practice within the teacher-training course. For him, of particular value were the activities associated with discussion with peers.

Ava, by her own admission was a student who was largely unengaged with learning while at Avondale College '*I was one of those science students that they probably*

had faculty meetings about so I would say that I kind of missed the reflective process throughout my college time'. In her description of activities of reflective practices at Avondale, while she *'didn't do very much reflecting'* and for her, *'there was nothing really that prompted me to do that'*, upon recollection she insightfully comments that:

> *College teaches you to question, question your practices and even now I guess the assignments, some of the assignments that we had to do, hand in like making your own programs and now that I think about it I would say that was planting the seed of reflection.*

It is evident that the activities within the teacher-training course exposed pre-service teachers to a range of reflective practices. It is also evident that for most participants these activities while perceived as assessment tasks, by their prepetition became persistent foundations, *'seeds for reflection'* for professional practice. In particular interactive, rather than written, tasks appear to have deeply impacted the participants in terms of their recollections of reflective practice experiences that were of personal and professional relevance and meaning.

Lecturing staff, especially in the Education Faculty, are aware of the developmental challenges facing them as they attempt to build reflective practices in their students. The Dean of the faculty observes that meta-cognition is not a highly developed skill for the average commencing pre-service teacher. Consequently, a deliberate program of activities, built primarily around the practicum experiences and action research, is integrated into their study program.

> *I personally think students aren't very good at reflection and that is one of the things we try and do, is build that as a skill. Maybe those kids who lock themselves away at night and write in their diary each day might be a bit better. Who knows, maybe the growing popularity of blogging may be something that is going to enhance the school, but I think naturally, we know that meta-cognition is not a skill that students have highly developed when they come here. And planning, monitoring and reflection, it is very poor so we've got to try and build it. So I suppose the biggest thing that we do in hitting reflection hard would be*

in their practicum experiences, where we ask them to actually plan their day and at the end of each lesson they write a personal reflection and evaluation. At the end of the prac they have to write evaluations and reflections. And I think that when they do that at the end of their first semester, that for many of the students, would be the first enforced reflection they have done in a while. And then I think we build on that. So I would say that practicum is the most structured kind of reflection that culminates in their third and fourth year, where they do a practitioner based research, which is a structured approach of using the research technique to facilitate reflection on a particular aspect of professional performance.

The practicum, a major focus at Avondale College for instilling reflective practice in the lives of pre-service teachers, is further described by the Dean of the Education Faculty as:

Training metacognition into kids, the way that you're most successful is using sort of Vygotskian techniques involving scaffolding and everything else. And that is what we do with our prac. We actually give them a pro forma that requires them to write in the thing about their reflection. And that pro forma is removed by the final year of their course. And some of them, in their final year, consequently don't do it as well. But I do think it is an important thing, the structure as it is.

Given the deliberate nature of the structure in the Education Faculty, built around the practicum, it is not surprising that it is identified as the dominant reflective practice activity through the voice of the teacher participants.

4.9 Perception of Participants Regarding Lecturers' Development and Enhancement of Participants' Disposition Towards Reflective Practice.

The participant teachers described a process of maturing as they developed as professionals at Avondale College. In that process, it is evident from their recollections that there was significant input into their disposition and participation in reflective practice by the lecturing staff. The Science and Mathematics Faculty in

particular appeared to the participant teachers to be deliberately developing in them a capacity for, and orientation towards, critical analysis and reflection. Sienna described it in these terms:

> *In the science faculty were you encouraged to ponder and to think and critically analyze and those sort of things to do, it's somewhat similar to reflective practice.*

In the institution as a whole there was, for Riley, a climate in which there was a modelling and encouragement of reflective practice:

> *Whether it was direct or indirect, intentional or otherwise, there was quite a bit being modeled. There was quite a lot of opportunity, whether it was crafted and created in a formalized setting, or whether it was informal along the way, to sort of consider your own reflective practice and sort of see how your lecturers and teachers do that. (Riley)*

Individual lecturers through their modalities of interaction with their students and their pedagogical styles fostered and developed reflection in their students. Commenting on Alexander's interactions in the lecture and laboratory settings Sienna observed the development of critical thinking through the discovery process employed in one subject:

> *He just asked us questions. He never answered any. Every time we asked him a question he'd ask us a question back, I can still remember asking him things and he'd be like well what about this? And you'd be like oh you just asked another question. But yeah he told us at the very beginning of the subject he did one lecture, and he basically told us what he was studying and all that kind of stuff, so it was good because then we kind of knew where he was coming from and why he wanted to do this and why he wanted us to find out for ourselves rather than ... he wanted us to find out for ourselves rather than going to him and him just telling us everything, and I that's why I guess he was asking all those question.*

Alexander, in commenting on his teaching and exposure to students of reflective practice, places it in the context of a broader educational purpose:

There is so little you can teach kids in a three-year undergraduate degree. And, and, so the concept of lifelong learning becomes very important ... that's why I teach one subject by problem based learning, 'cause I want them to be critical, I want them to analyze problems, I want them to communicate, I want them to find something in the literature, I want them to think critically about what they're finding, is it really good information, is it not. So, in other words, to develop skills, generic skills, they can use as lifelong learners. I do sometimes ... [expose them to the meanderings of the forest of my head's reflective practices]... not so much the second year 200 level, certainly at 300 level I will. Umm, I will try and get across to them that the information ... I'm giving to them is going to be possibly changing very rapidly over the next 2, 3, 4 years. Ah, probably a good half of what I teach them I didn't learn when I was at university ... I do sort of share the umm, umm, meandering pathway of knowledge. I like students to get a hold of that without being disturbed by it ... and there's some students that just won't get what you're talking about anyway. And they would just want the facts, and I'll give you the facts back in the exam. But other students, you can see we'll think about what you're saying.

Ella, in commenting on the Science lecturers noted their focus on questions:

They did teach us to think for ourselves, but to ask questions and to be willing to search for answers to hard questions and to recognize that maybe we wouldn't find the answers that we expected we might.

Riley develops this focus on questions theme in noting the change that occurs as one stops seeking answers and seeks questions:

Step out of the student role, start thinking as a teacher, and it is really interesting because it changes the way that [you] look at [your] chemistry and what [you]'re doing. [You] suddenly stop looking for easy answers and start looking for nasty, hard questions.

As developing science teachers, many participants were becoming increasingly aware and analytical of the philosophical, pedagogical and learning characteristics of their lecturers. Participants were impacted in particular by those lecturers, who in the pre-service teachers' perspective had a clear mastery of the complexities of the learning journey they were participating in. Riley, reflecting on his time in Cooper's lectures and laboratories, comments on this lecturer's modelling of reflective practice:

> *Cooper was modeling reflective practice] quite openly. He certainly wasn't saying, "This is reflective practice and this is how I do it", but you could sense and you could see what he was doing and even in maybe the two or three years that he taught you, you could see just small changes in the way that he presented material based on how he got to know the student cohort and his experience with them.*

Riley makes further comment on this open intentionality of demonstrating a high personal standard of professional teaching practice:

> *Cooper in particular was a very good educator. His content was harder for most people to access because it required, at second and third year level it required a good, firm understanding of physical chemistry as well as a good grasp of mathematical concepts, which most students didn't have. But he was very deliberate and careful about the way that he presented his content, but then also in the way that he helped students through assignments and helping them to actually learn rather than just get things done and hand them in. He was very good like that. As a science-teaching student, you noticed that he was very, very intentional about putting good practice into his teaching and he would often make reference, even while he was lecturing, to ways that he's improved what he does through the years. So he might say, "Well, we used to do this for these reasons, but we found it wasn't working because of this and now we teach it in this way", or he might say, "Well, this is a very good little model that we've developed because we found students weren't understanding this concept and so we've worked away to build a little model."*

Benjamin, recollecting his experience at Avondale College, affirms the passion of his lecturers and the threading of the reflective practice sub-text within their teaching and interactions with pre-service teachers;

> *[Interest] was engendered by each of the lecturers in their chosen field because I could see they were passionate about it and it was something which they enjoy doing. The critical reflective practice was not necessarily a spoken component or a written component of what we did, but it was certainly an underlining - looking back and I could see it as an underlining principle in the way that they were doing things.*

4.10 Recollections of Interactions, Impacts, and Roles of Mentoring on Teaching Practices.

The teacher participants in this study all spoke with clarity regarding the significant impact specific individuals made on their development as individuals, professionals, and as reflective practitioners. It is most evident that strong and on-going relationships were developed with some lecturers during their pre-service training. It is also evident that while there were many complex facets to these relationships, they were founded from a sense of deep respect by the students and genuine caring by the lecturers.

Samuel outlined the complexity and deep philosophical basis of these relationships as he recollects the impacts of the significant mentors he experienced at Avondale College:

> *I never got the impression that they were trying to teach me something and maybe that was the subtlety of a good part of it, because I never got the impression, I just got the impression that they cared about me and what it means to grow and develop into a mature thinking scientist who could still be a scientist and could still hold on to the faith ... that idea of being a good Christian scientist, so someone who has a strong faith, who recognizes the power of science to reflect and its benefits on reflection and it's just why so fantastic, is a lesson that I guess it's a goal. I'm not sure it's a lesson; I would see it as an aim. I would see that one of their aims was to get me to go there and I see one of my*

aims as to bring up Christian young people who have a strong faith who also appreciate and value science. And the two can be reconciled to offer a beautiful insight into how to live a good life and how to be better people.

Samuel chose as a metaphor for the mentoring he received the images of a coach and a parent:

There's the concept of a coach who takes you and cares about you, cares about you doing well and helps you work through things. But I honestly think it probably goes beyond that and I would say that for some of the lecturers the role was more of a parental role, where they cared about you as an individual and wanted to succeed on a similar, I felt it was more a similar level as what a parent wants you to succeed. And was willing to build up a relationship to guide you through, was willing to put up with some really bad thinking, some immature ideas, but not criticize them, but rather guide and gently correct and work you through this process

The imagery of a coach or one evoking a family relationship was strongly re-iterated by a number of participants:

Sort of like they're a coach, you're a player but it's not as if you don't have a say, they're more of a coach that lets you put your ideas across and lets you try things and if they don't work then fine let's try something new, they can have their little inputs and tweak your ideas to make them maybe work better as well, they're the type of coach that listens and doesn't just turn up for the trainings, they do team building stuff. (Emily)

Like a very much a parent type child relationship, but not in a bad way. Not in a overbearing authoritative type thing, more so … Maybe actually, I will rephrase that, it's probably like a big brother type idea, especially in the science faculty where you can approach them. (Ava)

I guess it's more integrity and respect of how they would probably raise their families that I would see. That's what a faculty is like, like an extended friendship family. ... It's a unit. It's a group that works together. They know your good parts, your faults and yet you still work together. You get along - that sort of aspect of it. My mother always said that, "You work yourself out of a job as a parent", so when they're young you give them lots of instruction and you're slowly working yourself out of the job but the relationship changes into one of a friendship rather than so much of it mentoring and you collaborate together. And I guess in some regards that's how I see it ... I got a feeling of safety within the community. I guess that's the other part of it is community. (Charlotte)

It was like you were adopted into a family you know, and you're accepted no matter how you did but you were encouraged to exceed. ... You just became part of this little family that had a particular interest in science. (Olivia)

The imagery of these familial metaphors reflects on a learning environment of caring, safety, security, community, a sense of belonging, growth and increasing maturity.

Isabella uses the college dormitory as the setting for her analogy: Once again the emotional attributes of the familial setting are drawn upon:

I think that they're almost like a dormitory dean. They were there and they were there to help you find the rules and do the curricular materials and that sort of thing. At the same time there was a certain side of them that cared about personal things that may have hindered you from doing assignments and things like that.

Joshua places the mentoring relationship in the context of a chemical bond with its forces of attraction.

I mean they have something attractive to offer so; I continue with my chemical bonding thing, they offer something attractive and the

chemical bond is all about a force of attraction; you wanted to learn what they had to offer and more to the point chemical bonding is a two way thing, they wanted to offer as well and so they were motivated to do the right thing for the student, and do the best that they could and they would labor to the n'th degree to make sure that you understood such and such a concept, and they didn't want to stop until you did really, they had that real personal concern for their student.

Riley draws on the mountain top guru imagery in his analogy:

You sort of got this sense that they were a bit like a sage: you were going to them for tit bits and wisdom.

William extends this by likening the relationship to one of a helpline, '*where one could go any time*', and receive advice, assistance and guidance.

It is significant, but not unexpected, given the scale of interaction and the subject specialism affinity, that almost all of the mentors mentioned by the teacher participants were lecturing staff from the Science and Mathematics Faculty. Often the lecturers mentioned were significant lecturers in the major or minor that the teacher studied while at Avondale College.

For the lecturers, a sense of community and attendance to pastoral care feature high in their conception of mentoring. Alexander likened the process of mentoring as one of osmosis, where there is

'*Often the unconscious and non-deliberate transmission of values*' with '*students just being exposed to lecturers again 'cause of small class sizes, and so it just transmits.*'

For Mia, Avondale College '*stands for largely, competency, knowing your stuff, passion and delivery, demonstrating that passion through delivery.*' For Mia, this is transmitted through pastoral care for the students.

Oliver sees the mentoring he provides as being akin to a craftsman and an apprentice in an increasingly collegial relationship:

Because I'm dealing mostly with people who are to become teachers or who are already teachers who are doing upgrading programs or research programs, I'm dealing with colleagues. A lot of what I do now has to do with guiding people in research and I like to think of that as an apprenticeship process. It's my students are working with me because I have greater experience than they; I've been there before. I know what the process involves, in other words I'm the craftsman and I'm initiating them into the ways and procedures that are involved in that craft, apprenticeship. But rather than thinking of my students as being some lesser being, they are colleagues and they are simply learning the process from someone who's had more experience than they.

At the core of the teaching-learning interface is the transmission of knowledge, skills and understandings. At the heart of a mentor-mentee interface is relationship. Cooper notes the centrality of relationship over the place of transmission for pre-service science teachers at Avondale College and the impact that this has personally on him as a mentor at the teaching-learning interface.

One of the things that does make you think from time to time is what students express as to what they take away from Avondale, particularly at the point of their graduation. They will express appreciation to teachers, but what I think registers most with them is not what they seem to be learning in their classes, but the friendships they've made. Friendships anchor much more highly on their agenda than academic knowledge for example. And I sometimes reflect myself why is it that what we do with these students in class measures much lower than what friendships develop. So that continually drives me. I would like to hear somebody say for example, what I learnt in chemistry I will never forget. But that never happens. What they say is that it's the friendships they make. And so you say to yourself well how important really is the teaching/learning process in the scheme of things?

4.11 Summary.

This chapter has given voice to the participant teachers within the framework of the broad themes identified earlier in Chapter Three. Through their narrative, a common operational focus in their conceptualisation of reflective practice exists. Their definitional conceptualisation focuses on their individual improvement of practice while their metaphoric expressions of reflective practice focuses on practical improvements for their students. Through their voices, there existed a strong congruence with lecturers' conceptualisations of reflective practice.

The current reflective practice by the participants in this study was generally unstructured within a context of an individual's community of collegiality. Few frameworks were reported that deliberatively fostered professional reflective practice. This reflected the status of reflective practice for the lecturer participants at Avondale College who also articulated a strong commitment to reflective practice while their practice was exhibited idiosyncratically rather than systematically, and informally rather than in more formal, written modalities.

Relationship with lecturers and spirituality were key elements in the Avondale learning context of importance to the teacher participants. Of particular importance, in the development and expression of reflective practice, were the interactions pre-service teachers had with lecturing staff, often on an informal basis. Staff from the Science and Mathematics Faculty particularly impacted pre-service science teachers in the development of their critical thinking skills, with education subjects, skills and content not being a priority for many science pre-service teachers. The support, passion, dedication and accessibility of some lecturing staff impacted students deeply. Many students noted the impact of contagious learning by inspiring lecturers.

Teacher participants found difficulty recalling specific pre-service reflective practice activities outside of the teaching practicum. Written assessment tasks were perceived as being artefacts of the course with oral practicum debriefings, especially those involving peers, being identified as the most meaningful activity in developing and fostering reflective practice.

Specific mentor relationships were identified as having significant impact on the development of pre-service teachers as reflective practitioners, with the relationships typified by deep respect by the students and genuine caring by the lecturers.

Chapter Five contains a discussion of the data reported in this chapter. The discussion provides a synthesis of the data as they relate to the research questions.

CHAPTER 5

DISCUSSION

Reflection is 'an orientation to the activities of life rather than a mental process itself'.

Moon (1999, p. 100)

5.1 Introduction.

This chapter discusses further the issues and themes arising from the voices of participants articulated in Chapter Four. Through these voices, this study seeks to hear the 'narrative intelligence' (Ghaye et al., 2009, p. 385) of the participants. This discussion centres about the two research questions that this study examines.

- How professional reflective practices are developed during the pre-service experiences of science teachers? and

- How in-service teachers' subsequent development of reflective professional practice is affected by:

    o Interactions with pre-service lecturers?

    o The perception of pre-service lecturer's practice of reflective critical thinking by science teaching graduates?

5.2 How Professional Reflective Practices are Developed During the Pre-service Experiences of Science Teachers

It is evident from the narratives of the teacher participants that there is a process of gradual development in professional reflective practice during their undergraduate training. Their narratives also explicitly note that the form and nature of this development is not clearly demarcated by discrete stages or pathways.

Many teacher participants found it difficult to recollect with any clarity much of their reflective experiences or statuses during their pre-service training. Those teacher participants who could recollect with some clarity concurred that most undergraduates largely reflected at the technical and factual levels. There was also a consensus amongst participants that there was not a clear, linear or staged

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progression in depth or breadth in the development of their reflective practice. These recollections support Brockbank and McGill's (1998) critique of Schön's 'hierarchical approach to having sequenced stages' (Hughes, 2009, p. 454).

Teacher participants did relate that in their recollections they perceived significant differences in the frequency, scope and level of reflection after their first eighteen months of pre-service training. This change appears to be associated with the second year practicum experience at the end of their third semester of study. Teacher participants also commented on significant differences between their reflective practices as a pre-service teacher and those they currently engage in as practising, experienced, teachers.

Dreyfus and Dreyfus (1988) describe learning as having five phases: novice, advanced beginner, competent performer, proficient performer, and expert. Writers such as Johns (2004) describe reflection as having layers, these layers having some congruence with developmental phases. Johns describes 'reflection-on-experience as the first level people encounter as novices in learning to do "reflection as a way of being"' (p. 2). Emslie (2009) acknowledges that 'people may occupy more than one level at the same time, as well as traverse through levels either way, in learning and doing critical reflection in complex and diverse contexts' (p. 419). Larrivee (2000) also observes that 'the route to becoming a reflective practitioner is plagued by incremental fluctuations of irregular progress, often marked by two steps forward and one step backwards' (p. 304).

The Centrality of the Practicum Experience in the Development of Reflective Practice

For the Avondale graduates the education component of their professional training is often described as being of secondary interest, with the Science related subjects being perceived by the teacher participants as being intellectually more challenging and more closely aligned to the their personal interests. Reflective practice as a professional education activity, then, does not usually register of being of any major import, except of being of relevance to some assessment tasks.

In the context of the education subjects, the teacher participants detailed the teaching practicum experiences as being of special significance in their development as a professional teacher. The Education Faculty places great importance in the early

immersion of trainee teachers in a field setting, and invests a significant time component of the course in actual field experiences. An Avondale College graduate typically spends more time on practicum experiences throughout their course than graduates from comparable training institutions. Additionally, Avondale lecturing staff are proactive in visiting, supporting, and debriefing their pre-service teachers while they are on practicum placement. The sustained involvement, *con brio*, of Education Faculty lecturing staff during their undergraduate practicum placements was identified as a key element in the development of reflective practice in the recollections of the participating teachers.

Reconstruction involved the affective as well as the cognitive domains of participants. As practicum placements involved considerable investment by the pre-service teachers emotionally, as well as in terms of the formulation and recasting of their conceptualisation of the art and science of teaching, their concomitant development of emergent professional reflective practice often was associated with the expression of emotional states. This expression concurs with Clegg (2000) who notes that

> *'reflective practice as a methodology is particularly likely to produce references to emotional states' and that 'descriptions of emotional state are invoked in the context of the relation to the supervisee, other colleagues and, more broadly, about the institutional context, moreover both positive and negative emotions are described as powerful enablers and inhibitors of action' (p. 460).*

Some participants, teachers and lecturers, linked the practicum experience as being critical in the pre-service teacher's conceptualisation of himself or herself as a teacher. The re-orientation, often associated with the first two practicum placements, were also associated with reflections not just on matters associated with professional life and growth, but about the essence of who they were, and were to become, as a person. Norsworthy (2008) also notes this by observing that

> *'individual experiences … are interpretations and constructions in the process of meaning making, a process holistically connected with who*

[participants] are.' Consequently in considering experience, one considers one's very personhood' (p. 88).

The impact of significant academics and others on this consideration and development of 'one's very personhood' is perceived as being important. Spilková (2001) comments on this by discussing the possible length of relationships involved, and the consequential impact on the development not just of 'one's professional 'self'' but on the genesis of professional reflective practice

'long-term cooperation between supervisors and mentors, permanent movement of the student between the faculty and the school and systematic theoretical reflection on practical experience creates a space for a communication between the world of theory and the world of practice; it helps students understand their activity, it causes and consequences, it supports a transition for intuitive to conscious and substantiated action; it has significant emotional charge; it stimulates the formation of one's professional 'self'; and it instigates work on oneself' (p. 63).

Emslie (2009) also notes that reflective practices arising from such experiences

'aim to generate new and deeper accounts of identity and experience, in particular putting students in touch with their intentions, purposes, hopes, aspirations and commitments, and the origin of these in their lives. And students can come to appreciate ways in which they can carry what they give value to into the future' (p. 421).

Norsworthy (2008) also noted that pre-service teachers often have an expectation of certainty, especially if they see knowledge as a commodity, being disconnected from the personhood (Norsworthy, 2008, p. 188). Some participants, such as Ella specifically noted the importance of the practicum experience in assisting her move beyond this perspective in her pre-service experience. Her reconstruction also linked the development of depth in her reflective practice during the practicum, a co-occurrence also observed by Malderez and Bodóczky (1999) who noted that desirability of the establishment of the 'reflective habit' during the period of the early practicum placement.

Kolb (1984) associates a 'higher level of learning' with reflection and conceptualisation associated with the end of active experimentation. One can draw a parallel with the association made by teacher participants in this study with developmental shifts in their reflective practice following their intense practical and vicarious experimentation with the practice of teaching during their practicum experiences.

The reported establishment of conscious reflective practices during or consequential to a major practicum experience may be related to the orientation pre-service teachers took during practicums, particularly those practicums during their second and subsequent years of training. Observation of supervising teachers, and the assessments made of their own teaching practices are associated with judgements made relating to the effectiveness of teaching practices. As observed by Diezmann and Watters (2006) a common approach for ascertaining the effectiveness of teaching is reflective practice. Assessment and other structured experiences associated with the practicum placement experience at Avondale College include structured reflective practice activities. These activities, along with the emphasis placed on reflection within the last decade in the pedagogy subjects within education pre-service courses, combined with the nature of the practicum experience provide a rich basis for the practicum experience to be a significant milestone in the development of reflective practice in the recollections of the participants.

Norsworthy (2008) observed that

> *'what is not apparent within the literature is an understanding of the characteristics and/or structures deemed to be paramount within initial teacher education programmes in order to make it possible for pre-service teachers to be reflective about both their own learning and teaching' (p. 9).*

In this study, it is evident from the narratives of the participating teachers that one of the most significant structures within the Avondale pre-service education experience that aided the development of reflective practices was the embedding of frequent, extended, field-based practicum sessions within the course. The accompaniment of on-site visitations and subsequent debriefs by Education Faculty staff was also

identified as a significant and supportive adjunct to the practicum session, as these visits often facilitated the commencement of connectivity of relationship between students and academic staff from the Education Faculty.

The Influence of Personal Traits and Prior Experiences of Reflective Practice

A number of participant teachers self-nominated the influences of some personal trait characteristics, and their previous experiences of reflective practice or critical analysis, as being of importance in the genesis and subsequent development of reflective practice in their professional lives. A number of these individuals cited that they could recall always being of a questioning, reflective nature and that their pre-service training subsequently only honed and fostered this into a particular form associated with the educational context.

It was suggested by some of these participants that Science students by their very nature were questioning, inquisitive individuals who had exhibited some elements of critical analysis early in their formative years of schooling. Questions related to the connections between personal traits and the practice of reflection were beyond the scope of this study, as were questions relating to a nature or nurture basis for the development of reflective practice. However, it is noteworthy that for some participants there was a self-identification of proto-genesis of reflective practices before they embarked on their pre-service teacher training, and this is worthy of further investigation in the future.

Changes in the Focus of Reflective Practice during Pre-Service Training

Participant teachers and lecturers both noted that significant changes in the focus of reflective practice occurred during the course of the initial professional teaching degree. Parsons and Stephenson (2005) report the importance of metacognition as an element of reflection. The growth in metacognition, especially during the last two years of the four-year teacher training degree program parallels the changes in focus.

Norsworthy (2008) observes that the various approaches to reflective practice

> *'assume that student teachers commence their teacher education as active learners, or indeed as already possessing the skills, knowledge and disposition necessary for effective critical thinking … in very few cases does there appear to be any recognition that these goals, skills or*

Dewey's pre-requisite dispositions need to be explicitly developed' (p. 56).

Some teacher participants, in reflecting on their orientation and skill set during the first portion of their professional training at Avondale College, observed that while they believed at the time that they had the necessary armoury of attributes necessary for reflective thinking, upon reflection they could see that the lecturers were developing, scaffolding and equipping them with these. While Hatton and Smith (1995) observed that 'the common conclusion is that there is little evidence of critical reflection on the part of students' (p. 8), this only resonates with the early semesters of study for the majority of teacher participants in this study. The major factors involved in the evident differentiation appear to relate to the specific emphasis given to reflective activities integrated and embedded in the education courses, and the strong emphasis given within the Science faculty to the development of modalities of critical thinking in order to support the enculturation of the scientific methodology and worldview that is strongly embedded in the faculty.

Roskos, Vukelich, and Risko (2001) differentiated between the depth of reflective practice amongst pre-service teachers in their description of how pre-service teachers 'eagerly describe, report and query … but they do not interpret, evaluate, critique teaching activity in ways that deepen their understandings of the contextual and socio-political dimensions of teaching practice' (p. 598). Norsworthy (2008) found that 59% of pre-service teachers in her New Zealand study 'viewed the approach to learning which they bring to their initial teacher education as a hindrance to their ability to learn in a manner which is reflective' (p. 118). Derived substantially from their high school experiences, pre-service teachers in her study identified a number of approaches to learning that were barriers to the development of reflection: a dependence on receiving content; no expectation or requirement to think for themselves; a belief and expectation that they will receive from the teacher educator, and give the teacher educator one 'right' way or answer; and a student's sense of inadequacy, apprehension and boredom (Norsworthy, 2008, p. 124).

One participant teacher in this study, Ella, especially dwelt on her journey in making the transition from her pre-Avondale experiences and worldview to that of a more reflective trainee teacher. Her descriptions, reported earlier in Chapter Four, find

congruence with those reported by Roskos, Vukelich, and Risko, as well as those reported by Norsworthy. What differentiates Ella's experience is her development of deep reflective practices subsequent to her first two practicum experiences. Her development is akin to the description of a 'kathartic movement' by White (2002):

... an experience is kathartic if one is moved by it – moved not just in terms of having an emotional experience, but in terms of being transported to another place from which one might, amongst other developments:

- *have a new perspective on one's life and history and identity,*

- *re-engage with neglected aspects of one's own history,*

- *make new meanings of experiences not previously understood,*

- *initiate steps in one's life otherwise never considered,*

- *think beyond what one routinely thinks, and so on. (p. 15)*

White's (2002) study focuses on the use of prior knowledge to 'generate knowledge for future practice' (Emslie, 2009, p. 421). White sees this resonance or reverberation with the past as being transformative to one's professional identity and practice – this transformation being seen as a 'kathartic movement'. For Ella, this was the how she described her change in perspective following her initial practicums. Other participants, in less stark, or 'non-Damascus road-like' terms, described a similar growth and re-orientation following their initial practicum experiences. For most participants, this transformation was a process of gradual dawning and re-orientation, and recognisable only in retrospect.

The coincidence of this transformation for many participants in this study with the latter half of the period of their pre-service training may also be reflective of a number of other factors. As many of the participants commenced their pre-service training immediately after the completion of their secondary schooling, the processes of physical, social and emotional maturation continued during their pre-service training. Developments of maturity in these areas, often accelerated by the experiences of semi-independence from home, facilitate a readiness for deeper emotio-cognitive activities such as critical thinking and reflection. Brockbank and

MacGill (1998) suggest that 'there is an emotional level needed to reflect on one's actions' (Hughes, 2009, p. 454) and that one's emotional level may be a blockage to deeper reflection.

Also associated with the latter half of the pre-service training at Avondale College is the introduction to more abstract, conceptual frameworks as students engage with the third and fourth year subjects in both their subject specialisations and in their education subjects. For those specialising in the sciences, subjects at this level demand considerable exercise of critical analysis, reinforcing the multitude of reflective practice activities and exercises being concurrently experienced within many of the education subjects being studied. The concomitant impacts of these strands appear to have impacted significantly and positively on most teacher participants' development and expression of reflective practice. No participant attributed causality to any of these strands, however their presence and interactions were noted.

Norsworthy (2008) reports that LaBoskey (1993) discriminates pre-service teachers on the basis not of their reflective or non-reflective practice – but on the consistent nature of that practice. In Norsworthy's study her Alert Novices share Dewey's attitudes of open-mindedness (Dewey, 1933 p.30), whole-heartedness and responsibility. This study also found that these attitudes were recalled by some of the teacher participants, particularly subsequent to the completion of the second year practicum.

Hamlin (2004) observed that

> *'once engaged in practice teaching, student teachers' concerns become more focused on whether or not students like them and whether or not they are doing the task correctly ... they rarely progress beyond issues of self, task and students' (p. 169)*

Napper-Owen and McCallister's (2005) study of pre-service physical education students also found that 'teacher candidates focus initially on their own actions and secondly on the actions of their students' (Uhrich, 2009, p. 502). This study confirmed that the primary orientation of pre-service teachers, as self-reported in their reconstructions, was one of self-focus. Interestingly, this orientation became

weaker, especially in the last year of their training, and for many of the participants had become significantly re-oriented with a strong student focus after a time of in-service experience.

Forms of Reflective Practices

It is evident from the descriptions provided by lecturers, especially those from the Education Faculty, and from the descriptions given by participant teachers, that there was a range of reflective practice activities and structures in place during their teacher training at Avondale College. It was also evident in the teacher reconstructions of their pre-service training that there was little definitive remembrance of any particular form of reflective practice that was seen to be of any lasting significance, except peer and lecturer induced reflections on the practicum experiences.

For all participants in this study, Uhrich's (2009) comment that 'there is ambiguity with regard to the way reflective behaviours are defined and reinforced' (p. 503) is indicative of the overall approach to the development of reflective practice within its pre-service teachers at Avondale College. The lecturers interviewed generally reported a lack of a systematic, unified approach towards the teaching of reflective practice. This finding accords with Norsworthy's (2008) finding that

> *'pre-service teachers tend to experience teacher education as a compilation of unconnected modules of study ... result[ing in] ... a lack of coherency and opportunity for integration of knowledge ... and so, it is left to the neophyte, the pre-service teacher, to draw through understandings and insights to the reflective moment' (p. 6).*

The self-reported recollections of the reflective activities of the teacher participants also concur with the findings of Holly and McLoughlin (1989) that the practice of reflection through writing, such as by journaling, is sustained by few teachers following the first year after graduation, with only one of the participants maintaining in some form any systematic, written form of reflective practice.

Fazio (2009), using the Rearick and Feldman (1999) framework, identifies three forms of reflection: autobiographical – introspection or self-reflection – detailing, decoding and interpreting objects and events; collaborative – greater clarity to issues

than can individually be perceived – elevate considerations above the subjective particulars of the immediate contexts – promoting problem-solving and further actions; communal reflection – reflecting on contexts beyond the individual's space – social representations are located beyond the immediate group. All these are research oriented. It is evident from the recollected narratives of the participating teachers in this study that their experiences outside of the practicum placements in the Education Faculty seldom led them beyond the initial autobiographical form of reflection.

What was evident from the voices of the teacher participants was that reflective practices experienced within the teacher education component of the course were limited in their effectiveness as a pre-service initiation to the embedding of reflective practice. For the majority of activities, assessments and interactions associated with the instillation of reflective practices in pre-service teachers the teacher participants in this study reported that few extended them into the voluntary or reflective quadrants of Smith and Tillema's (2003) model or Roberts (2009) model as outlined in Figures 2 and 3.
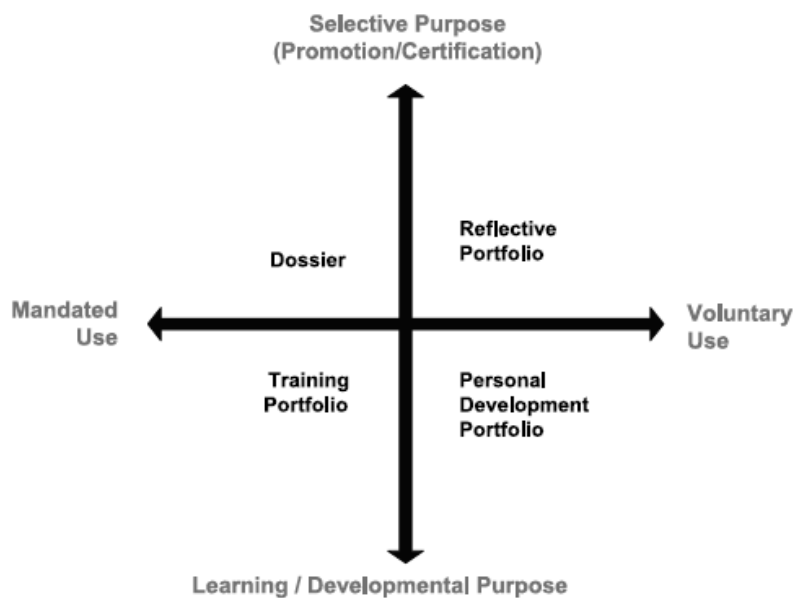
FIGURE 2. SMITH AND TILMAN'S MODEL OF PORTFOLIO USE (SMITH & TILLEMA, 2003. CITED IN ROBERTS, 2009, p. 639)

Process Focus

Reflective

Structured Evaluation
Students may respond to questions in a pre-defined structure, but not necessarily reflect

Critical/Reflective portfolio
Students demonstrate a high degree of reflection in their work

Recorder ← → Reflector

Dossier
Students collect large quantities of evidence

Annotated Dossier
Students will collect evidence, but will provide some degree of commentary

Descriptive

Product Focus

FIGURE 3. ROBERTS (2009, p. 640) MODEL CONNECTING FOCUS OF REFLECTION, PROPENSITY TO REFLECT, AND LIKELY STUDENT OUTCOME.

This recollection and consequential approach towards the more formal forms of reflective practice in their professional life may be reflective of the lower status given to meaningful mentor-mentee relationships for the participants in the Education Faculty, compared to the higher proportion of high quality relationships reported with members of the Science and Mathematics Faculty.

Wong (2009) recognised that journaling is just a tool for reflection and noted that 'the deeper journaling came from students that had a relationship with the professor' (p. 183). The importance of personal connection in the development of reflective practices at Avondale College is discussed further in the next section of this chapter.

Personal Connection as Seminal in Fostering the Development of Reflective Practice
The identified importance of the presence and support of a familiar Education lecturer during the critical developmental juncture of the practicum supports Parsons and Stephenson (2005) notation of the importance of collaboration with a critical partner, student or staff, for the enabling of 'deeper thinking about practice in an atmosphere of supportive and constructive but honest feedback' (p. 95). Norsworthy (2008) also emphasises 'the importance of relational connectedness as a key to the development of reflective practitioners' (p. 200). For the pre-service science teachers at Avondale College, the practicum experience was often the first major incidence of

personal connection of any significance they could recall occurring with their Education Faculty lecturers.

Ghaye et al., (2009) notes that connections of high quality have a high emotional carrying capacity, tensility, and demonstrate openness to new ideas and influences. Practicum experiences are professional environments that are predisposed to these three characteristics. The active and vicarious involvement of Education Faculty staff in the practicum visitation and debriefs fosters connectivity between the pre-service teacher and the academic staff member. The evident high level of pastoral care in the emerging professional context assists the development of a higher quality connectedness than there would otherwise be. Similar to the sports world where 'high quality connections (HQC's) are at the heart of improving performance' (Ghaye et al., 2009, p. 385), some academic mentor-mentee relationships at Avondale College between lecturers and pre-service teachers were reported by participants as exhibiting high levels of connectedness.

Of particular importance in fostering the development of reflective practice was the relationship all participants noted with some significant individual lecturers, particularly a number of specific lecturers from the Science and Mathematics Faculty, and a small number of lecturers from the Education Faculty. Interestingly, all but one of the Education Faculty members identified as being of significance in the development of reflective practice by the participating teachers were from a Science or Mathematics teaching or academic background. The one faculty member not from a Science and Mathematics background came from a primary school background. Consequently, the participants identified no Education Faculty lecturer from a secondary teaching background, except those from a Science and Mathematics teaching background, as being of significance to them.

It is evident that some factor of co-identification was involved as a basis of the identification of these individual academics. All those academics identified by the participating teachers engaged their pre-service teachers cognitively, emotionally and spiritually. It is evident that the participating teachers held them in high regard as individual persons, as well as academics. There was also evidence of a strong congruence of worldview and of one's personal hierarchy of knowledge between

participating teachers and the lecturer(s) they identified as being of significance to them.

The deep respect for them was reinforced by a sense of involvement and engagement in a participative community that engaged in meaningful dialogue. The descriptions of this engagement and dialogue are in many ways analogous to the importance of community in the development of reflective practice that is described by Wong (2009) who was involved in pre-service professional training for ministers

> *'we realized that our emphasis of identity construction as it relates to reflection rested with the individual sense and we lacked this community sense of identity among ourselves as professors and in the classrooms where we teach. We came to know that learning to reflect involved dialogue in community. In community, professors and students locate learning in the process of collaboration, not just in the heads of individuals … learning takes place in the context of participation, not just in the thought processes of an individual mind' (p. 184).*

Meyer (1999) examined conversations with pre-service teachers and supports this notion that when part of a community of learners the pre-service professional is predisposed to 'embrace ambiguities, and … [take a] … reflective stance towards teaching' (Pedro, 2001, p. 42). The participating teachers in this study identified such an approach as a feature of the teaching of, and interactions with, the nominated significant lecturers.

The reported differentiation between the connectedness of pre-service teachers with lecturing staff in the two faculties may be explained partly by the subject orientation and content priorities of the participating teachers at the time of their training, but is deep enough, and commented on enough by the participant teachers to be of significance. In a broader context, Houston and Warner (2000) comment on this as an apparent systemic issue for teacher education:

> *'providing structures and venues for prospective and in-service teachers to reflect on their professional judgements and actions permeates teacher education as a concept but not as a general practice. Education espouses this stance, but it remains an elusive target … the*

rhetoric of inquiry and reflection reflects a deep commitment to these twin concepts, but the actual practice by teachers and teacher educators continues outmoded methods' (pp. 129-130).

Emslie (2009) contrasts this in his description of a teaching environment that emphasises personal connectedness, in this specific case one for pre-service social work professionals in Melbourne, Australia:

'quality teaching and learning occurs in interactive and engaging teaching spaces that enable students to understand, interpret and create meaning through their active participation in the learning process' (p. 420)

From the voices of the participating teachers, the degree of personal connectedness with academic staff appears to be the central significant differentiating factor between the impacts of the respective faculty on the development of reflective practice in their undergraduate years. Paradoxically, the participating lecturers inversely relate the level of reported connectedness to the reported intentionality in teaching reflective practice. While the Science and Mathematics Faculty's participating lecturers deliberatively and intentionally seek to develop critical thinking skills and practices, only one lecturer in the faculty reported that they intentionally sought to assist and facilitate the development of professional reflective practices in pre-service teacher, while all participating Education Faculty academics reported that they had for the last decade sought to proactively develop and foster reflective practices in all pre-service teachers.

Even taking into account Kreber's (2004) findings, who in a study of academics found that objective indicators or evidences of reflection were much lower than declarations of reflective practice during the research interviews, and that the questioning of presuppositions, or critical thinking' was not common in undergraduate classes, it is evident that the identified lecturers, predominately in the Science and Mathematics Faculty, have significantly impacted the development of reflective practice through their personal connectedness with their students and through the effective modelling of reflective teaching practices.

The differentiation between the reported impacts of the significant academics on the development of reflective practice raises the question of the relationship between the exhibited reflective practice of the academic staff member(s) of personal significance and high quality connectedness for a pre-service teacher, and the level of subsequent demonstrated reflective practice of that particular teacher.

5.3 How In-service Teachers' Subsequent Development of Reflective Practice is Affected by Their Interactions with Pre-service Lecturers

Through the narrative of participating teachers, this study supports Norsworthy's (2008) findings from her study of pre-service teachers in New Zealand that modelling pedagogy, using authentic teaching approaches, living the questions, and assessment (requiring personal connection and including multiple phases) assists the development of reflective practice.

The direct relevance of questions relating to their interactions with pre-service lecturers was manifest through the animation of teacher participants during this portion of their interviews. The role of positive mentor-mentee relationships in 'assist[ing] students with getting into the swing of doing reflection on action and developing good preliminary habits' (Emslie, 2009, p. 420) during their pre-service training has been partly discussed on the both Chapters Two and Four. It is evident from the voices of the participants that there exists at Avondale College a culture, especially in the Science and Mathematics Faculty, of close and generally positive relationships between academic staff and pre-service teachers.

One could attribute to these relationships an innate contagion of modelling practice; a relatively unintentional and automatic mimicking and convergence of the practices of another. In this sense the pre-service lecturers, with whom the pre-service teacher develops a mentor-mentee relationship, experiences what Descartes described as the 'impossibil[ity] for the soul to feel a passion without that passion being truly as one feels it' (Descartes, 1984, p. 26). Orland-Barak (2010) alludes to this in the context of the sociocultural roots of the theories of professional learning by noting that in

> *'Attending to the value of dialogue and collaboration, reflective and collaborative approaches to mentoring stress the reciprocal relationship between mentor and the mentee/s who engage in*

communal, democratic dialogue, attending to the cultural and educational codes and interests of all the parties involved' (p.19).

Orland-Barak (2010) uses the concept of 'learning-in-praxis' to highlight the inherent complexities when actions and ideologies interact in a specific context, such as in an institution such as Avondale College. Undergirding her concept and drawing on the work of Edwards, Gilroy, and Hartley (2002) is the belief that

'Participants' co-construction of professional knowledge is initiated and sustained through on-going, progressive discourse among colleagues who interpret and (re)value work-related situations' (p. 19)

This builds on an earlier work that places the role of the mentor

'not that of an external agent providing solutions to educational problems, but that of a participant and facilitator whose task is to assist teachers to arrive at sound practical judgements.' (Orland-Barak & Rachamin, 2009, p. 603).

Emslie (2009) also argues that lecturers are 'responsible for encouraging learning environments that enable the disclosure of personal failure, ambivalence and success' (p. 420). In doing so, the onus is for lecturers to 'ensure confidentiality, promote mutual respect, and foster sharing, questions and differences of opinion' (p. 420) while also model[ing] preferred behaviour through personal sharing and self-disclosure and by actively participating in activities' (Emslie, 2009, p. 420).

Orland-Barak (2010) makes the important observation regarding the role of the praxis in mentoring with the notation that reflective and collaborative approaches move beyond the contents and skills in practice of a course curriculum towards 'the acquisition of professional competence and performance within domains of praxis' (p. 26). Orland-Barak's concept of 'appreciation as a discursive activity' (2010, p. 31) reinforces the discursive and complex nature of mentoring as described by participants in this study, embedding as it does 'a process of typifying' (p. 33) involving the construction of conscious guidelines and rehearsals for future actions (Schutz, 1970).

By contrast Ghaye et al., (2009) noted that that more explicit a mentor is the easier it is for mentees to understand what they need to do, giving occasion for the mentor to model professional skills and content.

A range of participants in this study noted the significance of the mentor-mentee relationship in building repertoires of professional practice. It is noteworthy that the majority of teacher-participants in this study specifically noted the impact of particular lecturers on the development of their reflective practice, although the majority did not at the time of their professional training specifically link their interactions with these lecturers with the development of their reflective practice.

From the voices of the participating teachers, it is primarily in the context of experience in the professional field, firstly as practice teachers, then as novice and experienced teachers that reflective practice is a conscious element of the individual's professional life. As already noted, the conscious awareness of reflective practices by the participating teachers appears to have substantially been contextualised after they have been professional practitioners. It appears from their narratives that both the depth and range of experiences and the quality of positive relationship with specific lecturing staff have a correlation with their own reflective practice.

Significantly, those lecturing staff who were predominantly named as significant mentors also were those who were nominated as those that most openly displayed reflective practices and behaviours to their students. It was these lecturers who also tended to maintain an active, open dialogue with their past students once they entered professional practice. The reporting of this through the participants' voices reinforces Wenger's (1998) model of professional learning.

> *'Building on the apprenticeship model of situated learning, he describes social learning as mutual engagement with others and participation in communities of practice which have a common enterprise or purpose and which negotiate their own meanings and repertoires' (Hughes, 2009, p. 453).*

The impact of social learning, 'engagement with others in communities of practice' ran deep in the reconstructed narratives. While subsequent interactions with lecturers

were not systematic or regular in nature all teacher participants in this study acknowledged the foundational patterns and elements of solid reflective professional practices to some extent.

These high quality connections with lecturing staff also support the key elements of mentor-mentee relationships as identified by Ghaye et al., (2009):

- High emotional carrying capacity: capacity to withstand more emotional expression and range of expressions
- Tensility: the ability of the connection to bend and maintain good functioning. Associated with resilience
- Degree of connectivity: the generativity of the relationship and the openness to new ideas and influences, ability to make creative space. (p. 395)

The complexity of the discursive and mentoring processes along with the idiosyncratic nature of an individual's professional journey makes it difficult to un-entangle those precise elements in the interactions that were critical in the in-service teachers subsequent development of reflective practice. However, it is evident from the consistent emphasis on the mentor relationships, and the animation when recounting these relationships, that the modelling impact of these positive relationships accounted substantially for the subsequent development of reflective practices in these science teachers.

5.4 How In-Service Teachers' Subsequent Development of Reflective Practice is Affected by the Perception of Pre-Service Lecturing Staff's Practice of Reflective Critical Thinking by Science Teaching Graduates

In the literature a tension, sometimes seen as widening, exists 'between theoretical and practical discourses' (Wong, 2009, p. 173), between theory and practice, and it is here that pre-service teachers 'are often asked to make sense of practice' (p. 173). The literature of the last two decades generally assumes that 'reflective practice will create effective theory-practice links' (Brady et al., 1998, p. 2).

> *'Teacher educator's stories invite pre-service teachers into an exploration of how the 'theory' looks in practice ... [a] sense of*

authenticity also receives significant attention in terms of teacher educations as reflective practitioners (Norsworthy, 2008, p. 173).

This study through examining those elements self-identified by teachers' voices as being seminal in the development of their reflective practices during their pre-service training has highlighted that in this process the role of pastoral care and a 'caring and nurturing role' (Carter, 1997, p. 168) undertaken by significant others is vital. Carter noted that a private Australian Catholic university teacher training course assisted 'neophyte teachers move towards an ideal of reflective practice inter alia through building self-efficacy allied with an emerging critical self-awareness of self in the catholic tradition'. This movement was greatly assisted in Carter's study through the role of associate teachers in the practicum setting. This study examines the role of pre-service lecturing staff in the development of reflective practices.

One could paraphrase and adapt Marra (1991, p. 53. Cited by Ghaye et al., 2009, p. 387) in the context of education, instead of sport, by stating that

'mentored with due care and played with integrity, teaching can be one of the best preparations for the successes and failures, joys and frustrations, solitary tasks and group efforts that we encounter in our everyday lives'.

Caillouett's (1998) study of the voice of three pre-service teachers and two first year teachers derived four assertions from the voice of these individuals:

- reflection needs pre-service initiation in order for it to be integrated into the classroom;
- respected supervisors' approved practices define effectiveness;
- reflective practice is difficult to internalise and requires continuous, purposeful practice; and
- the school placement and culture impacts the development of reflective practice.

The voices in this study reiterated and confirmed the first two assertions of Caillouett's study. From the reconstructed experiences of the teacher participants in this study, the reciprocal professional learning that occurred in the mentor-mentee

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situation provided an alignment that brought about the establishment of a culture that was significantly shaped by the practices and values of the lecturing staff involved.

It is evident from the lecturers' voices that while no deliberate, unified pedagogical perspective relating to reflective practice was in place, especially within the Science and Mathematics Faculty, there was a strong pastoral and educational focus on the individual student and their personal, academic and professional development.

> *'Valuing the learner's emotional as well as intellectual engagement, constructivism is not just a theory about how to teach, but it reminds us that the learner – in all her complexity – 'must be at the center as we think about our subject matter, our curriculum, and our pedagogy' (Kroll, et al., 2005, p. 58)' (Cook-Sather, 2008b, p. 232).*

Lecturing staff, especially those identified by the teacher participants as being influential in their modelling of reflective practice, all display a clearly thought out and well articulated system of personal and professional values. This clarity of values affirms the proposition that clarity of values and a firm philosophical stance may be required for the effective transmission of reflective practices:

> *'We may have to be more aware both of our values and how we value … our philosophy'(Ghaye et al., 2009, p. 388).*

Fundamental beliefs arising from one's worldview regarding development, learning and the nature of humans are core to one's self-reflection.

> *'Developing the practice of self-reflection involves observing patterns of behaviours and examining behaviour in light of what we truly believe' (Larrivee, 2000, p. 303).*

Larrivee (2000) formulates four levels in the process of examining a core belief:

- the philosophical, where core beliefs, values, life meanings and ethics are held;
- the framework of underlying principles, enabling experiences and beliefs to be organized and interpreted;

- the interpretative, linking beliefs with the daily practice and patterns that arrange life, roles and human interactions; and

- decision making, that links beliefs with moment-to-moment decisions, interventions and specific behaviours.

Commenting on these the relationship of examining core beliefs and values to one's actions as a reflective practitioner Ghaye et al., (2009) link values to relationships and performance.

> *'The challenge to reflect on the links between knowing and doing ... the alignment between values, such as acting with integrity and care, and our actions. Values determine our attitudes towards people and activities. Actions are the ways we interpret these values in particular performance settings' (p. 388)*

While Ghaye et al., (2009) are specifically referring to the context of high sports performance and winning with integrity and care, it is no coincidence that the lecturers who are highly regarded by the teacher participants in this study are seen to share these same characteristics: integrity, care and high academic performance. Ghaye et al., (2009) link these concepts to the notion of reflected best-self:

> *'The reflected best-self portrait ... comprise[s] the interpretations we make of experiences and interactions with others' (p. 391).*

Drawing from the work of Glickman (2002) the notion of best-self encapsulates the displayed characteristics of the influential mentors in this study. Their seeking one's 'best-self' through improving outstanding performance while 'acting with integrity and care' (Ghaye, et al., 2009, p. 385) is not only openly admired by the teacher participants in this study, but is also consciously emulated by them. It is somewhat ironic that in the arena of reflective practice, where

> *the focus on reflection as a hopeful intervention into the technical-rational teacher paradigm appears to have been at its peak [in the 1990's] ... overcoming the technical-rational approach to teacher education' (Norsworthy, 2008 p. 13)*

it is those lecturers in this study from the pure sciences who have excelled in the eyes of their students.

It is also apparent from the voices of the teacher participants that the enablers required for performance enhancement are abundantly present in their pre-service interactions with these lecturers. Ghaye, et al., (2009) list four mutually supportive 'enablers' involved in performance enhancement that each have the ability to build and sustain:

- *'a positive atmosphere ... based upon feelings such as optimism and enjoyment.*

- *positive relationships built upon trust, courage, empowerment and high quality connections and networks.*

- *positive communication fuelled by best-self and appreciative feedback.*

- *positive meaning so that everyone involved knows and understands the direction of travel'(p. 390).*

The strong *esprit-de-corps* evident within the student and lecturer cohorts under study reinforces the effectiveness of these enablers. Of note is the operation of the effective modelling of reflective practice by the nominated lecturers, when institutionally the place of reflective practice within the professional education training courses was embryonic and largely non-integrated for the pre-service training of the majority of teacher participants in this study.

Collective efficacy (Goddard, Hoy, & Woolfolk Hoy, 2000, 2004), arising from social cognitive theory (Bandura, 1997, 2000), describes teachers' collective perceptions on the effectiveness of their practice. Empowerment experienced by the lecturers as they foster the success of their students can make a significant impact on student achievement (Bandura, 1993). The positive response from the science teachers when recollecting their pre-service lecturers' reflective practices can be partly explained by the positive emotions associated by those exposed to the enablers. As expressed by Ghaye, et al., (2009)

'It is a paradox of human psychology that while we remember criticism we respond well to praise' (p. 389)

While active mentoring has long been a core element of the culture of Avondale College and Adventist Education for the transmission of ethical values and lifestyle standards, it has not been explicitly valued as a pedagogical tool for the transmission of educational traits and skills, such as those associated with professional reflective practice. It is noteworthy that the teacher participants so closely identify their predisposition and development of reflective practice to the reflective practices they saw displayed, especially by the pure scientists, during their training.

Berry (2004) comments:

'pre-service teachers' prior experiences as learners serve as powerful templates for the ways in which they practice as teachers. Their beliefs about teaching are informed by the accumulation of experience over time and, once formed, these beliefs are extremely resistant to change, even when they are shown to be inconsistent with reality' (p. 1302).

It is evident from the reconstructed recollections of the science teachers that significant transformation occurred in their critical thinking and reflective practices as a result of their initial tertiary training. The power of transformation and evolution of beliefs about teaching due to their training, especially in practicums, and in relationship with significant academic mentor relationships, allied with the transformative realities experienced during their early full-time teaching year were all identified by the teacher participants as occurring.

Hughes (2009), working from Schön, identified four stages of reflection:

'1. action;

2. recording observations;

3. reflection-on-action (first reflections – thinking about .. and the reasons); and

4. second reflection – interrogating self to understand and analyse the
practice and produce new knowledge of the situation' (p. 456).

It is evident in this study that for the lecturers identified by the teacher participants as being of significance, there are demonstrations of reflection at levels 3 and 4. Teachers in the study identified themselves with the first three levels of reflection, with many, especially those with some significant classroom experience, identifying with the fourth level. It is not evident from this study what catalysts or experiences precipitated the extension of the individual teacher to the fourth level.

The role of the participating teachers' perception of pre-service lecturer's practice of reflective critical thinking in this transition between stages is uncertain. What is certain is that the majority of participating students clearly perceived positively a demonstrated practice of reflective practice by those lecturers they identified as being significant in their development as a person and a professional at Avondale College. The converse is also true with those lecturers they held in a lower professional esteem. The core characteristics that differentiated these two groups of lecturers were associated with Glickman's (2002) and Ghaye et al.'s (2009) 'best self' in terms of academic performance, relationships, and integrity.

Davis (2003) notes that changes in higher education, as well as the scarcity of time mitigate against the development of reflective practices in higher education, especially for former colleges of higher education such as Avondale College that are facing challenges and pressures to diversify from their traditional focus on teaching and learning for undergraduate professionals towards a more research and scholarship oriented academic world.

5.5 Summary.

This chapter provided a synthesis of the data collected during this study. It did so by addressing the data through the research questions.

The subjects in this study displayed some difficulty recollecting with clarity their development of reflective practice in their pre-service training. Their recollections do however note that their development was not one of discrete stages, with a focus on the technical and factual elements of reflection, predominately descriptive in

nature recording actions, observations, and were autobiographical in nature. Reflective practice activities were often narrowly associated with the completion of assessment tasks. Participants generally noted the centrality of the second year practicum as a watershed in their understanding and development of reflective practice. This development was also congruent with their maturation in their understanding of their own identity as a person and their professional self. Consequently, reflective practice deeply impacted many participants' affective as well as cognitive domain.

The linkage between frequent, extended, field-based practicum sessions within the professional training course and the commencement of connectivity of relationship between students and academic staff with the development of deeper reflective practices by the pre-service teacher was noted through the voices in this study.

A number of teacher participants noted that they had pre-existing personal predispositions to reflection and that the critical thinking skills associated with the scientific worldview assisted the expression of these predispositions.

There was general ambiguity for the participants in this study regarding the institutional portrayal of reflective practice. This may result from reflective practice only recently receiving a strong emphasis in the professional education courses, or may be the result of the lack of a systematic, unified approach towards the teaching of reflective practice in the institution.

Only one participant maintained any form of systematic, formal reflective practice after graduating from the course. This disjuncture correlates with the notation by most teacher participants in this study that there was a marked differentiation between the nature and forms of reflection during teacher training and during full-time teaching. One conclusion of this study is that for the teacher participants the reflective practices experienced within the teacher education component of the course were limited in their effectiveness as a pre-service initiation to the embedding of reflective practice.

Personal connectedness with lecturing staff and peers through high quality relationships was of particular importance for the teacher participants in this study in the development of their reflective practice. Such relationships fostered a culture of

supportive collaboration and constructive critical thinking. It was evident in this study that the high levels of pastoral care exhibited by specific lecturing staff was of significant importance. For all participants in this study those lecturing staff with whom they formed such relationships, with all came from a Science or Mathematics background, except one staff member from a Primary teaching background. While some factor of co-identification associated with common subject interests and worldviews was evident the seminal basis for these positive mentor-mentee relationships included: integrity; care; and high academic performance. The characteristics of the learning culture associated with these lecturers conform with Ghaye et al., (2009) mutually supportive enablers of a positive atmosphere, relationships, communications, and positive meaning.

This study also supported Norsworthy's (2008) findings that modelling pedagogy, using authentic teaching approaches, living the questions, and assessment assists the development of reflective practice. This study also noted that a deep respect for lecturing staff is reinforced by a sense of involvement and engagement in a participative community that engaged in meaningful dialogue.

It was observed in this study that pre-service teachers' positive perception of a lecturer's own practices of reflection correlates with the positive significance of that individual in that pre-service teachers' development as a professional, including the development of reflective practices. The authentic lecturer-student relationships voiced in this study were an innate contagion of modelling practice, embedding a complex process of typifying in a culture of strong values and deep, discursive activity. For the teacher participants, this provided a basis for the construction of conscious guidelines and rehearsals for future actions, building repertoires for future professional practice. The depth and range of experiences and the quality of positive relationship with specific lecturing staff voiced in this study displayed a correlation with subsequent reflective practice by the teacher participants

Chapter Six concludes this study with an overview of its major findings, limitations to the study, and an outline of possible further areas of study.

CHAPTER 6

CONCLUSION

'When I saw, I reflected upon it; I looked, and received instruction.'

<div align="right">Proverbs 24:32 NASB</div>

'Reflective practice has facilitated the investigation of the metaphorical layers of the onion of professional practice'.

<div align="right">(Norsworthy, 2008, p. 73)</div>

6.1 Introduction.

Ersözlü and Arslan (2009) observe that a fundamental objective of education is the training of self-awareness, awareness of others, communicative expression and reflection. This study focuses on three of these objectives, with a particular reference to the training of reflection.

In examining the relationship between in-service and pre-service professionals' reflective practice, this study examined some of the mechanisms for the transference of professionalism between academic lecturing staff and emerging professionals. Early literature (Schön, 1987, 1991) on reflection emphasised the imperative to teach reflective practice if 'professionals [were to] include critical reflection in their repertoire of skills and knowledge after graduation' (Emslie, 2009, p. 417).

This qualitative study invited 17 practising science teachers to give voice to their insights and recollections regarding the development of reflective practice within their initial teacher education experience at Avondale College. These teachers were selected from the graduates of the science education course over the last 15 years who are employed by schools operated by Adventist Schools Australia.

Eleven lecturing staff from the Education Faculty and the Science and Mathematics Faculty were also invited to give voice to their insights into the development of reflective practice within the initial science teaching course at Avondale College. Authenticity of the voice of participants in the study was valued.

While a stated aim of this research at the commencement of its study was to develop theoretical constructs from individual conceptualisations the journey of the research

has been one of discovery for the researcher. The individual re-conceptualisations of the participants, along with the reflections and discoveries of the researcher while interrogating the participants' voices has gathered together a range of implications and conclusions, more harmonious with the methodology employed in this study, than a construct derived from the data gathered.

This chapter provides a summary report of the major findings of the study, a brief discussion of the major implications of the study, an outline of the limitations of the study, a listing of possible areas of future research, and some concluding remarks.

6.2 Major Findings of the Study for Each Research Question

6.2.1 How Professional Reflective Practices are Developed During the Pre-service Experiences of Science Teachers

As narrated by the teacher participants in this study, it is evident that there is a process of gradual development in professional reflective practice during the years of undergraduate training. This development lacked any pattern of linear or staged progression, supporting Brockbank and McGill's (1998) critique of Schön's sequenced stages.

Specific recollections of clarity regarding their pre-service reflective experiences or statuses were generally limited. Education subjects on the whole were typically described as being of secondary interest, importance, and rigour compared to the Science content subjects in their course. Consequently, reflective practice was seen during their initial training as being of secondary, minor importance. There was a strong association of reflective practice activities with assessment tasks of a descriptive nature, requiring little intellectual effort.

A significant differentiation in the frequency, scope and level of reflection occurred for most teacher participants after their first 18 months of pre-service training. This was associated with the second year practicum experience. Another major differentiation was their pre-service reflective practices compared to those they currently engage in as experienced teachers.

The centrality of the practicum experiences in their development as professional teachers was reinforced by the proactive involvement of Education Faculty staff in visiting, supporting, and debriefing the pre-service teachers while they are on

practicum placement. This involvement, along with the associated practicum experiences, were identified as crucial elements in the development of reflective practice in the recollections of the participating teachers. Affective and cognitive domains were involved in the reconstruction of these elements, reflecting the extent of personal investment by the pre-service teachers in these activities and relationships, as well as the significant reformulations and applied conceptualisation of themselves as a teacher that accompanied these watershed experiences. The practicum experiences also assisted pre-service teachers to move beyond viewing knowledge as certainty and as a commodity. The emotional, intellectual and professional investment often was concomitant to further development of a higher level (Klob, 1984) in emergent professional reflective practice.

The reconstructed narratives in this study detail the embedding of frequent, extended, field-based practicum sessions within the course accompanied with on-site visitations and subsequent debriefs by Education Faculty staff as one of the most significant structures within the Avondale pre-service education experience that aided the development of reflective practices.

Some participants voiced the significance of personal trait characteristics, and their previous experiences of reflective practice or critical analysis, as proto-genesis of reflective practices before they embarked on their pre-service teacher training. Others noted a growth in metacognition, especially during the last two years of the four-year teacher training degree program, that paralleled a change in focus as there was a more specific emphasis given to reflective activities that were integrated and embedded in the education courses, and there was continued strong emphasis given within the Science Faculty to the development of critical thinking. Some teacher participants recalled that they believed at the time that they possessed all the necessary attributes for reflective and critical thought, but subsequently perceive that lecturers were persistently but gently developing, scaffolding and equipping them with these. The latter years of their course also were times of considerable maturation when the level of subjects studied required engagement with more abstract, conceptual frameworks. Participants in this study noted the concomitant nature of these many elements of change with the development of their reflective practice, however no attribution of causality was noted. For many participants in this

study, recognition of the development of their reflective practices only occurred in retrospect rather than being an awareness at the time.

This study confirmed that the self-reported primary orientation of pre-service teachers was one of self-focus. This orientation became weaker and re-oriented to a strong student focus in the latter part of training or after a time of in-service experience.

While participants detailed a range of reflective practice activities and structures during their teacher training none were accorded any significance, except peer and lecturer induced reflections on the practicum experiences. Lecturers also reported a significant lack of a systematic, unified approach towards the teaching of reflective practice. This finding accords with Norsworthy's (2008) finding regarding a lack of coherence in the pre-service teachers' teacher education experience. Only one participant sustained a formal form of reflective practice after graduation. Here this study supports the findings of Holly and McLoughlin (1989). It is evident that formal reflective practices experienced within the teacher education component of the course were limited in their effectiveness as a pre-service initiation to the embedding of reflective practice

Wong (2009) linked deep reflective activities with students that had personal connectedness with academic staff. Parsons and Stephenson (2005) link collaboration with a critical partner for enabling 'deeper thinking about practice' (p. 95). Norsworthy (2008) denotes 'relational connectedness as key to the development of reflective practitioners' (p. 200). This study supports these findings through reporting that such connectedness, primarily through mentor-mentee relationships, was seminal in fostering the development of reflective practice for almost all the teacher participants in this study.

The practicum experience, especially the debrief, give a major incidence of personal connectedness with Education Faculty staff in a context with the characteristics of connections of high quality (Ghaye, et al., 2009). Academic mentor-mentee relationships at Avondale College between lecturers and pre-service teachers were reported by participants in this study as exhibiting high levels of connectedness. With only one exception, all lecturers identified by participants as being of significance were from a Science or Mathematics teaching or academic background.

Academics identified by the participating teachers as significant engaged their pre-service teachers cognitively, emotionally and spiritually and were held in high personal regard. These academics engaged their students in a participative community that involved them in meaningful dialogue. This finding supports Meyer's (1999) finding that students engaged in a community of conversing learners is predisposed to 'embrace ambiguities' and adopt a 'reflective stance'.

The voice of participating teachers reported in this study that the degree of personal connectedness with academic staff appears to be the central significant factor on the development of reflective practice in their undergraduate years. This finding supports Ghaye et al.'s (2009) assertion that 'high quality connections are at the heart of improving performance' (p. 385).

6.2.2 How In-service Teachers' Subsequent Development of Reflective Practice is Affected by Their Interactions with Pre-service Lecturers

This study concurs with Norsworthy's (2008) findings that modelling pedagogy, using authentic teaching approaches, living the questions, and assessment assists the development of reflective practice. This study also concurs with Pedro's (2001) findings that reflection is learned substantially from significant others, the process of reflection being socially determined, being a 'product of the utterances to which the participants responded in on-going dialogue they held with others' (p. 112).

Close and generally positive relationships between academic staff and pre-service teachers typified the recollections of participants in this study. These relationships exhibit an innate contagion of modelling practice; a relatively unintentional and automatic mimicking and convergence of the practices of another. Participants in this study noted the significance of the mentor-mentee relationship in building repertoires of professional practice. Those academic staff named as significant mentors were also nominated as those that most openly displayed reflective practices and behaviours to their students. Discursive activity and deep engagement with others was reported often in the reconstructed narratives.

6.2.3 How In-Service Teachers' Subsequent Development of Reflective Practice is Affected by the Perception of Pre-Service Lecturer's Practice of Reflective Critical Thinking by Science Teaching Graduates

The teacher participants in this study report that the reciprocal professional learning that occurred in the mentor-mentee situation provided an alignment that brought about the establishment of a culture that significantly shaped by the practices and values of the lecturing staff involved. There was a strong pastoral and educational focus on the individual student and their personal, academic and professional development with nominated academic staff displaying system of personal and professional values. In reporting this, the study supports the linkage made between values, relationships and performance by Ghaye et al., (2009). These academic staff share the characteristics of integrity, care and high academic performance that are linked to the notion of reflected best-self.

Participants reported that the enablers required for performance enhancement (Ghaye, et al., 2009) are also present in their interactions with nominated lecturers. Active modelling by academic staff was reported by teacher participants in the transmission of ethical values, lifestyle standards, and reflective practices. Most participants in this study reported a positive demonstration of reflective practice by those lecturers they identified as being significant in their development as a person and a professional at Avondale College.

6.3 Implications of the Study

Reflective practice is an exceedingly difficult professional attribute to embed in the life of a pre-service teacher. Evidence that supports this includes the fact that all but one of the teacher participants ceased any form of formal reflective practice within months of graduation. This implication is also supported by the fact that despite the wide variety of methods, instruments and strategies employed by the Education Faculty very few can be recalled by graduates of a few years experience, and even fewer are even spasmodically employed by these teachers. This is a major challenge to teacher educators, especially as reflective practice is currently a central thread in the profession of teaching.

This paucity of systematic post-graduation utilisation of reflective practice can be linked to the report earlier in this research that the teacher participants had little

recall of any reflective practice in their training, apart from those associated with a practicum assignments. This finding reinforces the research findings elsewhere in NSW of undergraduate utilisation of systematic reflective practices taught at undergraduate level in the later setting of in-service professional teaching (Grey, 2006).

Arising from this implication is the type of reflective practice experienced by pre-service teachers. As many of the teacher practitioners interviewed attested, most reflective practice activities and processes encountered were perceived as artefacts of the course and of value only as assessment pieces to succeed in meeting the academic requirements of a particular subject. These activities and processes were also deemed to be of low intellectual value by many of the participants.

As previously reported there was a strong ambivalence towards activities relating to reflective practice within their pre-service Education courses. Such activities were reported as being non-systematic and were accorded low value by the participants. Only one participant reported the action-research final year assignment, a major reflective activity in the course. It is evident from the voice of the participants that they saw little linkage at the time of their undergraduate training of the validity or utility of reflective activities to their subsequent professional lives.

The lack of integration of reflective practice within the elements of the course reinforced this perception. Teacher educators have a major curricula and pedagogical challenge in creating a more integrated and valued delivery of reflective practice to their students that arises above the autobiographical and descriptive levels of analysis.

This finding also has major implications for other professions such as Nursing and Social Work who have heavily invested in reflective practice as a major tool of development within the professional life. While the literature in Education, Nursing and Social Work makes extensive comment on the place of reflective practice in training courses, and provide examples of the same, there is scant literature reporting specifically on the incidence levels of actual practice continuing long-term in the field after the completion of training.

This finding also has significant implications relating to the in-service practices of teachers. It appears that the pragmatic operational environment teachers find themselves in, along with time demands, results in an overall non-systematic approach to reflective practice for the in-service teachers in this study. With greater systemic demands of accountability and with reflective practices now being embedded in emerging professional standards this research finding has major implications for the future practices of teachers in the Adventist education system in Australia.

For lecturing staff in pre-service Education courses this finding raises significant issues relating to systematically embedding reflective practices into the delivery of their courses. As reported by the teacher participants in this study, the mere presence of reflective assessment and practicum tasks is not sufficient to embed reflective practices. The challenge for Education lecturers is to consistently attribute sufficient value to, and to deeply model, reflective practices in the pre-professional context, so that pre-service teachers perceive it to be of enduring personal professional value.

The second implication arising from the study is the importance of embedding reflective practice within experiential learning contexts. The centrality of the practicum in the recollections of the participants' development of reflective practice denotes the value of such embedding. The practicum experiences are a major watershed in the developmental process of reflective practice according to the recollections of the teacher participants.

Avondale graduates have a unique concentration throughout their courses of practical field placements. It is evident from this study that the conjuncture of these placements with the proactive support, involvement and debriefing by academic staff is not only valued by the pre-service teacher, but is a vital milestone in developing reflective practice in the pre-service student. While resource intensive, the manifest effectiveness of this conjuncture of experiential learning, construction of the professional self, mentor relationship building, and collegial dialogues in assisting the develop deeper levels and awareness of reflective practices is worthy of examination to see how it can be extended and enhanced within the professional training program.

A further implication arising from the study is the centrality of positive relationships that engage in meaningful, open and honest dialogue. Positive peer and mentor relationships ranked highly for the teacher participants in this study in the development and exercise of the predispositions to reflective practice. High quality, authentic connections by academic staff demonstratively engender reflective practices, especially practices that are at the higher levels of reflection. Academic staff who display warm, strong pastoral and educational focus on the individual student and also are openly intentional in achieving quality in their own personal, academic and professional development have had a profound impact on the professional development, including reflective practice, of the teachers participating in this study. This linkage of personal attributes of quality academic staff (integrity and care) and their high academic performance to the imparting of professional qualities have powerful implications in the recruitment and human resource management of those who facilitate initial professional training courses.

The linkage of deliberate mentor relationships has major implications in the cultural and operational environments of a faculty. Contact time and availability are key resource elements that in the changing face of higher education often are sacrificed, especially when access to senior academics by undergraduates is crucial to the development of effective and meaningful mentoring relationships. All of the academics nominated have diverse and immense workloads, yet appeared to the teacher participants to make a priority to make themselves available for the emerging professional.

Within the Adventist teaching profession this study implies that systematic reflective practice and professional peer collegiality are serendipitous occurrences, rather than being elements embedded within the educational cultures of Adventist schools in Australia. Reflection for practising teachers in this study appears to be largely unstructured, idiosyncratic and any peer collegial reflection occurs in the context of informal dialogue. This level and manner of manifestation is highly reflective of the description of reflective practice culture operating in the two faculties involved in this study at Avondale College. One could conclude that the corporate reflective environment in these faculties are inculcated by pre-service teachers and replicated in their own professional practice. If this conclusion is correct, there is an implication that a more systematic addressing of reflective practice within the academic

communities is needed. The relationship between the cultures and practices of Avondale College and the Adventist schools staffed largely by graduates from Avondale College also denotes the immense influence exerted by modelling to pre-service professionals.

6.4 Limitations of the Study

Avondale College was the only teacher training institution included in this study. By limiting the study to this institution factors that may have been more prevalent in the voices of alumni from other institutions may not be accounted for in the voices of Avondale College graduates. Similarly, by limiting this study to Avondale College, unique characteristics of that institution, such as its explicitly Christian perspective, may have shaped, by inclusion or exclusion, the responses elicited.

Similarly, limiting the sample of teacher participants to those currently employed in Adventist Schools Australia excluded other graduates who may have a differing perspective from those not in an employment relationship with the sponsoring denomination of the teacher-training institution under study, or in an educational institution with a similar broad operating philosophy of education. The homogeneity arising from this limitation of the sample of participants selected for study was balanced by the professionalism of the participants, their geographic spread over all Australian states and their employment in schools with a wide differentiation in demographic and sociological characteristics, as well as in their operational implementation of curriculum and philosophy, and the voices of lecturing staff at Avondale College.

As the study sample was also confined to the voices of science teachers the study was also limited, as other voices in teacher education, such as the humanities, creative and applied arts, business studies, and primary education were explicitly excluded. Perspectives that incorporated the worldviews and perspectives from these other sectors and disciplines would have added to the breadth of the study and given it wider relevance and broader applicability, as well as providing an opportunity for more voices to be articulated. Any differences of significance between sectors and disciplines were unable to be analysed due to the restricted participant sample.

This study only utilised qualitative methods, primarily narrative recall via semi-structured interviews. While this methodology enabled a richness and depth of voice to be articulated, analysed and interpreted, supplementation through an accompanying instrument enabling another approach such as quantitative analysis could have provided some additional depth to the objectivity in the study and provided a further basis for comparative analysis with other institutions or settings in any replicate study. For example, a multi-method approach to the research questions, such as in a combination of surveys and interviews, could enhance the initial value of a piece of research such as this, and potentially increase the confidence and accuracy of findings of others from a more normative or interpretative background in the findings (Gillham, 2000).

6.5 Opportunities for Further Research

A number of the participants indicated that they saw evidence of some predispositions for reflective practice in themselves or others prior to their tertiary studies. Others voiced the perspective that some individuals appeared to be reflective by nature, for other individuals it clearly was a developed set of skills and way of thinking. An exploration of the nature and place of pre-existing dispositions in pre-service teacher intakes towards reflective practice compared to the disposition development for those individuals who do not display naturally reflective dispositions could provide insights into the relationship of dispositions for reflective practice to the developmental processes for reflective practice within teacher education initial training courses.

As their voiced descriptions of their reflective landscapes were very similar, being informal, non-structured, and largely composed of internal conversations of one's mind or collegial informal conversations, it would intriguing to examine more closely the linkages between academics and teachers' lived experiences of reflective practice if there were more structural and written elements of reflective practice embedded within their respective organisational cultures.

This study specifically examined the pre-service reflective practice world through the reconstructed experiences of experienced teachers. Few studies have examined the development of reflective practice in pre-service professionals throughout their initial training through the medium of the voices of in-service teachers. Given the

significant reforms and major changes in professional training in the last decade it would be informative to be informed by the voices of pre-service teachers in a longitudinal study as they progressed through their course. This study has revealed the difficulty even recent graduates have in recollecting with clarity and detail events and processes within in their undergraduate degree. A study *in situ* of graduates as they progress through their course would provide a rich data mine for analysis.

6.6 Summary and Concluding Remarks

The acquisition of a professional attribute such as reflective practice is idiosyncratic and complex in nature, as are relationships, such as those involved in mentoring. Layering such complex processes and activities in the context of maturating youth undergoing their initial professional training adds to the inherent complexities under examination in this study. Despite these complexities and the difficulties in any attempt to isolate a specific variable, or to unravel the influences of one variable on another, a number of conclusions are manifest from the voices articulated by participants in this study.

This research confirms the centrality of experiential learning contexts, such as teaching practicums, in the development of reflective practices in pre-service teachers. The study also supports previous research that outline the many difficulties in initial training courses when seeking to embed reflective practice in the life of an emerging professional.

The conjuncture of high quality connections with academic staff, especially in a mentoring relationship and the fostering of the predispositions for reflective practice has emerged from this study as a dominant foundational influence in the current reflective practices of the teachers participating in this study.

A significant outcome from this research is the highlighting of the role of relationships and connectedness with academics during pre-service teacher training in impacting the role and shape of reflective practice in one's professional teaching life. This study found that high quality connectedness, primarily through mentor-mentee relationships was seminal in fostering the development of reflective practice for almost all the teacher participants in this study

Finally, in facilitating the articulation of voice, and in querying the practice of reflection within the teacher-education course, the act of research itself facilitated an opportunity for stimulating the process of reflection in research participants, possibly to consciously begin to transform their own learning environment and reinvigorate their own reflective practices.

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APPENDICES

APPENDIX A

CONSENT FORM

SCIENCE TEACHERS' CONCEPTUALISATION OF PROFESSIONAL REFLECTIVE PRACTICE: A RECONSTRUCTION OF THE IMPACT OF PRE-SERVICE INTERACTION WITH LECTURING STAFF.

CONSENT FORM

I, _____ have read the information on the attached participant information sheet. Any questions I have been asked have been answered to my satisfaction. I agree to participate in this research but understand that I can change my mind or stop at any time without problem.

- I have been provided with the participant information sheet

- I understand the purpose and procedures of the study.

- I understand that the procedure itself may not benefit me.

- I understand that my involvement is voluntary.

- I understand that all information is treated as confidential.

- I agree for this interview to be recorded.

- I agree that research gathered for this study may be published provided names or other information that may identify me is not used.

- I understand that no personal identifying information like my name and address will be used and that all information will be stored securely for 5 years before being destroyed.

- I have been given the opportunity to ask questions.

- I agree to participate in the study outlined to me.

Name: _____

Signature: _____

Date: _____

Investigator: Paul de Ville

Signature: _____

APPENDIX B

PARTICIPANT INFORMATION SHEET

CURTIN UNIVERSITY OF TECHNOLOGY
SCIENCE & MATHEMATICS EDUCATION CENTRE

My name is Paul de Ville and I am currently completing a piece of research for my Doctor of Mathematics Education at Curtin University of Technology.

Purpose of Research I am investigating the formation of professional reflective practice during the training of science teachers at Avondale College.

Using interviews with practising science teachers and College lecturers like you, I will use the narrative of your voice in interviews to reconstruct an understanding of those elements in the pre-service learning environment that impacted on your reflective practice. Through an analysis of these narratives the research will examine the foundational mechanisms for the development of long-term professional reflective practices.

Of particular interest in the research is an examination of any lasting influence on the science teachers' subsequent range of reflective professional practices that arose from their perceptions of, and interactions with, the practice of reflective, critical thinking by their lecturers.

Your role
- I am interested in finding out your professional reflective aptitudes, understandings and practices.
- I would like to find out what pre-service learning experiences at Avondale College contributed to the development of your professional reflective practices.
- I will ask you to describe and analyse the role of your Avondale lecturers on the formation of your professional practice.
- The initial interview will take approximately 30-60 minutes.
- You will be provided with a copy of a record of the interview to check and make changes.
- You will be invited to participate in further dialogue through email and possibly a further interview.
- You may be invited to participate in a further group interview with a cohort of science teachers

Consent to Participate Your involvement in the research is entirely voluntary. You have the right to withdraw at any stage without affecting your rights or my responsibilities. When you have signed the consent form I will assume that you have agreed to participate and allow the use of your data in this research.

Confidentiality The information you provide will be kept separate from your personal details, and I will have only access to this. The interview transcript will not have your name or any other identifying information on it and in adherence to university policy, the interview tapes and transcribed information will be kept in a locked cabinet for five years, before it is destroyed.

Further Information This research has been reviewed and given approval by Curtin University of Technology Human Research Ethics Committee (Approval Number SMEC20070029). If you would like further information about the study, please feel free to contact me on 02 4980 2125 or by email: joyful1@bigpond.net.au Alternatively, you can contact my supervisor Professor Darrell Fisher on 08 9266 3110 or d.fisher@curtin.edu.au

Thank you very much for your involvement in this research, your participation is greatly appreciated

RESEARCH SUMMARY & AIMS

SCIENCE TEACHER'S CONCEPTUALISATION OF PROFESSIONAL REFLECTIVE PRACTICE: A RECONSTRUCTION OF THE IMPACT OF PRE-SERVICE INTERACTION WITH LECTURING STAFF

RESEARCH SUMMARY & AIMS

The proposed research examines the interfaces between three broad and central themes in the development of a professional teacher:
- reflective professional practice;
- mentor relationships and expert role models; and
- in-service training.

The interfaces between these three broad themes are explored through the narratives of lecturers and practicing science teaching graduates. These narratives will be gathered through interviews and correspondence with lecturers and graduates from Avondale College, NSW – a private higher education provider with a history of excellence and high levels of graduate satisfaction in science teacher preparation.

Through an analysis of these narratives there will be a reconstruction of an understanding of the key foundational mechanisms within the pre-service learning environment that have had long-term impacts on the reflective professional practices of science teachers.

Key research questions are:
- How professional reflective practices are developed during the pre-service experiences of science teachers?
- How in-service science teachers' subsequent development of reflective professional practice is affected by:
  - o their interactions with pre-service lecturing staff? and
  - o their perceptions of pre-service lecturing staff's practice of reflective critical thinking?

The research will specifically examine those long-term influences on the science teachers' subsequent range of reflective professional practices that arose from their perceptions of, and interactions with, the practice of reflective, critical thinking by their lecturers. Any congruence between the impact of modelling and mentoring and the formation of professional reflective practice during the training of science teachers at Avondale College will be evaluated.

The proposed research will be informed through a critical research framework, with a strong emphasis on participant and practitioner involvement, with an emphasis on description, exploration through the recording of personal experience, introspection and review. The qualitative methodology used in the research will focus on understanding the way in which the practicing science teachers and lecturers reconstruct and interpret their professional worlds. It is anticipated that the captured voice of the teachers and lecturers will reveal the conception, beliefs, and thinking that supports their professional reflective practice.

INTERVIEW GUIDE – TEACHER INTERVIEW

The following headings, question and follow up prompts are a guide for the semi-structured, open-ended interviews with teachers.

What does reflective practice mean to the individual?

- What does reflective practice mean to you?
- Do you have a metaphor for your definition?
- Give an example of a time you have engaged in reflective practice

How does the individual see the status of their present reflective practice?

- Describe the process you regularly use to critically analyse your teaching?
- How do you involve your peers in professional dialogue regarding your teaching practice?
- Have there been any specific episodes or experiences that have given you pause to stop and reflect on your role as a teacher?

What broad impacts did the 'Avondale experience' of professional training have on teacher's personal perspectives regarding reflective practice?

- As a professional teacher what were the most significant and influential factors in the 'Avondale experience' that have contributed to your development as a professional teacher?
- Were there specific skills or opportunities that were meaningful for you at Avondale that facilitated your reflection on your development as a professional?

Were distinct predispositions and skills for reflective practice fostered and encouraged?

- In what ways was Avondale a supportive and healthy learning environment for the development and expression of reflective professional practices and attitudes?
- What characteristics and conditions did lecturers bring that enhanced the development of a disposition and capacity to reflect?
- Was there a climate of trust, respect and non-defensive openness by lecturing staff at Avondale? How was this engendered?
- Did lecturing staff exhibit and develop a supportive and collaborative culture with students? How was professional collegiality, collaboration and a sense of professional community developed or articulated during your training as a teacher?

Is there identifiable development in reflective practice for pre-service teachers?

- Can you identify specific phases in your development of reflective practice at Avondale?
- What metaphors characterise the reflective thinking of the pre-service teacher? How are these different from those of you as an experienced teacher?

What types of reflective practice activities did undergraduate science teachers encounter?

- Can you describe any particular interaction or observation of Avondale's academic staff that gave you cause to pause and consider their modelling of professional reflection?
- The undergraduate reflective practice environment can have a task orientation or a relational orientation. How would you describe the orientation of the reflective practice environment you experienced at Avondale?

What are the perceptions of graduates regarding lecturing staff's development and enhancement of their disposition towards reflective practice?

- Can you share with me some examples of classes at Avondale that incorporated the modelling of reflective practice?
- Do lecturers at Avondale give a unified, institutional perspective on reflective practice?
- Were there any limiting factors you experienced that did not help you to be reflective?
- The literature comments on the importance of collaboration, dialogue and discussion in the development and transformation of professional concepts, values and actions. Can you recall specific, salient instances in your training that transformed you professionally as a reflective practitioner?

What are the recollections regarding mentoring?

- How did you see good teaching modelled at Avondale?
- What phrases or metaphors would you use as analogous to the mentoring given by lecturers at Avondale/
- Can you describe a time when your mentor 'provoked' you to reflect on your own practice/
- Looking back on your training at Avondale, can you comment on significant relationships with lecturing staff that significantly contributed to your development as a professional teacher?

What is the impact of mentoring on the teaching practices of science teachers?

- What lessons have you learnt from your lecturers' mentoring styles that have

impacted on you as a professional, and how do you use these lessons in your mentoring of others?

- Has the mentoring given to you by Avondale lecturers developed your own insights into your teaching, enabling you to view your classroom through a second and different professional lens?

INTERVIEW GUIDE – LECTURER INTERVIEW

The following headings, question and follow up prompts are a guide for the semi-structured, open-ended interviews with Avondale College lecturers.

What does reflective practice mean to the individual?

- What does reflective practice mean to you?
- Do you have a metaphor for your definition?
- Give an example of a time you have engaged in reflective practice

How does the individual see the status of their present reflective practice?

- Describe the process you regularly use to critically analyse your teaching?
- How do you involve your peers in professional dialogue regarding your teaching practice?
- Have there been any specific episodes or experiences that have given you pause to stop and reflect on your role as a teacher?

What broad impacts did the 'Avondale experience' of professional training have on teacher's personal perspectives regarding reflective practice?

- For students what are the most significant and influential factors in the 'Avondale experience' that have contributed to their development as a professional teacher?
- What specific skills or opportunities are meaningful at Avondale that facilitate students' reflection on their development as a professional?

How are distinct predispositions and skills for reflective practice fostered and encouraged?

- In what ways is Avondale a supportive and healthy learning environment for the development and expression of reflective professional practices and attitudes?
- What characteristics and conditions do you as a lecturer bring that enhances the development of a disposition and capacity to reflect in students?
- Is there a climate of trust, respect and non-defensive openness towards students by lecturing staff at Avondale? How is this engendered?
- How do lecturing staff exhibit and develop a supportive and collaborative culture with students? How iss professional collegiality, collaboration and a sense of professional community developed or articulated during students' training as teachers?

Lecturer perspectives on the identifiable development in reflective practice for pre-service teachers?

- Can you identify specific phases in the development of reflective practice by pre-service teachers at Avondale?
- What metaphors characterise the reflective thinking of the pre-service teacher? How are these different from those of an experienced teacher?

What types of reflective practice activities do undergraduate science teachers encounter?

- Can you describe any particular interaction or observation of Avondale's academic staff that gave you cause to pause and consider their modelling of professional reflection?
- The undergraduate reflective practice environment can have a task orientation or a relational orientation. How would you describe the orientation of the reflective practice environment you experienced at Avondale?

What are the perceptions of graduates regarding lecturing staff's development and enhancement of their disposition towards reflective practice?

- Can you share with me some examples of classes at Avondale that incorporate the modelling of reflective practice?
- Do lecturers at Avondale give a unified, institutional perspective on reflective practice?
- Were there any limiting factors you observe that do not help students to be reflective?
- The literature comments on the importance of collaboration, dialogue and discussion in the development and transformation of professional concepts, values and actions. Can you recall specific, salient instances in teacher training at Avondale that transform students professionally as a reflective practitioner?

The mentoring role of the lecturer

- How do you see good teaching being modelled to students at Avondale?
- What phrases or metaphors would you use as analogous to the mentoring given by lecturers at Avondale/
- Can you describe a time when a student you mentored 'provoked' you to reflect on your own practice/
- Looking back on your training at Avondale, can you comment on significant relationships with lecturing staff that significantly contributed to your development

What is the impact of mentoring on the teaching practices of science teachers?

- What lessons do you seek to impart in your mentoring styles that impact on students as a emerging professionals, and how do you use these lessons in your mentoring of students?