Investigating an ePortfolio-based learning environment for developing reflection with pre-service teachers

Pauline K Roberts
BTeach, BEd, Med

School of Education
Murdoch University

This thesis is presented for the degree of Doctor of Education
Murdoch University
2014
DECLARATION

I declare that this dissertation is my own work and contains as its main content work that has not previously been submitted for a degree at any tertiary institution.

______________________
Pauline K Roberts
ABSTRACT

The term reflection has been part of the vocabulary of pre-service teacher education for many decades. During this time, many strategies have been created and implemented to encourage the development of reflective abilities in future teachers. Recent literature has highlighted that many of these approaches are largely unsuccessful in developing reflection, or that reflection in such contexts is superficial.

Concurrent with recent developments in methods to encourage and support reflection has been the improved affordances of technology and its increased use in higher education. These developments include both the range of platforms available and the opportunities for these platforms to be used as learning environments. Within electronic platforms, students can access resources and learning tasks in a range of modes that they complete to demonstrate their understanding.

This doctoral thesis explored the two areas of reflection and electronic learning environments to inform the development of an ePortfolio-based learning environment designed to scaffold the reflective abilities of pre-service teachers. The purpose of the research study was to examine: In what ways can an ePortfolio platform provide an environment for scaffolding reflection in pre-service teachers in a university environment?

Through cycles of implementation and review specifically designed for electronic learning platforms, the study developed an environment to scaffold and promote reflection. The implementation was based on a model of teaching that comprised: examples of good practice; the provision of an area within which students could interact with one another; and specific activities developed from literature to target the enhancement of reflection. These activities were selected and developed based on research into reflection and how best to support the development of reflective practitioners.

The learning environment was developed within the PebblePad ePortfolio system. A multiple methods approach was undertaken with Bachelor of Education students completing action research projects. Data collected in the study included an online survey, the examination of usage statistics, focus group and individual interviews, and document analysis to answer the
research questions. The majority of the data were analysed using a constant comparative approach, however, work samples were examined against a hierarchical model of reflection to identify if there was evidence of a range of levels of reflective writing.

The research found that the ePortfolio-based learning environment was an effective platform for the scaffolding of reflection to a limited degree. In terms of the research sub-questions, the students were able to access the prompts within the ePortfolio-based learning environment and utilise them in completing assessment tasks for their action research projects (Research Question 1). The students also highlighted reflective discussions as being valuable in the development of reflection, although these interactions were generally occurring outside the ePortfolio environment (Research Question 2). Students also reported that the provision of a strong model of reflective writing was extremely useful, and the prompts that were provided helped them to learn some of the skills of reflection (Research Question 3). There were, however, limitations to the research that impacted on the level of effectiveness of the environment. These were identified as: the timing of the research implementation; the lack of contextualized scaffolding from the tutors within the action research project; and the reduced sample size of participants.

A number of design principles were identified from the research for future iterations of ePortfolio-based learning environments. These were identified in the areas of the embedding of electronic learning environments in an integrated manner through higher education courses; changes to the way the interaction was facilitated within the environment; and the utilisation of strong models of reflective writing to scaffold pre-service teachers’ reflective development.

The model trialed and reviewed in this research study shows promise as a systematic framework for the development of programs for broader implementation within teacher education courses with ePortfolios and other electronic platforms. These principles could be applied to develop not only reflection, but other equivalent processes in a range of discipline areas in higher education.
ACKNOWLEDGEMENTS

There are a number of people without whom this research project and thesis would not have been completed and although it is a small token, it is important to acknowledge them here.

Firstly to my family, geographically near and far, for their ongoing love, support and practical assistance throughout the process. In particular to my husband Matt for the valiant effort to hide his frustration at my ongoing self-doubt and regular late night work sessions. Your support throughout the process made a huge difference. To my children who appear as pseudonym characters in this ‘book I am writing’ for their patience in waiting at the end of my desk for the sentence, paragraph, or section to be finished so they could ask their question.

Secondly to my friends and colleagues who listened through with my regular venting sessions, were able to sympathise with me throughout the process and continue to encourage me that there was light at the end of the tunnel. Particular mention must go to those whose names made it into the thesis for stepping in to help with the practical aspects of life when I was busy on the research.

Finally, particular mention must go to my supervisors Dorit Maor and Jan Herrington whose ‘tough love’ was required at times for me to realise what needed to be done to get this research study completed and written to the standard it has reached for completion. Their support, advice and expertise were instrumental in the completion of this dissertation.

When you are studying for something as large as this, with a family, it definitely takes a village to get it completed. Thanks to everyone in that village.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Declaration</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>iv</td>
</tr>
<tr>
<td>Table of contents</td>
<td>v</td>
</tr>
<tr>
<td>List of tables</td>
<td>x</td>
</tr>
<tr>
<td>List of figures</td>
<td>xi</td>
</tr>
</tbody>
</table>

## Chapter 1  
**Introduction to the research project**
- Reflection  2
- ePortfolio  4
- eLearning environment  5
- The research study  6
- Limitations of the research study  8
- Research questions  9
- Organisation of the thesis  9

## Chapter 2  
**Reflection and ePortfolio research in higher education**
- What is reflection? 12
- Why reflection is important in education and teacher preparation 18
- The framework for teacher reflection
  - Cognitive psychology 22
  - Critical theory 23
  - Motivation and caring 24
  - (1) Action 26
  - (2) Constructing Knowledge and Meaning 30
(3) Professional Knowledge Base

Attributes 35

Collegial environment 37

Technology in pre-service teacher education 39

ePortfolio use in higher education 43

Research study framework 48

Chapter 3

Methodology of the research project

eLearning lifecycle 50

Enculturation teaching model 54

Research design 56

   Context 56

   Participants 57

   Procedure 58

Data Collection 60

   Focus group interviews 60

   Online survey 64

   Individual interviews 65

   Analysis of work sample 67

data analysis

   Learning analytics 68

   Case studies 70

Data analysis 70

   Confidentiality 72

Data audit trail 73

   Open coding 73

   Axial coding 74

   Memo drafting 74
<table>
<thead>
<tr>
<th>Chapter 4</th>
<th>Implementation of the eLearning lifecycle</th>
<th>76</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full trial of environment</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>Review and improvement of environment</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Trial of improved environment</td>
<td>86</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>Engagement with the ePortfolio teaching environment</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Data sources</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>Usage statistics</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>Online survey</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>Focus group interviews</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>Individual interviews</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>Case studies</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>Area 1: Usability of the ePortfolio-based learning environment</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Area 2: Barriers to student engagement</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>Area 3: Use of other platforms for drafting and reflecting</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Case study review</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>Case study 1: Chelsea</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td>Case study 2: Jaye</td>
<td>116</td>
</tr>
<tr>
<td></td>
<td>Summary</td>
<td>124</td>
</tr>
<tr>
<td>Chapter 6</td>
<td>Interaction within the ePortfolio-based learning environment</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>Data sources</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Usage statistics</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Blog comments review</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Online survey</td>
<td>130</td>
</tr>
</tbody>
</table>
Chapter 7  Impact on reflection of the ePortfolio-based learning environment

Data sources  159
Area 1: Reduced engagement with the activity prompts  160
Area 2: The focus on reflective writing  165
Area 3: ‘Teaching’ reflection  167
Case study review  170
Case study 5: Thomas  170
Case study 6: Madison  179
Summary  188

Chapter 8  Concluding comments and implications for future practice

Summary of thesis  191
Findings in relation to the theoretical frameworks  192
Limitations of the research  197
Design principles for future environments

Future research directions

Appendices

I  Glossary of terms used in research

II  Matrix of theoretical frameworks

III  Timeline of research

   implementation and researcher role

IV  Cascading data matrix

V  Participant Information letter

VI  Participant Consent letter

VII  Survey questions from website

VIII  Peer review of the research project

References
<table>
<thead>
<tr>
<th>Table Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Common factors identified across various theoretical approaches to reflection</td>
<td>15</td>
</tr>
<tr>
<td>2.2</td>
<td>Overview of framework to other approaches</td>
<td>26</td>
</tr>
<tr>
<td>3.1</td>
<td>The eLearning lifecycle</td>
<td>51</td>
</tr>
<tr>
<td>3.2</td>
<td>Response count for each data source</td>
<td>57</td>
</tr>
<tr>
<td>3.3</td>
<td>Focus group interview schedule</td>
<td>62</td>
</tr>
<tr>
<td>3.4</td>
<td>Individual interview schedule</td>
<td>66</td>
</tr>
<tr>
<td>4.1</td>
<td>Activity prompts with source and purpose</td>
<td>78</td>
</tr>
<tr>
<td>4.2</td>
<td>Prompts for Cycle 5 with source and purpose</td>
<td>86</td>
</tr>
<tr>
<td>5.1</td>
<td>Categories from axial coding to sub-question 1</td>
<td>95</td>
</tr>
<tr>
<td>5.2</td>
<td>Reported percentage of access to prompts</td>
<td>99</td>
</tr>
<tr>
<td>5.3</td>
<td>Jaye’s reported prompt usage</td>
<td>118</td>
</tr>
<tr>
<td>6.1</td>
<td>Categories from axial coding to sub-question 2</td>
<td>130</td>
</tr>
<tr>
<td>6.2</td>
<td>Details of Blog comments</td>
<td>134</td>
</tr>
<tr>
<td>6.3</td>
<td>Alesha’s reported prompt usage</td>
<td>144</td>
</tr>
<tr>
<td>7.1</td>
<td>Activity prompts with links to framework and purpose</td>
<td>158</td>
</tr>
<tr>
<td>7.2</td>
<td>Categories from axial coding to sub-question 3</td>
<td>159</td>
</tr>
<tr>
<td>7.3</td>
<td>Reported usage of Professional Knowledge prompts</td>
<td>161</td>
</tr>
<tr>
<td>7.4</td>
<td>Average reported use of exemplar and activity prompts</td>
<td>163</td>
</tr>
<tr>
<td>8.1</td>
<td>Future research opportunities of theoretical frameworks and models</td>
<td>203</td>
</tr>
</tbody>
</table>
### LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure No</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>4R’s of reflection</td>
<td>17</td>
</tr>
<tr>
<td>2.2</td>
<td>Framework for teacher reflection</td>
<td>25</td>
</tr>
<tr>
<td>2.3</td>
<td>Research framework to show overlap of elements</td>
<td>49</td>
</tr>
<tr>
<td>4.1</td>
<td>Prompt 1- A reflection on teachers</td>
<td>79</td>
</tr>
<tr>
<td>4.2</td>
<td>Prompt 3 – Reflective journal as a BLOG</td>
<td>82</td>
</tr>
<tr>
<td>4.3</td>
<td>Prompt 9 – Reflective writing review</td>
<td>87</td>
</tr>
<tr>
<td>5.1</td>
<td>Assets created by whole student group</td>
<td>96</td>
</tr>
<tr>
<td>5.2</td>
<td>Files uploaded by type, number and size</td>
<td>106</td>
</tr>
<tr>
<td>5.3</td>
<td>Usage log for Chelsea</td>
<td>109</td>
</tr>
<tr>
<td>5.4</td>
<td>Record of Chelsea’s timeline and file type</td>
<td>110</td>
</tr>
<tr>
<td>5.5</td>
<td>4R’s of reflection</td>
<td>113</td>
</tr>
<tr>
<td>5.6</td>
<td>Example 1 of Chelsea’s reflective writing</td>
<td>114</td>
</tr>
<tr>
<td>5.7</td>
<td>Example 2 of Chelsea’s reflective writing</td>
<td>114</td>
</tr>
<tr>
<td>5.8</td>
<td>Example 3 of Chelsea’s reflective writing</td>
<td>115</td>
</tr>
<tr>
<td>5.9</td>
<td>Example 1 of Jaye’s reflective writing</td>
<td>120</td>
</tr>
<tr>
<td>5.10</td>
<td>Example 2 of Jaye’s reflective writing</td>
<td>122</td>
</tr>
<tr>
<td>5.11</td>
<td>Example 3 of Jaye’s reflective writing</td>
<td>123</td>
</tr>
<tr>
<td>6.1</td>
<td>Sharing statistics among cohort</td>
<td>132</td>
</tr>
<tr>
<td>6.2</td>
<td>Usage log for Alesha</td>
<td>143</td>
</tr>
<tr>
<td>6.3</td>
<td>Alesha’s timeline and file type</td>
<td>143</td>
</tr>
<tr>
<td>6.4</td>
<td>Example 1 of Alesha’s reflective writing</td>
<td>146</td>
</tr>
<tr>
<td>6.5</td>
<td>Example 2 of Alesha’s reflective writing</td>
<td>146</td>
</tr>
<tr>
<td>6.6</td>
<td>Example 3 of Alesha’s reflective writing</td>
<td>147</td>
</tr>
<tr>
<td>6.7</td>
<td>Usage log for Zak</td>
<td>148</td>
</tr>
<tr>
<td>6.8</td>
<td>Zak’s timeline and file type</td>
<td>148</td>
</tr>
<tr>
<td>6.9</td>
<td>Example 1 of Zak’s reflective writing</td>
<td>151</td>
</tr>
<tr>
<td>6.10</td>
<td>Example 2 of Zak’s reflective writing</td>
<td>152</td>
</tr>
<tr>
<td>6.11</td>
<td>Example 3 of Zak’s reflective writing</td>
<td>153</td>
</tr>
<tr>
<td>7.1</td>
<td>Usage log for Thomas</td>
<td>171</td>
</tr>
<tr>
<td>7.2</td>
<td>Thomas’ reflective journal as a Blog</td>
<td>171</td>
</tr>
<tr>
<td>7.3</td>
<td>Thomas’ timeline and file type</td>
<td>174</td>
</tr>
<tr>
<td>7.4</td>
<td>Example 1 of Thomas’ reflective writing</td>
<td>176</td>
</tr>
<tr>
<td>7.5</td>
<td>Example 2 of Thomas’ reflective writing</td>
<td>177</td>
</tr>
<tr>
<td>7.6</td>
<td>Example 3 of Thomas’ reflective writing</td>
<td>178</td>
</tr>
<tr>
<td>7.7</td>
<td>Usage log for Madison</td>
<td>180</td>
</tr>
<tr>
<td>Section</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>7.8</td>
<td>Madison’s timeline</td>
<td>181</td>
</tr>
<tr>
<td>7.9</td>
<td>Example 1 of Madison’s reflective writing</td>
<td>185</td>
</tr>
<tr>
<td>7.10</td>
<td>Example 2 of Madison’s reflective writing</td>
<td>186</td>
</tr>
<tr>
<td>7.11</td>
<td>Example 3 of Madison’s reflective writing</td>
<td>187</td>
</tr>
<tr>
<td>8.1</td>
<td>Model of the research frameworks</td>
<td>192</td>
</tr>
</tbody>
</table>
CHAPTER 1

Introduction to the Research Project

This chapter provides an overview of the thesis and will outline why this research focus was important in the development of programs for pre-service teachers. This includes a discussion of why reflection is an important focus for research in higher education. This project introduces the use of an ePortfolio platform as a possible solution to scaffolding reflection for pre-service teachers. The context and methodology of the study will be outlined as well as the research questions that guided the project. The chapter will close with an overview of the sections of the thesis.

Research in higher education plays an important role in the changing social and political agendas within which it is imbedded. Education cannot be viewed as a separate entity rather it is influenced by the wider society within which it is embedded (Archer, 1979). Recent publications in relation to this societal influence of education have highlighted several areas that specifically bring pressure to university settings as they develop programs for their students in the current global climate.

Firstly, Ball (2008) contends that educational reform is tied through the development of skills and ‘new knowledge’ to the requirements of the knowledge community. At present, the changes in that knowledge community are dominated by the area of technology. This means that universities need to innovate and improve performance on a constant basis to keep meeting these requirements. This increasingly means the use of technology within all levels of teaching as this is an area that society as a whole is embracing.

The second key area that came from the current social climate is that of the business of education and the pressure associated with the statistics of enrolments. Changes to the fee structures of universities now mean that students need to pay for their education, which increases their perception of the value of the teaching they receive (Marshall & Rowland, 2014). Coupled with this, rates of participation in higher education are steadily increasing which adds to the pressure on institutions to meet the needs of this
competitive customer base and show that innovative programs are being offered.

A flow on effect of the increase in participation rates is that there is no longer the guarantee of a position for graduates in the workforce at the end of their degree (Ball, 2008). This means that as well as developing innovative learning practices, university courses must also increase aspects of job readiness. Reflection and the associated aspects of lifelong learning, may be able to help students make these required connections, which to date appear to be in the worst cases undervalued or at best taught at a superficial level.

**Reflection**

Taken literally, the term 'reflection' refers to the image viewed when looking into a reflective surface such as a mirror. The opinion formed of this image is influenced by factors in its surroundings, such as light. The perspective of the person examining the reflection determines the viewpoint. The reaction to the image becomes an individual opinion influenced by the context and experience of the viewer. This basic premise flows to reflection in other areas.

In more complex and abstract applications, reflection requires the examination of ideas or beliefs relating to practice. The concept has been applied to numerous professions as a component of ongoing development. Professional areas that have traditionally embraced reflection are those “in which there was a particular emphasis on personal interaction” (Boud, 2006, p. 2), which include nursing and teaching. The latter is the focus of this research study.

Reflection has long been an important component of teacher education programs. It is a complex process that has been debated in relation to the terminology used to describe it, the process implemented to complete it, and the method to facilitate it (Rogers, 2001). The definition used initially for this research came from the work of Dewey (1933) who wrote that reflection is the “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusions which it tends” (p. 9). This definition implies that the process is
dynamic and requires examination of evidence and background information in a specific way.

The concept of reflection has been widely researched since Dewey proposed this initial definition. The majority of this research has been published in higher education, particularly in the social sciences. The focus in degree-structured higher education was reflection on practical components of the course. Reflection has previously been encouraged in teacher education courses due to the need for novice teachers to make links between theory and practice (Penso, Shoham, & Shiloah, 2001). Pre-service teachers come to university with a range of background knowledge that must be “reconstituted in the context of becoming a teacher and in the creation of a professional knowledge of teaching” (Vazir, 2006, p. 445). This, however, is “a complex process that strongly influences learning by increasing understanding, inducing conceptual change, and promoting critical evaluation and knowledge transfer” (Strampel & Oliver, 2007, p. 973).

A number of approaches have been implemented to enhance the development of this complex process (Rogers, 2001). The implementations of reflective practice have been specifically concerned with how and when to apply components of the process. A cyclic approach of plan-act-review has been the tradition for reflective practice, which can occur in minor or sizeable iterations towards improvement. The timing of this review process has been examined closely by Schön (1983) who proposed the phrases reflection-on-action and reflection-in-action. Reflection-on-action refers to reflection that takes place after an event, while reflection-in-action is implemented when experiences are examined at the time they occur.

Much of the research into reflection in higher education focuses on reflection-on-action in terms of reviewing practices retrospectively to plan changes for future experiences. This research project aimed to provide pre-service teachers with more opportunities to reflect-in-action and develop the ability to think and act on the run (Schön, 1995).

Despite the importance afforded to the development of reflective skills and abilities, to date the “teaching of reflection [remains] inconsistent and superficial” (Barton & Ryan, 2013, p. 1). This is perhaps due to the difficulty in
defining and investigating reflective ideas and concepts (Hatton & Smith, 1995). Pre-service teachers generally have a broad understanding of reflection and the process involved (Pedro, 2005). Without focused attention, however, on all levels of the reflective spectrum through scaffolded experiences (Ryan, 2012), the development of the required abilities will continue to be “tagged on, rather than constituting a way of working and learning” (Barton & Ryan, 2013, p. 2). For educational institutions there is a challenge to identify new methods to facilitate the required focused attention towards the development of reflection. One method that has been offered is that of the ePortfolio.

ePortfolio

The requirement of new methods to develop reflection coincides with another shift in higher education pedagogy stimulated by advancing technology. Society increasingly uses technology in all aspects of life and higher education must make changes to remain current with these advancements (Rillero & Padgett, 2012). Electronic learning platforms are required to provide more complex learning systems in higher education that allow more flexible learning options for students (Strampel & Oliver, 2010). One type of platform that is increasingly used to meet these needs in a range of areas of higher education is the ePortfolio.

Electronic portfolios or ePortfolios are platforms that enable students to archive products of learning while also allowing for reflection on the process and the comparison of products and trends (Beishuizen et al., 2006). Although ePortfolios have previously been used in higher education, the focus has primarily been on use for assessment purposes and the provision of evidence against set criteria, attributes or competencies (Allan, Zylinski, Temple, Hislop, & Gray, 2003; Raison & Pelliccione, 2006; Jun, Anthony, Achrazoglou, & Coghill-Behrends, 2007; vonKonsky, Oliver, & Ramdin, 2009).

ePortfolios are starting to replace paper-based portfolios in areas such as education to allow students to demonstrate their skills and achievements towards university requirements or against government standards for teachers. Digital portfolios allow for the integration of a wider range of evidence, and provide the students with the opportunity to upload and comment on a range of supporting data, including multimedia samples.
Platforms for ePortfolios range from open source blog formats and websites such as WordPress and Blogger, through to commercial platforms including PebblePad, that provide a range of features for students to use in collecting evidence and reflecting on practice.

Recently the potential of ePortfolios to provide students with Personal Learning Platforms has been identified (Lorenzo & Ittelson, 2005; Stefani, Mason, & Pegler, 2007; Chesney & Marcangelo, 2010). Such platforms allow students to create ePortfolios with multiple levels and use separate sections for reflection, presentation and archiving of evidence. For this potential to be realized, however, there needs to be full consideration given to how and why to use ePortfolios (Housego & Parker, 2009). The effective use of this platform requires a clear identification of the purpose of the ePortfolio so that students are able to see how the platform is relevant to their learning (Chmielewski, 2010). This can be achieved through an integrated approach (Hallam et al., 2010) that follows a progression of systematic implementation and review (Clark & Hardham, 2010).

Much of the current research investigating the use of ePortfolios has been focused on a limited implementation where students are required to complete assessment tasks within the ePortfolio based on written guidelines. There have been some studies of integrated implementation that are still developing but what is needed is a more systematic approach to the use of ePortfolio platforms that lead towards the development of design principles for learning (or in this case eLearning) environments.

**eLearning environment**

This research project endeavored to bring the abovementioned elements of reflection and ePortfolios together to develop an electronic learning environment to scaffold the development of reflective abilities within a Bachelor of Education course. The goal of the research project was to develop a set of design principles (Phillips, McNaught, & Kennedy, 2011) to guide the development of ePortfolio-based learning environments. The primary focus was to develop and trial an electronic learning environment with pre-service teachers in a higher education setting. This environment was developed based on a systematic implementation and review process.
The terms eLearning environment, ePortfolio based Learning Environment and teaching environment are used interchangeably throughout this thesis to describe an electronically based teaching space. Although there are a number of uses for these terms throughout the literature on electronic learning platforms, this project refers to the environment as the ePortolio platform of PebblePad. The environment included the prompting blog developed to facilitate the provision of additional resources and support to the students, as well as the students’ own space where they were able to work on their research projects. The researcher’s role was to develop and maintain the environment to facilitate the development of reflection.

The research study

A Western Australian metropolitan university was the context for the research project. This institution was trialing the PebblePad ePortfolio platform in several teaching units across the campus. As part of an action research semester unit in the School of Education, the unit coordinator adopted an ePortfolio system to promote students’ reflection and further engage them in the action research process.

This action research unit was a component of the 4th year of the Bachelor of Education degree that required students to complete a research project to improve their teaching practice in an area of their choice. The group of students involved in the research came from both campuses of the university. Across the two campuses, there were a number of mature aged students and as is often the case in primary teaching degree programs, the population was predominantly female. Most of the pre-service teachers had to this point completed their degrees as internal students attending on-campus lectures and tutorials. This meant that they had had limited experience with online learning platforms and the use of digital discussion forums. The student cohort enrolled at the regional campus was small group that had been studying together for the entire degree program so was a particularly close group that had developed strong relationships across the period of their studies. These study habits and relationships are important considerations for the design of learning environments.
The ePortfolio had been used in previous years within the unit mainly for low-level activities such as submitting assignments. The students were encouraged to use the platform for other aspects of their individual projects, however, there were two key issues that students confronted when using the ePortfolio. These were technical issues relating to the use of the platform itself and the level of support provided to the student group. This led to further examination of the methods to scaffold the development of reflection and the suitability of the ePortfolio platform for this process.

The review of the literature on ePortfolio implementation recommended a systematic approach to the adoption of such platforms (Clark & Hardham, 2010). The approach of this research study aimed to develop a framework specifically for the implementation and review of electronically-based platforms for teaching and learning. The eLearning Lifecycle developed by Phillips, McNaught and Kennedy (2011) is based on the processes of both action research (Kemmis & McTaggart, 2000; McNiff, Lomax, & Whitehead, 2003) and design-based research (Herrington, Reeves, & Oliver, 2010) to present a cyclic approach of act and review towards improvement in practice.

For this study the cycles of act and review were completed over the space of one year with two iterations of implementation. This consisted of placing prompts into the learning environment to guide reflection and then a review of the effectiveness of these strategies. Between the two cycles of implementation changes were made based on analysis of the data collected in the first iteration, including feedback from the student cohort. Changes were also based on the issues identified by the researcher and the teaching team within the unit as the research progressed.

At the conclusion of the second research implementation within the teaching unit, data were collected to examine the effectiveness of the different components of the implemented learning environment. Data collection consisted of an online survey, focus group and individual interviews, retrieval of usage data from within the ePortfolio platform and the collection of student work samples. The analysis and interpretation of the range of perspectives gained across different types of data allowed for a more detailed picture of the student experience to emerge. From early in the research,
however, a number of limitations emerged with the implementation of the study.

**Limitations of the Research Study**

Two key limitations that were identified early in the research study were the timing of the implementation of the environment and the level of involvement of the researcher within the teaching unit. These two limitations are discussed here, while other limitations that emerged throughout the research implementation are discussed where applicable throughout the thesis.

The timing of the implementation of the environment posed difficulties for the research implementation. The students were completing the 4th and final year of their Bachelor of Education degrees. At this stage, they had developed study habits they had implemented throughout this time and many did not use computer-based systems as part of their regular learning. The ePortfolio environment had not been provided to them prior to this teaching unit and so became a new platform that they were required to learn at a time when they felt that their workload had significantly increased. The timing also reduced the students’ ability to collect and collate evidence of their practice over an extended period of time which may have increased their engagement with the platform.

The other limitation to be discussed here concerned the role of the researcher within the students’ projects. To minimise the concerns of the ethics committee towards the research study, the researcher did not take on a tutoring role in the unit for the time of the research implementation. This was a positive in that there was no bias or pressure on students to be involved in the research but also meant that some of the advice and guidance may not have been designed to fully meet the needs of the students. As a tutor, the researcher would have been more in-tune with the students’ progress within their individual action research projects and may have been able to cater more specifically for their individual needs through the ePortfolio-based learning environment.
Despite these limitations, the research study was implemented with some minor changes. These changes are discussed in the relevant chapters and further attention given to these limitations as relevant throughout the thesis document.

**Research questions**

The overarching research question that guided the study was:

*In what ways can an ePortfolio platform provide an environment for scaffolding reflection in pre-service teachers?*

This was investigated through the three research sub-questions of:

- How effective are the prompts and learning activities provided in the environment in increasing engagement and developing students’ reflections?
- To what extent were the trial strategies successful in developing reflective interactions among students and why?
- What impact does engagement in the ePortfolio environment have on the level of students’ written reflection?

The answers to these questions provided an overview of the effectiveness of the ePortfolio based learning environment in scaffolding the development of reflective abilities in pre-service teachers. By identifying the factors that were successful in this area, the research aimed to provide strategies that could be implemented within other higher education institutions to assist in the enhancement of reflection. The details of these findings and the conclusions drawn from this implementation are provided in this thesis. This includes the recommended design principles for this and similar learning environments to facilitate, not only the development of reflection, but other areas of higher education.

**Organisation of the thesis**

The thesis has eight chapters including this introduction which outlines the research project. The focus of the thesis was the identification of design principles for an ePortfolio-based learning environment that would scaffold the development of reflection in pre-service teachers.
Chapter 2, the literature review, outlines literature related to reflection in higher education, particularly in the preparation of teachers, and describes why this process is important. The examination of the cited literature is organised under the Framework for Teacher Reflection that provided the theoretical basis for the implementation of the research project and guided the data collection and analysis process. The literature review also describes some of the research into the use of ePortfolio platforms and explains why this format was chosen as the environment for this project.

Chapter 3 outlines the methodology of the research. This chapter describes the eLearning Lifecycle (Phillips et al., 2011) that was developed based on the tenets of action and design-based research methodologies that guided the implementation process. This chapter includes the description of the cycles implemented in the research and the methods of data collection and analysis applied through the research study.

Chapter 4 provides the details of the research implementation. This chapter includes the description of the environmental prompts provided to the students within the environment. It details the cycles of implementation and provides some early results of the research process and the initial design principles that emerged.

Chapter 5 is the first of the results chapters. It examines the findings in relation to the first research sub-question that focused on student engagement with the environment. The discussion here is organised by the categories that emerged from the coding process. The chapter closes with the examination of case studies of two students and their experience with the ePortfolio-based learning environment.

Chapter 6 focuses on the second research sub-question relating to the interaction among the students. The findings in this area are outlined in terms of the categories that arose through the data analysis process. These included the use of other discussion platforms by the students and the preference for face-to-face interactions that were not facilitated in the external nature of the action research unit. This chapter closes with a review of two case studies of students who used the ePortfolio platform to differing degrees.

Chapter 7 is the final findings chapter and centers on the third research sub-
question. The focus in this chapter is on the level of students’ reflective writing after engagement with the activity prompts. The data and categories identified from the axial coding of this sub-question are discussed in turn. The chapter incorporates two additional case studies to deepen the description of the findings in relation to the students’ experiences with the ePortfolio environment.

The final chapter (Chapter 8) summarises the results detailed through the findings chapters in relation to the theoretical foundations of the research study, and draws together the components to answer the overarching research question. Conclusions are drawn from the research project and the design principles are further explained. These are in terms of recommendations for the use of ePortfolio-based learning environments to scaffold the development of reflection. The concluding chapter provides possible uses of the frameworks employed in this study for further research in the areas of reflection and ePortfolio, as well as other areas of educational research.
CHAPTER 2

Reflection and ePortfolio Research in Higher Education

This chapter reviews the literature on reflection and why it is considered to be a critical aspect of teacher education programs. Discussion of common factors identified from the various theoretical approaches is organised using the Framework for Teacher Reflection (Colton & Sparks-Langer, 1993). This model provided the theoretical foundation for much of this research project. The reasons for this choice of model are also explained. The literature chapter continues with a review, and explanation of the use of an electronic portfolio or ‘ePortfolio’ for implementation in this research study. This discussion leads into Chapter 3 which outlines the methodology chosen.

What is reflection?

The term reflection can encompass a number of perspectives including reflective thinking (Dewey, 1933), reflective learning (Boyd & Fales, 1983), reflective teaching (Bailey, 1997), critical reflection (Mezirow, 1997), or mindfulness (Tremmel, 1993) depending on the focus of the author. There are similarities across these ideas and most involve a series of levels or hierarchy of reflection from descriptive to critical from which to review experience. With a plethora of literature written about reflection in various fields, including education at all levels, it is important to clarify how the term reflection was used within this study.

Since the early 1900s the term reflection has been discussed and many definitions have been proposed (Penso, et al., 2001). A simple dictionary definition is “a fixing of the thoughts on something; careful consideration” (The Concise Macquarie Dictionary, 1982). When Dewey first proposed the 20th century conception of reflection (Hatton & Smith, 1995), he argued that reflection is the “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusions which it tends” (Dewey, 1933, p. 9). More recently, reflection has been described as a “complex process that strongly influences learning by increasing understanding, inducing conceptual change, and promoting critical evaluation and knowledge transfer” (Strampel & Oliver,
It has also been described as a “transformative process” that enables “access to deep and substantive knowledge” (Barton & Ryan, 2013, p. 3). These descriptions were applied when specifically looking at “academic reflection, as opposed to personal reflection, [which]… involves a conscious and stated purpose, and needs to show evidence of learning” (Ryan, 2011b, p. 101).

The definition used throughout this research came from the work of Tripp and Rich (2012). They proposed reflection to be “a self-critical, investigative process wherein teachers consider the effect of their pedagogical decisions on their situated practice with the aim of improving those practices” (p. 678). This definition was chosen as it focused on improvement in practice within a given context and Rogers (2001) noted that the context of reflection was important.

In a conceptual analysis of reflection in higher education, Rogers (2001) examined numerous approaches to reflection and recognised important implications for higher education settings. Rogers (2001, p. 40) identified “no fewer than 15 different terms being used to describe reflective processes.” These definitions included terminology in relation to general terms as well as the timing and content of the reflection.

The general terms used to define reflection included those of Dewey’s (1933) reflective thought, reflective learning (Boyd & Fales, 1983), reflective teaching (Bailey, 1997), academic and personal reflection (Ryan, 2011b) and reflective thinking (Barton & Ryan, 2013). The terms related to timing included the three key timeframes of before, during and after the experience or event at the centre of the review process.

Reflection that occurs before an event has been termed anticipatory reflection (Seibert & Daudelin, 1999) and involves the planning that may happen before entering the educational setting. Reflection at the time the experience occurs has been described by Schön (1983) as reflection-in-action. Other authors have documented the ideas of active reflection (Seibert & Daudelin, 1999) and thoughtful action (Mezirow, 1991). These require the practitioner to think on their feet and make changes immediately. Finally reflection-on-action (Schön, 1995), retrospective (Loughran, 1996) and proactive reflection (Seibert &
Daudelin, 1999) occur after the challenging incident or change has been made. This post-style reflection may even occur over an extended period of time to explore alternatives for the future (Hatton & Smith, 1995). Ramsey (2010) provided a different perspective on this compartmentalised timing by suggesting that reflection that takes place after the event is actually blended with the reflection that occurred prior to and during the experience. This more recent idea lends itself to the ongoing process of reflection towards improvement.

The final area of terminology Rogers (2001) discussed was that of the content or the information upon which the reflection focused. There had been a general consensus that reflection was concerned with problem solving or problem-based learning (Dunlap & Grabinger, 2003). However, it could also be used to encourage “reaction to practical events, often not deliberately directed towards the solution of specific practical problems” (Hatton & Smith, 1995, p. 35). The key element in outlining the content of reflection is the focus on learning from experience and “the process of internally examining and exploring an issue of concern” (Boyd & Fales, 1983, p. 100).

A concern identified through the literature was that the terms used to define reflection were “often ill-defined, and have been used rather loosely” (Hatton & Smith, 1995, p. 33). Rogers (2001) discussed the definitional components of reflection and claimed that when the numerous theories and practices of reflection were integrated it was recognized as a cognitive and affective process that:

1. required active engagement;
2. was triggered by an experience;
3. involved examining ones beliefs and ideas; and
4. resulted in a new understanding of practice (Rogers, 2001).

Table 2.1 provides an overview of these definitional areas from Rogers (2001) as well as the other common factors of reflection identified in his review.
Table 2.1: Common factors identified across various theoretical approaches to reflection (simplified from Rogers, 2001, p. 39)

<table>
<thead>
<tr>
<th>Common Factors</th>
<th>Variations Used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Terms</strong></td>
<td></td>
</tr>
<tr>
<td><strong>General terms</strong></td>
<td>Reflective thought</td>
</tr>
<tr>
<td></td>
<td>Managerial reflection</td>
</tr>
<tr>
<td></td>
<td>Mindfulness</td>
</tr>
<tr>
<td><strong>Terms based on timing</strong></td>
<td>(1) Before</td>
</tr>
<tr>
<td></td>
<td>Anticipatory reflection</td>
</tr>
<tr>
<td></td>
<td>(2) During</td>
</tr>
<tr>
<td></td>
<td>Reflection-in-action, Contemporaneous reflection, Thoughtful action with reflection, Active reflection</td>
</tr>
<tr>
<td></td>
<td>(3) After</td>
</tr>
<tr>
<td></td>
<td>Reflection-on-action, Retrospective reflection, Reactive reflection, Proactive reflection</td>
</tr>
<tr>
<td><strong>Terms based on content</strong></td>
<td>Content</td>
</tr>
<tr>
<td></td>
<td>Process</td>
</tr>
<tr>
<td></td>
<td>Premise</td>
</tr>
<tr>
<td><strong>Antecedents</strong></td>
<td>Triggered by unusual or perplexing event</td>
</tr>
<tr>
<td></td>
<td>Requires readiness, willingness and conscious choice on part of learner</td>
</tr>
<tr>
<td><strong>Contextual Factors</strong></td>
<td>Context influences reflection either positively or negatively</td>
</tr>
<tr>
<td></td>
<td>Solutions arrived at in one context may not be applicable in another</td>
</tr>
<tr>
<td></td>
<td>Context includes both individual and environmental factors</td>
</tr>
<tr>
<td></td>
<td>Contextual factors can be altered</td>
</tr>
<tr>
<td><strong>Definitional Components</strong></td>
<td>Cognitive and affective process or activity</td>
</tr>
<tr>
<td></td>
<td>Requires active engagement on part of individual</td>
</tr>
<tr>
<td></td>
<td>Triggered by an unusual or perplexing situation or experience</td>
</tr>
<tr>
<td></td>
<td>Involves examining one’s responses, beliefs, &amp; premises</td>
</tr>
<tr>
<td></td>
<td>Results in integrating new understanding gained into one’s experience</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>(1) Identify a problem and make a deliberate decision to seek a solution</td>
</tr>
<tr>
<td></td>
<td>(2) Collect additional information regarding the problem</td>
</tr>
<tr>
<td></td>
<td>(3) Plan a solution and make a decision to act</td>
</tr>
<tr>
<td></td>
<td>(4) Take action based on the plan</td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>Education (e.g., reflective practical based on models of arts education)</td>
</tr>
<tr>
<td></td>
<td>Use of a coach or mentor</td>
</tr>
<tr>
<td></td>
<td>Use of structured experiences used alone or in group setting (e.g., questions, critical incidents, journals)</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>Learning</td>
</tr>
<tr>
<td></td>
<td>Enhanced personal and professional effectiveness</td>
</tr>
</tbody>
</table>

There is also the expectation that there are many levels to the reflective process. Reflection has often been described in terms of “different types or hierarchical levels” (Ryan, 2011b, p. 100). The most recognized levels in written reflections move from reporting or descriptive levels, through relating and making links to practice; to reasoning and investigating theoretical perspectives; to finally reconstructing practice to assimilate the new information (Ryan, 2011b, 2013). Zeichner and Liston (1987) outlined three levels of reflection from technical rationality, to practical action, to critical reflection, while Strampel and Oliver (2007) discussed the levels of reflection.
as leading from a descriptive tale to critical analysis with each level involving cognitive processing that, at the more critical levels, lead to deep learning. At the more advanced levels, it is believed that “critical reflection involves thinking and problem solving” (Yost, Sentner, & Forlenza-Bailey, 2000, p. 40) yet it “does not just provide new facts; it opens opportunities to experience the world and oneself in a fundamentally different way” (Sengers, Boehner, David, & Kaye, 2005, p. 50). These ‘higher levels’ or critical elements of reflection were the aim of the developmental process in the current study, as they allowed for higher levels of thinking to occur. Care needed to be taken, however, to ensure that the examination of reflection was not reduced to a checklist process (Boud, 2006).

Boud (2006) raised concerns that reflection should not be reduced to an assessment task that directed students towards a recipe for reflection or to reflect without learning. In examining how reflection should be rehabilitated, Boud (2006) highlighted the need for the process to be linked to practice and not overintellectualised. The need for the process to be linked to practice was further emphasized by Atherton (2011) who proposed that reflection was being given too much importance in education. To avoid these concerns this study aimed to encourage pre-service teachers to write about their practical experience, then examine their own reflective writing. It was hoped they would be encouraged to develop these higher levels of reflection through the use of the **4R’s of reflection**.

The 4R’s of reflection was developed as part of a research project conducted by a team at the Queensland University of Technology (QUT) led my Mary and Michael Ryan. The *Developing Reflective Approaches to Writing (DRAW) Project* was aimed at “developing a systematic, cross-faculty approach to teaching and assessing reflective writing in higher education” ([www.drawproject.net](http://www.drawproject.net)). The 4R’s were described by the QUT research team as “a simple scale” that was “general and accessible” and could “be readily adapted with different prompting questions for specific disciplines or activity types” ([http://www.drawproject.net/reflection](http://www.drawproject.net/reflection)).

The model was developed from an adapted version of the scale identified by Bain, Ballantyne, Mills and Lester (2002) and a detailed review of literature in the areas of reflection and reflective practices in higher education. The visual
representation given to the model (Figure 2.1) provided a clear framework for approaching reflective writing.

<table>
<thead>
<tr>
<th>Level</th>
<th>Stage</th>
<th>Questions to get you started</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reporting and Responding</td>
<td>Report what happened or what the issue or incident involved. Why is it relevant? Respond to the incident or issue by making observations, expressing your opinion, or asking questions.</td>
</tr>
<tr>
<td>2</td>
<td>Relating</td>
<td>Relate or make a connection between the incident or issue and your own skills, professional experience, or discipline knowledge. Have I seen this before? Were the conditions the same or different? Do I have the skills and knowledge to deal with this? Explain.</td>
</tr>
<tr>
<td>3</td>
<td>Reasoning</td>
<td>Highlight in detail significant factors underlying the incident or issue. Explain and show why they are important to an understanding of the incident or issue. Refer to relevant theory and literature to support your reasoning. Consider different perspectives. How would a knowledgeable person perceive/handle this? What are the ethics involved?</td>
</tr>
<tr>
<td>4</td>
<td>Reconstructing</td>
<td>Reframe or reconstruct future practice or professional understanding. How would I deal with this next time? What might work and why? Are there different options? What might happen if...? Are my ideas supported by theory? Can I make changes to benefit others?</td>
</tr>
</tbody>
</table>

**Figure 2.1:** 4R’s of reflection ([http://www.drawproject.net/reflection](http://www.drawproject.net/reflection); Ryan, 2011a)

The use of this model was particularly important as the focus was on reflective writing, specifically the linguistic conventions required when writing in this genre (Ryan, 2011b). The majority of reflection that students are required to do in their Bachelor of Education degrees is in the written form due to assessment requirements, however, the process of writing reflections is in itself an important component.

Writing can be described as a social learning tool, where the student can be mentored along the continuum of reflection (Yost et al., 2000). It is believed that “the act of writing facilitates deeper analysis of the experience through assessing and articulating it” by allowing the writer to “stand outside the experience” and be more objective and emotionally detached (Pavlovich, 2007, p. 284). A number of studies completed by Yost and colleagues (2000) have shown that when engaged with journal writing over time, pre-service teachers can develop the habit of reflection. Other studies have found that peer and academic collaboration focused around reflective writing in case stories can help pre-service teachers evolve towards higher levels of thinking skills (Hunter & Hatton, 1998). This process should begin with actively
reading about reflection and problem solving (Dieker & Monda-Amaya, 1997) and the promotion of reflective thinking through the provision of questions to answer (Smyth, 1992). The critical or academic levels of reflection that are on the higher levels of any reflective scale require more detailed links between theory and practice as well as the focus on improvement to practice from a critical theory standpoint. These levels require an academic approach to writing in a genre of critical/transformative reflection (Ryan, 2011b).

Considering the complexity involved in defining, teaching and reviewing reflection, it was important to examine why this process was considered to be so central to education, particularly in the development of pre-service teachers.

**Why reflection is important in education and teacher preparation**

The concept of reflection has been used widely throughout the field of education and in teacher preparation and training (Hatton & Smith, 1995). This section of the literature review explores the development of reflection in teacher education programs and how societal changes have highlighted the importance of these abilities in graduate teachers. There is also further discussion of the shortfalls identified in current practice in the development of reflection in pre-service teachers.

When Dewey first wrote about reflection in the early 1900s it was in terms of education and although other disciplines use reflective components, much of the literature and research continues to be completed in this field. Reflection has specifically been seen as a “key component of the scholarship of teaching” (Pelliccione & Raison, 2009, p. 272) because the scholarship of teaching requires knowledge of literature and the ability of practitioners to make connections with this information to enhance their teaching and learning. Priest and Sturgess (2005, p. 1) argued that this “scholarship cannot happen without reflection” and as such was vital for teachers. It is recognised that teachers are educators whose role includes an expectation that they will transform young people and to do this they “must possess the dispositions to teach the person” (Wenzlaff, 1998, p. 564, 565). This required the ability to adapt to the increasing complexity of their roles (Hawkes, 2001) in “the rapidly changing knowledge society” (Gikandi, 2013, p. 8).
In teacher education programs, particularly during practical experience, there is a need for active engagement in “connecting theory with practice, so that [students] will develop a rationale for their teaching practices” (McBride, Xiang & Wittenburg, 2002, p. 30). Pre-service teachers come in to their degree with a wealth of background knowledge and experience that must be “reconstructed in the context of becoming a teacher and in the creation of a professional knowledge of teaching” (Beattie, 2001, p. v). It has been identified that teacher education programs need to move beyond the emphasis on content that is constantly changing, to a focus on thought processes (Wenzlaff, 1998) that enable continual review and improvement. “Teaching teachers to think must become one of the highest priorities of education” (McBride et al., 2002, p. 30) so that they are more able to understand the control they have over the decision-making processes of their work (Pedro, 2006) and develop strong professional identities (Sutherland, Howard, & Markauskaite, 2010). This process is not easy, particularly when the classroom can be an isolating environment and the practice of that environment is closely linked to the teacher’s personal identity (Justice et al., 2013).

Pre-service teachers need to develop self-directed skills and habits both in pedagogy and practice towards participation in policy-making decision processes (Yost et al., 2000). These policy-making decisions are important for developing an environment that is conducive to reflection (Seibert & Daudelin, 1999) and improving overall teaching practice. “The reflective practice paradigm [is] another way to help teachers learn how to accommodate the diverse needs of their students” (Pedro, et al., 2005, p. 50) and allows them to make ongoing changes to their practice. An additional role of reflection for pre-service teachers is to help them to understand the processes of other classroom teachers they may observe in their practicum experiences. This enhanced understanding may then enable them to gain more insight into the teachers’ thinking processes and practices around teaching and learning (Hsu, 2013).

Despite the long held beliefs on the importance of reflection in education, and the increasing demand of higher education classrooms to create reflective practitioners (Strampel & Oliver, 2008), it has been stated that many teacher
development programs “fall short in allowing opportunities for reflection” (Barak, 2006, p. 133). It appears that despite the ongoing discussion of how important reflection is for the preparation of teachers, the time to teach it is not always allocated (Ryan, 2011b), nor is the scaffolding provided towards clear expectations for use of reflective activities (Ryan & Ryan, 2013). It has been argued that “unless reflection is taught and assessed…then reflective practice in the higher education context will remain superficial” (Barton & Ryan, 2013, p. 2) and the results will continue to be a reaction to events rather than a reflection towards improved practice (Gün, 2011).

As highlighted in the definitional component of this literature review, reflective practice is a complex process that requires engagement from the practitioner with a focus on improved practice (Grundy, 1995). Yet it appears that students are often asked to reflect with no real instruction, scaffolding or feedback to develop these skills (Kember et al., 1996; Ryan, 2011b; Ryan & Ryan, 2013). Teacher education programs may need to question the assumption that students already know how to reflect (Spalding, Wilson & Mewborn, 2002) and begin to provide scaffolding and opportunities for reflection in a variety of modes (Ryan, 2012) at all levels along the reflective continuum (Ryan, 2013).

Some studies have tried to address these needs in recent years. Nelson and Sadler (2013) developed a heuristic to describe and interpret the orientations to, and components of reflection from literature. They highlighted the need for “more attention to the frameworks teacher educators employ to teach their pre-service teachers to reflect” (Nelson & Sadler, 2013, p. 54).

Del Carlo, Hinkhouse, & Isbell (2010) adopted a systematic approach similar to the type recommended by Nelson and Sadler (2013). They used Valli’s Model of Reflection to develop reflective skills outside the classroom context for science teachers. This research used qualitative inquiry with guiding research questions, a theoretical framework and a clear research methodology to engage students with all six modes of knowledge-to-practice suggested by Valli.

The Van Manen model was chosen by Ballard and McBride (2010) to improve reflectivity in Physical Education pre-service teachers through written
assignments and in-depth interviews. The Van Manen model consisted of three sequential stages that must be completed from technical rationality (TR), through practical action (PA), to critical reflection (Ballard & McBride, 2010). The third level of the Van Manen model (critical reflection) was also the goal of Ajayi (2011) who used a cyclic approach with students in an internship program. The phases of the approach incorporated explicit instruction to increase the capacity of students to develop critical reflection in their teaching. This was in terms of thinking and action, making connections between context and personal experience, and evaluation and critique of social structures.

Although these studies all reported some level of success with their implementation, they did not appear to provide great variety in modalities nor did they target all levels of reflection. The multidimensional process of reflection suggested by Etscheidt, Curran, and Sawyer (2012) looked at the technical, deliberative, and critical levels of reflection to allow the “attitudes, and skills of reflection [to be] consciously, explicitly, and systematically developed” (p. 9). It was this need for a multi-dimensional approach that led to the selection of the model for this research project.

There are a number of theoretical models of reflection available. For this research the Framework for Teacher Reflection developed by Colton and Sparks-Langer (1993) was chosen to provide the theoretical basis for the enquiry. This framework was selected as it was developed based on the ideas of three underlying theories of education being cognitive psychology, critical theory and the ideals of motivation and caring (Colton & Sparks-Langer, 1993). The practical components of the chosen framework also aligned with the work of well published authors in the areas of reflective practice and action research, such as Dewey, and Kolb (Colton & Sparks-Langer, 1993). The framework allows for the provision of a range of opportunities in the many areas identified by Rogers (2001) towards the development of not only the skills required to complete the process of reflection, but also the attributes associated with being reflective practitioners.

The next section of this literature review explains the theoretical underpinnings of the three areas that provided the bases for this research study and outlines how they link to the components of the framework for
teacher reflection. It also discusses how the model aligned with the common factors of reflection identified by Rogers (2001) (Table 2.1) and how the framework was used in this research study. A matrix of these components is also included as Appendix II to provide a visual representation of the relationships.

The framework for teacher reflection

The framework for teacher reflection was developed by Colton and Sparks-Langer in 1993 at a time when they felt “teacher education [was] at a turning point” (p. 45) due to increased pressure of accreditation guidelines. More complex questions were being asked of teachers in terms of their vision for teaching and the explicit identification of “what knowledge and thinking skills” were needed by teachers (Colton & Sparks-Langer, 1993, p. 45). In developing a conceptual framework to guide the development of teacher reflection and decision making, Colton and Sparks-Langer reviewed the theories of cognitive psychology, critical theory as well as motivation and caring. Each of these theoretical aspects are outlined below with the direct links to the framework components shown in the research matrix (Appendix II).

Cognitive Psychology

The theory of cognitive psychology encompasses the ideas of constructivist theory, experiential learning and the different thinking patterns of novice and expert teachers. It focuses on the examination of the process of learning. In cognitive psychology, this process gives autonomy to the learner as they acquire strategies to develop knowledge (Lefoe, 1998).

Constructivist theory specifically focuses upon the active process of constructing knowledge through a method that is supported by others (Cunningham & Duffy, 1996). The progression involves the interpretation of objects and events based on prior experience, mental structures and beliefs (Jonassen, 1994).

A key component of constructivist theory is the ideas of experiential learning. This style of scholarship requires the learner to seek understanding of an issue (Kolb, 1984). Kolb (1984) examined the works of Dewey, Lewin and
Piaget and identified that experiential learning required learning to be viewed as a process that was continuous and grounded in experience. It also involved a holistic approach to resolving conflicts via interaction with others with the aim of creating knowledge.

It was believed that this experience and involvement in learning differentiated novice teachers from experts. Studies involving these two groups of professionals identified that the schema of expert teachers allowed them to more quickly and effectively access pedagogical reasoning in making decisions (Anderson, 1984). The experience of expert teachers also allowed them to complete routine tasks with more automaticity or as Borko and Livingston (1989) proposed they could complete an improvised performance as they had more domain specific knowledge (Berliner, 1986).

These theoretical understandings provided input into a number of components of the Framework of Teacher Reflection as outlined in Appendix II. The second area of theory that Colton and Sparks-Langer drew from was that of critical theory.

**Critical Theory**

A dictionary definition of critical theory highlights it as “a philosophical approach to culture...that considers the social, historical and ideological forces that produce and constrain it” (Oxford Dictionary of English, 2014). For educators, critical theory identifies that decisions by teachers need to be made in relation to the culture they are working in and provide a framework from which to evaluate their work (Gutman, 1987).

Colton and Sparks-Langer (1993) identified that critical theory is reliant upon critical reflection. This level of reflection requires an awareness of alternative and conflicting theories in making decisions and provides the critical frame from which to link knowledge to practice (Van Manen, 1977). These ideas underpin the framework in that reflective practitioners are able to make these decisions as they display the attributes of reflective thinkers.

Teachers who are able to identify relevant theories and make decisions that they feel will be of benefit to the students in their classes are described as having a high level of self-efficacy (Ashton, 1984). The importance of self-
efficacy has been the focus of several studies (Klassen, Al-Dhafri, Hannok, & Betts, 2011; Klassen et al., 2013; Pajares, 1992; van Dinther, Dochy, & Segers, 2011), several of which have linked it with the third theoretical base of the Colton and Sparks-Langer (1993) framework being motivation and caring.

**Motivation and Caring**

The final theoretical areas that Colton and Sparks-Langer drew from were those of motivation and caring. The grounding belief in this area was that “reflective teachers are motivated to grow...[and]...willing to take risks and to learn continuously” (Colton & Sparks-Langer, 1993, p. 46).

“Motivation is a complex psychological construct that attempts to explain behaviour and the effort applied to different activities” (Watters & Ginns, 2000, p. 302) and has been proposed as a theoretical framework within which to base pre-service teacher programs (Cohen, 1983). It has been suggested that pre-service teachers need to model enthusiasm for learning (Watters & Ginns, 2000) as their beliefs are critical in determining the educational practices they demonstrate (Pajares, 1992).

One of the key components of motivation is self-efficacy or the belief that the teacher can make a difference in the students’ lives. Research has shown that pre-service teachers with higher levels of self-efficacy are more able to effectively problem-solve and this in-turn reduces the stress levels they experience within the classroom (Klassen et al., 2013). Teachers that are more able to deal with the stress of the classroom are more available for their students and can work to provide the caring learning environment that has also been identified as important.

In adding the area of caring to the framework for teacher reflection Colton and Sparks-Langer drew on the work of Noddings (1984) who supposed that teachers needed to model and provide caring for all students as a basis for the equality required within the classroom. It is believed that a caring, nurturing environment that models to the students an enjoyment of learning, is also more likely to have a positive impact on their development of knowledge and ongoing motivation to learn.
In drawing these areas of theory together, Colton and Sparks-Langer (1993) developed the Framework for Teacher Reflection as a basis for designing educational programs that enhanced reflection in the areas identified. An adapted version of the pictorial representation of this framework is shown in Figure 2.2.

![Framework for Teacher Reflection](image)

**Figure 2.2:** Framework for Teacher Reflection (adapted from Colton & Sparks-Langer, 1993, p.48)

Since its development, the Colton and Sparks-Langer (1993) framework has been used in publications on topics including professional practice (Danielson, 2007) and instructional leadership (Blase & Blase, 1998) as well as over 120 articles on topics such as: ‘demystifying’ reflection (Spalding, Wilson, & Mewborn, 2002); reflection in computer-mediated environments (Hawkes & Romiszowski, 2001); scaffolding reflective journal writing (Lai & Calandra, 2007); and taking reflection into the real world of teaching (Pedro, 2006). The sections of the framework made it adaptable to many settings, either as separate entities or the framework as a whole. The extent to which it has been used was testament to its strength as a model that guides the implementation of programs that target the enhancement of reflection in pre-service teachers.
The framework was also selected as each section could be integrated with the common elements of the theories of reflection identified by Rogers (2001). This conceptual analysis discussed earlier examined research on reflective practice, action research or journal writing, to develop programs that may increase reflective abilities in pre-service teachers. Table 2.2 provides the outline of how the ideas of Colton and Sparks-Langer (1993) and Rogers (2001) work together within the sections of the framework as it was applied in this research study. A detailed explanation of each section then follows.

<table>
<thead>
<tr>
<th>Table 2.2: Overview of the framework to other approaches to reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Action</td>
</tr>
<tr>
<td>Decisions of reflection</td>
</tr>
<tr>
<td>Action research</td>
</tr>
<tr>
<td>Methods &amp; Outcomes (Rogers, 2001)</td>
</tr>
<tr>
<td>Systematic procedures and opportunity</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attributes of Reflective Decision Makers</th>
</tr>
</thead>
<tbody>
<tr>
<td>The link to the dispositions of reflective practitioners that led to the choice of the Enculturation Teaching Model</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collegial Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Context defined by Rogers (2001)</td>
</tr>
<tr>
<td>The link to the teaching model being developed to provide the environment for the students in the ePortfolio space</td>
</tr>
</tbody>
</table>

**(1) Action**

The action part of the framework draws most strongly from the theories of cognitive psychology. This section was concerned with the decisions of reflection. It used the model of action research to frame the planning, implementation and evaluating process of a reflective practitioner. The aim of action research was to “provide pre-service teachers with the desire and tools necessary to fulfill their professional responsibilities” (Yost et al., 2000, p. 44).
There are a number of strong models of action research and reflective practice that have been used in education. McNiff (1995, pp. 90–3) suggested some important questions to ask when thinking about action research including:

- What is my concern?
- Why am I concerned?
- What can I do?

Grundy (1995) outlined a clear spiral process of plan → act and observe → reflect that could be practically implemented within an action learning project. The process of completing this cycle of action learning is often referred to as action research. Action research has long been identified as a “key ingredient in professional development” (Bryant, 1996, p. 106) and was widely used in the development of reflection.

When Rogers (2001) reviewed the techniques to develop or foster reflection in higher education settings, he did so in terms of the methods. In this discussion it was recognized that the development of reflection was “not a one-way linear process; it is more comparable to alternating current, flowing back and forth” (Boyd & Fales, 1983, p. 105). It was highlighted that in completing action research, it was often difficult to mesh the components of theory and practice together for effective growth and development (Kember et al., 1996).

The methodology of action research blends research and action (practice) into one process. Although it has the narrowest focus on the research continuum, as it looks at solving specific problems (Patton, 2002), it does enable practitioners to “investigate and evaluate their work” (McNiff & Whitehead, 2006, p. 7). It was this ability, to bring the realm of research to the people involved (McNiff & Whitehead, 1993) and focus upon practical concerns and goals of social science (Thomas, 2004), that made action research a practically-based mode of research.

The work of Schön (1983) was important in the action section of this model in terms of looking at reflection-in-action or reflection-on-action. Reflection-in-action occurs when practitioners are thinking about what they are doing, and at the time of being stimulated by a surprise, act upon what they know. The ability to successfully complete the process of reflection-in-action during the
event allows practitioners to deal with uncertain or unique situations that may occur (Schön, 1983).

Alternatively, reflection-on-action was described by Schön (1995) as making the process of reflection explicit after the event, including the action strategies, assumptions, and problem-settings that occurred. Reflection-on-action could take place across one or several separate incidents and often included critique and testing of the strategies and assumptions that were determined. Schön’s work has been criticised for focusing too much on the immediate situation rather than broader change (Gu-Ze’ev, Masschelein, & Blake, 2001), however, in the context of the students’ own action research projects it remains a relevant perspective to utilise.

Although the process of action and reflection appear quite straightforward, they are not linear processes and require the teacher to put themselves at the centre of the review procedure (Tremmel, 1993). This self-directed or problem-based learning (Dunlap & Grabinger, 2003) requires the integration of knowledge and practice (Penso et al., 2001). Here the expectation is that the practitioner can describe what they do, as well as describe how they do it and why they do it that way, which is sometimes missing or hard to clearly articulate in the normal occurrence of practice (Forrest, 2007). The articulation of the process forms part of the development which is why writing reflective entries is an important component of more complex reflection (Pavlovich, 2007).

This section of the model highlights that, in order to develop reflection, students require opportunities for planning, acting and reviewing to occur and for that process to be perceived as realistic and valuable to those involved. Gün (2011) highlighted that systematic procedures were necessary in developing reflection and that time and opportunity for improvement were needed for effective reflection. The facilitation of reflection and conceptual change happens when students are motivated and a state of cognitive disequilibrium occurs until the new information is processed (Gikandi, 2013). The processing of this “experience in terms of self” (Boyd & Fales, 1983, p. 101) creates and clarifies meaning for the person involved in the reflection, but there is a need to move beyond reaction to being proactive in reflective practice (Collier, 1999). To be able to complete the process of internalization
and clarification of understanding, a multimodal approach was recommended to: (a) make sense of the experience and (b) allow for reimagining of future experience (Ryan, 2012).

Recent applications of this type of approach in higher education included the phases of instruction and implementation trialed by Ajayi (2011), and the lesson study approach researched by Myers (2012). In an internship program, Ajayi (2011) trialed a process that included four phases of implementation with the goal of increasing critical reflection as defined by Van Manen. Phase 1 was instruction on the components of reflection while Phase 2 used video recordings for students to reflect and gain feedback and modeling on the four levels of reflective writing. Phase 3 required students to implement a planned experience in the classroom setting then reflect on this experience through an online post as part of the sharing process of Phase 4. This research showed that the process did help the participants to critique their practice and create personalized narratives (Ajayi, 2011).

Myers (2012) alternatively looked at the recently proposed process of the lesson study approach that was developed in Japan. This approach was in its infancy but required students to collaboratively plan a lesson, deliver it, then reflect and revise the lesson to possibly repeat the process. Myers (2012) used the lesson study approach with undergraduate students who worked in groups to become more reflective and effective teachers. The method involved reviewing the students’ reflective writing after being involved in the lesson study process. This research found that reflection was affected by the learner, the environment, and the task; and that students still needed guided discussions on the qualities of good reflection (Myers, 2012).

It was the multi-layer nature of this process, and the recommendations from research such as those presented here, that reinforced the need for a systematic approach towards the development of reflection. The full detail of the systematic approach is outlined in the description of the methodology in Chapter 3.
(2) Constructing Knowledge and Meaning

The Constructing Knowledge and Meaning section of the framework (Figure 2.2) focused on the conscious process of teacher reflection adapted from the work of Kolb and Dewey as a direct link to the theories of cognitive psychology. The experiential learning process developed from the ideas of combining past knowledge and experience into new understandings and was an important part of reflection and construction of knowledge and meaning.

While there was overlap between the authors discussed in the Action section of the framework, a number of the common factors from Rogers’ (2001) conceptual review, relate to the collaborative process of reflection and the purpose or planned outcome of the process. In its theoretical frameworks, action research is said to have had its basis in the epistemological assumption that knowledge was created through action and the relationship between practice, value, and logics (McNiff & Whitehead, 2006). It was discussed in terms of how we acquired and understood knowledge and that the creation of this knowledge was a collaborative process undertaken by groups of people who were focused on the same problem (Hampshire, 2000; McNiff & Whitehead, 2006; Peters, 1997). The collaborative process could also have been facilitated by a mentor or coach whose role was to assist in guiding the reflective process.

Gün (2011) used the term coach to identify the external process applied to assist students to become better reflective practitioners and apply these skills to their future teaching. Both Schön (1983) and Loughran (1996) wrote about the role of a coach or a mentor in fostering reflective habits. Loughran (1996) modeled ‘thinking out loud’ in his classrooms and the use of reflective journals. Alternatively, Tishman, Jay, and Perkins (1993) saw it as part of guiding in practice, with mutual dialogue including both student-student and teacher-student interactions.

The student to student interactions highlighted that the coach role could have been filled by a peer. Parkison (2009) utilised peers in field-based research projects where collaborative reflection was facilitated through a structured guidebook, while other studies have looked at peer coaching (Lee & Choi, 2013) or training buddies (Lamb, Lane, & Aldous, 2013) with placements of
Physical Education pre-service teachers. The interactions in these studies made use of collaboration and support within various environments.

The second area of commonality from Rogers’ work (2001) on Constructing Knowledge and Meaning was that of the outcomes. Most authors examined in Rogers’ (2001) conceptual analysis identified *learning* as the key outcome of reflection. This suggested that reflection was not singularly concerned with problem solving but the integration of new knowledge into existing ideas and understandings. Traditionally, action researchers have not looked for a fixed outcome, but were interested in producing positive theories that show what they were learning and invited others to learn with them (McNiff & Whitehead, 2006). The aim was to make positive changes to the social structures on which the research was founded. “The outcome of the process is a changed conceptual perspective” that placed the self at the source of learning (Boyd & Fales, 1983, p. 101) and resulted in the reconstruction of knowledge (Yost, et al., 2000) or “conceptual change, knowledge transfer and action” (Strampel & Oliver, 2007, p. 980). Sutherland, Howard and Markauskaite (2010) expanded on the idea of personal and social change to incorporate the development of a *Professional Identity*. They believed that an important outcome of reflection was the development of the teachers’ self image and their *teacher voice* in articulating their beliefs (Sutherland et al., 2010). Factors they believed impacted on this development included: the task set; the need for a mentor to assist with the difficult process of reflection; opportunities for private reflections; and clarification of the importance of previous experience in the process. The outcomes of these processes were the key tenets of what was termed *critical reflection* (Hatton & Smith, 1995).

According to Colton and Sparks-Langer (1993), the process of critical reflection required the pre-service teacher to choose to attend to an experience, take part in reflective discussions with others, develop possible solutions, and implement an action plan. The inclusion of ‘discussion with others’ and the ‘development of solutions’ was a much more detailed implementation of the ‘Plan’ phase of the action research model and began to incorporate some of the ideas of critical theory. As such, the Construction of Knowledge and Meaning is differentiated from the Action section of the model. It was more than just action as it required a deeper review and higher
order thinking processes towards the development of new meaning and knowledge (Yost et al., 2000).

Wenzlaff (1998) described this as a personal exploration involving experimentation and reflection. The process allowed for the collaboration of ideas and solutions from a range of perspectives (Callison, 2007). Work in this area by Donaghy and Morss (2007) used a process of reflection, identification of a problem and a discussion with a tutor or mentor, followed by the writing of a more detailed and deeper reflection, to demonstrate the value of constructing meaning through reflection and discussion with others. The move to a deeper level of reflection required some metacognitive awareness (Dunlap & Grabinger, 2003) that may have been developed through these interactions. Metacognition is ‘thinking about thinking’ so metacognitive awareness is becoming conscious of the thinking processes that are occurring through the practices associated with reflection.

This collaborative discussion and interaction in higher education is grounded in social constructivism as a learning model that fosters “personal meaning making and discourse among communities of learners” (Jonassen, Davidson, Collins, Campbell, & Haag, 1995, p. 5). For the purpose of this study, the focus on interaction came from the work of Maor and Taylor (1995, p. 2), who described social constructivism as portraying “the learner as an active conceptualiser within a socially interactive learning environment.” This entailed the epistemology in which learners collaboratively used their own experience to jointly construct new understandings (Taylor & Maor, 2000).

Several authors who have written on social constructivism have also discussed reflective practice, with a similar focus on the situated learning and learning by doing that Dewey proposed in the 1920s and 30s (Cunningham & Duffy, 1996). This highlighted social constructivism as a distinguishing feature of the development of reflection. To enhance the development of reflective abilities there was a need to provide opportunities for pre-service teachers to be involved in the construction of their own understandings. These understandings, however, are embedded in the past experiences of the pre-service teacher, which most strongly relates to the Professional Knowledge Base section of the Framework for Teacher Reflection.
The Professional Knowledge Base section of the framework was derived from the work of authors of reflective teaching such as Shulman, as well as Zeichner and Liston in the areas of critical theory and cognitive psychology (Colton & Sparks-Langer, 1993). Shulman (1987) examined ‘effective teachers’ and found that those who reviewed their practice in terms of good role models were able to make improvements to their own teaching. His focus was on the content knowledge required by teachers, and the pedagogy or teaching practices they used to share this knowledge with their students (Shulman, 1987). This began to highlight the difference between the novice and expert teachers and the schema they have developed through experience (Anderson, 1984; Berliner, 1986). Zeichner and Liston (1987) focused on professional development beyond the initial teacher education program and the development of pre-service teachers who could be involved in partnerships in decision-making and educational policies important in critical theory.

The influences of this section included:

1. pedagogy, both in terms of generic methods and theories as well as pedagogical content knowledge (PCK) (Shulman, 1987);
2. context of the particular setting including the families, the culture, the mix of students, and the timing of the day;
3. prior experience of the teacher and the students; the personal and social values of the teacher including family values, life experiences, and key texts read; and
4. scripts implemented both in terms of the automatic reaction to occurrences while focusing on more critical issues (in-action) and those that guide thinking processes and analysis (on-action and for-action) (Colton & Sparks-Langer, 1993).

In this section of the model (Figure 2.2) the process of reflection was identified to be influenced by the individual’s background knowledge that adds to the development of the pre-service teachers’ worldview (Collier, 1999). This perspective was strongly shaped by their own experiences as a student (Wenzlaff, 1998) and their motivation to become a teacher (Paulick, Retelsdorf, & Möller, 2013). To enhance the ideas within the professional
knowledge base, pre-service teachers needed to be given access to the key texts on reflection (Pedro et al., 2005) that would build their own understandings.

The process of writing as discussed earlier was also identified in the development of the ideas of reflection, particularly in the use of journals and more recently blog style postings. “Reflective writing can promote reflective thinking” (Spalding & Wilson, 2002, p. 1396), however, “reflective writing by higher education cohorts tends to be superficial unless it is approached in a consistent and systematic way” (Ryan & Ryan, 2013, p. 244). One approach that has been trialed in several studies was the use of structured questions to promote reflection. A study by Nolan (2008) had some success with guided reflection techniques to structure reflective writing while Nesmith (2011) found that the type of questions asked by the tutor had an impact on the depth of reflection and the application of course theory.

Other researchers have explored the options of online journaling formats. Online journals were considered to facilitate interactive and collaborative learning (Lee, 2010) by providing a support network (Rettig, 2013) and providing access to a critical friend for ideas and suggestions (Lee, 2010). The findings of these studies were consistent with the notion that reflection does not just happen and that a determined focus on the process, together with assistance in its development is needed.

An important component of this Professional Knowledge Base section, in terms of the examination by Rogers (2001), was the incident or experience that may prompt pre-service teachers to decide to expand on their background knowledge. The two key antecedents identified were “an event or situation beyond the individual’s typical experience,” or what Schön (1995) describes as the surprise, and the inclination or decision by the individual who experienced the surprise to connect to the process of reflection rather than ignoring it. The process of reflection was believed to usually be “triggered by an experience” (Boyd & Fales, 1983, p. 100), or when there was a “disorientating dilemma” (Palloff & Pratt, 2007, p. 187) that required an adjustment to the beliefs of the teacher. There was also a need for the teacher to be interested in the problem at hand so that they had ownership of the dilemma (Gün, 2011). This highlighted the importance of engagement with
the process and the requirement of reflection to have meaning to the person undertaking it.

The feelings link between elements (3) the Professional Knowledge Base and (2) the Construction of Knowledge (see detail in Figure 2.2) also indicated the impact that personal feelings, beliefs, and values had upon this process and how individuals would react to a given situation (Colton & Sparks-Langer, 1993). These personal feelings, beliefs, and values implied that reflection was more than a process that was simply implemented by pre-service teachers. Feelings had an important role in the classroom, particularly in relation to change and the educational outcomes of students (Stenhouse & Jarrett, 2012). These important components are what Colton and Sparks-Langer (1993) identified as the attributes of reflective practitioners. These attributes comprised the outer level of the framework and provided another level for examination of reflection.

Attributes

The previously discussed three sections of the Framework for Teacher Reflection worked together within what Colton and Sparks-Langer (1993) identified as the overall attributes of reflective decision makers. These attributes were listed as: flexibility; social responsibility; efficacy; and consciousness as shown in the outer circle of the Figure 2.2. These four attributes aligned with the areas of critical theory as well as motivation and caring that were considered important for reflective practitioners. Colton and Sparks-Langer (1993) noted that these attributes may not come easily for all students and the development of these aspects of a reflective practitioner took focused effort and guidance. The attributes are not merely a set of skills but a collection of ideals and actions that demonstrate a commitment to, and potential for, reflection. The concept of attributes, or the development of characteristics of reflective thinking rather than simply a set of learnable skills, drew parallels to the work of Tishman, Jay and Perkins (1993) on thinking dispositions.

In a discussion of the dispositions of thinkers, Tishman, Jay and Perkins (1993) identified that having the ability to think was not enough. A disposition required a connection based on ability, sensitivity, and inclination
(McBride et al., 2002). This connection entailed a change in thinking patterns and a consciousness or mindfulness (Tremmel, 1993) to the process. Wenzlaff (1998) defined disposition in a number of ways including: an approximate equivalent; to a habit; through to a definition adapted from Katz and Raths (1985) which suggested “that dispositions are patterns of actions which require some attention to what is occurring in the context of the action” (Wenzlaff, 1998, p. 565). This definition strongly aligned with previously discussed interpretations of reflection, and highlighted that reflection is not just made up of a set of skills or processes, but required some type of habit or disposition to be effective.

Tishman and colleagues (1993) discussed dispositions in relation to thinking that included traits such as being “broad and adventurous;” having “sustained intellectual curiosity;” wanting to clarify and seek understanding; being “planful and strategic;” being “intellectually careful;” seeking and evaluating reasons; and being meta-cognitive or thinking about the process of thinking (Tishman et al., 1993, p.148). These dispositions identified that to be a deep thinker or to be reflective in your learning, there needed to be a conscious engagement in the process, and attention given to the steps and resources required to inquire more deeply. In line with the reflective attributes, these dispositions were just as important as the skills required to reflect or think, and needed to be developed through a different method of teaching (Tishman et al., 1993). The development of these types of dispositions was important in the development of lifelong learners (Wenzlaff, 1998) and critical thinkers (McBride et al., 2002), which were both believed to be important traits of a reflective practitioner.

Ryan and Ryan (2013, p. 244) believed that “deep reflective skills can be taught, however, they require development and practice over time.” In their development of a model to teach and assess reflective practice in higher education (see the 4R’s of reflection Figure 2.1), they supported a systematic developmental approach that fostered reflection on all levels of the reflective scale across programs or courses. It was this type of strategic pedagogic intervention that formed the focus of this research through a teaching model that was suggested to target dispositions.
The approach suggested by Tishman, Jay and Perkins (1993) to develop thinking dispositions utilized an *enculturation model of teaching* based on three clear components. Firstly, the provision of exemplars or examples of practice as models; secondly the encouragement of interaction between the participants in the process; and thirdly “direct instruction ... [through] ...activities” (Tishman et al., 1993, p.150). These components were similar to those suggested by Strampel and Oliver (2007) for the development of reflection through an ePortfolio, which further reinforced the choice of the enculturation teaching model to enhance the reflective attributes of the pre-service teachers. Further explanation of this teaching model is provided in the description of the methodology for the research project. To provide this model, attention needed to be given to the final area of the Colton and Sparks-Langer (1993) model - the *Collegial Environment* (see Figure 2.1).

**Collegial environment**

The final aspect of the Colton and Sparks-Langer (1993) framework was that of the collegial environment and the impact that had on developing reflective practitioners. This collegial environment, or what Rogers (2001) described as the context, was believed to play a pivotal role in the overall development of reflection.

The environment is an important factor in any reflective process, particularly in terms of discussions with colleagues and the opportunities to implement any planned action towards change. The actual environment must be conducive to reflection and include autonomy, feedback, access to and stimulation by others, as well as a level of challenge (Seibert & Daudelin, 1999). Alternatively, if the environment is not flexible, reflective activities may not be able to be implemented which will inhibit purposeful reflective action (Rogers, 2001).

It has been said that reflection must occur in the social context in which the incident or surprise happened (Gün, 2011; Schön, 1995). In the pre-service teacher context, however, there are often “managerial and power-control discourses which can override university learning” (Ryan, 2011b, p. 101) and have a significant impact on the reflection that was made. This conflict between university requirements and the expectations of the teaching context
added to the difficulty in developing reflection for pre-service teachers. “Reflective processes themselves are richly fostered when they take place in a context where peers, colleagues, and critical friends can contribute to and scrutinize ideas, actions and beliefs” (Hawkes, 2001, p. 301).

For pre-service teachers, this collegial environment is difficult to be a part of within educational settings, as they have limited access to school contexts. Traditionally, when pre-service teachers do attend schools, they are there as visitors to the setting and may not have autonomy over the classroom environment. They are there short-term in the role of a student, which often precludes them from becoming a full part of the collegial environment (Phillips & Carr, 2006). This resulted in the need for the collegial environment to be developed elsewhere.

When reviewing the components and identified levels of reflection involved, it became increasingly evident that the development of reflective habits was an extremely complex task and that “unless critical reflection is planned as a part of the process … reflective activities will be sporadic at best” (Hawkes, 2001, p. 311). When working with students on reflection, particularly in the university context, the numerous components that are outlined above need to be clearly articulated in the teaching programs so that students are able to engage in a mutually understood framework for reflection.

To bring the components together for this research study, reflection was reviewed in terms of the descriptions provided by Rogers (2001) and the applications of these in more recent research. The resultant understanding for each component that was applied to this research is outlined below in the order of presentation in Table 2.1.

1. the terms associated with Dewey’s, and Tripp and Rich’s definitions of reflection with a focus on both on-action and in-action (Schön, 1983);
2. the antecedents of instances from the student’s own experience and reflection that prompted them to identify an area of their teaching that required improvement;
3. in the context of the face-to-face teaching environment of the classroom that the students are visiting to implement their projects;
(4) with a **definitional component** that focused on the examination of the students’ beliefs within their practice and engagement towards improvement in their chosen area;

(5) the **process** the students were required to complete was the integration of literature-based research and learning from experience in the classroom;

(6) utilising the **method** of an action research project based on a model they chose;

(7) with the **outcome** being - improvement in their chosen area of teaching and development of reflective abilities towards a more critical style of reflection.

The overall focus was the improvement in teaching practice for the students in the area that they had identified through a self-directed, but clearly scaffolded, action research project. For this facilitation to be successful, it was important to identify a pedagogy that addressed current changes in education design and made use of advancements in technology.

In recent times, developments in technology and changes to the way people communicate and learn have highlighted the importance of the skills of reflective practice and the requirement of teachers to continue to stay current among this increasingly rapid change. Yost et al. (2000, p. 39) believed that “teachers of the future must have the intellectual, moral, and critical thinking abilities to meet the challenges of 21st-century schools.” These abilities included the use of technology in their teaching, and for their ongoing professional development.

**Technology in pre-service teacher education**

Changes in higher education courses have led to the integration of more technology into pedagogical practices. Within programs for pre-service teachers, video technology has been used for some time to enhance reflection, and blogs are well documented in research studies as being effective in facilitating reflective writing. This section of the literature review looks at these two areas in more detail.
The increase in technology use in all aspects of life is having an effect on higher education systems, although the implementation and impact are perhaps not as expected. 1997 saw the first mandated implementation of websites across a tertiary institution and it was from this early stage that the top-down approach showed to be the least effective (Noble, 1998). The findings of a research study carried out across seven countries in 2002 found that when it came to ICT in higher education, (1) change was slow, not radical; (2) the use of ICT was happening in teaching and learning but as part of a more blended approach; and (3) the use of technology was adding to instructor load without any real reward (Collis & Wende, 2002).

More recent research has highlighted that the implementation of technology needs to address concerns around cognitive, emotional and contextual factors (Straub, 2009) and that motivational and enjoyment factors in using the technology were important contributing factors for the perceived usefulness of it (Teo & Noyes, 2011). Computer-mediated technologies are being used increasingly in higher education as “possible contexts for higher-order learning” (Strampel & Oliver, 2010, p. 924) by taking the focus away from rote memorization to learning through making connections with concepts and prior knowledge (Rillero & Padgett, 2012). The trend recently has moved to the use of social constructivist frameworks offered by Web 2.0 technologies, as they are said to be more learner focused (Strampel & Oliver, 2010) and allow for increased access, convenience, and ease of use (Maudoodi, Baldwin, & Jones, 2012).

A review on the use of specifically Web 2.0 technologies by Hew and Cheung (2013) found that it was not the technology itself that had an impact on learning, rather the way it was used to enhance learning. Web 2.0 technologies are constantly evolving (Phillips, McNaught, & Kennedy, 2011) which provides many opportunities for higher education. At the same time this presents challenges in terms of how to integrate the technology into teaching and learning, rather than just adding it on to existing course structures. The successful integration of technology depends on the teachers’ ability to create a socially active learning environment (Sadaf, Newby, & Ertmer, 2013). The research study reported in this thesis aimed to contribute to existing research into the use of technology in higher education to promote
reflection through a platform that built upon the previous use of technology in teacher education, such as video recording and blogging.

A recent literature review related to the use of video in enhancing reflection in teaching incorporated 63 separate studies. In this review, Tripp and Rich (2012) focused on research where students viewed videos of their own teaching practice in numerous contexts. From this review they were able to identify six dimensions of variation across the studies examined. These were:

1. the task type;
2. the manner of facilitation;
3. the extension of both individual and collaborative reflection;
4. the length of the video;
5. the number of reflections; and
6. the tools used for measurement.

The implications identified from these studies were that pre-service teachers appeared to prefer to engage with colleagues during the review of the video. The pre-service teachers also felt that a guiding framework was useful in targeting the reflection, as long as they were able to select the focus of the reflection. The final implication found in this research was that although the use of video did aid change in reflection levels, many studies were not able to specifically outline how this occurred (Tripp & Rich, 2012).

Further to this, advancements in video annotation software allows for the increased use of video to capture practice and show evidence of improvement (Rich & Hannafin, 2009). This process allows for sharing of practice and collaboration through other online platforms such as blogs.

Web-logs or ‘blogs’ have been used for reflection in higher education for some time and have been found to enhance self-regulation skills in students (McMahon, 2013). Blogs are a Web 2.0 based technology that allow the blogger to post entries by typing comments in a similar way to completing a short Word document. The blog interfaces available are generally simple in design with a dashboard section that allows the user to navigate around the blog. Posts allow for links to other resources, including hyperlinks to web-based documents. The availability of these entries to others over the Web is what
has expanded the interest in these platforms in developing communities of practice that may facilitate interaction and enhance reflection.

In 2009, Yang found that the simple interface, community building capacity, hyperlink affordances, and learner centred environment of the blog led to active discussions of teaching theories and the implications of these theoretical ideas amongst pre-service language teachers. The options of sharing resources was also highlighted by Top, Yukselturk, and Inan (2010) as a positive aspect identified by the students themselves. This study found that, although the students did not make full use of the options within the blog platform by completing only what was required for assessment, they did report positive perceptions of the blog itself (Top et al., 2010).

The focus of research into the use of blogs differs in focus from student perception to examination of actual reflection levels. Two contradicting studies that looked at the level of reflection in blog posts were completed by Killeavy and Moloney (2010) and Harland and Wondra (2011). The earlier study found that the blog reflections examined were very descriptive in nature. The conclusion drawn was that more direction and support were required within the online blog platform to facilitate higher levels of reflection (Killeavy & Moloney, 2010).

In contrast, Harland and Wondra (2011) compared blog entries of one group of students to paper assignments of another group and found that the blog entries showed higher levels of reflection in a fewer number of words. There were some other differences in the assigned tasks across the two groups that may have contributed to the results in this study (Harland & Wondra, 2011), but it does demonstrate the importance of peer interaction for reflection.

There have been studies to investigate whether this type of community group can be developed in an online environment. Killeavy and Moloney (2010) believe that for the online interaction to be successful, the group must already exist in another context before it can be transferred to an online space. This inferred that a more blended and integrated approach to the learning environment was required.

More recently, both video evidence and blogs are expanding and being used in a more integrated platform of personal learning spaces and/or ePortfolios.
These electronic platforms are increasing in use in higher education for a variety of purposes, and can also be implemented to focus on the development of reflection in pre-service teachers.

**ePortfolio use in higher education**

Driven largely by government policies around their required use (particularly in the United Kingdom) electronic portfolio, or ePortfolio implementation, has increased over recent years (Clark & Eynon, 2009; Joyes, Gray, & Hartnell-Young, 2009; McAllister, Hallam, & Harper, 2008). An ePortfolio is:

> A collection of authentic and diverse evidence, drawn from a larger archive representing what a person or organization has learned over time on which the person or organization has reflected, and designed for presentation to one or more audiences for a particular rhetorical purpose. (Barrett, 2005, p. 5)

This definition introduces the notion that at a base level, a person may use a simple ePortfolio within a working document comprising a collection of personal records and reflections. At the same time, the ePortfolio has the potential to move beyond this starting point to a more comprehensive presentation portfolio (Pelliccione, Dixon, & Giddings, 2005) that demonstrates skills and abilities and is possibly adapted to meet different purposes (Clark & Eynon, 2009). The traditional focus of an ePortfolio in current implementation models has been on the presentation of a polished and refined end product used to assess a particular set of skills or content knowledge. Such an ePortfolio is similar to the more traditional style of presentation portfolio used in the arts and drama disciplines.

There has been an increase in the use of ePortfolios as an assessment tool (MacEntee & Garii, 2010; Raison & Pelliccione, 2006), particularly in terms of demonstrating skills, abilities, and achievements against set criteria or required competencies (vonKonsky, Oliver, & Ramdin, 2009; Jun, Anthony, Achrazoglou, & Coghill-Behrends, 2007). The advantage of the ePortfolio was that it could utilise a range of digital media (Allan et al., 2003) which provided opportunities for a wide range of assessment submission formats and the provision of evidence towards competency standards (Moran, Vozzo,
Reid, Pietsch, & Hatton, 2013). The use of an ePortfolio has been seen as a more authentic opportunity for students to demonstrate their learning (Raison & Pelliccione, 2006) and allowed for reflection in relation to learning goals and the planning of professional development (vonKonsky et al., 2009). While assessment is an important part of the learning process, this earlier research was primarily focused on an end product and, as such, may not have fully explored the potential of the ePortfolio platform as a learning tool.

A useful extension to the understanding of an ePortfolio is provided by Joyes and colleagues (2009, p. 487) who added that “[b]ehind any product, or presentation, lie rich and complex processes of planning, synthesising, sharing, discussing, reflecting, giving, receiving and responding to feedback.” The description given to these processes was that of ePortfolio-based learning, which gained the attention of the Joint Information Systems Committee (JISC) that works with educational institutions throughout the UK in supporting and promoting the use of digital technologies (Joyes et al., 2009). The planning and analysis affordances of the ePortfolio were integral parts of the learning process that made it an appropriate medium for this research study.

A comprehensive definition of the components of an ideal ePortfolio came from the work of Duncan-Pitt and Sutherland (2006) from the University of Wolverhampton who described it as:

A system that belongs to the learner, not the institution; populated by the learner not their examiner; primarily concerned with supporting learning not assessment; for life-long and life-wide learning not a single episode or a single course; that allows learners to present multiple stories of learning rather than just a simple aggregation of competencies; and, importantly, where access to them is controlled by the learner who is able to invite feedback to support personal growth and understanding. (p. 70)

There are a number of platforms available for ePortfolios, both in open source (available free on the Internet) and commercial formats, that require licenses to be purchased to enable access and use. The complexity of the platforms range from blog-style formats (such as WordPress and Blogger) to integrated personal learning platforms designed for collection and presentation of a
large amount of data in many styles and formats (such as Mahara and PebblePad). Each platform has benefits and disadvantages, depending on the context of use, and the purpose of implementing the ePortfolio. A key purpose that has recently expanded in the use of ePortfolio is in the area of facilitation of teaching and learning environments.

In a 2005 white paper, Dr Helen Barrett, who has been called the “grandmother of ePortfolios” (Barrett, n.d.), advocated that ePortfolios be utilized primarily as learning tools. Barrett (2005) highlighted the processes of learning and assessment built into the practice of developing an ePortfolio. She proposed that the technology was now available to “engage students in active participation” around reflection through “assessing and managing their own learning” (Barrett, 2005, p. 23). As technology is changing so rapidly, this statement is perhaps even truer now, eight years after it was initially made. It has been identified that “without reflection [the ePortfolio] is just a multi-media presentation, a fancy resume, or a digital scrapbook” (Pelliccione & Raison, 2009, p.273).

ePortfolios offer the opportunity to change how teaching occurs as they allow for collaborative learning and the provision of immediate feedback (Strampel & Oliver, 2010). The two components of the ePortfolio that make it possible to use as a learning environment are (1) the process of creating the ePortfolio that can promote learning and (2) the product that represents the knowledge and competence gained (Strampel & Oliver, 2010). The process involves the development of transferable skills beyond the production of an online resume or snapshot of artefacts (Nettleton, Lowe, & Dorahy, 2008).

A number of authors have written of the potential of ePortfolio platforms for teaching and learning (Lorenzo & Ittelson, 2005; Stefani, Mason, & Pegler, 2007; Housego & Parker, 2009; Chesney & Marcangelo, 2010) although to date “evidence regarding portfolio effectiveness is scant” (Shepherd & Hannafin, 2011, p. 189). Throughout the United Kingdom ePortfolios are widely used but the process is still developing due to the variation of views of the range of stakeholders involved (Joyes, Gray, & Hartnell-Young, 2009), with similar patterns occurring in the United States.
In the Australian context, collaborative work such as occurred in the Australian ePortfolio Project (Hallam et al., 2010) have developed some important guidelines around the implementation of ePortfolios for teaching and learning. The key recommendations included that there needed to be a focus on the reason for the ePortfolio (McCowan, Harper, & Hauville, 2005), a clear framework for the implementation that was embedded into the coursework (Hallam et al., 2010), a scaffolded approach that provided pedagogical as well as technical support (Pelliccione et al., 2005), and time allocated for long-lasting change to be effected (Hiller et al., 2007). It was believed that the implementation of these factors would promote a successful environment that provided holistic support to the development of the pre-service teacher, which not only provided a format for presentation of skills and abilities, but facilitated the ongoing development of reflection.

Research on the use of ePortfolios has begun to look at the ways that they can be utilised for teaching and learning although there are still studies being done on the assessment affordances of the ePortfolio and the usability of the platforms for measuring competency against standards. Some of these include the examination of students’ perceptions of this process (Lewis & Gerbic, 2010), however, there is a shift to add other elements to the process. A case study approach was used by Ayan and Seferoğlu (2011) to examine levels of reflective writing within a WordPress ePortfolio platform against Hatton and Smith’s (1994) framework for reflectivity; while Stapleton, Cuthrell, and Smith (2012) paired video narrative with the ePortfolio to attempt to and bridge the theory/practice gap.

Oner and Adadan (2011) used the Mahara platform to set reflection-based tasks for students to complete during an internship placement. They found that timely feedback and the structure of the task was important. A similar approach was used by Shepherd and Hannafin (2011) who embedded question prompts, assignment directions, and support materials within an ePortfolio platform. Their findings suggested careful consideration needed to be given to the cognitive demand required by students and to examine how to ensure that the outcome achieved was worth the extra effort required.

Other research has focused on the role of the ePortfolio in shaping teacher identity (Zhou, Chye, Koh, & Chia, 2013) in a similar way to that discussed by
Sutherland et al. (2010). This study found that although the platform did provide a useful lens through which to explore teacher identity, the context imposed by the practice setting, the institution, and the individual student were still stronger influences (Zhou et al., 2013).

Extending on some of this work, a study by Thomas and Liu (2012) focused, not only on the instructional roles of the ePortfolio in terms of assessment and showcasing skills, but on the development of reflection and reflective practice. This research went beyond examining perceptions of students and staff regarding the ePortfolio to look at the content of the reflective entries. They found that there was a pattern of descriptions and comments about teaching being provided in the reflective entries that they termed the *sunshining process* (Thomas & Liu, 2012). This process involved the students being very positive in their evaluations and using all the *buzzwords* as well as *blameshifting* or *downtoning* any negative aspects of the experience. These positive commentaries were believed to have been included as the ePortfolio was part of assessment and the possibility of it being used for future employment (Thomas & Liu, 2012). The need for the distinction between commentary and reflection in an ePortfolio was also raised by Kidwai, Johnson, Hsieh, Hu, and Buzzetto-More (2010) who named it the *cliché response*. The recommendations from these two studies included the need for specific questions or clear goals of reflection; clear strategies and guidelines for assessment; timely feedback, and online sessions with students to work through any concerns (Kidwai et al., 2010; Thomas & Liu, 2012). These types of strategies could be provided through a more integrated total learning environment within the ePortfolio platform and, as such, were the focus of this research study.

An ePortfolio can provide a working environment within which pre-service teachers can write about their experiences, as well as collate and synthesise evidence from their practice as part of the regular routine in their education (McCowan et al., 2005). They can share and discuss pieces of evidence and learn from other’s experiences (Bolliger & Shepherd, 2010) even though they may not be in the same school setting or able to interact face-to-face. These affordances of the ePortfolio environment explain why it is seen as having great potential in the development of teaching and learning practices, but it
should not be introduced in an ad hoc way, particularly when focusing on reflection (Lorenzo & Ittelson, 2005).

The provision of a total learning environment is important in the development of reflection as it provides the important context for reflective development that was highlighted by Rogers (2001) and reinforced in the discussion earlier in the literature review as part of the Colton and Sparks-Langer (1993) framework for teacher reflection. As such, it was the focus of this research study to develop a framework that could be applied in wider contexts and other ePortfolio platforms to prompt a more systematic approach in the future for the development of reflection.

Much of the research into electronic learning environments and the use of computer mediated communication tools in education was all quite specific to the platform being used. What was needed was a more universal approach with a focus on pedagogical considerations that could be applied across numerous electronic platforms (Lamont, 2007; Shepherd & Hannafin, 2011). This therefore, became the focus of this research study.

Research study framework

The particular challenge of this research was to bring together the ideas and issues identified within this literature review in relation to the development of reflection under the umbrella of the Colton and Sparks-Langer (1993) framework and the use of technology for this process. The method was to apply the enculturation teaching model (Tishman, Jay, & Perkins, 1993) as a practical framework to enhance reflection in pre-service teachers in an ePortfolio based collegial environment. Figure 2.3 illustrates how the components of the study work together towards the goal of this research.
Figure 2.3: Research framework to show overlap of elements

The square around the outer edge of the model represents the ePortfolio-based learning environment within which the scaffolding occurred. The large circles identify the components of the enculturation teaching model implemented in the environment that consisted of examples of reflective practice and writing; the activities to target reflection and the interaction affordance provided within the platform. The text at the intersections of these circles represent the areas of the Colton and Sparks-Langer (1993) framework for teacher reflection that guided the development of the activities and examples provided. Further explanation of the methodology of the study and the details of the planned environment are outlined in Chapter 3.
CHAPTER 3

Methodology of the Research Project

This chapter describes the methodology used to conduct the study and explains the use of the ePortfolio platform as the learning environment. The sections of this chapter comprise an outline of the ePortfolio environment used in the research; a description of the eLearning Lifecycle (Phillips et al., 2011) that guided the cyclic implementation of the electronic learning environment; the multiple methods approach adopted for data collection of the research; and how these data were collated and analysed.

For this research the PebblePad platform was chosen as the ePortfolio environment. This choice was made, not only because it was the platform adopted in the university, but because the platform features were appropriate for the content of the action research unit and offered the capabilities to develop an ePortfolio-based learning environment. The PebblePad platform was designed as a Personal Access Diary in which students could collect and collate evidence in a range of formats to use as learning tools across the complete learning process (Pebble Learning Ltd, n.d.). The version used throughout this research was PebblePad 2.0 which has since been replaced by Pebble+. The formats and asset types discussed here were particular to that earlier version and some of the problematic issues encountered in this research have since been rectified in the new offering. Despite these issues the basis of the platform was strong and the options for sharing the exemplars, providing the interaction space, and imparting the activity prompts were available. Within this platform the research study was implemented following the framework of the eLearning lifecycle.

eLearning Lifecycle

The eLearning Lifecycle developed by Phillips, McNaught, and Kennedy (2011) provided a promising framework for the construction and iterative evaluation of electronic learning environments. The process was described as evaluative research because “in e-learning evaluation research, the evaluation component involves making judgments about the usability and usefulness of an e-learning environment, while the research component involves a search for fundamental understanding” (Phillips et al., 2011, p. 62). Although the
lifecycle was set out in a linear fashion (Table 3.1), it was not designed to be prescriptive, and the research process could be started at any stage of the model for a varying number of iterations, depending on the situation and problem being addressed.

**Table 3.1:** The eLearning Lifecycle (Phillips, McNaught & Kennedy, 2011, p. 115).

<table>
<thead>
<tr>
<th>Research phases</th>
<th>Analysis of problem</th>
<th>Development of solutions</th>
<th>Testing of solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Analysis of problem</td>
<td>Design</td>
<td>Implement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Documents</td>
<td>Questions to ask</td>
</tr>
<tr>
<td>1</td>
<td>Design e-learning artefact</td>
<td>Develop e-learning artefact</td>
<td>Initial trial</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Does the e-learning artefact work technically as it should? How can it be improved?</td>
</tr>
<tr>
<td>2</td>
<td>Refine design</td>
<td>Design e-learning environment which embeds e-learning artefact</td>
<td>Develop e-learning environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Does the e-learning environment work as its designer(s) intended? How can it be improved?</td>
</tr>
<tr>
<td>3</td>
<td>Refine problem analysis</td>
<td>Design e-learning environment which embeds e-learning artefact</td>
<td>Develop e-learning environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>How well does the e-learning environment work to support student learning?</td>
</tr>
<tr>
<td>4</td>
<td>Refine design</td>
<td>Revise e-learning environment</td>
<td>Deploy to students (full trial)</td>
</tr>
<tr>
<td>5</td>
<td>Refine problem analysis</td>
<td>Renfe design</td>
<td>Revise e-learning environment</td>
</tr>
<tr>
<td>6</td>
<td>Refine design</td>
<td>Revise e-learning environment</td>
<td>Deploy to students (live)</td>
</tr>
</tbody>
</table>

The eLearning Lifecycle Framework (Phillips et. al., 2011) was presented as a tool to encourage research into eLearning in a more systematic and rigorous way, while providing a flexible framework that could be adapted to different situations. The authors describe the methodology as being aligned with a “pragmatic paradigm” which was “the most appropriate approach for evaluation research of the effectiveness of e-learning” because it “takes the best features of each paradigm and applies them to the research problem being studied” (Phillips et al., 2011, p. 79).
This model was also chosen because it was based on a review of both action research and design-based research methodologies in a way specifically targeted at eLearning environments (Phillips et al., 2011). The components of the two methodologies are briefly described below in terms of how they applied to the implemented methodology of the eLearning Lifecycle.

Action Research

Phillips et al. (2011) describe action research or action inquiry as “an umbrella term for the deliberate use of any kind of a plan, act, describe, review cycle for inquiry into action in a field of practice” (Phillips et al., 2011, p. 88). Action research blends the fields of theory and practice together (Cumming-Potvin, 2007) to allow practitioners to examine their own work (McNiff & Whitehead, 2006). The focus is on practical concerns (Thomas, 2004) and has been shown to encourage self-directed or problem-based learning (Dunlap & Grabinger, 2003).

Based on these definitions of action research, it was clear that while it was sufficient for the students to complete this style of research, the wider study needed to move beyond the “individual teaching practice” to examine the products developed in the eLearning environment (Phillips et al., 2011, p. 89). For this reason the framework was extended to incorporate some elements of design-based research approaches.

Design-Based Research

The definition of design-based research provided by Phillips and colleagues (2011) was:

In design-based research practitioners and researchers work together to define problems, develop evaluation-research designs, collect data, consider the findings, and then generate design principles for two purposes – to guide further refinements in the e-learning artefact lifecycle under consideration, and to make contributions to wider theory on e-learning design principles and student learning. (p. 90)
Design-based research, otherwise termed ‘design research’ or ‘development research,’ has been described as a “multi-faceted, complex endeavour” (McKenney & Reeves, 2011, p. 1) that focuses on improvements in practice. The field of instructional technology lends itself to the use of this method (Reeves, 2006) that incorporates a cyclic process of implementing interventions to develop (successive) prototypes. Herrington, Reeves and Oliver (2010) identified the key components of design research as:

- A focus on broad-based, complex problems critical to higher education;
- The integration of known and hypothetical design principles with technological affordances to render plausible solutions to these complex problems;
- Rigorous and reflective inquiry to test and refine innovative learning environments as well as to reveal new design principles;
- Long-term engagement involving continual refinement of protocols and questions;
- Intensive collaboration among researchers and practitioners; and
- A commitment to theory construction and explanation while solving real-world problems.

Some of the elements listed here were not fully implemented in this research study, specifically the timeframe may not be considered long-term nor was there intensive collaboration with practitioners. For these reasons, the blended approach of Action and Design Based Research elements offered by the eLearning Lifecycle was the most relevant to be implemented. The overall goal was to match the research questions with the stages of the eLearning lifecycle to then collect evidence through appropriate methods to be able to draw useful and insightful conclusions (Phillips et al., 2011).

The implementation of this process aimed to develop prototype theories or design principles that could be used as guidelines to inform the design of interventions in other problem areas. The developers of the eLearning lifecycle use the definition of Nieveen, McKenney and van der Akker (2006) to explain design principles as “heuristic guidelines to help others select and apply the most appropriate knowledge for a specific design task in another setting” (p. 153). It is believed that over time design principles have the potential to be generalised into theories (Phillips et al., 2011). An important
part of that implementation included the use of the enculturation teaching model within the eLearning environment.

**Enculturation Teaching Model**

Within the eLearning environment being implemented and reviewed following the stages outlined in Table 3.1, the focus of this research study involved the provision of teaching strategies within an ePortfolio platform to scaffold the development of reflection in pre-service teachers. The model used for the teaching focus came from the work of Tishman, Jay, and Perkins (1993) and their use of an enculturation teaching model to develop thinking dispositions. The components of the model were similar to those suggested by Strampel and Oliver (2007) to help in the development of reflection in electronic environments. The enculturation teaching model consisted of exemplars of good practice, discussion among peers, and the provision of activities to target the development of skills which in this case were designed around reflection. Specifically, the activities comprised of tasks such as: reflective writing on personal experience (Phillips & Carr, 2006); completing a reflective journal (Spalding, Wilson, & Mewborn, 2002); and reviewing these entries using the 4R’s of reflection (Ryan, 2011a).

(1) Exemplars: In the electronic environment, the exemplar prompts were designed to provide models of reflective thinking and writing for students to see the expectations and standards required in their work. This represents the learning resources identified by Strampel and Oliver (2007). For this research study in the ePortfolio learning environment, the exemplars of strong reflective writing and practices came from texts and writings on action research and reflection, as well as feedback from previous students who had used the platform well. The exemplars were needed to clearly demonstrate the purpose of the ePortfolio platform as a tool for learning (Barrett, 2005). Without this clear purpose there was the risk of the ePortfolio becoming an electronic scrapbook (Pellicione, Dixon, & Giddings, 2005) or a repository of evidence without the component of reflection. The exemplar prompts also provided outlines of the format for the assessment tasks to allow the students to gain confidence in the new platform and therefore free up time and cognitive energy to focus more attention on their reflective writing.
Reflective Discussion: The second aspect of the environment was the provision of a space for interaction or reflective discussions between students and tutors, as a tool to facilitate understanding. This area formed part of the learning supports (Strampel & Oliver, 2007) within the environment and was facilitated through the blog function in the GatewayResources section of the PebblePad platform. In this area there was the opportunity to provide a group blog that the students could use to discuss the process of action research and their experiences. The students were also given the opportunity to set up smaller blogs if they wanted to develop a small group discussion on a particular topic.

Although blogging is largely seen as a reflection-on-action tool, the use of the blogging format for the dialogue was planned to assist the students to develop in-action abilities by internalising the thought process and clarifying thinking through reflective discussions (Schön, 1995). Blogging has also been shown to enhance self-regulation (McMahon, 2010), which provided further reasons for the choice of this discussion format.

These blog discussions were also planned to help guide some of the additional activities that could be added to the learning environment based on students’ comments and questions. This opportunity was provided so that the process could become an iterative one of review and improvement based on student need.

Activities: The third and final component of the environment was the planned prompts that provided activities designed to target some of the skills associated with reflection. This was the learning tasks aspect suggested by Strampel and Oliver (2007) and used activities that were planned based on research into how students learned to reflect and the types of processes that assisted in this development. Details of the prompting activities and their theoretical groundings are discussed in Chapter 4, which details the implementation of the research. The activities were developed and implemented with input from the students as well as further research and reflection during the research process, that was designed as outlined in the next section of this chapter.
Research Design

The research methodology employed the eLearning lifecycle (Table 3.1). It entailed the implementation of several cycles of the model focused on the development of an ePortfolio-based learning environment to scaffold the development of reflection. Appendix III provides the detailed timeline of the research implementation in terms of the Lifecycle model as well as specifically outlining the role of the researcher at each of these phases.

Context

The research was conducted at two campuses of a metropolitan Western Australian university. The group of 84 students initially involved in the research was a cohort of fourth year Bachelor of Education students undertaking a research unit on action learning in education as part of their specialisation in Early Childhood or Special Needs Education. This unit was offered as a compulsory external subject that involved the students in the design and implementation of an action learning project over a period of 26 weeks. The project was offered as a means of developing reflective practice and improvement in a specific area of each pre-service teacher’s preparation.

The use of the action learning project was designed to allow for a more situated learning approach (Herrington & Oliver, 2000) that incorporated more complex and collaborative tasks (Herrington, Parker, & Boase-Jelinek, 2014) and took place over an extended period of time. These types of tasks are seen as more authentic for student learning (Herrington et al., 2010) that can be used in online contexts.

In completing the action research projects, the students were required to submit three assignment pieces:

(1) Plan / Rationale that outlined the proposed research and why this focus was important;
(2) Progress Report that allowed for feedback on the reflective processes and writing before completion of the project; and
(3) Final Report that provided full detail of the action research project that was undertaken.
The format for these three submissions were modeled through the exemplar prompts placed within the ePortfolio-based learning environment as introduced later in this chapter and detailed in Chapter 4.

**Participants**

A group of 84 students were enrolled in the action research project and were given access to the ePortfolio-based learning environment throughout the implementation of the research. At the conclusion of the research study when the formal data collection took place, this group had reduced to 79 students.

The students were invited to be involved in the stages of data collection to provide a combination sample across multiple needs and interests (Miles & Huberman, 1994). Table 3.2 provides the details of the numbers of responses collected in each data type described in the data collection process.

<table>
<thead>
<tr>
<th>Data source</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online survey</td>
<td>25</td>
</tr>
<tr>
<td>Focus group interviews</td>
<td>7</td>
</tr>
<tr>
<td>Individual interviews</td>
<td>8</td>
</tr>
<tr>
<td>Blog comments/feedback</td>
<td>10</td>
</tr>
<tr>
<td>LMS comment/feedback</td>
<td>10</td>
</tr>
<tr>
<td>Total Respondents</td>
<td>60</td>
</tr>
<tr>
<td>Total after multiple sources removed</td>
<td>37</td>
</tr>
</tbody>
</table>

When all the data had been collected, collated, and analysed, the numbers of respondents (60) were reviewed for any overlap of students being a participant in more than one level of data collection. When this review was completed it was found that 37 individual students had provided feedback in some format to the data collection process (see Appendix IV for matrix of response details). Out of the 79 students who completed the action learning project, this represented some form of feedback from 47% of the cohort.

Although some of the contributions by individuals were small, the goal of the research was not to determine generalisable results but to examine trends and tendencies of the group of pre-service teachers (Ellis, Goodyear, O’Hara, & Prosser, 2007). These responses allowed for that to occur.
Procedure

The research was implemented using the eLearning Lifecycle model of Phillips et al. (2011), based on the enculturation teaching model described by Tishman et al. (1993), using the ePortfolio environment of PebblePad. Each stage of the implementation as outlined in the timeline in Appendix III is described below in terms of both the cycles of the model, and information pertaining to what was actually placed within the ePortfolio teaching environment by the researcher.

Cycle 0 - Analysis of problem

This cycle was completed in the process of planning and designing the proposed research. The problem was identified as the need for the development of reflection in pre-service teachers through a scaffolded process. As highlighted in the literature review in Chapter 2, the development of reflection is complex and requires a strong foundation for implementation of activities aimed at facilitating the enhancement of reflection.

As described earlier, an ePortfolio environment was chosen as the platform to facilitate the scaffolding using an enculturation teaching model (Tishman et al., 1993). The elements included in the PebblePad environment were: (1) examples of good practice, (2) opportunities for interaction, and (3) activities to scaffold the development of reflection in pre-service teachers.

Cycle 1 & 2 - Design and refine the e-learning artefact

The eLearning Lifecycle (Phillips et al., 2011) was developed to guide the design and implementation of an eLearning environment from a blank canvas. As PebblePad already existed as an artefact (Table 3.1) the design phase at Cycle 1 was condensed for this research study.

The action learning project for the students that was embedded into and scaffolded through the ePortfolio platform was also a fully developed teaching unit/subject within the Bachelor of Education course. This meant that much of the refining of the design required at Cycle 2 (Table 3.1) was not required. As a result, the detailed implementation of the eLearning Lifecycle
for this project began at Cycle 3, when the environment for the PebblePad platform was designed (Appendix III).

**Cycle 3 – Design the environment**

Cycle 3, the ‘pilot’ of the environment, occurred when a less-structured version of the ePortfolio-based intervention was provided to a cohort of students. This implementation involved the researcher designing and providing activities within a resource Blog to assist with their action learning projects (cf. Roberts & Maor, 2012). These activities were designed to address requests from students. After reviewing the results of the pilot phase, changes were made to the environment for a full trial as part of Cycle 4.

**Cycle 4 – Refine Design – deploy to students for full trial**

Based on further review of the literature on reflection, learning environments (in particular ePortfolios), as well as previous experience with the unit (Roberts & Maor, 2012), the research implementation in its final structure was planned within the electronic environment. The ePortfolio platform utilized technology-based teaching strategies including: (1) examples of good practice, (2) facilitation of interaction among students to co-construct knowledge, and (3) activities to develop the skills associated with the process of reflection.

The implementation of Cycle 4 involved the researcher planning and providing prompting tasks within the Gateway Blog with a focus initially on getting the students to engage with the environment, and use the platform to write, reflect, and share experiences. The details, results and initial design principles of this cycle are discussed in Chapter 4.

**Cycle 5 - Refine Design**

Once the initial environment was trialed with the pre-service teachers during the first semester, the feedback received via discussions, blog posts, and emails was utilised by the researcher to make changes to the ePortfolio-based learning environment for another full trial in the second teaching semester. This trial required a new group of prompts to be developed and provided to the students by the researcher. In this iteration, the focus was on the areas of academic writing, and incorporating evidence of personal growth to the
student projects. The details of this implementation, some of the summative results and the initial design principles are also provided in of Chapter 4.

Cycle 6 - Refine Design

After the submission of the final assignments, a full round of data collection was implemented by the researcher. This process provided a detailed review of the electronic learning environment to identify improvements for future iterations. The thorough process of data collection and analysis is outlined in the following sections.

Data Collection

As indicated in the outline of the design, the data collection for this research formed part of Cycle 6 of the eLearning Lifecycle (Appendix III). It involved the use of multiple methods including focus group and individual interviews, an online survey, document analysis, and learning analytics. The data were used to determine whether engagement with the exemplars, interactions, and activities provided within the ePortfolio environment had any impact on the further development of the reflective abilities of the pre-service teachers involved.

Focus Group Interviews

The fourth year pre-service teachers involved in the Action Learning unit and the PebblePad environment were asked to volunteer to take part in the research. The first request was for participants to be involved in focus group interviews. Focus group interviews were chosen to stimulate the “group process of decision making to gather more accurate information” (Dyckhoff, Zielke, Bültmann, Chatti, & Schroeder, 2012) and to allow the interactions to reveal more about individuals’ points of view (Ary, Cheser Jacobs, & Sorensen, 2010).

Patton (2002) highlighted a number of advantages of a focus group interview including:

1. the cost and time effectiveness of the strategy;
2. the enhanced quality of responses through the interaction amongst the participants as they gain more enjoyment from the process; and
that the points of view can be more quickly identified as shared or diverse.

However, there are some disadvantages when using focus group interviews including:

(1) the number of possible interview questions are often limited in this format;
(2) there is reduced time for each participant to speak;
(3) the issue of confidentiality may prevent participation or limit the personal responses obtained; and
(4) there are more management issues for the facilitator (Patton, 2002).

It was hoped that at least some of these concerns could be overcome by keeping the group size small and allowing self-selection of the groups.

It was planned that 5 groups of 4-5 students (25 students in total) would take part in focus group interviews. The invitation was sent via the blog in the ePortfolio platform that was accessed by all students, and followed up with an email to the whole cohort. Due to logistical problems, however, only three focus group interviews were conducted.

These 45-minute group interviews were semi-structured and designed to provide descriptions of the experiences with the ePortfolio-based learning environment and engagement with the prompts and blogs provided. The use of the standardised open-ended interview, as defined by Patton (2002), allowed a set of questions to be planned, arranged, and approved by the university ethics review committee. Although the interviews were conducted using a predetermined question schedule that assisted in maintaining the interview focus, there was some flexibility within the interview which was important to allow the discussion to follow the interest of the students and to “gain a more valid response” (Burns, 1996, p. 330). The researcher, who had a printed copy of the list of pre-approved questions, conducted the interviews. This printed question schedule allowed the discussion to be flexible and follow the participant conversation, then effectively be brought back to focus when required.
The interviews were audio recorded for transcription and analysis. Audio recording was chosen to maintain the raw data and allow the interviewer to maintain focus on the group rather than taking notes (Burns, 1996).

In terms of question type, the interview made use of several of the six types of questions classified by Patton (2002). The participants were asked about:

(1) their experiences and behaviour;
(2) their opinions;
(3) their feelings;
(4) their knowledge; and
(5) their backgrounds.

These were examined in relation to the elements of the Colton and Sparks-Langer (1993) framework and the PebblePad teaching environment. Patton’s (2002) sixth type of question – sensory - was not relevant to this study. Table 3.3 outlines the planned question, the type of question the area of the research it related to, and the rationale for asking that particular question.

**Table 3.3: Focus Group Interview Schedule**

<table>
<thead>
<tr>
<th>Question</th>
<th>Type of Question</th>
<th>Area of Research</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>So are you completing the 4th year of your BEd? Are there any specialties in your study?</td>
<td>(√)</td>
<td>√</td>
<td>Colton &amp; Sparks-Langer (1993)-(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>This is a preliminary question to settle the students in to the questions and start them thinking.</td>
</tr>
<tr>
<td>What is the most challenging aspect of your degree?</td>
<td>(√)</td>
<td>(√)</td>
<td>Colton &amp; Sparks-Langer (1993)-(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>To settle and take the focus to overall degree to start with.</td>
</tr>
<tr>
<td>Have you been required to reflect on your teaching throughout your degree?</td>
<td>(√)</td>
<td>(√)</td>
<td>Colton &amp; Sparks-Langer (1993)-(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>This starts to focus on reflection but in terms of the whole degree rather than experience with the environment itself.</td>
</tr>
<tr>
<td>In what ways?</td>
<td>(√)</td>
<td>(√)</td>
<td></td>
</tr>
<tr>
<td>How would you describe your ability to reflect prior to commencing this unit?</td>
<td>(√)</td>
<td>(√)</td>
<td>Colton &amp; Sparks-Langer (1993)-(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Starts to get the participant to be making value judgments about their own perceived level of reflection.</td>
</tr>
<tr>
<td>Has your perception of reflection changed during your involvement in this unit? If so, how/why?</td>
<td></td>
<td>(√)</td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Type of Question</td>
<td>Area of Research</td>
<td>Rationale</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------------------</td>
<td>---------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Did you access some of the examples provided through the PebblePad blog on reflection and good reflective writing?</td>
<td>√</td>
<td>Focus on exemplars in the environment</td>
<td>This is designed to check if the participants used the environment provided and if so, how.</td>
</tr>
<tr>
<td>Were these helpful?</td>
<td>√, √</td>
<td></td>
<td>This is a direct value judgment as they are the only ones who can determine the level of value.</td>
</tr>
<tr>
<td>In what ways?</td>
<td>√, √</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Were you involved in the blog posts and the ongoing discussion around the unit?</td>
<td>√, √</td>
<td>Focus on the interaction planned in the environment</td>
<td>As with the examples, need to see if they used them and what they thought about them in terms of value to their study or any barriers that prevented them using them.</td>
</tr>
<tr>
<td>Why/why not?</td>
<td>√, √</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Were there other avenues where this discussion was occurring?</td>
<td></td>
<td></td>
<td>This is to identify if social media is facilitating the reflective discussion rather than the PebblePad environment.</td>
</tr>
<tr>
<td>Did you complete any of the suggested activities within the ePortfolio environment?</td>
<td>√</td>
<td>Focus on the activities provided in the environment</td>
<td>As with the other 2 areas of the environment, need to find the merit in the environment and any barriers to their use.</td>
</tr>
<tr>
<td>Why/why not?</td>
<td>√, √</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If you did complete any of the activities, which ones did you do?</td>
<td>√</td>
<td></td>
<td>This is more specific on the types of activities that caught the interest and will identify areas of the Colton and Sparks-Langer (1993) model as the activities were planned from that framework.</td>
</tr>
<tr>
<td>Which did you find the most useful/ least useful? In what ways?</td>
<td>√, √</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you think you will continue to use an ePortfolio in the future?</td>
<td>√, √</td>
<td>Overall framework of reflective practitioners</td>
<td>The perceived value of the environment will depend on future applications so it is important to know whether it will be sustained.</td>
</tr>
<tr>
<td>Why/why not?</td>
<td>√, √</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you have any additional comments to make?</td>
<td>√, √</td>
<td></td>
<td>Further useful information can be gained through an open general question such as this.</td>
</tr>
</tbody>
</table>

Although the majority of these questions were closed in nature (Patton, 2002) the interaction within the focus group meant that the discussion flowed well. The flexibility afforded by having the researcher conduct the interviews was also important in probing student answers further to gain sufficient detail towards answering the specific research questions. If someone other than the...
researcher were to conduct the interviews, however, questions to target higher levels of thought and response (Bloom, 1956) would need to be added to this schedule.

Of the planned five focus group interviews, only three were conducted at the end of the implementation of the ePortfolio-based learning environment. When the focus group interviews were planned and being conducted, the participants were involved in a practicum placement that caused issues in scheduling the interviews. As the feedback was needed to build towards the next level of data collection, the researcher needed to develop a means by which to gain responses from a larger group of participants. To compensate for the reduced number of focus group interviews, an online survey was developed to attain views from the wider student cohort.

**Online Survey**

After receiving approval from the ethics committee to make a change in the data collection method (2012/117), an online survey was administered (through Survey Monkey). The survey allowed for a convenience sample (Miles & Huberman, 1994) of students to provide written responses to questions similar to those asked in the focus group interviews. The online survey allowed students to provide this feedback at their convenience.

The advantages of using an online survey included:

1. flexibility,
2. speed,
3. convenience,
4. ease of data entry and analysis,
5. ease of administration, and
6. low costs (Evans & Mathur, 2005).

As the students could not participate in the interviews, the researcher needed a quick and efficient way to access the group, and the use of an online survey allowed for this. The survey also provided numerical data of the students reported access to and engagement with the prompts placed within the ePortfolio-based teaching environment.
The disadvantages, however, were that:

1. there was no opportunity to further probe student responses or
2. to have the group interaction that the planned focus group interviews would have provided.

Nevertheless, the survey provided useful complementary data to support the focus group interview transcripts.

Within the online website, the survey questions were based on the focus group interview questions, including a ranked Likert scale section relating to the individual activity prompts implemented within the environment. By adding a list of email addresses to the program, an email generated by the researcher was automatically sent to all students and the Survey Monkey platform was able to track who had completed the survey to allow for automatic follow-up emails to be sent. It was hoped that an email addressed to a personal email account would increase the response rate, and reduce the number of students possibly thinking it was a junk mail - a common problem associated with online or electronic surveys (Evans & Mathur, 2005).

The use of the survey also meant that the collation of the data was more streamlined to allow easier coding and analysis as well as providing a wider range of statistical data than the interview. This data could be tabulated and reviewed for reported patterns of usage amongst the students. It also facilitated a more systematic identification of students to be invited to participate in an individual interview.

**Individual Interviews**

Based on the interactions with the researcher and peers within the focus group interviews, and responses from the online survey, eight pre-service teachers were selected to be involved in individual interviews. The selection of participants to be invited for individual interviews was based on earlier collected responses to provide maximum variation (Miles & Huberman, 1994). This was achieved by identifying students who reportedly used the environment sparsely, and those who implemented many of the prompts provided to select participants from each of these groups for an interview. The strategy to choose students from across these usage patterns was
implemented to attempt to increase the likelihood of the collection of a more diverse range of opinions.

The planning and rationale for the individual interviews was the same as the group interviews, although the aim was to further investigate individual experiences with the platform. Interviews allow researchers “to find out from [participants] those things we cannot directly observe and to “enter into the other persons perspective (Patton, 2002, p. 340/341). The purpose of these longer individual interviews (one hour each) was to allow the accounts of individual experience when using the platform to be documented, and identify the impact the environment may have had on the development of reflection. Table 3.4 details the questions added for the individual interviews.

**Table 3.4: Individual Interview Schedule**

<table>
<thead>
<tr>
<th>Question</th>
<th>Type of Question</th>
<th>Area of Research</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td><strong>Do you think your reflective entries moved between the levels identified by Ryan (2011)?</strong></td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>How did you participate in the blog discussion? Did you use other platforms?</strong></td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td><strong>Did you complete a range of the offered ePortfolio activities?</strong></td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td><strong>Based on the data provided, would you consider yourself engaged with the development of reflection?</strong></td>
<td></td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><strong>Is this a useful indicator?</strong></td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Do you think someone with fewer entries and activity types would still effectively develop reflection?</strong></td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td><strong>Why/why not?</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Do you have any further comments to make?</strong></td>
<td>√</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The individual interviews were audio recorded and transcribed to collect raw data for analysis and allow the interviewer to focus on the conversation rather than making notes.

During these interviews, as well as probing beyond these initial question levels, the students were shown a number of documents to review as both examples of their writing and a demonstration of their usage patterns as determined by the statistics collected within the PebblePad platform. This stimulus allowed for focused examination of engagement with the ePortfolio-based learning environment and provided the incentive for some of the discussion. This discussion also enhanced the document review process, as instead of the researcher alone viewing and interpreting the documents, the participant’s perceptions of the samples were able to be recorded as well.

**Analysis of Work Sample Documents**

In this method of data collection, several document types were collected for review from within the ePortfolio platform. These were used to identify the level of reflection within students’ work and the interactions taking place in the environment. These included the blog posts within the PebblePad environment, email feedback, and some of the pre-service teachers’ work samples.

These types of documents were personal documents that were collected as physical materials, although in electronic form. This type of material provided a strong primary source of evidence as they came directly from the participants without alteration (Ary et al., 2010). The process of reviewing these documents or artefacts included the steps outlined by Ary and others (2010) of:

1. identification of what to investigate;
2. the selection of the document type;
3. formulation of coding categories;
4. devising the sampling plan; and
5. analysing the data.

It was essential that the coding themes related to the theoretical foundations of the research, and were used to define the categories and sub-categories
used in the coding process (Burns, 1996). For this research, the samples were reviewed using Ryan’s (2011a) 4R’s of reflection to identify if any variation had occurred in the level of the participants’ writing during the semester.

All participants were asked to provide consent for the use of their blog posts as well as volunteer their reflective entries and final research projects to the review process. The examination of these multiple types of written documents provided depth to the review that could not be gleaned from examination of the usage statistics alone.

**Learning Analytics**

A selection of usage log data was collected from within the PebblePad platform for review using learning analytics. The purpose was to identify the recorded level of student engagement with the ePortfolio platform. The definition provided for learning analytics is the “interpretation of a wide range of data produced by and gathered on behalf of students in order to assess academic progress, predict future performance, and spot potential issues” (Johnson et al., 2013). At the 1st International Conference on Learning Analytics and Knowledge held in 2011, the definition proposed by the convenors was: “Learning analytics is the measurement, collection, analysis, and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs” (https://tekri.athabascau.ca/analytics/). The process of learning analytics has developed with the use of electronic teaching mediums and the expansion of this area of research has occurred with the growth of data on learner activities becoming more readily available.

Based on work in Business Intelligence and Data Mining, the use of data in education has grown with the increased use of Learning Management Systems (LMS) or Virtual Learning Environments (VLE) (Buckingham Shum & Ferguson, 2012). The original adaptations to the use of this data were the areas of **Academic analytics** to make decisions and guide actions within institutions, and **Action analytics** that required a level of benchmarking (Buckingham Shum & Ferguson, 2012). The shift to what is now called **Learning analytics** was motivated by the practical use of data for decisions
relating to teaching and learning, and reflection on these processes, rather than administrative purposes (Dyckhoff, Zielke, Bültmann, Chatti, & Schroeder, 2012). The goal now, according to Greller and Drachsler (2012), is to use the data to develop more personalised learning spaces that incorporate more effective strategies, increase the speed of competency development, and enhance collaboration. There are, however, some issues relating to the use of such data mining techniques.

There may be ethical issues with the use of digital data including:

1. who owns the data;
2. who has access to it; and
3. the way some of the data could be used in a negative way (Greller & Drachsler, 2012).

The data is generated automatically as part of normal user behaviour and, as such, is highly authentic (Greller & Drachsler, 2012). This makes it very valuable for research but also raises concerns relating to the competency of the researcher to do the analysis. Current authors on learning analytics are turning their attention to developing both a design framework for the process (Greller & Drachsler, 2012) and an exploratory Learning Analytics Toolkit (eLAT) to support teachers and researchers in the process of reflection and improvement based on the data collected (Dyckhoff et al., 2012). It is also important to note that the use of statistical data is not enough for the full review of platforms, as social aspects need to be further explored (Buckingham Shum & Ferguson, 2012). This socio-technological sphere is important for the data to have an impact on change at the level of the decision makers (Macfadyen & Dawson, 2012).

For this research study, a low-level utilisation of learning analytics was planned based on the data readily accessible within the ePortfolio. In the PebblePad platform, each time a document or piece of evidence is created, it is called an asset. The platform tracks these assets and allows students to graph how many assets of each format have been created through the use of the system. The usage data for the group as a whole was accessed to review general patterns of engagement, while the pre-service teachers were asked to provide copies of individual graphical data from their PebblePad accounts.
This graphical data was then analysed and compared to the assessment of students’ work samples against the 4R’s of reflection (Ryan, 2011a). This was done to identify any patterns in student reflections and as impetus to create questions relating to engagement within the individual interviews. The data collected from these stages was also used to add to the determination of which students to review as case studies within the research study.

**Case Studies**

The case studies within this project were used to provide an in-depth review of several individual students as a basis of identifying any change in the reflective behaviours that may have occurred through exposure to the ePortfolio-based learning environment. Stake (1994) argues that “case study is not a methodological choice, but a choice of object to be studied” (p. 236). In this reseach, case study was implemented as an additonal data collection strategy because it is contextually based; it involves the participant as part of the process; utilises multiple sources of data; and can be targetted towards specific research questions (Yin, 1994).

The six cases reported in this thesis were selected based on the data collected through the multiple methods outlined earlier. Each case was selected based on the relevance to the research questions, the diversity of the responses provided and the complexity of the data already collected (Stake, 2006). After reviewing all the data collected, students were chosen based on the amount of data available on each (a convenience sample (Denzin & Lincoln, 2000)) but also on the variation shown within both the opinions given and the level of reflection evident in the work samples provided.

The data from these multiple sources was then collated and analysed towards answering the research questions. The full process of data analysis is outlined in the following section.

**Data Analysis**

The analysis of the data for this research was implemented with a constant comparative approach. Each level of the data was collected and collated for analysis against the overarching components of the research from the
theoretical models presented in the literature review and summarised in Appendix II.

The constant comparative method of data analysis emerged from the work of Glaser and Strauss in 1967 in response to criticism of qualitative research methods (cf. Leech & Onwuegbuzie, 2008). The approach utilises step-by-step strategies through a self-correcting process to identify the themes as they emerge from the data (Charmaz, 2000; Hewitt-Taylor, 2001). This process was applied to each of the data sets as described below.

The use of an **online survey** meant that a number of reports could be generated automatically. A summary was downloaded of all results that were reviewed from both statistical and coding perspectives. The questions that required students to respond on a Likert rating scale were tabulated and reviewed in terms of descriptive statistics from the cohort. This provided an overview of the students’ reported usage of each of the prompts and was used to determine the perceived level of engagement. The written responses were collated and printed to allow for examination and coding. This was done by highlighting the responses in different colours from the perspectives of the enculturation teaching model (Tishman et al., 1993) and clarifying whether the response related to the exemplars, the interaction, or the activities.

The same highlighted colour coding of responses was completed with the transcripts of the **focus group and individual interviews** to highlight the key points through the analysis process. The three areas of the exemplars, the interaction, and the activities provided the *a priori* categories from which to begin the data analysis.

The **usage statistics** collected from the PebblePad platform provided overall numerical data of the types and counts of assets created by the student cohort. These were provided in the format created by the PebblePad platform and used to identify any patterns of use, and for comparison against other data types to gain a more detailed picture of the students’ level of engagement within the platform.

The examination of **work samples** was done using the model of the 4R’s of reflection (Ryan, 2011a). Each piece of the students’ work was annotated
based on the levels outlined in this model, and compared with other samples from the same student, to identify any change across the examined work samples. Throughout the annotation process, the colours from the representation of the 4R’s of reflection (Figure 2.1) were used to highlight the sections of the text. This allowed for systematic comparison across the levels within the model.

Confidentiality

The use of these multiple sources that were coded under clearly defined categories allowed for a complete picture of the students’ use of the environment to be developed to answer the research questions. The presentation of individual responses throughout this analysis uses codes and pseudonyms to protect the confidentiality of the students and allow for direct quoting of their comments. The codes used for each data set are:

(1) The online survey has coded responses, for example H11-OLS. The code H11 was assigned based on the tutor group and the number the person was on the class list. This code was provided to the online site when the survey was emailed to the students so the returned response was provided based on this code.

(2) The feedback in blogs and LMS was provided by initial, for example, T-Blog Post or Ta-LMS feedback. The T or Ta is the student’s initials and the Blog Post or LMS refers to the source of the data.

(3) The interviews were coded with initials and the number of either the focus group or individual interview, for example S – FG Int 2 or M – Ind Int. The S or M is the student’s initial while FG Int and Ind Int signify the focus group interview and individual interview respectively. The number at FG Int 2 refers to which focus group the student was part of.

(4) The case study students have been given pseudonyms chosen by the researcher, with gender evident, and care taken to avoid the same initial of the real name.

To provide details of how these processes were applied, the description of the data audit trail is included below. The audit trail is the clear description of the process implemented in the collection and analysis of the data. This is to
make public what has happened during the research as a means of cross-checking the conclusions being drawn (Denzin & Lincoln, 2000). This adds dependability (or what is known in quantitative research as reliability) to the process and adds to the assessment of the quality and rigor of the data (Anfara, Brown, & Mangione, 2002). In this description of the audit trail, the coding processes are outlined to bring together the codes and categories developed under the initial questions posed for the research project.

**Data Audit Trail**

The implementation of this study used the constant comparative approach of “analyzing qualitative data where the information gathered is coded into emergent themes and codes” (Hewitt-Taylor, 2001, p. 39). The process used here utilised a priori coding from the three components of the teaching model, specifically, exemplars, interaction, and activities and followed the process outlined by Glaser (1965) and simplified by Leech and Onwuegbuzie (2008) of:

1. open coding (for this research coding to the three teaching model areas);
2. axial coding into categories; and finally
3. selective coding and the process of refinement including the writing of memos on the data categories.

The process was applied to all the data collected across the multiple methods approach (Leech & Onwuegbuzie, 2008). The coding of the earlier data from the online survey and focus group interviews was reviewed to add questions to the individual interviews. However, the full coding and analysis was completed with the entire data set once the collection process had been completed.

**Open Coding**

Initial coding used a priori codes to focus on the three areas of the enculturation teaching model (Tishman et al., 1993). This was implemented because the questions in the data collection were initially developed to review the ePortfolio-based learning environment and, as such, were directed specifically at the three areas of exemplars, interactions, and activities. These
three areas were also directly applicable to the research questions, which further justified their use as a priori codes.

The completion of the coding process was guided by the work of Hewitt-Taylor (2001) who had explicitly outlined how each stage of the constant comparative coding could be completed. For the first level of coding, hard copies of all the data were printed, examined, and highlighted using a colour code system to delineate the three a priori codes.

From this, the electronic versions of the data were used to copy and paste the text highlighted from each data source into one document for each code area. These new documents were then printed for review, and to prepare for the next level of axial coding.

**Axial Coding**

At this level of coding new hard copies of the data were printed, this time in the coded areas of exemplars, interactions, and activities. Colour coding was again used to examine categories that developed in each of these areas. The categories were identified by reading through each of the printed documents, and highlighting key points in different colours. Often these key points would be identified across the multiple data sets provided by different participants to reinforce the importance of that category in the analysis process.

**Memo Drafting**

The key points identified through the axial coding process were then examined in terms of the research questions to be applied to the analysis. From these initial key points, the major categories for each question were determined through a memo writing process (Charmaz, 2000).

Memos were written for each of the categories to determine the level of evidence provided for each category, and whether there was overlap that allowed the merging of some of these categories. This drafting process led to a reduction in some of the categories, and by linking them to the initial research questions, the key categories emerged.

Once the categories for each research question were identified, the findings were examined to provide the results and conclusions to the research study as
detailed in Chapters 5, 6, and 7. The next chapter (Chapter 4) provides a description of the implementation of the ePotfolio-based learning environment during Cycle 4 – Refine design full trial; and Cycle 5 – Refine design. This includes the details of the prompts that were provided to the students, some preliminary descriptive results and the initial design principles that emerged from this process.
CHAPTER 4

Implementation of the eLearning Lifecycle

As outlined in Chapter 3, the methodology chosen for implementation of this research study was the eLearning lifecycle. This cyclic model was chosen as it was purposely designed to develop electronically based learning environments. The ePortfolio-based learning environment implemented for this research was facilitated through the PebblePad platform to target the enhancement of reflection in pre-service teachers. This chapter details what was specifically implemented within the ePortfolio environment and introduces some of the changes made through the iterative implementation based on informal student feedback. It also introduces the initial design principles that emerged from this stage of the research process.

The implementation of the research during Cycles 4 and 5 is detailed in this chapter including the initial results and the changes made to the learning environment between the two cycles. The discussion is primarily based on the feedback received from students through emails and blog posts. Some preliminary descriptive data are outlined, however, the formal data were collected at the completion of this implementation and are discussed in Chapters 5, 6, and 7.

Full trial of environment

Cycle 4 of the eLearning Lifecycle was the first implementation of the ePortfolio-based learning environment with the entire student cohort (Appendix III). This involved the provision of the prompts to the students through the PebblePad ePortfolio platform.

During the first full implementation cycle, the students used the PebblePad environment to complete their assignments and were asking many questions about the platform. The focus of these questions appeared to be on the assessments, as it had during the previous pilot cycle (Roberts & Maor, 2012), and there was little use of the blog discussion function within the PebblePad environment. This section outlines Cycle 4 and the feedback received during that time.
At the beginning of the project, a group of 84 students embarked on their own action learning projects. Enrolment in this semester unit required the students to use the PebblePad platform for assignment submission. It also gave them access to the ePortfolio-based learning environment that was designed to encourage involvement with the platform to enhance their reflective abilities.

Within the version of PebblePad that was used for this research, there was a section that students could access called the Gateway. This area was set up at the beginning of the teaching period so that student groups had access to the Gateway relevant to their unit enrolment. It was an area of the platform that all students could access and provided a space for interaction and resource sharing.

The Gateway section of the platform was used by the students to submit their assignments and had provision for the sharing of resources and messages. These affordances made it an ideal space to set up the electronic learning environment in the format of an ongoing blog that was made available to the students. This blog was designed by the researcher to provide additional assistance to the students throughout their projects. It was within the Gateway Blog that the prompts were placed to scaffold the students’ reflection.

Table 4.1 provides the outline of the prompts placed by the researcher in the Gateway Blog as part of Cycle 4. The shaded area in the table differentiates the exemplar prompts that provided outlines for assignments, from those included as additional optional activities that targeted the skills of reflective thinking.
Some of the prompts were placed in the gateway blog based on the researcher’s previous experience with the PebblePad platform and students’ difficulties, as well as in response to student need as identified through questions and emails to the researcher. The prompts were designed to address the areas of examples, interaction and activities based on the Colton and Sparks-Langer (1993) framework. An example of what the students’ saw when they accessed the blog prompts is shown in Figure 4.1.
Prompt 1 - *A reflection on teachers* came from the work of Phillips and Carr (2006) and required the students to look back over their own experience in the classroom, either as a student, or as a pre-service teacher within practicum settings to identify what type of teacher they wanted to be. This activity was based on an early set of questions from *Becoming a Teacher Through Action Research* (Phillips & Carr, 2006) and was designed to encourage the students to think about what a good teacher looked like, sounded like, and how they acted based on their own experience. It was provided as a low stakes, yet useful activity that may have later formed a piece of evidence in their projects. The task was implemented at this early stage to encourage the students to begin to interact with the PebblePad platform.

The additional activity prompts placed in the blog by the researcher were not an assessable component of the action research project. They were added to the blog within the ePortfolio environment to provide assistance to students as they worked through their individual projects and were planned to encourage reflection. They were based on literature on reflection and designed to engage students in using all levels of reflection in their thinking and writing.

To begin to review the effectiveness of this prompt in the environment, the first area examined was the number of comments placed on this blog prompt. The text in the bottom right hand corner of Figure 4.1 shows that there were six comments added to this prompt. From a cohort of 84 students this was a small number, however, those who did post in the blog commented on the
value of completing the prompt for their own experience. They emphasised mainly the value of this activity in identifying the style of teacher they wanted to be and what impact they would like to have on future students.

It made me think of why I want to become a teacher and who was responsible for some of my great memories as a student. (CS- Blog Post)

I think that it was a great way to start reflecting. (RC- Blog Post)

It was also interesting that negative experiences students had in the classroom had an impact on the reflection activity too, in terms of what they did not want to do in their own practice.

It also reminded of some of the negative experiences that have helped to shape the type of teacher I don’t want to be!!! (SH- Blog Post)

In terms of the success of the research study, these comments although small in number were encouraging. It appeared the students were engaging with the prompts that were provided to outline the additional activities towards developing reflection and making use of the opportunity to discuss their experiences. This provided an expectation that the implementation of the learning environment would be effective and that the students would embrace the blog posts as a means of providing feedback and communicating with others about their experiences.

Two further activity prompts were implemented in Cycle 4: Prompt 2 – Something to talk about and Prompt 5 – Time to refine. These were included to encourage the use of the platform for discussion as well as engage the students in exploring the options available. However, these additional prompts received no comments in the blog forum.

This may have been due to the voluntary nature of the activities or the heavy workload at this time of the semester, which included preparation for an upcoming practicum. These factors meant the students’ focus was on other areas of their study. There was also the potential that students were completing these discussions through other platforms and did not feel the need for it to be developed through this blog medium, as was raised in the later focus group interviews.
The students who participated in the focus group interviews four months later commented that much of the discussion about the unit, the assessments, and the PebblePad learning environment was happening outside the formal learning environment. Due to the action research project being offered only as an external unit, there were no on-campus tutorials. This meant the students were talking about their project issues in a face-to-face context when they were on campus for other activities, over the phone, or through other online avenues such as Facebook. The content of the discussion in these other platforms could not be reviewed for this research, which made it difficult to interpret the value of this portion of the planned eLearning environment. To attempt to capture these informal discussions, changes were made to the prompts that were implemented in the following semester. These are discussed later in this chapter.

The shaded sections of Table 4.1 list the exemplar prompts that were implemented in Cycle 4. These more structured prompts were designed by the researcher to provide the students with examples of reflective practice in relation to the use of the PebblePad formats for completing the assignment submissions. These prompts were very descriptive based on the requirements of the assignments and provided step-by-step guidelines of how to utilise various aspects of the PebblePad platform.

The reason for the inclusion of these very structured exemplar prompts was to allow students to have a clear format for the layout of their assignments in the unfamiliar PebblePad platform. It was planned that if the students had a clear structure they could concentrate more intensely on the content they were to include. The exemplar prompts were not designed to show the students how to reflect, but rather to provide a model of how to structure their writing and assignments within the templates provided in the PebblePad platform, whilst meeting the assignment requirements. An example of one of these exemplar prompts can be seen in Figure 4.2.
This prompt directed the students to set up an asset in PebblePad that was labeled as a Blog. Within PebblePad there are a number of standard formats that can be chosen to enter predetermined information with directions given for each section of the entries. Each of these formats is labeled as an asset type and each time the students complete an entry it is added as an asset to their individual asset store. The blog template allowed the students to add reflections to their own blog throughout their projects, with each entry being added to the whole blog but also saved as an individual Thought in their asset store for direct access.

The process of writing a reflective journal has been shown to be beneficial in the development of reflection (Ryan, 2011b), and the use of blogs have also been reported as enhancing the levels of reflective writing (Strampel & Oliver, 2008). Blogs “offer students the ability to share their reflective journals…in a learning space surrounded by other learners” (Strampel & Oliver, 2008, p. 992). This learning space provides “unique, rich opportunities for the development of reflection and meta-cognition” (Justice et al., 2013, p. 52).
Prompt 3 was designed by the researcher to provide a guided framework for this process of reflective writing as well as introducing students to the procedure of blogging. It was also included as a means of encouraging the students to regularly log in to the PebblePad platform to place items in their asset store to access throughout the completion of their projects. The step-by-step nature of this prompt was important to assist students who were feeling overwhelmed by the new platform. There were opportunities for the students to individualise their blogs in terms of appearance (relating to the colour scheme and banner used) but the focus of this prompt was on setting up the basic format at the beginning.

Prompts 4, 6, and 7 (Table 4.1) were provided to the students in Cycle 4 and were the exemplar prompts related to the design of a Webfolio for assignment submission, and outlined how to attach files and documents to these asset types. For the student cohort it was decided that a Webfolio asset type would be used for all submissions within the PebblePad system. The webfolio template allowed the students to create a set of pages that could be accessed from the menu-style list on the front page of the template and allowed for a range of formatting options within the individual pages. The webfolio also facilitated the creation of links to other references, web pages, and assets with PebblePad that the students had previously created.

The decision to use the webfolio format for all submissions was based on feedback from the earlier experience with the PebblePad program, where there was a mismatch between the task and the format of the submission (Roberts & Maor, 2012). It also meant that once the students had acquired the basic skills required to complete a webfolio, these skills were immediately transferable to other submissions. It was aimed to minimise confusion and build the students’ confidence in the platform more quickly. Additionally, the formatting options of the webfolio template were the most similar to a Microsoft Word document that the students had already experienced in their daily work.

The exemplar prompts received more comments from the students in the Gateway Blog, although from the original cohort of 84, these numbers were still limited. The details of how many comments received per prompt were:
The majority of the posted comments were questions to the researcher to clarify aspects of the submissions, which meant that once the question was answered, the discussion concluded. There were, however, some positive comments and feedback relating to some students’ increased confidence using the platform. Some students responded that sections of the environment had worked well and that the prompt provided by the researcher in the blog had been helpful in reducing the stress around the assignment submission.

- Prompt 4 – Plan/Rationale Outline - 4 comments
- Prompt 6 – Adding ethics checklist - 7 comments
- Prompt 7 – Progress report - 1 comment
- Prompt 8 – Uploading evidence - 4 comments

That worked well! Starting to get the hang of this PebblePad! (RC- Blog Post – Prompt 6)

This has been very helpful and now makes this assignment a lot clearer and therefore a lot less stressful. (CS – Blog Post – Prompt 8)

It was at this point in the research that time was taken to review what had happened so far and what needed to be altered to move forward into the new semester. This meant reviewing the blog entries and comments provided to this point, exploring the literature further, and making changes to the environment for the next cycle of implementation.

**Review and improvement of environment**

The primary area of concern identified in Cycle 4 was the lack of discussion and interaction between the students that occurred within the platform. For the enculturation teaching model to be effective there needed to be discussion amongst the group as a means of sharing ideas and developing reflections based on that discursive process (Tishman et al., 1993). By ‘putting thoughts into words,’ it was hoped that the students were able to enhance their thinking and their engagement in the reflective process (Schön, 1995; Maor, 2008).

As evidenced in this chapter, the students were providing short statements of feedback or asking questions relating to the mechanics of the platform. While there was some positive feedback there was little engagement in discussion,
and once the questions that had been raised by the students in the platform were answered, the discussion thread came to an end.

To begin to address this concern further literature on social interaction within online learning environments was consulted. This review identified that for collaboration and reflection to develop, students needed scaffolding (Maor, 2003), and stimulus should be introduced to promote this (Maor & Hendriks, 2001). Therefore, more specific and more frequent probing questions were required on the individual activity prompts to guide the discussion and provide a framework within which the students could interact.

It was also decided that to encourage further use of the activity prompts, the blog post that contained the prompt would include the citation of the source from which it was developed. This was included to demonstrate to the participants the theoretical grounding for the activity and provide a point of reference for further exploration. The inclusion of these details would possibly demonstrate to the students the value of the prompt towards the development of deeper reflection.

These two points became the first of the initial design principles identified from the research implementation as detailed below:

Initial Design Principle (IDP) #1: the interaction within the ePortfolio-based platforms needs to be scaffolded and the discussion stimulated by probing questions;

IDP #2: the students need to identify the theoretical link behind the activity to appreciate the value of investing the time and energy required to complete the task.

As discussed earlier, the design principles that develop from the eLearning Lifecycle methodology are context specific findings that may be transferred to other similar contexts (Phillips et al., 2011). The initial learning design principles are then refined as the cycles of the framework progress. The next section of this chapter outlines the implementation of Cycle 5 of this research based on these changes, and discusses the initial findings from the execution of that round of prompts.
Trial of improved environment

In the eLearning Lifecycle (Phillips et al., 2011), Cycle 5 is the stage where the design is refined and deployed to the students via a Live Trial (Appendix III). For this research Cycle 5 involved the provision of a new round of prompts that were provided to the students through the Gateway Blog. By this stage of the action research unit the students had completed the action phase of their research and were beginning to collate and report on their results. The prompts provided in this Cycle were aimed towards reflective writing and the completion of the students’ Final Reports. The majority of the prompts in this Cycle were optional activity prompts, with only two exemplar prompts (Prompts 15 & 16) relating directly to the assignment submission. Table 4.2 details the prompts implemented in Cycle 5 of the study.

<table>
<thead>
<tr>
<th>Prompt No</th>
<th>Activity Prompt</th>
<th>Source</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Reflective writing review</td>
<td>QUT DRAW Project (2011)</td>
<td>This activity is a link to a platform for evaluating the level of reflection in student writing. Students completing these entries, and reflecting on their writing against the determined criteria can make improvements to the writing.</td>
</tr>
<tr>
<td>10</td>
<td>Outline of 4R Framework</td>
<td>Ryan (2011)</td>
<td>This provided the graphic of the 4R framework mentioned in Prompt 9 for the students to use.</td>
</tr>
<tr>
<td>11</td>
<td>Video Review</td>
<td>Jensen, Shepston, Connor, &amp; Killmer (1994)</td>
<td>The students will be asked to video or audio record a teaching experience to review their practice with the review statements. Permission must be gained before recording and only the students will view these recordings.</td>
</tr>
<tr>
<td>12</td>
<td>Verbal 3 step framework</td>
<td>Donaghy &amp; Morss (2007)</td>
<td>The students complete a mini action research cycle on one event in their experience. The process will be completed in the form of a verbal report to a peer for immediate feedback.</td>
</tr>
<tr>
<td>13</td>
<td>Reflective journal review</td>
<td>O’Connor &amp; Diggins (2002)</td>
<td>As the students begin to put their projects together, this prompt aims to get them to go back over their entries to add further detail or extra links to theory.</td>
</tr>
<tr>
<td>14</td>
<td>Conclusion questions</td>
<td>Phillips &amp; Carr (2006)</td>
<td>This will assist the students to bring their projects together and provide an overall review towards their concluding chapter. It is aimed at getting them to think about the bigger picture and to take the project beyond the focus of assessment.</td>
</tr>
<tr>
<td>15</td>
<td>Final report</td>
<td>Previous experience</td>
<td>As with the Plan/Rationale and Progress Report, this prompt gave the guidelines for the assignment submission.</td>
</tr>
<tr>
<td>16</td>
<td>Attachments</td>
<td>Student request</td>
<td>This provided students with instructions to upload evidence and forms required with their submissions.</td>
</tr>
</tbody>
</table>
At this time, Prompts 9 and 10 were placed in the Blog to provide an introduction and outline of the 4R Framework developed by the DRAW project at Queensland University of Technology (QUT) (www.drawproject.net). The focus on peer and self-assessment of reflective writing had been identified as an important part of the “sustained scaffolding” required in improving the levels of writing as students begin to understand how to express their knowledge appropriately (Ryan, 2011b, p. 109). To target this, two Gateway Blog entries were provided where the students were asked to find an entry they had completed for their reflective blog and share this with a peer. This was designed to allow the pairs to ‘mark’ each other’s work and provide feedback based on the criteria outlined in the 4R reflective framework (Ryan, 2011a). The students were given access to a Form created within the PebblePad platform that could be completed and attached to the shared asset to provide feedback.

Figure 4.3 provides the visual of this initial prompt to illustrate how the source was detailed and the questions were added as the new design components added in Cycle 5.
Although the questions were added to these activity prompts they were not successful in engaging students in discussion within the platform at this stage of the implementation. The one comment received was for Prompt 10 – *Outline of the 4R framework* where a student wrote:

That will be really helpful to me. (VM – Blog Post)

There was no other discussion. This was unexpected in that, when the focus group interviews were conducted, many of the students involved commented on the value of this particular prompt.

I did apply it, it’s the only reason I scraped over the line. (M - FG Int 1)

Although there were no comments placed in the Gateway Blog, the results of the online survey reported that a number of students read this prompt and found it useful. When asked to comment on the prompt that was the most useful, one student in the online survey wrote:

The outline of the 4 r’s. (H18 - OLS)

Another also specifically named the 4R model and commented that it helped to guide her reflections:

Also the 4Rs to guide my reflections. (H11 - OLS)

The feedback on this particular model for reflection is analysed and discussed in more detail in Chapter 7.

Prompts 11, 12, and 13 were implemented at this time and were activity prompts focused on the literature for the development of reflective skills, including the use of video review (Jensen, Shepston, Connor, & Killmer, 1994), implementing a three-step framework (Donaghy & Morss, 2007), and reviewing reflective journals (O’Connor & Diggins, 2002). There were no comments posted in the blog for these three prompts despite the questions being added to intentionally promote discussion. The early data collection via focus group interviews and the online survey also did not highlight these prompts as being used by the students. In these feedback forums, a number of students did answer that they had read these prompts but did not implement anything in relation to them due to time factors. The lack of engagement with
the activity prompts will be elaborated upon in the full discussion of the results in Chapter 7.

Prompt 14 - Conclusion Questions came from the work of Phillips and Carr (2006) and was included because the conclusions were often an area of concern in the final report. In previous years the students would write well about their experience within the action research project and the findings that came from the implementation. However, the conclusion chapters were often rushed, and appeared to be added on as afterthoughts, rather than as important components in drawing the research projects to a close.

There were set marking criteria in relation to the conclusion of the reports, therefore it was important to draw this to the attention of the students and assist them in improving this area of the final reports. The drawing of conclusions and identification of future implications are important for the ongoing reflective cycle.

Prompt 14 had no comments added to it and there was no Pebblepad discussion created in relation to this prompt. However, feedback in the focus group interviews and survey results indicate these prompts were read and implemented by the students within the context of the final projects. At this stage the students were using other avenues to discuss issues and were working on their own projects.

The final two exemplar prompts were added after students’ requested an outline for the final reports for their action learning projects. Prompts 15 and 16 were step-by-step guidelines for the formatting of the final assignment and were provided to alleviate the concerns relating to the structure of the submissions. The rationale for this was that students could then concentrate more fully on the content of their writing.

The three comments posted by students in response to these prompts were questions relating to technical problems and clarification of expectations, although one student had figured out the solution to their own problem and then provided some positive feedback on the system.

Pebblepad continues to amaze me. It really is a great way to present a project!. (LP – Blog Post)
It was at this point in the research process that the focus shifted from implementation and general review to that of formal data collection and evaluation. Once the final report submissions had been marked, graded, and returned to the students by the tutors within the action research project unit, the student cohort were invited to take part in focus group interviews or complete an online survey. From these, selection was made for individual interviews.

The results of these data collection processes are outlined in Chapters 5, 6, and 7. The chapters are organised in terms of the three research sub-questions and the areas of the enculturation teaching model that guided the initial coding of the data as described in Chapter 3.
CHAPTER 5

Engagement with the ePortfolio teaching environment

Following on from the description of Cycles implementation in this research, provided in Chapter 4, the next three chapters address the research sub-questions that guided the conduct of the study. The organisation of the findings discussion is structured using the areas of investigation that emerged from the data analysis. The results of the mixed methods approach were analysed using the constant comparative framework (Charmaz, 2000; Glaser, 1965) as detailed in Chapter 3. Each of the three findings chapters are focused on a different research sub-question and the data sources used to address that area of the research study.

This chapter focuses on the first research sub-question:

*How effective are the prompts and learning activities provided in the environment in increasing engagement and developing students’ reflections?*

The purpose of this question was to identify students’ perspectives on the PebblePad learning environment and the value they placed on the scaffolds provided within this space. As the environment was planned based on research on how to improve reflection, the students needed to firstly engage with the environment if there was to be any benefit to them from the environment being implemented.

As engagement was a key component of this research sub-question, it was important firstly to clarify the understanding used for this research. This chapter will then outline the data sources used to answer this research sub-question and discuss the findings in relation to the categories that emerged from the data. For this research sub-question, those categories related to: the usability of the environment; the barriers the students identified to their engagement; and the use of other formats for drafting and completing assigned work. The chapter concludes with the examination of case studies to further explore student-reported levels of engagement within the ePortfolio
platform and the outlining of the design principles that emerged from this section of the study.

Engagement is defined by The Concise Macquarie Dictionary as “the state of being…busy or occupied; involved” (1982, p. 404). In general education, “engagement refers to the active participation of stakeholders… in the development and implementation of decisions relating to … rules and procedures” (Brady & Scully, 2005, p. 159). When transferring engagement to higher education settings, Smith, Sheppard, Johnson and Johnson (2008) describe “student engagement [as] the frequency with which students participate in activities that represent effective educational practice” (p. 87) which they believe indicates to some degree the quality of the education being received.

For the purpose of this research, ‘engagement’ was defined by the students’ level of interaction with the prompts placed within the ePortfolio-based learning environment and any actions they took as a result of accessing these prompts. The levels of engagement were determined by the reported use of the prompts by the students in terms of whether they accessed the prompt, and any action they may have taken from the directions provided.

Data Sources

In assessing the level of engagement within the ePortfolio-based learning environment, the key data sources used were the usage statistics extracted from the PebblePad platform itself and the students’ reported use of the prompts from the online survey. These data were added to the questions in the interviews relating to engagement with the PebblePad platform and usage of the exemplar prompts. Details of each of these sources are outlined below.

Usage Statistics

The initial phase in identifying the level of student engagement within the platform was to analyse usage statistics from the cohort of students. These usage graphs detailed the number of assets the group created while completing their action research projects. Within the PebblePad environment statistics are automatically generated each time a student creates an asset or
document in the system. These details include the asset type and the size of the asset. The usage statistics were generated for the whole student cohort that were enrolled in the action learning project and had access to the ePortfolio-based learning environment.

Online Survey

The online survey was administered to the students via the Survey Monkey website. The survey was added to the data collection process when logistical issues of practicum placements and workload prevented students from being able to take part in the planned focus group interviews. The survey comprised of 17 questions with a combination of short answer, ranking scale, and longer written response formats. The data presented from the online survey was based on the responses of the 25 students who attempted it. Out of the 79 students who completed the unit, this represented a return rate of 32%. The data gained from the question that asked the students to rank the level of use they had had with each of the prompts was significant in identifying the level of engagement within the environment. Higher levels of use reported on a scale from ‘did not look at’ to ‘read and shared with others’, were interpreted as higher levels of engagement by the students with the prompts provided.

Focus group interviews

The three focus group interviews comprised of 2-3 students and were conducted for a 45-minute period during two weeks. A total of seven students took part in focus group interviews.

Individual interviews

The individual interviews included eight students who were chosen based on responses to previous data sets. The selection process aimed to identify maximum variation (Miles & Huberman, 1994) of usage patterns to be further examined. Of the eight students, four had been involved in focus group interviews while the others had provided detailed responses in the online survey or blog discussion. During the hour long individual interviews the students were asked where possible to log in to the PebblePad platform so
that their individual usage graphs could be viewed to prompt discussion about their levels of engagement.

Case Studies

As discussed in the methodology chapter, case study reviews were conducted with six students (two of which are discussed in this chapter) to provide a deeper analysis of data sets towards answering the research questions. The case study participants had been involved throughout various levels of the data collection process. The selection of the case studies was based on reviewing the full data set for each of the 10 students interviewed, either as part of a focus group or individually. The individual cases were chosen to facilitate the selection of students who displayed differing access patterns from the sub-groups within the cohort. The case studies were built with information from varying combinations of data sets including online survey responses and interview transcripts. Where possible, individual usage data was collected during the interviews and a variety of student work samples were examined including assignment submissions and individual reflective blog entries. The nature of this data provided a more detailed picture of individual students to identify if there had been any change in the level of reflection as a result of being engaged with elements of the ePortfolio-based learning environment. Although the examined data for each case is not identical, the combination of multiple sources in each case study allowed a detailed picture to be formed for the individual students to answer the research questions.

The data from these multiple sources were analysed simultaneously using steps from the constant comparative approach as detailed by Charmaz (2000). The initial coding of the data occurred in relation to the a priori codes of exemplars, interaction, and activities taken from the enculturation teaching model (Tishman et al., 1993). Once these codes had been assigned to each data set, a document was created that contained all the data relevant to the original code.

This document was then reviewed using an axial coding process that was defined by Leech and Onwuegubuzie (2008, p. 594) as “when the researcher groups the codes into similar categories.” This process involved the use of
coloured highlighters with a colour being assigned to a key point as it was identified. The same colour was used throughout the document each time the data alluded to the same or similar key point and a different colour used when a new point was identified. The categories identified for the exemplar-coded document are detailed in Table 5.1.

**Table 5.1: Categories from axial coding for sub-question 1.**

| Initial Categories for Exemplars coding | Ability to complete task as prompted; ease of use of the PebblePad platform; planned future use on ePortfolio environments; engagement with the prompts in the platform; use of other electronic formats for example Word; timing and mode of implementation of the ePortfolio platform; technical problems with the platform; multimedia aspects that can be added; collection of evidence. |

These categories were then reviewed in more detail through a memo process (Charmaz, 2000). This process was used to identify the categories from the student responses that directly related to the research sub-question. The memo process involved the writing of a ‘memo’ that detailed the evidence for each category of the data. This was used to identify which were the most relevant to the research question and had enough evidence from the data to provide for detailed examination.

The completion of this memo process led to the identification of three areas of investigation to answer the first research sub-question. These three areas were:

1. The usability of the environment in terms of access to the prompts and the impact this had on the development of reflection;
2. The barriers to engagement that the students identified; and
3. The use of other formats for the drafting of assignments and the effect this had on the level of engagement.
Each of these areas will be examined with description of the related data and what this means for the research study. The discussion will also include possible solutions or future design principles for these areas as part of the ongoing review and improvement in the ePortfolio-based learning environment.

**Area 1: Usability of the ePortfolio-based learning environment**

The first area of investigation that emerged from the data in terms of engagement with the prompts within the environment was the students’ perception of the usability of the ePortfolio-based learning environment. Perceived usability has been identified as a key determinant in the adoption of technological innovations (Straub, 2009) so it was important to review if the students were using the platform and how easy or difficult they found the process. As the environment was provided as the tool to enhance reflection, it was paramount to examine how the students used the environment and whether it met the needs of the research study.

The key data source for the usability of the platform came from the usage statistics collected within the PebblePad platform for the whole student group. The pie chart in Figure 5.1 was extracted from the PebblePad platform and illustrates the count or number of each asset type created by the student cohort of 84 students within the teaching period of 28 weeks over two semesters.

![Asset Type Count](image)

**Figure 5.1:** Assets created by whole student group.
This figure shows that the group of students created a total of 1592 separate assets including: 104 Blogs; 849 Files; 250 Webfolios, and 250 Thoughts. In order to examine what these numbers mean in relation to the ePortfolio-based learning environment, it is important to first provide an overview of these formats. Each asset type examined in this research study is listed and explained in turn below:

- The Blog asset type is designed like other online blog formats and allows students to add to their overall document as they wish with the newest post remaining at the top of the blog.
- The Files are documents, pictures, or other media that the students can upload and have in their asset stores to use in other assets as they work within the platform.
- The Webfolios are web pages that allow the students to create separate pages within the one document and allow for the addition of pictures, files, and links to other assets or resources as required by the student.
- The Thought assets are the individual entries created each time something is added to the students’ blog. It is added as an additional asset so students can link them to other projects individually, rather than as part of the whole blog.
- The Form assets listed are those used in the marking process and in the provision of evidence of classroom practice as required in the assessment submissions. These forms were created within the PebblePad platform by the unit coordinator. These were then made available to the students to complete the required details as part of the submission. When completed these documents were added to their individual asset stores.

In this research project the students were given exemplars of a blog and webfolio. The blog exemplars were to be used as a model for their reflective journals while the webfolio templates were the ones that students were directed to use for their assignment submissions. Based on an originally enrolled cohort of 84 students (reduced to 79 over the course of the research project implementation) and the requirements of the unit they were undertaking, the usage statistics returned anomalous results, particularly in
terms of the prompts provided to the students and their engagement within the platform.

Firstly, the development of 104 Blogs by the student population of 79 showed that the students did appear to engage with the task of completing the blogs as outlined in Prompt 3 - Reflective Journal as a Blog. What this figure did not show, however, was the extent to which the students were utilising these blogs once they were created, or whether it was the prompt that instigated the development of these blogs. To examine this, the usage data was further explored and the results of the online survey were reviewed.

Each time a student added a post to their individual blog, it was not only incorporated into the blog itself but also added as a separate thought asset in the student’s store. This meant that the student could access the post from their asset store directly, rather than having to go into the blog each time. With this in mind, although the students created 104 Blogs, only 250 Thoughts were posted across these blogs. This appeared to indicate that, although the blogs were created, the students were not utilising them extensively. For the engagement with the environment and the planned enhancement of reflection, this was an important point and, as such, was further explored through the online survey data.

To examine the students’ reported engagement with specific prompts descriptive statistics were collated from the online survey. Within the survey there was a question that utilised a ranking scale against a list of the prompts used, in the order that they were uploaded to the blog. The students were asked to rank their engagement with the prompts on a Likert scale, choosing between categories of:

- Did not look at;
- Read only;
- Read and used in project;
- Read and completed activity;
- Shared writing from activity with others.

The differentiation between “read and used in project” and “read and completed activity” was to identify if students were completing work unrelated to assessment items. The final category of “shared writing from
activity with others” was to examine the use of the collaborative nature of the platform.

Table 5.2 shows the percentages of usage as reported by the student group in the online survey. The shaded prompts were those that provided exemplar guidelines focused on assessment items built into the action research project, while the remaining prompts are the additional activity prompts that were included to enhance the students’ reflection. The activity prompts were not assessed as part of the students’ action research projects.

<table>
<thead>
<tr>
<th>Prompt Number</th>
<th>Prompt provided to students</th>
<th>Didn’t Look</th>
<th>Read only</th>
<th>Read and Used in Project</th>
<th>Read and completed</th>
<th>Shared</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reflection on teachers</td>
<td>46.7</td>
<td>46.7</td>
<td>6.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Something to talk about</td>
<td>33.3</td>
<td>60</td>
<td>6.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Reflective Journal as a Blog</td>
<td>26.7</td>
<td>53.3</td>
<td>6.7</td>
<td>13.3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Plan/Rationale Outline</td>
<td>6.7</td>
<td>13.3</td>
<td>66.7</td>
<td>13.3</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Time to refine</td>
<td>40</td>
<td>40</td>
<td>13.3</td>
<td>6.7</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Adding ethics checklist</td>
<td>6.7</td>
<td>6.7</td>
<td>60</td>
<td>26.7</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>Progress report</td>
<td>0</td>
<td>6.7</td>
<td>66.7</td>
<td>26.7</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Uploading evidence</td>
<td>0</td>
<td>7.1</td>
<td>57.1</td>
<td>35.7</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Reflective writing review</td>
<td>0</td>
<td>42.9</td>
<td>42.9</td>
<td>14.3</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Outline of 4R Framework</td>
<td>6.7</td>
<td>33.3</td>
<td>60</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Video Review</td>
<td>46.7</td>
<td>53.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>Verbal 3 step framework</td>
<td>42.9</td>
<td>57.1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Reflective journal review</td>
<td>20</td>
<td>60</td>
<td>13.3</td>
<td>6.7</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Conclusion questions</td>
<td>26.7</td>
<td>26.7</td>
<td>40</td>
<td>6.7</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Final report</td>
<td>0</td>
<td>0</td>
<td>73.3</td>
<td>26.7</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>Attachments</td>
<td>0</td>
<td>21.4</td>
<td>42.9</td>
<td>35.7</td>
<td>0</td>
</tr>
</tbody>
</table>

In terms of Prompt 3 - Reflective Journal as a Blog, the survey results stated that of the 25 students who completed the survey (32% of the cohort) 26.7% of the respondents did not look at the prompt; 53.3% read it only; while 20% of the
respondents reported completing the activity. This equates to only 5 of the responding students creating a blog from this prompt. When 104 blogs were created, either the students who created the blogs did not take part in the survey, or the blogs were created independently without following the prompted guidelines. This disparity was raised in the interviews with students.

What emerged from the focus group and individual interviews was that many students were keeping their reflective journals in other formats such as Microsoft Word or hand written notebooks. The students had chosen to use formats they had relied on in the past and were comfortable with. They were not motivated to try the new format for their reflective journals. Theories on motivation have shown that for change to occur, the students need to have control and responsibility over actions and to make the change by choice (Cohen, 1983). At this stage of their degrees, the students’ journal practices were developed so they did not see the need to change, especially when they could transfer files from these formats later. From these alternative journal writing formats, the students could later select key entries that were either added to the blog or uploaded as Word document files to the Final Report. The practice of uploading files will be discussed later in this chapter as the third area of investigation related to engagement with the ePortfolio-based learning environment.

The second factor for further examination, drawn from the global statistics in relation to engagement with the platform, was the number of webfolio assets created by the student group (Figure 5.1). Throughout the study period there were three assessable submissions that the students were directed to submit in the webfolio format. The creation of 250 Webfolios by the cohort is consistent with these assessment requirements (~80 students with 3 submissions each). However, within this statistical representation, there is no indicator of the quality of these submissions. This was determined by the a priori criteria embedded in the action learning project guidelines. These global statistics also failed to demonstrate how engaged the students were with the ePortfolio learning environment being provided. This required examination of the online survey results and interviews in relation to the use of the prompts placed in the environment.
The exemplar prompts, that provided the students with clear instructions on how to complete and format (layout) their assignments (the shaded sections of Table 5.2), report much higher usage patterns by the students. Based on the addition of the columns of “read and used in project” and “read and completed activity,” 80% (66.7+13.3) of students involved in the survey reported using or completing the Plan/Rationale activity from the outline; 93.4% (66.7+26.7) reported using or completing the Progress Report prompt; and the full 100% (73.3+26.7) of the respondents (32% of the cohort) reported using or completing the Final Report submission from the exemplar prompt provided in the Gateway Blog. This provided evidence that the students were engaging with the exemplar prompts that were related to the assignment submissions.

The trends shown by the descriptive statistics in Table 5.2 highlighted that the exemplar prompts were used more frequently and at higher engagement levels than the activity prompts. These results were furthered reinforced in the focus group interviews. One student stated:

If that (the exemplar prompts) didn’t happen [they] would have been lost and…would have been panicking. (K - FG Int 2)

The importance of the exemplar prompts to the students was also highlighted in the comments that were added to the blog posts, where students expressed that they were:

Getting really stuck on the layout of the assignment[s]. (R- LMS Post)

The students generally reported that the exemplar prompts allowed them to understand the requirements of the assignments and how to submit the assignments in the PebblePad platform. They were engaging more with these prompts because the guidelines and examples presented were scaffolding their use of the platform to complete the assigned tasks.

These exemplar prompts were included in the environment to allow the students to understand the requirements for the assignments and how to set them out within the platform. It was planned that the inclusion of these detailed guidelines would allow the students to focus more on the content of these assignments and therefore their reflection. When examined from this
viewpoint, the engagement with the exemplar prompts by the students in the ePortfolio-based learning environment was positive. The students had identified the purpose of these tasks and that there was a specific outcome of their engagement with it. This meant they were more motivated to complete these exemplar tasks (Watters & Ginns, 2000).

Despite the increased level of engagement with the exemplar tasks, the students’ comments regarding the timing of the use of the environment (discussed below) need to be considered in planning further iterations of the research. This is primarily because the exemplar prompts were only one level of the scaffolding provided and were at the lower end of the scale in terms of complexity in developing reflection.

In contrast to the discussion of the usability of the environment, it was also important to examine what may have prevented the students from engaging more deeply with the ePortfolio-based learning environment. Further examination of the students’ responses throughout the data collection process led to the identification of the barriers to their engagement.

**Area 2: Barriers to student engagement**

When collating the student data that related to their engagement with the ePortfolio-based learning environment, as defined by the students’ reported use of the prompts, several points were repeatedly raised as barriers to their engagement. While some of these barriers were inherent in the action research project unit and the PebblePad platform itself, which have been raised as research limitations, some were a result of the environment being trialed for this research study.

The key barrier that emerged from the data was the timing of the implementation of the ePortfolio-based learning environment. Throughout the online survey and interviews, several students commented that they wished they had used PebblePad from the first year of their degrees. One reason for this was so that they could access a total, chronological collection of their assignments and feedback in the one place:

> At least with PebblePad it like you can see the progression where as in paper you’d have to look through. In PebblePad it’s just there. (Md –FG Int 2)
Several students believed that this practice would have facilitated more ongoing revision of reflections they had written in previous years:

Even if we started it in that [first year] unit you could start it from there cause like writing on paper...I don’t read through my reflections. (S – FG Int 2)

The effective implementation of an ePortfolio allows students to “track growth (change) over time and discover opportunities for development” (Hiller et al., 2007, p. 8). This required the platform to be embedded in the degree. The need for a fully integrated implementation of an ePortfolio platform has been highlighted in many studies as important for the success of the learning environment. It has been noted that the process should be used in all units from first year until the students complete their degrees (Housego & Parker, 2009; Lorenzo & Ittelson, 2005; McCowan et al., 2005). The students’ interviews and online survey responses reinforced this finding. Several students felt if they had used the platform from the beginning of their studies their familiarity with the platform, by their fourth year, would have allowed them to focus more effectively on the activity prompts and the coursework for the unit.

One student pointed out the difficulties of having the platform introduced in the final year of study:

I found the use of PebblePad quite frustrating. I would have preferred to use PebblePad prior to my last year of uni rather than have another hurdle to try and overcome. (M- Email feedback)

Another student reiterated this frustration in particular when studying externally:

It is hard enough other than adding in new programs every change of subject. To me this is wasting my time, it is hard enough to survive and take out time to do study, let alone having to learn new programs all the time. (R2-OLS)

One student offered the introduction to the platform earlier as a solution that would possibly be more applicable to their future as a teacher, especially the aspect of being able to access the platform remotely:

Take on such a program as PebblePad university wide...This would allow more time for students to actually practice refining their reflective thought and practicing this before entering the "real world". As a "real teacher" one would write in a way that is easy and as least time
consuming as possible. Being able to log onto PebblePad from anywhere allows this. (A14- OLS)

Although the timing of the introduction of the platform was not the focus of this research study, these comments show that the use of the platform over time would have allowed for some of the other drivers for engagement to be implemented including the personalisation of the space, the development of the collegial environment (Edwards, 2013), and the promotion of the habits of lifelong learning from both formal and informal situations (McAllister et al., 2008). The students may also have valued the process more highly in terms of their future teaching in relation to their levels of self-efficacy (van Dinther et al., 2011).

In relation to engagement and the development of reflection, the feedback from the students suggested that if they had been introduced to the environment earlier and had built up practices for using the platform, they would have made more use of the prompts. This was because the environment would have been second nature to them by fourth year. This may have allowed them to be more engaged with the reflective components of the ePortfolio-based learning environment and been able to focus on the enhancement of their reflective thinking and writing.

Ongoing use of the platform would also have meant the students would be comfortable using PebblePad and would not have developed skills and preferences for other electronic platforms for the completion of assignments. The use of other platforms for the drafting and completion of components of the students’ action research projects emerged as the third key area in the level of student engagement with the ePortfolio-based teaching environment.

**Area 3: Use of other platforms for drafting and reflecting**

When examining the level of student engagement with the PebblePad environment, it emerged that the students were not fully utilising the platform for the drafting and writing processes of their assignments. The usage data from the PebblePad platform showed that while the students were creating reflective blogs, they were not adding many entries to them as evidenced by the lack of Thought assets being created. Examination of other data sources provided evidence that the reflective journals and other written
work required for the action research projects were being completed in other formats and added to PebblePad later. This work was added either by uploading files as separate PebblePad assets to the platform or through a “copy and paste” action of the text from formats such as Microsoft Word. This practice by the students had an impact on their engagement with the platform in terms of the time spent in the environment and the practice gained through manipulating the program. As such, further examination of this behaviour as a barrier to the utilisation of the ePortfolio-based learning environment was required.

Evidence of the use of other formats for drafting and reflecting within assignments and journals, and the extent to which students relied on this method, came from the number of file uploads recorded within the PebblePad platform. Across the study period, 79 students uploaded 849 files in total to the PebblePad platform (Figure 5.1). The details provided in Figure 5.2 show the top 20 types of files uploaded by the students and the details relating to the number (count), the type, as well as the total and average size of the files that were uploaded by the whole cohort of 84 students across the teaching period of 26 weeks.
The large number (453) of Word files (.doc and .docx) provided an indication that the students were more comfortable working in this format. This data did not record instances when students chose to type in Word then “cut and paste” the text directly into their webfolios which would indicate the use of other formats was even more prolific. As such, this practice was discussed in the interviews. One student commented in the online survey that they found the PebblePad platform:

So different from Word that [they were] used to. (R11-OLS)

While another student discussed the assignments and commented:

I did it all in a Word document and then just copied and pasted it. (K- FG Int 2)

The Webfolio asset format was chosen as the template for assignment submission as it was the most flexible of the formats offered in the version of
PebblePad used in the research. In this template the students could format text with bold, underlining, and italics in a similar way to that offered by a Word document. There were still small differences, however, which may have presented challenges to the students. Janosik and Frank (2013) found that students had difficulty adapting to any change, even small, from formats they were more comfortable using and this impacted on the engagement within the platform.

The use of other platforms by students to complete the majority of the work for their projects, and the transfer or “cutting and pasting” of the contents over for submission, had a noteworthy impact on their engagement with the ePortfolio platform. Not only did it impact on the usage statistics and alter the results collected from them, it reduced the time spent by the students in the PebblePad platform that was needed for them to become more involved with it.

The PebblePad platform itself was designed as an ePortfolio that had reflection imbedded into every aspect. In the version of the platform used in this research all asset templates contained a section that asked the students to reflect on what they had just done. The students, having reduced engagement with the platform, indicated that they were not being exposed to the full benefit of the ePortfolio-based learning environment towards the development of reflection. To further examine the impact of reduced engagement on students, case studies were reviewed. The in-depth examination of the data from two students allowed for detailed pictures to be drawn regarding engagement with the platform.

**Case Study Review**

The purpose of the case studies within this research was to examine, in depth, the perspectives of individual students with the ePortfolio-based learning environment. The six cases that are presented across the three findings chapters were chosen from different areas of the student group. The criteria used to select the case study included the relevancy of the case to the research question, the diversity provided by the case and whether the case provided good opportunities to examine the complexity and context of the research (Stake, 2006). The sub-groups were based on enrolment mode; gender;
The selection process was based on examination of the available data for students, identifying which sub-group of the cohort they belonged to and their reported level of engagement within the ePortfolio-based learning environment. This meant that while the cases did not have identical data sets, each were involved in multiple data collection processes which allowed for the development of a comprehensive picture of the student’s experience.

To further examine the first research sub-question, a review of two case study students was conducted. The students’ in these case studies reported divergent levels of engagement with the PebblePad platform for varying reasons. They also demonstrated differing levels in their reflective writing. Each student had their own view on what element of the action research project and ePortfolio-based learning environment had been most beneficial in the development of their reflective abilities.

Case Study 1: Chelsea

Chelsea was an external student who had completed her studies whilst working as a receptionist in a legal practice setting. This student was chosen because she had been an external student throughout the whole of her degree.

The data set for Chelsea included a response to the online survey (A18- OLS); the provision of usage statistics created in the PebblePad platform; reflective journal excerpts (Journal); and an individual interview (Ind Int).

Chelsea completed her action research project on the use of ICT in the classroom, which is an important area of learning for pre-service teachers as identified in the National Professional Standards for Teachers (NPST) developed by the Australian Institute for Teaching and School Leadership (AITSL). The title of her project was: Are we Engaging Digital Natives in Learning? An investigative report into the effectiveness of digital technologies in early childhood. The research involved the comparative use of ICT in a pre-primary classroom on the Gold Coast, Queensland, and a year one classroom in metropolitan Perth, Western Australia. From the action research project, Chelsea concluded that ICT implementation in early childhood comprised mostly the use of interactive white boards, computers, and digital cameras.
Chelsea concluded that the use of this technology did enhance the outcomes for students. This supposition impacted on her ideas for future teaching by demonstrating the importance of utilising these types of technologies with early childhood students.

Chelsea completed only part of the online survey, however, she did respond to the question on her ability to reflect prior to commencing the action learning unit:

I would say that I was competent at using my reflections to inform planning, it was simply that I felt more exposure to the process 'for real’ was necessary. I do also feel that if our reflections from practical placements were looked at and assessed … more students would have more practice at it prior to this unit. (OLS)

Chelsea’s view of herself as confident in the use of reflection was corroborated by the use of the PebblePad platform as determined by her individual usage statistics (Figure 5.3). In comparison to other case study samples reviewed, her usage statistics represented a higher number of assets created across the study period.

![Figure 5.3: Usage log for Chelsea](image)

The usage statistics from Figure 5.3 illustrated that Chelsea created one Blog that contained 14 Thoughts, uploaded 20 Files, and created the required three Webfolios.

Chelsea reported that the blog was completed as suggested in Prompt 3 - Reflective Journal as a Blog. This graphic showed that the blog was used throughout the unit with the 14 Thoughts added to this asset. Chelsea added

evidence to her submissions in the form of uploaded Files and was able to complete the three assessment pieces as required, including the addition of the mandatory Form. Her confidence in her ability to reflect enabled her to focus on other aspects of the environment such as the uploading of evidence (including photographs) from her practice and copies of documents from her mentor teacher to support the reflective entries in her blog.

When specifically examining engagement with the platform, however, a second usage graph extracted from the PebblePad platform provides a different point of view. Figure 5.4 shows the timeframe for the creation of the assets listed in Chelsea’s pie graph and details the types of files that comprise the 20 shown in Figure 5.3.

![Figure 5.4](image-url)

**Figure 5.4:** Record of Chelsea’s timeline and file type

Figure 5.4 shows that the assets began to be created through March and April followed by a spike in July. Chelsea created 35 assets in July leading up to the submission of the final report assignment. The figure shows that the types of files uploaded were a combination of documents (.doc and .docx, pdf) and picture files (jpg) as well as three .zip files. This shows that, although Chelsea utilised the ePortfolio platform by creating a number of assets and had confidence in attaching evidence to her webfolio submissions, much of this evidence was added in a small period of time leading up to the submission of assignments. This practice reinforced the statements in her interview about the use of other formats for the drafting process of the assignments.
When shown these usage records in the interview, Chelsea reported that she did not feel they truly reflected her engagement within the unit as she:

Did a lot of my documents in Word and then just uploaded them. (Ind Int)

Chelsea felt she was engaged with her action research project and took many hours to complete her research but she:

Found PebblePad a bit of a pain to use. (Ind Int)

This was because it was a new platform and it was introduced at a time when her workload was already higher than previous years. She had also received negative feedback from students who had completed the action research project in earlier years and had relayed comments about the problems they had faced with the platform. These points are important for the adoption of technology as the perceived ease of use influence the views surrounding the individual adoption of technology-based innovations (Straub, 2009). Chelsea already had a negative view of the program before she had even accessed it, which would have impacted on the progress of her adoption of the technology.

Chelsea also felt it would have been much better if students were able to choose PebblePad earlier in their degree and:

Were to upload a document of their whole uni experience…for events etc that have happened each year. (Ind Int)

This view reinforces the need to see the value of the technology for future use which links to self-efficacy factors, and also shows a higher level of commitment by the university in supporting the adoption of the platform—both important factors in the individual adoption of technology (Straub, 2009).

In terms of engagement with the prompts provided as part of the teaching environment, Chelsea made several comments about the Gateway Blog that was provided and why it was useful:

I found [the] blog very useful. [As I had] not used PebblePad before and…didn’t know what it was. (Ind Int)
Chelsea particularly commented on the exemplar prompts and reported they were good because they:

Specifically broke down what [was] required in each section. (Ind Int)

In the interview, Chelsea reported that she had completed Prompt 1 - Reflection on Teachers and she did look at Prompt 14 - Conclusion Questions, which she found useful to make sure she was on track. Chelsea did not complete any of the other tasks from the activity prompts as she felt she was on-track with her research project. This perception of the additional activity prompts as being supplementary - for those students who required extra help with their reflection - was raised by other students in the focus group interviews and is an important factor in motivation. As such this became an issue that is discussed as part of Chapter 7.

When asked what she felt was the most useful component of the ePortfolio-based learning environment in further developing her reflection, Chelsea identified all aspects of the Colton and Sparks-Langer (1993) model. Chelsea articulated a clear understanding of the process of reflection and felt that completing the action research project helped her “find out what [she] was looking for and needed to think about” (1- Action - decisions); and as part of this process she would have “to do [her] own research” (3 Professional Knowledge Base); so she could “act on that knowledge” (2 Construction of Knowledge and Meaning - action plan). She identified that the key to reflection within the action research project was not to look at:

Everything all at once, that sometimes it’s best to stop and just look at one or two particular things. (Ind Int)

The need to focus on specifics is a key in beginning more effective reflection as the students must “notice and deliberate about aspects of their practice” (Ryan, 2013, p. 146). This process becomes more difficult if there is not a specific focus.

Chelsea explained that she did not think that there was a perfect reflection and that she would continue to learn what to look for and may need to change through further experience (Ind Int). This related to the (2)
Construction of Knowledge and Meaning and (3) Professional Knowledge Base sections of the framework.

Based on Chelsea’s reported engagement with the exemplar prompts and the use of some of the activity prompts placed within the teaching environment, it was important to identify the level of her reflective writing at different stages during the implementation of the research study. To determine this, samples from Chelsea’s Reflective Journal and final research project were reviewed against the 4R’s of reflection (Figure 2.1).

The 4R’s of reflection was chosen to review the work samples as it had been developed as part of a project conducted by QUT aimed at the development of reflective writing (www.drawproject.net). The colours from the reflection model (as repeated in Figure 5.5) were used to highlight sections of the students’ journals and project excerpts to identify the level of reflection demonstrated in the writing as categorised by these hierarchical criteria.

<table>
<thead>
<tr>
<th>Level</th>
<th>Stage</th>
<th>Questions to get you started</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reporting and Responding</td>
<td>Report what happened or what the issue or incident involved. Why is it relevant? Respond to the incident or issue by making observations, expressing your opinion, or asking questions.</td>
</tr>
<tr>
<td>2</td>
<td>Relating</td>
<td>Relate or make a connection between the incident or issue and your own skills, professional experience, or discipline knowledge. Have I seen this before? Were the conditions the same or different? Do I have the skills and knowledge to deal with this? Explain.</td>
</tr>
<tr>
<td>3</td>
<td>Reasoning</td>
<td>Highlight in detail significant factors underlying the incident or issue. Explain and show why they are important to an understanding of the incident or issue. Refer to relevant theory and literature to support your reasoning. Consider different perspectives. How would a knowledgeable person perceive/handle this? What are the ethics involved?</td>
</tr>
<tr>
<td>4</td>
<td>Reconstructing</td>
<td>Reframe or reconstruct future practice or professional understanding. How would I deal with this next time? What might work and why? Are there different options? What might happen if...? Are my ideas supported by theory? Can I make changes to benefit others?</td>
</tr>
</tbody>
</table>

**Figure 5.5:** The 4R’s of reflection (Ryan, 2011a; http://www.drawproject.net/reflection)

In an early journal entry written after a visit to the classroom where the action research project took place, Chelsea’s writing was very descriptive. As can be seen in Figure 5.6, Chelsea reported what had happened in the classroom.
At the beginning of the year, the teacher was assessing students’ abilities in order to determine reading groups. For half an hour each day, there is a group of 4-5 students who are given a separate task to the rest of the class: they are provided with a comprehension activity, then they read a book, then complete literacy games on the computer (hangman etc). The rest of the class work as a whole, reading sentences on the blackboard, discussing the words, and then playing “Charlie”. I intend on discussing that small group of 4-5 students who use the computer to play literacy games.

Figure 5.6: Example 1 of Chelsea’s reflective writing

This initial entry was typical of the writing in her journal at this stage of her research project. It was clearly an example of Level 1 reflection – the reporting and responding stages of the 4R’s of reflection (Ryan, 2011a), in that Chelsea had simply recounted the incident as it happened.

An entry that came later in Chelsea’s Journal (Figure 5.7) did show a higher level in her reflective writing as defined by the 4R’s of reflection (Ryan, 2011a).

I really do believe that this computer is not set up for student use. It is an adult chair at an adult table, and due to the arm rests there is insufficient room for the chair to slide under the table. On the table there is only enough room for the monitor, keyboard and tower, meaning when students are publishing their work the first draft must be balanced either on their lap, held in their hand, or balanced on top of items on the adjacent teachers desk. To help her, I held the book to the left of the computer so she could use two hands to focus on typing. Now, I knew not to expect a competent touch typist whose speed is over 120 words per minute, however I was surprised to find that she was using two fingers to type: the pointer finger on each hand. She did have to look for the keys, however did not struggle with the fact that the keys are marked with uppercase letters. She held her left hand over the left part of the keyboard, and her right hand over the right side of the keyboard, with two fists extending her pointer fingers. Thinking about this now, I feel that these actions displayed technoliterate capacity.

Figure 5.7: Example 2 of Chelsea’s reflective writing

Figure 5.7 discusses an incident with an individual child that occurred during one of Chelsea’s visits to the school setting. This shows that Chelsea begins relating to what she is recording by commenting on the workspace as not being “set up for student use.” This observation indicated knowledge or understanding of the ergonomics of the space. At the conclusion of this entry
Chelsea presented a reasoning comment, that in completing the observed activity the student’s “actions displayed techno-literate capacity.” These more complex comments demonstrate links to theory in relation to the content area of her research project and wider understanding of the link from her observation to her action research. This enables the entry to be classified at both Level 2 – relating, and Level 3 - reasoning on the reflective framework (Figure 5.5).

A final and more detailed entry from a later date in Chelsea’s journal progressed further and briefly illustrated evidence of reflection at Level 4 – reconstructing. This occurred when Chelsea commented that she “must further investigate” the transfer of the techno literate skills that the students are demonstrating in the observation she has made (Figure 5.8). This type of reconstructing comment started to feature briefly in several of Chelsea’s journal entries at this time.

![Figure 5.8: Example 3 of Chelsea’s reflective writing](image-url)

Although this reconstructing comment was very brief, it demonstrated the intention to reframe future practice that is required in the reconstructing level of reflective writing. Chelsea had reported on the incident, discussed how this
related to her previous experiences and then applied some aspect from the literature, even though it’s not referenced in her reasoning. Finally, she reconstructed her thinking to plan changes into the future.

The progression through the levels of reflective writing shown in these entries demonstrated a change in Chelsea’s reflective writing. The inclusion of sections that could be categorised in the higher levels of the hierarchy was consistent with Chelsea’s perception that she had enhanced her reflective processes throughout the action research project.

Chelsea felt the key to this progression was the time spent in the classroom. The process of being able to collect evidence of her practice and having the opportunity to reflect on this teaching experience was important. This is supported by the writing of Boud (2006) who highlighted the need for reflection to be embedded in real world situations to make meaningful connections and changes to practice. The process of implementing changes based on these reflective entries was completed as part of the action research project and modeled through the ePortfolio-based learning environment, which Chelsea valued as a process.

To summarise the findings of this particular case study in relation to the research question, Chelsea engaged with the exemplar prompts in the ePortfolio-based learning environment and reported accessing some of the activity prompts. Her reflective writing showed progress through the teaching period and she felt that this was due to her engagement with the action research project as modeled in the environment.

Case Study 2: Jaye

In contrast to Chelsea’s level of engagement and progression of reflective activity, the second case study chosen provided an alternative access pattern to the environment. This was due to her mode of study and a medical issue that appeared to be triggered by the platform. Jaye was chosen as the second case study as she had been selected to take part in an Internship Program that was being implemented in collaboration across several universities. Involvement in this program meant that Jaye spent the whole final year of her degree within a school setting for varying time periods (such as 2-3 days per
week). This lead to a 10 week full-time teaching practicum in Term 3 of the school year. The reason Jaye was chosen as a case study was because this internship experience provided a different insight into the process of ongoing reflection.

The data set for Jaye included response to the online survey (R29- OLS), an individual interview (Ind Int), and work samples from her assignment submissions. Jaye had kept her journal as a Word document and had not uploaded any excerpts from this to her PebblePad submissions. This meant the entries were not available for review. Due to a computer problem at the time of the interview there was also no opportunity to secure Jaye’s individual usage graph or asset records.

The topic of interest for Jaye’s action research project was encouraging academic achievement through a range of collaborative teaching practices. This project was titled: Effective teachers encourage higher academic performance through group discussion. The project was implemented in a split pre-primary/year one class. Jaye believed that:

> Action research is an ongoing process that is certainly cyclical, which in turn become apparent that as you engage within this process you will pass through many discrete moments within a cycle (Grundy 1995). However, one needs to commit truly to the process wholeheartedly. (Excerpt from Final Report)

From her research, Jaye felt she would continue to use collaborative learning in her future teaching because:

> This method did provide all children the opportunity to actively construct knowledge, by sharing their ideas, opinions, and understanding within the discourse of discussion. (Excerpt from Final Report)

In terms of identifying Jaye’s engagement with the ePortfolio-based teaching environment, the online survey provided the key source of data with support from the individual interview. When asked about engagement during the interview, Jaye admitted that she completed the majority of the work for her assignments in other formats rather than within the PebblePad platform. This
was partly because of the internship program she was involved with that used another platform for reflection:

Being part of the internship so a lot of my reflection was on there (the course site for the internship) instead of PebblePad (Ind Int).

The other reason for using other platforms was something unique to this case study, in that the graphics, or some other design feature of the PebblePad platform, appeared to trigger Jaye to experience migraines. Jaye had no idea why this happened, but each time she logged in to PebblePad she could only work for a short time before she was unable to continue due to the pain. This was obviously a major contributor to what she reported as a reduced level of engagement within the platform. Jaye’s migraines led to her accessing PebblePad to check the prompting blog, then working in Word to complete the tasks, before logging back in to PebblePad to transfer the files over. Nevertheless, she did report that she had read 14 of the 16 prompts and used 6 of them in the completion of her action research project (Table 5.3).

<table>
<thead>
<tr>
<th>Table 5.3: Jaye’s Reported Prompt Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prompts</td>
</tr>
<tr>
<td>Did not look at</td>
</tr>
<tr>
<td>Read only</td>
</tr>
<tr>
<td>Read and used in project</td>
</tr>
<tr>
<td>Read and completed activity</td>
</tr>
<tr>
<td>Shared Writing</td>
</tr>
</tbody>
</table>

This level of access to the prompts in the environment was actually higher than many of the other students reviewed, including Chelsea. Jaye also completed the assignment submissions in the required webfolio format and used a variety of styles in completing the three separate submissions. This variation included experimentation with a range of colour and banner layouts within the platform.
Jaye commented that Prompt 4 - *Plan/Rationale Outline* was the most useful and that she felt the:

Unit allowed me to refine my reflective process as it allowed me to implement changes to modify teaching to enhance student learning and see first hand improvements. (OLS)

Despite the reported health issues that arose in using the platform, Jaye declared she was extremely reflective and the more frequent contact with the classroom setting that she experienced on the extended practicum enabled her to implement the action research project more effectively. Jaye had a higher level of self-efficacy because she was spending more time in the classroom and felt she could enact some level of change within that setting (Ashton, 1984).

The internship program meant Jaye’s reflections were more focused on the required standards for the pre-service teachers to meet as part of their development:

I did a lot of my reflection [against] the AITSL [Australian Institute of Teaching and School Leadership] standards. (Ind Int)

Jaye also found that the continued action research process helped her to understand the required flexibility within her teaching as she stated:

I had to let go of that whole having control so I used the action research for that process…it works really well (Ind Int).

In the interview Jaye discussed the components of the environment and identified that she likes to complete smaller, rather than larger, cycles of action research. She also reported that finding the time to be involved in collaboration was the most difficult aspect of the environment to manage. This demonstrated an alignment with the (1) Action component of the Colton and Sparks-Langer (1993) model, by implementing change in a cyclic manner. The use of reflective discussions with others towards outlining solutions aligns with (2) Constructing Knowledge and Meaning.

Jaye suggested that reflection should be integrated more into practicum placements by requiring students “to prove that they’re reflecting” (Ind Int) by engaging in discussion with their visiting supervisor. In this situation the
student would actually need to implement the full reflective cycle in the process of discussion in a similar fashion to that outlined in Prompt 12 - Verbal 3-step Framework. This comment, again, reinforced the need for reflection to be based in practice (Boud, 2006) and contain an interactive component (Atherton, 2011).

When reviewing Jaye’s level of reflection, the samples examined came from her assignment submissions. An entry was taken from each assignment submission and it is important to clarify that they are only segments of much larger entries. The excerpts were selected to demonstrate the variation in Jaye’s reflective writing based on the levels in the 4R’s of reflection (Ryan, 2011a) and to provide a comparison over time. The first entry (Figure 5.9) was taken from the Rationale section of the first submission that required the students to outline why their chosen action research topic was important.

In order to facilitate critical reflection I have chosen to use Bronfenbrenner’s ecological theory – the context of reflection model. As this model promotes deep reflection and analysis as to how the context and environment will impact teaching and learning; as well as personal, theoretical and political ideologies (Bronfenbrenner, 2007). This model has allowed identification of personal strengths and weaknesses in regards to my teaching pedagogy, which represent my personal ideologies and will become obvious as I proceed through this project. Upon reflection I have recognized that my strength is providing diverse learning enriched centres that supports the diverse variety of learners within my class, allowing them actively construct knowledge. However I have come to the realisation that my weakness is group discussions as I am missing key skills that are required to enable all children to become actively involved. This is certainly apparent as the minority consistently take part within discussions and the majority become withdrawn or disengaged as I consistently use hands up or coral responses. This appears to be where behaviour management strategies become intensified, as children start to use inappropriate behaviours such as talking out of turn, fidgeting, hitting, lying down or wandering etc. These behaviours are unproductive and disengage other students from learning. Inappropriate behaviours appear to be minimal when all children are actively engaged with concrete manipulatives throughout the learning centres. This leaves me feeling that my teaching skills are not effective.

Figure 5.9: Example 1 of Jaye’s reflective writing
At the start of this entry, Jaye stated she was applying Bronfenbrenner’s ecological theory to facilitate critical reflection. This statement showed an understanding of the levels of reflection and reflective writing. The linking to the Bronfenbrenner model at the beginning of the text provided the reasoning behind the comments made. The reporting and relating that occurred later in the entry were based on the identification from the initial engagement with the Brofenbrenner model. This ability to directly apply a theoretical reflective model was not shown by other students whose reflective entries were examined. When this entry was compared to Chelsea’s first entry, Jaye was already demonstrating reflection in higher levels of the hierarchy (Figure 5.5) and making the links between theory and practice to improve her teaching.

The second entry to be reviewed for Jaye came from the initial reflection section of her Progress Report (Figure 5.10). This entry demonstrates Jaye’s ability to utilise a range of levels of the 4R’s of reflection (Ryan, 2011a) in reporting on aspects of implementation, relating these to her experience, reasoning what had happened against literature, and reconstructing what should happen in the future in relation to the experience.
Jaye began this entry by relating the classroom experience to her background knowledge and reasoning why the collaborative strategies were not working. She then further reports on what had happened in the classroom and reconstructs what needed to be changed with reasoning based on literature. The level of reflection in this entry was at a much higher level than that provided by Chelsea. This may have been due to the increased use of the prompts within the environment but it is difficult to claim a direct relationship. The entry demonstrated her ability to effectively review her
practice based on the literature she had read as a means of ongoing improvement to her practice.

It was difficult to choose one excerpt from Jaye’s final report to use as a work sample because the whole reflective discussion moved amongst the levels of reflection in a similar fashion to that shown in Figure 5.10. Figure 5.11 is an excerpt from the reflective discussion section of Jaye’s final report and shows her utilising all four levels of the 4R’s of reflection (Ryan, 2011a).

Figure 5.11: Example 3 of Jaye’s reflective writing

In this example, Jaye described events from the experience, related this to her experience, and then added the link to the literature as part of her reasoning. There was also planning for the future as part of the reconstructing process. The detail and use of all levels in this example demonstrated the range in
Jaye’s reflective writing and her ability to integrate her knowledge of theory with practice.

To review this case study in terms of engagement with the ePortfolio-based learning environment, there were factors that inhibited Jaye’s engagement with the electronic environment for long periods of time. Despite this, her reported level of engagement in the online survey actually demonstrated a high use of the prompts in contrast to other students reviewed. This may be due to the increased interaction she was having within the classroom that increased the perceived value of what she was doing therefore increasing her level of self-efficacy (Ashton, 1984). It may also be that Jaye is a highly motivated student (selection for the internship program is based on previous high achievement) and that she viewed reflection as an important part of her ongoing learning (Carrington & Selva, 2010).

Jaye’s level of reflection was high throughout her writing and she felt this was due to her connection with the students in her class. This connection was gained through the ongoing contact within the school-based teaching environment accommodated by the internship program. This, again, is not directly attributable to the ePortfolio-based learning environment, however, Jaye was engaged with the prompts provided. The scaffolded action learning project appeared to be key in the ongoing development of Jaye’s reflective writing as she alluded to in her final report. Her concluding paragraph shows her self-belief as an educator (Ashton, 1984) as she describes the reflective journey she had undertaken and highlights the benefit of ongoing self-critique of her practice:

> I think that self-critiquing my practice was aiding to not only improving my practice it was improving childrens participation and minimising unproductive behaviours, evidential documentation clearly portrays how effective group discussion was becoming as children were becoming active participants in discussion. (Excerpt from Final Report)

**Summary**

In order to answer the research sub-question How effective are the prompts and learning activities provided in the environment in increasing engagement and
developing students’ reflections? the data coded under exemplars were examined.

An initial review of the ePortfolio-based learning environment demonstrated some success in that the Gateway Blog presented an efficient medium for the integration of the enculturation teaching model (Tishman et al., 1993). The students were able to access the prompts in the blog and utilise the exemplar prompts to complete and submit their assignment tasks. To enable stronger conclusions and recommendations to be made, a detailed review of the evidence was required.

The review of the data from the initial area of the exemplars led to the identification of three areas of investigation relating to: the usability of the environment; the barriers to engagement; and the use of other formats for the drafting of assignments.

The data examined relating to the usability of the environment included the descriptive statistics generated within the PebblePad platform. These data showed that the students were able to complete the assessments as outlined in the exemplar prompts which impacts on motivation. The perceived ease of use of the platform is an important factor in the individual’s adoption of technology along with the support provided to make the change within the given context (Straub, 2009). This second factor was further reinforced by the students reporting that the exemplar prompts provided to guide the completion of assignments were very useful and alleviated the stress associated with the formatting of the assessment items.

The engagement with the other activities within the ePortfolio-based learning environment was limited primarily due, to confusion regarding the purpose of the tasks. This is discussed in more detail in Chapter 7. This restricted level of engagement was explained to some extent through the discovery of several barriers to engagement.

Throughout the analysis of the data in relation to the barriers to engagement, the students’ responses mostly indicated that they were frustrated at having to learn a new platform in addition to completing their action research projects. This was partially due to the higher workload required of them in their fourth year but also related to the key requirements of technology
adoption. The students had not been involved in the decision to use the platform, nor were they able to clearly see how it would help them with their future careers. They felt social pressure to use the platform but the support from the wider institution was limited. These four factors are important in the adoption of technology yet were not addressed in the implementation of the platform (Straub, 2009). Because of this, their attention to using the e-Portfolio and its embedded reflective supports was constrained to the key assessable tasks of the unit that consumed most of their focus.

A key indicator of the reduced level of engagement within the platform was the number of files uploaded to the PebblePad platform as detailed by the usage statistics generated within the platform. These statistics, and the responses in other data sources, indicated that the students were using other formats to complete much of their written work then transferring this to the PebblePad platform for submission. This practice reduced the time spent within the platform and thus limited engagement with the reflective provisions of the ePortfolio-based learning environment.

The examination of the findings in these three areas and the case studies presented in this chapter showed that the exemplar prompts were effective in guiding the students’ reflections through their research projects. However, the reduced engagement with the additional learning activities did not allow for the full utilisation of the reflective development opportunities of the environment.

To improve the ePortfolio-based learning environment, ensure that more of the prompts are effective in developing reflection, two key design principles are recommended:

Design Principle 1: Introduce an ePortfolio at the beginning of the pre-service teacher program.

Design Principle 2: Embed the ePortfolio in as many learning activities as possible.

The longer period of use would provide the students with more time to adjust to and adopt the technology of the platform which may increase the perceived ease of use as well as allow them to identify how it will help in their future
careers. It may also provide a more supported implementation by the university. By exposing students to the platform earlier, they could develop skills and confidence in using the templates provided. This could reduce the use of other various formats for the drafting of reflective writing, rather than engaging directly in situ. The effect of this increased interaction with the platform could form the basis of a more successful implementation of the ePortfolio-based learning environment. This would arguably make the prompts and other learning activities designed to target and support the development of reflective skills, more effective in assisting the students.

In relation to the first research sub-question the analysis of data has shown that the prompts and learning activities had limited overall effect in increasing engagement and helping to develop students’ reflective abilities. There were some positive indications of the potential for the design of the ePortfolio-based learning environment, however, these findings must be viewed within the overall implementation. These findings indicated that reflective habits of mind (Mezirow, 1997) were difficult to effectively establish with all students within the limited time frame of the research study.

In the next chapter, the second area of the enculturation teaching model – the interactions, is discussed. This includes the examination of which strategies were successful, or not, in developing the interaction component of the enculturation teaching model within the ePortfolio-based learning environment and why.
CHAPTER 6

Interaction within the ePortfolio-based learning environment

The second research sub-question that is addressed in this chapter identifies which strategies were most successful in promoting interaction within the ePortfolio-based learning environment. The previous chapter reviewed the data and analysis in terms of the exemplar prompts placed in the environment and the impact these had on engagement. This chapter examines the data relating to the interactions students had within the ePortfolio platform and why it occurred in this way. The focus on interaction particularly examines the second element of the enculturation teaching model (Tishman et al., 1993) implemented in the ePortfolio-based learning environment.

The research question at the centre of this chapter is:

*To what extent were the trial strategies successful in developing reflective interactions among students and why?*

In a similar way to Chapter 5, this chapter outlines how the research question is positioned in the study and describes the data types used in examining this. The chapter discusses the data in relation to the categories that emerged in the analysis process. For interaction, the areas of investigation that emerged from coding with the constant comparative approach included: the importance of the discursive process to the action research projects; the preference for discussion in face-to-face situations, including with other stakeholders outside the platform; and the use of other online discussion platforms.

The second area of the enculturation teaching model (Tishman et al., 1993) is the provision of a space to facilitate interactions among the students. This was the area that received the most discussion in the focus group interviews and was the most difficult to foster throughout the implementation of the research. As discussed in Chapter 4, the addition of the guiding questions with each prompt for the implementation of Cycle 5 did not appear to have any effect on the use of the Gateway Blog for discussion amongst the students. This chapter will elaborate that, although interaction did not occur in the ePortfolio-based learning environment, the data from the online survey
and interviews reported that the students were involved in reflective discussion through the completion of the action learning projects. They viewed these interactions as an important component in the development of reflection.

**Data sources**

The data sources for this sub-question include the usage statistics and the blog comments from the PebblePad platform, the online survey responses, and the interviews. A review of two case studies will also be presented. The first is a student who reported using the PebblePad platform to share and discuss their written work with peers prior to submission of assignments. By contrast, the second student had only minimal engagement with the environment.

**Usage Statistics**

The major components of the statistics automatically generated by the PebblePad platform were discussed in Chapter 5. In relation to interaction, the platform also recorded the number of *shares* and *collaborations* that occurred among the student group which are reviewed in this chapter.

In the PebblePad environment the students are able to select to send an asset from their personal asset store to another person within PebblePad or via email to people who do not have accounts within the platform. Each time this process is completed it is counted within the ePortfolio as a share. This sharing facility also provides options for collaboration on particular assets by the person who created and sent the asset by selecting the level of input the receiver can have when the asset is sent. It is the recorded numbers of these shares and collaborations by the platform that are used in this chapter.

**Blog comments review**

By reviewing each post within the Gateway Blog, it was possible to examine which posts had received comments from the students. It was possible to code the content of these comments to provide further detail of the types of interactions that were occurring within the ePortfolio-based learning environment.
Online Survey

There were two questions in the online survey that specifically focused on the use of the blog platform. The first was a yes/no response to whether the online blog in PebblePad had been used, while the second question required an open-ended response to explain the reasons for and against the use of the blog. The responses provided a contrast to the usage data extracted from the platform.

Interviews

As described in the methodology chapter and further outlined in the discussion of the engagement data in Chapter 5, the focus group and individual interviews were conducted to further investigate the student perspectives on all aspects of the environment. The discussion in relation to the interaction component of the teaching environment accounted for substantial time in the interviews. The analysis of these data assisted in clarifying the categories for review for the research project.

These data sources were initially coded for interactions in relation to the enculturation teaching model (Tishman et al., 1993). The axial coding process as described in Chapters 3 and 5 yielded a number of categories listed in Table 6.1.

Table 6.1: Categories from axial coding for sub-question 2.

| Initial Categories for Interaction coding | Sharing work stats versus reported use of blogs and platform to share; preferred discussion with mentor teacher or tutor; different contexts – with people outside university setting; preferred other formats for online discussion; face to face preferred options; time factors; regular routines developed; preferred group to interact with; importance of the discursive process as identified by the students in interviews. |

In defining the key areas of investigation through a memo writing process from these coded categories, it was important to review the overall structure of the action learning project as an external unit as this had an impact on the
students’ responses. Once this was taken into consideration the areas of investigation were defined from the data as:

(1) the importance of reflective interactions to the students in completing their action research projects;
(2) the preference stated by students for having interactions in a face-to-face setting often with others outside the platform; and
(3) the preference for other platforms to facilitate computer mediated discussion.

Each of these areas will be discussed with reference to the data and literature to support the design principles identified from the research study.

Area 1: Importance of reflective interactions

The data collected throughout the research project reinforced the importance of interactions in the development of reflection. This was not only from a theoretical point of view but also from the feedback of the students themselves. All of the students who contributed to the data indicated that being able to talk about events that happened in the classroom setting was an important contributor to effective reflection. An example of this viewpoint came from one of the individual interviews:

There’s no point in just going over it in your own head because you know your opinion. (T – Ind Int)

To examine these perspectives further, the number of shares recorded within the PebblePad platform was reviewed. A report generated by the PebblePad platform at the level of the Global Statistics was a table that detailed the account usage for the whole student cohort based on the particular unit code. This table, shown as Figure 6.1, identified the number of users (including teaching staff), and the details of the shares and collaboration that took place among that group.
The PebblePad sharing process included features such as setting viewing permissions related to the person receiving the asset; providing a grade or feedback; comment; copy; cascade; or collaborate on the shared asset.

The use of the ePortfolio environment for collaboration and sharing of reflective discussions was a key goal of the research. Figure 6.1 shows that there were 90 private shares among the cohort of 84 students. This indicated that there were 90 incidences of students sharing assets directly with selected peers within the platform. These statistics show that the students were utilising the sharing aspects of the platform, however, the nature of this collaboration cannot be gathered from this data. These private shares also do not include the sending of assets to the PebblePad Gateway.

Figure 6.1: Sharing statistics among cohort.
The Gateway was the repository for the students’ assessment pieces. It was also the area within the platform that facilitated the blog where the research prompts were posted. Figure 6.1 showed that there were 547 separate assets published to the gateway by this group of students in the study period of 26 weeks. When considering a group of initially 84 students with three submissions each (=252), there are approximately 300 additional assets that were posted within this gateway space. Even when the submissions for repeat assignments were taken into account this figure appeared high. One explanation may have been that the gateway was the area where the prompting blog was placed and there was some discussion in this area. However, a more detailed breakdown of the 547 assets in terms of type, or the area of the gateway where the asset was shared, was not available from the PebblePad platform.

To gather detail on the use of the gateway the comments placed in the blog were examined. Table 6.2 outlines the blog prompt by name and number then provides the detail of any comments that were added to this prompt. The shaded rows differentiate the exemplar prompts from those placed as activity prompts and the double line after Prompt 8 identifies when the specific questions were added to the prompts. As discussed in Chapter 4, these questions were added to the prompts at the end of Cycle 4 based on the recommendations in the literature that specific questions may help to stimulate interaction within the electronic environment.
The details in Table 6.2 show that a total of 26 comments were made within the Gateway Blog. Nine of these were responses to questions placed by the researcher which leaves 17 comments placed by students. Eight of these comments were positive feedback on the PebblePad platform, while the remaining 9 were questions to clarify either a technical concern or an issue of the assignments. All of the student questions were in relation to the exemplar prompts and there were only four comments from the students across the total number of activity prompts. These were all short feedback comments on the individual prompt or the overall PebblePad platform. The first three feedback comments were related to Prompt 1 - *Reflection on Teachers* and included positive feedback on the process. The fourth comment placed by the student in the activity prompts was in response to Prompt 10 - *Outline of the 4Rs*:

<table>
<thead>
<tr>
<th>#</th>
<th>Prompt Name</th>
<th>Question</th>
<th>Feedback</th>
<th>Interaction</th>
<th>Response</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reflection on Teachers</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Something to talk about</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Reflective Journal as a Blog</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Plan/Rationale Outline</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Time to Refine</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Ethics Checklist</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>7</td>
<td>Progress Report Outline</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Uploading Evidence</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Reflective Writing Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>Outline of 4R Framework</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Video Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>Verbal 3-Step Framework</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>Reflective Journal Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Conclusion Questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Final Report</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>Attachments</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
Thank you …, that will be really helpful to me. (V – Blog Post)

There was no interaction between individual students within the PebblePad discussion space. The students were not engaging with the ‘interaction’ aspect of the teaching model as planned. There was, however, some peer interaction in the course-based LMS.

The comments posted by the students in the LMS for the action research project unit were in relation to helping someone with an issue or to share an experience, but remained short and concise. To further examine the interaction that was taking place in the ePortfolio-based learning environment the online survey results were reviewed.

In contrast to the statistics collected in the PebblePad platform that showed 90 private shares among the cohort of students, the online survey results suggested that collaboration was not occurring in the platform. Of the 25 students that completed the online survey, none reported sharing any completed work from the exemplar or activity prompts with others (Table 5.1). This highlighted the disparity between the data collected within the PebblePad platform and the response of the students. This was a concern when reflection itself was seen as a collaborative process (McNiff & Whitehead, 2006) that required “discourse on practical experiences” (Yost et al., 2000, p. 42). The agreements between authors on reflective practice and those from the social constructivist theories outlined in Chapter 2 were testament to the importance of interaction in the development of reflection.

The students’ responses in the interviews showed that they understood the importance of these reflective interactions, particularly in relation to their action learning projects but were completing them elsewhere. The students involved in the data collection identified that they preferred these interactions to be face-to-face and often with stakeholders outside the ePortfolio teaching environment. These factors became an additional category to examine further for this research question.

**Area 2: Reported preference for face-to-face interactions**

Although the action research project was run externally and had no timetabled on-campus lectures or tutorials, the participants who took part in
the interviews stated that much of the reflective discussion would happen in informal face-to-face meetings. These interactions would occur among the students when they were on campus for other units. As the students were generally enrolled internally, they would still come to campus for other lectures and tutorial classes. This provided an opportunity to meet and discuss their concerns in relation to the project. Several statements in the interviews highlighted the use of face-to-face interactions over any electronic platforms:

We came in to the [other unit] and compared notes frequently. (M – FG Int 1)

I think face-to-face is better because on LMS I know that it’s got great ideas behind it you know all working together and everything but it never happens like that... I think face-to-face reflections are for me better than written. (C – Ind Int)

The face-to-face environments were also used to share written plans for feedback on hard copy documents (K- FG Int 2). One student felt that sitting at home in front of the computer was “very antisocial.” She commented that when they learned the most it was “with people” (M – FG Int 1). As pre-service teachers, many of the students interviewed saw the value of the social aspect of learning and felt that this was more relevant in face-to-face contact than external online units.

Although this area of investigation did not directly relate to the research question, it did provide a topic that needed to be considered in planning future iterations of the teaching environment. To increase interactions among the group within the ePortfolio-based learning environment, there perhaps needs to be provision for discussions through a blended approach to the unit or via Web-based services such as Skype or LMS-based video conferencing platforms.

There were also some responses that revealed the reflective discussion was happening in the school setting as part of the students’ action learning projects:
I had a lot of discussions with my mentor teachers. Because I spent so much time in the classroom...we spent quite a lot of time discussing various aspects. (M – Ind Int)

This discussion was occurring with the mentor teachers and/or teaching assistants who were supporting the students through the implementation phases of their action research projects:

It is because you can get over, you can do it straight away. Whereas you go home and...there’s not enough time to keep writing it down. (A - Ind Int)

Having those conversations with my mentor teacher and my EA (education assistant) who were both very experienced. It was really useful to either confirm something I had thought. (C – Ind Int)

These mentors did not have access to the online blog in PebblePad but they did have a direct impact on the classroom teaching environment. They were there to provide immediate feedback to the students and had a strong understanding of the action research process. This made the mentor a valuable resource in the process of reflection. The students respected their views as part of the reflective process which reinforced the ideas of the novice/experienced teachers’ theoretical framework of the research (Berliner, 1986; Carter, Cushing, Sabers, Stein, & Berliner, 1988). It also raised issues in relation to the role of the tutor in the online environment.

Through the interviews with the students, it became evident that one of the barriers to their discussion engagement within the ePortfolio platform was related to the role of the instructor within the environment. This drew parallels with the work of Swan (2001) who completed research into the effective use of online teaching environments. She highlighted that facilitation of interaction with the content, the tutor, and other students was crucial to the success of the environment (Swan, 2001). Further, Swan (2001) found that “for online discussion to be successful, it required a social environment that encouraged peer interaction facilitated by instructor structuring and support” (p. 30). This view was supported by more recent research that found “student-student interaction in course discussion is one of the most influential factors for successful online courses” (DeSchryver,
Mishra, Koehleer, & Francis, 2009, p. 3) and that “the purpose of interaction is to increase motivation for learning, creating mutual support among students and encouraging constructive learning” (Meishar-Tal, Kurtz, & Pieterse, 2012, p. 35). In terms of this research study, the person facilitating the discussion (the researcher) was not directly involved with the students’ action research projects. This may have had an impact upon the use of the interaction platform, as the role of the instructor has been identified as important in online teaching environments (Maor, 2003; Maor, 2008; Meishar-Tal et al., 2012).

The valuable reflective discussion described by the students who were interviewed occurred face-to-face and was managed predominately by the students themselves. It was not possible for the students to raise issues with their mentor teachers through the PebblePad blog, nor was it realistic when the discussion appeared to be much more effective in the classroom at the time and place the incident occurred. A prompt could perhaps be added that encouraged the students’ to post their response to these conversations with their mentor teachers or teaching assistants as a reflective entry in their reflective journal or blog or even to share with peers to allow for a social learning experience. This would allow for the incorporation of the oral discussion with the writing processes that have been identified as being important in taking reflection to higher levels of understanding (Mason, 1998).

When planning future iterations of the environment, the importance of these alternative modes of discussion need to be considered and changes made to maximize the value of the interaction. As early as 2000, Johnson, Aragon, and Shaik compared learning in online and face-to-face discussions and found that although there was no difference in the quality of learning that occurred, the students involved reported higher levels of satisfaction with the face-to-face learning environment. For online discussions to be successful, students needed to see the value of being involved and be able to see the “connections…between discussions and what they are supposed to be learning” (Ellis et al., 2007, p. 95).

Face-to-face interactions have been found in some studies to be more spontaneous and contagious with energy and enthusiasm (Garrison &
Kanuka, 2004). In contrast computer based discussions were more task oriented (Jonassen & Kwon II, 2001) and focused on the issues with less distractions (Garrison & Kanuka, 2004). Much of the research in this area argued for a blended learning approach that combined the effective components of these two interaction platforms as “a blended learning context can provide the independence and increased control essential to develop critical thinking” and provide for “a scaffolded acceptance of responsibility for constructing meaning and understanding” (Garrison & Kanuka, 2004, p. 98). For these approaches to be successful, there needed to be “effective integration” of the two modes of interaction, not just an adding on of one type (Garrison & Kanuka, 2004). The institution also needed to support the implementation process (Kim & Bonk, 2006).

The ePortfolio-based learning environment could be supported by a face-to-face component for the students through either a blended approach or video conferencing platforms. The goal would be to provide the “systematic and sustained critical discourse” needed for higher order thinking through “coordinated and synergistic” interaction (Garrison, Anderson, & Archer, 2001). The use of a blended approach may also reduce the use of other platforms for interaction among the student group.

**Area 3: Use of alternative platforms for discussion**

Many students commented that they used social media, predominantly Facebook, to discuss issues within their action research projects. One student commented that the large group discussions possible on Facebook provided them more anonymity in the discussion space (C-Ind Int) and it was a platform the students were comfortable using. There were a number of comments from the online survey and in the interviews regarding the use of other platforms.

In the online survey, the students were asked if they had used the blog discussion platform. Only four students who responded to the survey answered ‘yes’ and when these students were asked to elaborate why, they responded:

I was able to clarify understanding. (A3 - OLS)
I used limited amounts of blogs as my lines of communication already existed in the form of emails and texting. (A20 - OLS)

It was good talking to other students and getting answers. (H24 - OLS)

The students who responded in the survey that they did not use the blog elaborated that this was because they were communicating via:

- Facebook, Friends, E-mail, Text messaging, Small gatherings (study sessions). (A6 - OLS)
- Email to my tutor...who was an amazing support. (R29 - OLS)
- Through the ‘meetings’ communication among peers, sharing of ideas through emails. (H20 - OLS)

The responses in the survey demonstrated that the students involved in the reflective process valued interaction but that it was occurring through other avenues with a variety of stakeholders. The preference for existing platforms such as Facebook to be utilised instead of the PebblePad blog was further reinforced through the interviews. One student responded:

- We have a Facebook page that talked about different units and [prac] and that’s where everyone offers ideas and what they did so I suppose it’s a different forum. (K- FG Int 2)

Facebook, or any social media platform, was part of daily life for the majority of students and was a space that served a multitude of purposes through a one-stop login. The students controlled this space and had the flexibility to be involved how they wished. It was these and other components of social media platforms that made them preferred discussion tools for the students (Meishar-Tal et al., 2012) and raised questions in several areas including ownership of the online space (Maor, 2003); comfort with the platform; and who had access to the discussion. In studies that have used Facebook as an alternative to an LMS, learning in Facebook has been perceived as a dynamic learning environment and a “channel for expressing difficulties in learning so as to gain moral support from friends” (Meishar-Tal et al., 2012, p. 38). Other studies have found that students thought Facebook was used most importantly for social reasons, not for formal teaching purposes (Madge, Meek, Wellens, & Hooley, 2009). This blurring of formal and informal
learning in social media platforms is an area that is currently developing as a research focus in educational settings.

For this study, the reported use of other discussion forums, including social media platforms, may have been due to the fact that most students were accustomed to studying internally so were more comfortable in face-to-face discussions. They also liked the control and ownership that social media platforms offered them in leading discussions. The students commented that, because they had a separate login and had to go through several levels of the PebblePad platform to reach the gateway blog discussion, it was more convenient to use platforms such as LMS and email that they were accessing anyway.

For discussion with tutors, LMS was sometimes used or contact was made directly via email. Every unit/subject the students study in this institution has an LMS page so it may have been more convenient to access tutors for the action research unit via the LMS. Email can also be accessed via many devices, including mobile phones and tablets, so it was a much more efficient means of making contact with others, including tutors, at any time from any location. A student in one of the focus group interviews commented that her:

Tutor was amazing [in providing] support. I’d email her and like get a reply within that day which was really good cause…as an external you need that. (Md – FG Int 2)

The version of PebblePad being used in this research was also not user friendly in terms of the layout and options for adding comments to the blog. The students had to navigate several layers of the platform to become involved in the discussion. This may have influenced the level of engagement.

The levels of ownership of these alternate communication systems and their ease of use may have an impact on the engagement with any facilitated online discussion forum and is an important area to explore in more depth. Further detailed perspectives were provided through the review of case studies.
Case study review

For the interaction component of this research study, the students who were chosen for detailed examination as case studies had reported using the PebblePad platform differently. The first case student, Alesha, had used the platform to share work and interact regularly with another student, while the second student, Zak, had not been involved with the blog discussion at all.

Case Study 3: Alesha

Alesha was a mature age student who had completed her degree through a combination of internal and external units. Alesha was chosen for review due to her level of engagement with the platform based on her usage graph and the responses she provided relating to interaction within the platform. The data for Alesha consisted of an online survey response (A20- OLS), usage log graphs, an individual interview transcript, and work samples.

Alesha’s project investigated how to involve students in the planning process and was titled: How can I develop my planning skills to enable my students to become more involved in the planning process and in their learning? The project was implemented within a Year 7 classroom and focused on planning, with the students’ input, to increase the collaboration that occurred in the environment. Alesha reported that the time spent in the classroom to complete the action research project was a very important learning experience and that by:

Implementing a reflective, spiraling cycle of “problem identification, systematic data collection, reflection, analysis, data-driven action taken, and finally, problem redefinition” (Johnson, 1993, p1) anything is possible. (Excerpt from Final Report)

Alesha would be considered one of the most engaged students within the PebblePad platform on the basis of usage statistics. Her usage graph (Figure 6.2) shows assets she created by type and number (count).
Alesha created 12 individual Blogs, uploaded 38 Files, added 6 Thoughts to her blogs, and completed 6 Webfolios. This is beyond the number of blogs and webfolios students were prompted to create for assessment and showed that Alesha was using the platform for a range of purposes, not only her assignments. The large number of file uploads (38) also demonstrated the use of the platform to collect evidence of her developing experience.

To examine this file usage further, Alesha’s timeline and file details are included (Figure 6.3). This figure shows that there were two separate peaks in the creation of assets and that the majority of files that were uploaded were Word documents (.docx and .doc). The other file types were one picture file and an .mp3 recording, which is a file format that had not been used by many other students.
The timeline shows that there were several entries leading up to and including March, which led to the submission of the first assessment piece. Then there was a second concentrated spike as the final submission was due.

When asked if she thought these statistics were a fair representation of her engagement, Alesha said she didn’t really think so, as the level of assets here:

Probably reflects on the way they feel they reflect the best. (Ind Int)

When looking at the online survey response for Alesha, Table 6.3 details her reported access to the prompts placed within the Gateway Blog. This table demonstrates an important level of use of the prompts that Alesha actually described in the online survey as being ‘instrumental’ in her project.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not look at</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read only</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read and used in project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read and completed activity</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared Writing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Alesha commented in the survey that she was not involved in the blog posts due to time factors and the use of other communication strategies that she already had in place. When asked about the blog in the interview, she stated:

Yes, I would as I said it was not a great deal actually. I did a lot more with [another student]. If I had problems, we would talk to each other so we were able to do that. (Ind Int)

The student with whom Alesha interacted had used the blog platform to ask questions of the researcher on three separate occasions so this may have negated the need for Alesha to upload to the blog herself.
Alesha was also one of a small number of students who commented that they sent assets through the PebblePad platform to peers as a means of support throughout the unit:

To get feedback from someone else. One of the other students, … and I, used PebblePad between us as well. (Ind Int)

Alesha reported that this collaboration was important in the development of her project and ongoing reflection.

When asked if this interaction occurred in other platforms as well, Alesha replied that:

It was the PebblePad contact that set up…and it went from there to email and then to phone. It depends on the context of what we needed to talk about which way we communicated. (Ind Int)

When asked about reflection, Alesha felt that reflection was an overused term throughout the Bachelor of Education degree (Ind Int). Although she viewed herself as a very reflective person, her involvement in the unit helped to make her reflection more targeted on what she was doing in the classroom. To see if this perception came through in her reflective writing, work samples were taken from Alesha’s assignment submissions and reflective journal entries.

Alesha’s first sample (Figure 6.4) came from her Plan/Rationale submission and showcased her ability to write within all 4 levels of the 4R’s of reflection (Ryan, 2011a). It is important to note that the requirement of this submission was to develop an action plan that required some level of reconstructing in deciding what to do in the future in the area of investigation.
The second sample that was reviewed was an entry from Alesha’s Reflective Journal (Figure 6.5). This entry was completed later in the action research process and reviews the overall ideas of the action research project. The comments here were more general as they related to the whole process but showed that Alesha could write within a range of levels.

Alesha’s final journal entry (Figure 6.6) was written at the end of the implementation phase of her research. This sample provides an overview of Alesha’s writing in terms of the whole action research project. This entry has elements of all levels of the 4R’s of reflection (Ryan, 2011a) in brief sections and with general references.
These three examples are all very general and although all levels of the 4R’s of reflection (Ryan, 2011a) were present, the depth of these entries did not demonstrate Alesha’s ability to write critically reflective entries.

In terms of the goals of the research project, Alesha’s engagement with the prompts was high and she showed a consistent level of reflective writing. Alesha reported making use of the collaboration options available within the platform to share and discuss the assignments with a particular peer which links to (2) Constructing Knowledge and Meaning of the Colton and Sparks-Langer (1993) framework. She found that the prompts in relation to the action research project or the area of (1) Action, were the most effective in helping to refine her reflective skills. In contrast to Alesha, Zak had a reduced level of engagement with the PebblePad platform and his case study is described below.

Case study 4: Zak

The second case study in the area of interaction, Zak, was chosen because he had a reduced level of engagement with the PebblePad platform and reported not using the interaction affordances of the blog. Zak completed his action learning project in the area of differentiating activities for students from varying ability levels with the final report titled: Successful strategies for accommodating for both high and low level achievers. Zak reported that by
answering his focus questions, he felt a real sense of accomplishment and described the action learning project as:

> A long learning curve in my professional and educational growth.

(Excerpt from Final Report)

The data set for Zak included usage graphs from PebblePad, the first page of the online survey, an individual interview, and work samples. The usage statistics for Zak from the PebblePad platform (Figure 6.7) show that he created only the required 3 Webfolios throughout the study period of 28 weeks, uploaded 8 Files, and completed 1 Form.

*Figure 6.7: Usage log for Zak*

Of the 8 files that were uploaded across the study period, Figure 6.8 shows that there were 3 picture files, 1 pdf document, and 4 Word documents. The timeline graph also shows that the assets were created in spikes that correlated with assignment submissions.

*Figure 6.8: Zak’s timeline and file type*
To begin to examine the reasons for this reduced engagement with the PebblePad environment, the results of the online survey were examined. Zak had only completed the first page of the survey, which required responses to background information relating to confidence in reflection, and whether the respondents perceived their ability to reflect had improved as a result of the action research project. In these questions, Zak identified that he:

> Found it difficult to reflect prior to commencing this unit [and he felt that] the ‘4 R’s’ approach presented … during this unit is what assisted me in my reflective strategies. (OLS)

Zak also commented that he would have preferred to receive the reflective framework earlier to assist in guiding the reflective process throughout his degree. The reference to the 4R’s of reflection (Ryan, 2011a) demonstrated that Zak had read the prompt relating to that topic in the Gateway Blog, but there was no other indication of engagement with the prompts, as he did not complete the remainder of the survey. To further explore this, Zak was invited to take part in an individual interview.

When asked in the interview if he had used the prompts in the blog, Zak replied that he had not read all of them but that he had used:

> The original one that showed us how to actually make a portfolio, I kept referring back to that. (Ind Int)

When asked specifically about the 4R’s of reflection (Ryan, 2011a) that had been mentioned in the online survey, Zak responded that:

> I’m pretty bad at reflecting so when I saw the 4R’s framework it really helped me with trying to understand how I am supposed to be reflecting and the process in which I am supposed to follow not just writing what’s in my head. So, yes, no, I thought it was fantastic. (Ind Int)

This comment highlighted the importance of a clearly scaffolded approach to reflection that provided students with guidelines and examples of what reflection looks like (Ryan, 2011b; 2013).

In terms of the ePortfolio environment, Zak responded that he was not really engaged with PebblePad because he “didn’t have time to be engaged with anything apart from the assignments” (Ind Int). This shows that Zak had not
internalised the value of the platform and therefore was not motivated to complete anything that was viewed as ‘extra’ work (Cohen, 1983). He did feel that an ePortfolio was something that he would use in the future because he liked the idea of it and ongoing use would be by choice. The element of self-selection to use the ePortfolio is an important component of adoption of these types of platforms (Straub, 2009) but Zak felt that:

At that point in time (during the 4th year) it was just more trying to get it done. (Ind Int)

As the interview focus moved to the interaction within the environment, Zak reported that he did not take part in the blog discussion within PebblePad. He preferred to meet with friends on campus or raise issues through Facebook:

I think it was easy to talk about things like what we are finding hard. And like if I had a problem with anything I would talk to them about it so otherwise it was just through Facebook. I didn’t really, yes, use the blog much. (Ind Int)

When asked about the value of these reflective discussions, Zak responded that they helped to identify if problems were isolated or “across the board” (Ind Int) to then identify how to begin to solve them. These responses highlighted that Zak viewed reflection as a problem solving process rather than one that provided long-term benefits. He had not identified how this could impact on his future teaching to become more engaged (Carrington & Selva, 2010).

To examine the contrast in reflection from Zak to Alesha, who had reported a higher level of engagement with the interaction affordances of the platform, work samples were examined in relation to the 4R’s of reflection (Ryan, 2011a). Zak had mentioned this framework on several occasions as being useful in developing his reflections.

The work samples reviewed included an excerpt from Zak’s project plan, an evaluation completed on a lesson in the classroom context, and a section from the Final Report on the action learning project. These were chosen as they were completed at different stages of Zak’s action research project.
The first example of Zak’s reflection came from the Project Plan that was submitted prior to commencement of the implementation phase of the action research project. The excerpt (Figure 6.9) shows that Zak had a small amount of description (Level 1) and reconstruction (Level 4). The majority of the entry was written at the relating (2) and reasoning (3) levels.

![Diagram of levels of reflection]

**Figure 6.9:** Example 1 of Zak’s reflective writing

It is important to note that this excerpt came from the introduction to the Plan/Rationale assignment that asked the students to report on the topic they had chosen and why it was important. This may have impacted upon the level of reflection being demonstrated, as there was specific scaffolding of the Plan/Rationale process. In contrast, the second example being reviewed was an evaluation on a particular lesson given in the classroom context as part of the implementation of the action research project.

Figure 6.10 shows a piece of writing that was added as evidence to Zak’s Final Report as an example of reflecting on a lesson for improvement in the next cycle of research. It followed a set of guiding questions that had been included in practicum guidelines to stimulate reflection and provided a framework from which to review the lesson that had been implemented. This entry was written before the 4R’s of reflection (Ryan, 2011a) had been provided in the blog.
With the questions provided to guide the writing in this example, the reflection remained predominantly in Level 1 – Reporting where Zak described what happened. There was a small amount of relating when discussing changes to the lesson. The final point provided some reasoning and reconstructing although these were both very brief and did not provide detail of how the changes would be made. There was also no link to any literature through this review process, nor did the review relate to the topic of the action research in terms of differentiating the lesson to cater to student abilities.

Questions have been used successfully in a number of studies as scaffolds for reflective writing (Nesmith, 2011; Parkison, 2009; Rodman, 2010). In this example, however, the questions were provided to students purely for the purpose of reviewing a lesson they had implemented on practicum. There was no follow-up from this lesson reflection. This meant that while there were
reflective components in these questions, they were posed at lower levels which was how Zak responded in answering them. The comments here are at the lower levels of reporting and relating.

The third entry reviewed for Zak came from his Final Report. This section (Figure 6.11) was from the conclusion where the students were required to review the action research project as a whole.

This final entry from Zak remained within the relating level of the 4R’s of reflection (Ryan, 2011a) where he discussed what had happened and related it to previous experience. There were small sections of other reflective levels but this example did not show progression across the study period.

This is in contrast to Alesha who was heavily involved in the platform and showed variation in the level of her reflective writing. Zak did say that he felt he was not good at reflecting and although Example 3 (Figure 6.11) demonstrated writing in higher levels of reflection from Example 2 (Figure 6.10), he was still predominately at the relating level. This was also evidenced by his focus on reflection as a problem solving process rather than one of deeper learning.

Summary

The data coded initially under interactions was examined to answer research sub-question 2:
To what extent were the trial strategies successful in developing reflective interactions among students and why?

This appeared to be the most difficult aspect of the enculturation teaching model (Tishman et al., 1993) to develop as the discussion options available within the Gateway Blog were not being utilised by the students. This was despite the addition of the prompting questions to the blog posts as part of Cycle 5.

What emerged from the evidence provided by the students was that they understood the value of discussion in the development of reflection. This finding is important in the teaching of reflection that is often viewed as a solitary experience. A key concern in terms of this research study, however, was that this discussion was happening in other environments. The areas of investigation from the interactions developed as: the importance of reflective discussions; the preference for face-to-face interactions with peers and additional stakeholders; and the use of other online discussion platforms.

The data examined in relation to the students’ perception of reflective discussion demonstrated that the process was valued among the student group. They reported being involved in discussions with peers and mentors and identified that these were important to the process of their action learning projects. The use of discussion with mentors reinforces the ideas of the different perspectives of novice teachers in contrast to experienced teachers that formed part of the framework for teacher reflection (Colton & Sparks-Langer, 1993). This was also a positive for the ePortfolio-based learning environment in that interaction formed a key component of the teaching model. The students, however, highlighted that much of the discussion occurred in face-to-face contexts, which was a barrier to engagement with the ePortfolio-based learning environment.

As highlighted earlier, engagement in the context of this research related to the use of the prompts and affordances of the PebblePad platform for the completion of tasks relating to the action research projects. If students were utilising other modes and platforms for discussion, they were not spending this time within the ePortfolio platform and therefore engaging with the full capacity of that space.
Many of the students involved in the data collection process indicated a preference for meeting face-to-face with people to discuss concerns, issues, or to *bounce ideas* off others. For many students, this action research project was their first external unit and they were not accustomed to accessing formal online spaces for interaction. These findings led to the first set of design principles for this area of the research.

**Design Principle 3:** Utilise a blended approach or video conferencing platforms to allow the students to be involved in face-to-face interactions.

**Design Principle 4:** Add prompts to include written reflection and discussion based on the face-to-face interactions that are occurring.

**Design Principle 5:** Widen the access to the platform to other stakeholders within the students' action research projects to allow the discussion that occurs to be part of the process.

Many of the students reported that key reflective discussions involved their mentor teachers. In this iteration of the study the mentors did not have access to the platform. This can be arranged for future implementations to enable the students to interact in the environment with these important critical colleagues.

The final area of investigation for the interaction component was the use of other platforms by the students. Social media platforms such as Facebook provide students with an area to interact that they have control over and are more comfortable in using. Research has also identified that the use of these types of social platforms may help to overcome some of the issues relating to engagement with online discussions (Meishar-Tal et al., 2012). By adapting the PebblePad platform to become more user-friendly, the use of these alternative platforms may be reduced. This became the focus of the final design principle in relation to interaction.

**Design Principle 6:** Emulate the positive components of the social learning environments within the discussion platform or embed existing social media sites within the ePortfolio-based learning environment.

In relation to the research question *to what extent were the trial strategies successful in developing reflective interactions among students and why?*, the
ePortfolio-based learning environment was not successful in developing reflective interactions to any measurable extent. The findings from the data and the case studies highlighted that the students understood that interaction is important in the development of reflection, however, changes need to be made to the medium for the discussion. To engage students with interaction in the ePortfolio-based environment, the format needs to be adapted to more directly meet the needs of the students.

The next chapter focuses specifically on the activity prompts placed within the ePortfolio-based learning environment. This chapter will examine whether access to these additional tasks and the overall environment had an impact on the students’ perceived and/or actual levels of reflection.
CHAPTER 7

Impact on reflection of the ePortfolio-based learning environment

The discussion in Chapters 5 and 6 examined the engagement of the student cohort with the first two components of the enculturation teaching model (Tishman et al., 1993). This chapter reviews the findings towards the progression of students’ levels of reflection, particularly after engagement with the activity prompts placed in the environment.

Engagement with the activity prompts was measured by the students’ reported use of the exemplar prompts from the online survey and the interviews. In addition to the prompts that focused on the provision of exemplars of good practice, and outlined the submission requirements for assessment, the Gateway Blog facilitated the provision of prompts that were activities designed to assist the students to develop skills in reflection. The prompts were based on literature that focused on the development of reflection in higher education settings and were included to cover the three areas of the Colton and Sparks-Langer (1993) framework for teacher reflection.

This chapter investigates the use of these prompts, as reported across the data sets and examination of case studies, to answer the third research sub-question:

*What impact does engagement in the ePortfolio environment have on the level of students’ written reflection?*

This chapter details the activity prompts that were implemented through the ePortfolio-based learning environment, then outlines the data sources that were used in this section of the research. It discusses the areas of investigation that arose from these data to present the findings that report any change in the students’ level of written reflection after being exposed to the ePortfolio-based teaching environment. The chapter concludes with the examination of two case study students and the outlining of the design principles that emerged. The case study students reported that they were engaged with the
environment but the actual level of engagement varied considerably as
determined by the data. The student work samples were examined for
progression in reflective writing based on the 4R’s of reflection (Ryan, 2011a).

Table 7.1 provides the details of the activity prompts that were implemented
in the ePortfolio-based learning environment, specifically in terms of the
prompt title as the heading in the blog post; the source for the activity idea;
the component of the Colton and Sparks-Langer (1993) framework the activity
prompt incorporated; and the purpose behind its inclusion in the
environment.

Table 7.1: Activity Prompts with link to Framework and Purpose

<table>
<thead>
<tr>
<th>Prompt Number</th>
<th>Activity</th>
<th>Framework Link</th>
<th>Source</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Good Teacher Description</td>
<td>(3) Professional Knowledge Base</td>
<td>Phillips &amp; Carr, (2006)</td>
<td>The students were asked to describe and share what they think are the attributes of a good teacher.</td>
</tr>
<tr>
<td>3</td>
<td>Reflective writing in the blog</td>
<td>(3) Professional Knowledge Base</td>
<td>Spalding &amp; Wilson (2002)</td>
<td>Reflective writing can promote reflective thinking because it is a permanent record of thinking and is an outlet for feelings and can open up dialogue.</td>
</tr>
<tr>
<td>9</td>
<td>4r reflective writing</td>
<td>(3) Professional Knowledge Base</td>
<td>QUT DRAW Project (2011)</td>
<td>This activity was a link to a platform for evaluating the level of reflection in student writing. Students completing these entries and reflecting on their writing against the determined criteria can make improvements to the writing.</td>
</tr>
<tr>
<td>11</td>
<td>Video Review</td>
<td>(1) Action</td>
<td>Jensen, Shepston, Connor, &amp; Killmer (1994)</td>
<td>The students were asked to video or audio record a teaching experience and review their practice with the review statements.</td>
</tr>
<tr>
<td>12</td>
<td>Verbal 3 Step Framework</td>
<td>(1) Action / (2) Constructing knowledge and meaning</td>
<td>Donaghy &amp; Morss (2007)</td>
<td>The students complete a mini action research cycle on one event in their experience. The process is completed in the form of a verbal report to a peer for immediate feedback.</td>
</tr>
<tr>
<td>13</td>
<td>Journal Review</td>
<td>(2) Constructing knowledge and meaning</td>
<td>O’Connor &amp; Diggins (2002)</td>
<td>As the students begin to put their projects together, this prompt aimed to get them to go back over their entries to add further detail or extra links to theory.</td>
</tr>
<tr>
<td>14</td>
<td>Conclusion Questions</td>
<td>(1,2,3) All areas of the framework</td>
<td>Phillips &amp; Carr (2006)</td>
<td>This assists the students to bring their projects together and provide an overall review towards their concluding chapter. It was aimed at getting them to think about the bigger picture and to take the project beyond the focus of assessment.</td>
</tr>
</tbody>
</table>
The students were provided with the source of the prompt via an in-text citation in the second round of implementation, as outlined in Chapter 4. The reason for this was to provide the students with a theoretical base for the prompt after evidence suggested the initial activity prompts were not used. It was hoped the citation would help the students to identify the value of the prompt being provided and encourage them to consult the original source material.

**Data sources**

The data sources for this chapter included:

1. the online survey, in particular the students’ reported use of the activity prompts in the rating scale question;
2. written transcripts of focus group interviews;
3. written transcripts of individual interviews; and
4. case study examination including review of work samples against the 4R’s of reflection (Ryan, 2011a).

As with the review of the engagement and interaction findings (Chapters 5 and 6), analysis of the impact of the environment on reflection (if any) for this chapter is based on these multiple data sources and reported using the constant comparative approach (Glaser, 1965). The areas for investigation for this chapter emerged from coding the written transcripts for repeated key points from the students’ responses. Table 7.2 provides the details of the categories that emerged from the initial data coding.

**Table 7.2: Categories from axial coding for sub-question 3.**

<table>
<thead>
<tr>
<th><strong>Initial Categories for Activity coding</strong></th>
<th>Reflective writing; formatting; technical issues; frustration with the platform including the timing of the introduction; university experience with reflection; engagement with the prompts in terms of the reported level of use of each; timing with writing; log-in steps and access; privacy issues; action research; attributes – can you teach reflection; past experience; future use; value of the process.</th>
</tr>
</thead>
</table>
From this list of categories the areas for further investigation were condensed, through a memo writing process, to three key areas:

(1) the reduced engagement with the activity prompts;
(2) the focus on reflective writing; and
(3) the students’ perception on whether reflection could be ‘taught.’

Each of these areas will be discussed and the evidence for each presented to support the conclusions and recommendations made.

**Area 1: Reduced engagement with the activity prompts**

When examining the reported level of engagement within the ePortfolio learning environment, it was clear that the students who responded to the online survey were more engaged with the assessment task prompts based on the reported level of use. Many students reported that they had read the activity prompts, however, the online survey results (Table 5.2) show varying percentages of access to these prompts across the timeframe of the project. The actual implementation of tasks from the activity prompts was much lower on the non-assessed items. The prompts were developed based on the three components of the Colton and Sparks-Langer (1993) framework for teacher reflection. As such, the examination of the reported usage of these activity prompts has been divided into the areas of (1) Action, (2) Constructing Knowledge and Meaning, and (3) Professional Knowledge Base.

As shown above in Table 7.1, the Action component of the Colton and Sparks-Langer (1993) model was presented to the students through Prompt 11 – Video Review as well as being the foundation for Prompt 12 - Verbal 3-Step Framework. This area of the model was based on the need for reflective teachers to make decisions on their practice based on the cycle of planning, implementation, and evaluation (Colton & Sparks-Langer, 1993).

This collection of prompts had the lowest reported usage amongst the students who responded to the survey. Based on the percentages in Table 5.2, no students recorded that they used either Prompt 11 - Video Review or Prompt 12 - Verbal 3-Step Framework. Over half of the students (53.3% and 57.1% respectively) responded that they had read these prompts but had taken no action in response to reading them.
The second component in the Colton and Sparks-Langer (1993) framework was that of Constructing Knowledge and Meaning (Figure 2.1). This area involved choosing to attend to a situation, then through the use of reflective discussions, defining possible solutions to problems and making action plans (Colton & Sparks-Langer, 1993). For this area, the students were prompted with Prompt 12 - *Verbal 3-step Framework* and then Prompt 13 - *Reflective Journal Review*.

The reported engagement for the *Verbal 3-step Framework* has already been discussed under the Action component as being one of the least actioned prompts provided to the students. However, Prompt 13 – *Reflective Journal Review* was read by 60% of the students surveyed and 20% (13.3 used in project + 6.7 read and completed) reported using the prompt in the completion of their projects (Table 5.1). The lack of reported engagement with the activity prompts, particularly in these two areas, was an important issue that arose from the research in drawing conclusions on the value of the ePortfolio-based learning environment. If the students were not engaging with the prompts, changes need to be made so they can benefit from the components of the environment.

The third and final area of the Colton and Sparks-Langer (1993) framework that was used to examine the prompts was that of the Professional Knowledge Base. The students were required to review the influences and interpretations of their teaching practices in a range of areas. This included content and pedagogy and was based on examination of personal views and values, and their reflective writing as illustrated in Figure 2.1.

This area contained the largest number of prompts. Table 7.3 shows the numerical detail of the activity prompts in relation to this area.

**Table 7.3: Reported Usage of Professional Knowledge Base Prompts**

<table>
<thead>
<tr>
<th>Prompt Name</th>
<th>Did not look at</th>
<th>Read only</th>
<th>Used/Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection on Teachers</td>
<td>46.7</td>
<td>46.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Reflective Journal as a Blog</td>
<td>26.7</td>
<td>53.3</td>
<td>13.4</td>
</tr>
<tr>
<td>Reflective Writing Review</td>
<td>0</td>
<td>42.9</td>
<td>42.9</td>
</tr>
<tr>
<td>Outline of 4R Framework</td>
<td>6.7</td>
<td>33.3</td>
<td>60</td>
</tr>
</tbody>
</table>
Among those who responded to the survey, more students reported that they had used this group of activity prompts that directly related to reflective writing. The scale for this table has been simplified to three categories including:

- Did not read;
- Read only; and
- Used/completed.

This was to show the combined statistics of whether students used the prompt in their assignment or completed the set activity. The final column of ‘sharing’ was removed from this table as no students responded that they had shared any work from the prompts (Table 5.1).

Prompt 1 - Reflection on Teachers was the first prompt placed in the gateway blog and although 46.7% of students (almost half of the respondent sample) did not look at it, there was feedback in the blog post of the effectiveness of this activity from those who had completed it. One student provided feedback:

> I just wrote my reflection and it was not only great to reflect on my own schooling but it also clarified the kind of teacher I hope to be. (R- Blog Post)

A relatively high percentage (26.7%) of students did not look at Prompt 3 - Reflective Journal as a Blog. In contrast to this was the usage statistics that indicated 104 blogs were created by the full cohort of 84 students. This practice was discussed as part of the examination of the engagement findings in Chapter 5.

As shown in the data from the online survey, the 25 students from the cohort that completed the survey reported lower levels of engagement with the activity prompts than the exemplar tasks for assignments. Table 7.4 shows the average percentage of use of the prompts based on the reported engagement of the students who completed the survey.
Table 7.4: Average reported use of exemplar and activity prompts

<table>
<thead>
<tr>
<th></th>
<th>Didn’t Look</th>
<th>Read only</th>
<th>Read and Used in project</th>
<th>Read and completed</th>
<th>Shared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exemplar Prompts</td>
<td>5.7</td>
<td>11.7</td>
<td>58.1</td>
<td>24.5</td>
<td>0</td>
</tr>
<tr>
<td>Activity Prompts</td>
<td>29.2</td>
<td>49.6</td>
<td>16.6</td>
<td>4.6</td>
<td>0</td>
</tr>
</tbody>
</table>

To compare the usage of the two types of prompts, the percentages of ‘read and used in project’ and ‘read and completed’ were added together. These percentages show that on average 82.6% of students who responded to the survey completed the task of the exemplar prompts (58.1 + 24.5) while only 21.2% completed the activity prompt tasks (16.6 + 4.6). This difference is notable in the context of engagement with the ePortfolio-based learning environment.

In external environments, and particularly those that are online, students have more autonomy over their learning and what they choose to complete from within the teaching platform. When the students were asked why they had not completed the other tasks in the environment, the major barrier they identified was lack of time. This was followed by the identification of the value of the prompt in relation to the unit as a whole. As the additional activities were not assessed, the motivation of the students to complete the prompting activities was an area that required further exploration within the data.

Motivation is defined as “a complex psychological construct that attempts to explain behavior and the effort applied in different activities” (Watters & Ginns, 2000, p. 302). It is believed that motivation cannot be imposed but must be actively chosen (Cohen, 1983) which means that the students had to make the decision themselves to make the activities a priority.

Many of students in the data collection process commented that they were time poor throughout the semester. Some said that even if the activity from the prompt sounded interesting, they probably would not complete it unless there was an extrinsic value associated with it, in terms of marks.
I read some of them but I just – time was a factor. I did the first one but then there was too much else going on to do it. (A – Ind Int)

The lack of assessment of the activity prompts appeared to be a real factor in their decreased use. The students had not made the link from the task in the activity prompt to their future teaching but recognised that the marks for assessment did impact on their course completion (van Dinther et al., 2011). This was therefore their focus.

Another unexpected factor was that several students felt the activities were there to provide additional support to students who were struggling with their reflections, rather than being of value to the whole cohort.

I think for someone who was really struggling in those aspects I would have used them but I didn’t feel like I had to write it down. (Md – FG Int 2)

When deciding whether to complete the additional activity or not, one student commented that, as busy students, the focus was around the pass or fail grade within the unit.

[If missing the activity was] not going to have a negative effect then [the students are] going to go, well why should I bother! (T – FG Int 1)

The difficulty in engaging students in activities that are not assessed has been identified as a major issue in many online learning platforms (Macdonald, 2004). Macdonald (2004, p. 218) stated “a significant body of research supports the view that the design of assessment is critical in determining the direction of student effort, and that assessment is vital in providing a channel of communication between students and their mentors.”

The completion of the task required students to perceive the value of that task. Engagement with the activity prompts to the levels of completing and even sharing the completed task may have been increased if the students were more comfortable using the platform and it had been a part of their studies from the beginning. The evidence still suggests, however, that there is a need for scaffolding and/or coaching in the process of reflection to keep the students on task and to provide modeling of the use of the platform as an ongoing learning tool.
As evidenced through the reported usage data and quotes, the responses from the students regarding the activity prompts highlighted the need for an integrated approach in using the ePortfolio across degree programs. It also demonstrated the need for the students to understand the purpose of the task in their ongoing development. Congruent with student feedback, one particular element that was relevant to the research on the development of reflection was that the prompts students found most engaging were those that focused specifically on reflective writing.

**Area 2: The focus on reflective writing**

Of the activity prompts discussed above, the students reported increased engagement with those that were specifically focused on the development of reflective writing. Prompt 9 - *Reflective Writing Review* and Prompt 10 - *Outline of 4R Framework* had much higher percentages, 42.9% and 60% respectively, of students reporting that they used them. Prompt 10 – *Outline of 4R Framework* was mentioned specifically by many students as the most useful outside the exemplar prompts based on the assessment items. The fact that 60% of survey respondents reported using this prompt in their assignments demonstrates that students found it useful and felt they had benefitted from having a model against which to review their reflections. Several students in the online survey commented that they found Prompt 10 - *Outline of 4R Framework* the most effective prompt for details and guidance.

> It gave precise details of how to reflect. (H24-OLS)

> [I used it] to guide…reflections. (H11-OLS)

As discussed in Chapter 2, reflection, and reflective writing in particular, have been a central component of the curriculum of teacher education courses for some time. Recent research, however, has highlighted that despite the importance afforded to the development of reflective skills and abilities, there appears to be no in-depth and consistent methods being implemented to teach reflection (Barton & Ryan, 2013). The students interviewed in this study reported that they had been encouraged to reflect throughout their degree and that it had formed parts of assessment through a number of units or subjects but that each unit was different. A reported difficulty was that across different units/subjects in their degrees, there were different expectations of
what format the reflection should take, what should be included, and what evidence of reflection was required. The students, therefore, were left quite confused as to what was expected and prompted one student to comment that they felt the term reflection was overused (Alesha – Ind Int).

One student felt that there needed to be more examples of what was required in writing reflections:

Give more examples of good reflective writing and what we are expected to do. (H11 – OLS)

Another student proposed a more scaffolded approach through tutorial situations where questions were used to guide the reflective process:

They need to provide more authentic opportunities for students to reflect on a situation, such as a lesson, and the opportunity for the students to redo the lesson with the changes made (even in a tutorial based environment)...I think definitely have more formalised ‘reflective’ components of units earlier on in the degree to refine the skills. (A18 – OLS)

This need for directed scaffolding was reinforced by Pedro (2005) and Barton and Ryan (2013). These authors identified that pre-service teachers generally have a broad understanding of reflection and the process involved (Pedro, 2005), but required focused attention at all levels on the reflective spectrum (Ryan, 2012). Without this scaffolding, the development of the required abilities would continue to be “tagged on, rather than constituting a way of working and learning” (Barton & Ryan, 2013, p. 2). Several of the students who provided feedback on the environment commented that having a framework that clearly outlined the expectations of their reflections was extremely useful. They remarked that being provided with a similar framework earlier in their degree would have been preferable.

If someone had given us that framework when we did [the introductory unit] life would have been a lot simpler. (M - FG Int 1)

One student commented specifically on the value of the 4R’s of reflection (Ryan, 2011a) for improving reflection in contrast to previous experience throughout the degree:
I think that (the 4R model) had a big impact in making it (reflection) improve because throughout the past, like, in all the different units, they told us how to reflect and gave us little things that we are supposed to do but they didn’t actually explain like how to properly do it. (Ta – Ind Int)

In terms of the ePortfolio-based learning environment this area highlighted the need for ongoing focus on reflective writing and the provision of a clear framework to guide this process. The environment should not aim to reduce the examination of writing to a checklist process (Boud, 2006), but provide a clear hierarchical framework (Ryan, 2011b) with questions to prompt reflective thinking through critical incidents (Griffin, 2003) to enhance development. A key to this is to also ensure that the reflections are based on practical experience (Atherton, 2011; Boud, 2006) such as that provided in the action-learning project.

The students were self-selecting the tasks that focused on reflective writing because this was the area they were most concerned with. The scaffolding of these skills within the environment was important to the students who had taken part in the feedback process. This leads to the third theme of the activity prompts - whether the students felt reflection was actually something that could be taught.

**Area 3: ‘Teaching’ reflection**

The students were asked directly in the individual interviews if they felt that reflection could be taught. This question was added to the schedule outlined in Table 3.3 to examine the link to attributes that formed the outer rim of the Colton and Sparks-Langer (1993) framework. This question was central to the provision of the environment, as the enculturation teaching model (Tishman et al., 1993) was developed based on the disposition of thinkers, which was applied in this research to the attributes of reflection practitioners. It was also important for the engagement with the ePortfolio-based learning environment as the students need to see the value of the process to fully engage. The students will not engage with the environment if they do not think they can ‘learn’ to reflect. Carrington and Selva (2010) believed that structured reflection “can assist teachers to become ‘attuned’ to their own assumptions” (p. 46). This view comes from a critical social theory approach
that encourages pre-service teachers to view themselves as being able to make positive changes, and as such links with the factors of self-efficacy.

When asked if reflection could be taught, one student responded quite frankly:

If its taught properly. (Ma – Ind Int)

This student felt that, despite being encouraged throughout their degree to continually reflect, they had not actually been:

Taught really how to reflect until this [action research project]. (Ma – Ind Int)

The consensus among this group of eight students was that reflection does have a set of skills, conventions or processes that could be taught. This view is supported by Russell, (2005) who calls for an explicit, direct, thoughtful and patient approach to the teaching of reflection.

Beyond the level of skills of reflection, the students felt it was up to the individual to move forward with the process to make it more meaningful. This is where the aspect of dispositions or attributes of the reflective practitioner become important (Colton & Sparks-Langer, 1993; Tishman et al., 1993). One student stated:

I think you have got to be told what the skills are and then you have got to try and develop them yourself. (Ta – Ind Int)

Another student reviewed what he called the conventions of reflection and responded that:

You can teach somebody how reflection should look and what kind of categories to sort them in but you can’t necessarily go – I am going to draw thoughts out of your head and put them on paper. (T – Ind Int)

Some of the student responses to this question also highlighted the personal nature of reflection by claiming that:

Some people are naturally more reflective. (Mr – Ind Int) and

You can’t make someone into a reflective person. (M – Ind Int)
One student expressed it slightly differently by stating that:

You’ve got to be open to it. You have to got to be wanting to do it. (J – Ind Int)

This student distinguished between compulsory reflection and voluntary reflection and the key indicator of the effectiveness of that reflection was the action taken in response to it.

Many of the students also highlighted the need for the process to be linked to action. One student responded that reflection became more targeted when it was:

More about what I’m doing in the classroom than about me. (Mx – Ind Int)

These responses highlighted the importance of scaffolding the skills of reflection, as was done in the ePortfolio-based learning environment, as well as the opportunity to act upon these observations in classroom settings for them to become more meaningful. The action research course within which the ePortfolio-based learning environment was embedded required this action process, which meant that both areas were targeted as part of this research project.

This was a key finding of the research study in terms of the ongoing development of the ePortfolio-based learning environment. The students who identified that the development of reflection required both skills and a disposition towards the task reinforced the implementation of the enculturation teaching model (Tishman et al., 1993). It highlighted the appropriateness of the ePortfolio-based learning environment to provide the required conscious, explicit and systematic scaffolding (Etscheidt et al., 2012) of reflection within practice by using activities to target both the skills and dispositions or attitudes required to be reflective practitioners.

To further review the value of the environment and the development of reflection through action, the following case study review examines two students who reported high levels of engagement with the ePortfolio environment with differing outcomes.
Case study review

The two students being reviewed in these case studies were enrolled internally at the regional campus of the university. Both students were chosen because they reported high levels of engagement with the ePortfolio platform, although the evidence of this engagement differed and provided a contrast in reflective development. The cases of the two students are presented below, including the reasons for their selection, an outline of the data they provided, and a review of work samples. The work samples were examined to identify if their engagement with the platform had an impact on their reflection.

Case Study 5: Thomas

Thomas was chosen as a case study subject as he was very complimentary about the PebblePad platform in his interviews and went on to use the ePortfolio platform to complete an assessment task in another unit in his degree. Ironically, his statistics and usage within the PebblePad environment were only slightly higher than other students who provided less positive feedback of the platform.

Thomas completed his action-learning project on behaviour management in an early childhood setting, which has traditionally been a focus for many students. The title of his project was simply: Behaviour Management in Early Childhood and the implementation was based on The Early Years Learning Framework in a Kindergarten classroom. Thomas described his action research journey as “enlightening and uplifting” through which he learnt what he called:

One of the most important lessons…that students are a dynamic range of beings who will not always behave, but if you build a relationship with them that is stable and fair they will respond to you regardless of [the] external situation. (Excerpt from Thomas’ Final Report)

The data analysed for Thomas comes from the response to the online survey (A14- OLS), participation in a focus group and individual interview (FG Int 1, Ind Int), graphs of usage within the platform, and excerpts from submitted work.
At the initial level of descriptive statistics on engagement, Thomas’ pie chart and asset list are included as Figure 7.1. This graph shows that he set up his blog as a Reflective Journal, uploaded 5 Files, submitted the required Form for the assignment, and completed the required 3 Webfolios.

**Figure 7.1**: Usage log for Thomas

Although Thomas set up his journal as a blog, which he based on the instructions in the *Reflective Journal as a Blog* exemplar prompt, he did not post anything to it. This is evidenced by the lack of any thought assets showing in the pie chart in Figure 7.1. A picture of the blog has been included as Figure 7.2 to show that Thomas had taken the time to alter the banner and personalise the blog space but then had done little more with it. In the interview he reported that he made the blog because the prompt was emphasised as an important part of the project but had uploaded the reflections as files because he had completed them with pen and paper.

**Figure 7.2**: Thomas’ Reflective Journal as a Blog.
When Thomas was asked if he engaged with the PebblePad environment and if this graphical data represented his level of commitment with the unit he answered:

Not necessarily because [he knew] people that uploaded a lot of resources but didn’t access [the] blog at all. (Ind Int)

Thomas felt he was engaged in the process because he accessed the Gateway Blog. What makes this case study of interest to review, however, is that Thomas’ recall of the prompting posts he had read was not always accurate. This suggests a lower level of engagement than perceived which was evidenced through the interviews Thomas took part in.

In both the focus group and individual interview, when discussing the prompts that had been useful in the environment, Thomas referred to the “three R’s” (Ind Int) prompt and needed to be corrected that there were four. Although this appears to be a small point, for Thomas to make the same mistake twice demonstrated a lack of internalisation of the information read in the blog. This was further reinforced when the feedback from the tutor in Thomas’ Progress Report specifically listed the components of the 4R’s of reflection (Ryan, 2011a) and directed him to look at the prompt to improve his writing for the final report. Despite these repeated references to the prompt and Thomas reading them, he had not absorbed the ideas of the activity prompt.

In the online survey and the focus group interviews, Thomas offered that he had read all the prompting posts placed in the gateway blog except Prompt 11 - *Video Review*, and that he had used all the given exemplars prompts in completing his assignments. He was particularly positive about the usefulness of:

The assignment guideline write-ups in PebblePad such as Progress Report and the operational guides such as Uploading Evidence. (A14-OLS).

Thomas liked that the PebblePad platform was:
Easy to use. Cuts down time. Centralises reflections. Easily accessible [and he felt that this centralisation] allow[ed] you to store your data in such a way that the structure and flow of reflections are fluid and joined. (OLS)

A concern was introduced in the survey about the level of development of Thomas’ own reflection when there was:

No collative system in the university [and he] had to change styles and layouts based on what the lecturer or tutor preferred. (OLS)

Thomas felt that the use of PebblePad more widely in the university would assist in making reflection more refined:

Students proceed through their education degree reflecting in a structure and form that is the same. This would allow more time for students to actually practice refining their reflective thought and practicing this before entering the "real world"… Being able to log onto PebblePad from anywhere allows this. (A14-OLS)

In the interviews, Thomas stated that if the student group had been able to use PebblePad from first year it would have been much better and would have provided an ongoing point of reference:

It would have been more effective than paper because…once again I could go, [back and see] in first year I did these reflections, whereas I have no idea where my first year reflections are. (Ind Int)

Thomas liked the ePortfolio environment and the way PebblePad worked, but would have preferred internal on-campus classes to work through the prompting activities and interact with peers rather than engaging externally. He suggested that in a tutorial situation he:

Would have done more of the online stuff if [he] then had been able to…come in and…talk about them. (FG Int 1)

Further evidence of the discord between reported and actual engagement with the prompts came when Thomas discussed how much he liked the options in the ePortfolio system to link and upload a variety of media formats. In contrast to the discussion of these multimedia options, Figure 7.3
showed that Thomas uploaded only four picture files and one Word document to his PebblePad asset store. He did not incorporate all of these uploads in his assignment submissions which further contrasts to his view of the usefulness of the multi-media affordances of the platform.

![File Usage Graph]

**Figure 7.3**: Thomas’ timeline and file type

Thomas’ Final Report had three pieces of evidence attached as Appendices that were .jpeg picture files of notes taken in the classroom. The features of the PebblePad platform that Thomas complimented in his interview responses were not utilised in his assignment submissions. This highlights why it is important to consider corroborated evidence of student engagement.

Thomas reported that his reflection had improved through his action research project and had prepared him more for his upcoming practicum:

> I was actually doing action, action-based reflection and that respect like its really – at uni sometimes you are told [to] reflect on readings and its really passive. It’s like you have sat there and gone – this is what somebody else says and this is what I feel about what they have said. (Ind Int)

When discussing this comment in relation to the components of the teaching model provided in the environment, Thomas felt that the process of *planning*, *acting*, and *evaluating* practice on an ongoing basis were important factors in
his reflective growth. This demonstrated his link to the (1) Action section of the model.

Thomas linked to the section of (2) Constructing Knowledge and Meaning when he stated that:

Making sure everything that you have done is relatable to literature that would support it. (Ind Int)

Thomas also acknowledged that the prior experience and personal views developed through his action research project had made an impact on what type of teacher he wanted to be which links to (3) Professional Knowledge Base.

To identify if there was any progression in Thomas’ reflection throughout the action research project, work samples were collected of his assignments and reviewed using the 4R’s of reflection (Figure 5.5). The work samples reviewed were sections of the three assignment pieces. These were examined in order of submission to identify if there had been any change in the level of Thomas’ writing throughout this time.

The first excerpt (Figure 7.4) was taken from Thomas’ Plan/Rationale submission. This assignment required the students to outline the reasons for their choice of topic and discuss why that area was important, as well as describe the process they would use for their individual action learning project.
I believe that Behaviour management techniques and skills are incredibly hard to teach, and to learn, in a university lecture/tutorial environment. Reflecting upon my own sense of self and pedagogy across the week, I feel that behaviour management is an area that I need to improve on. As an Early Childhood educator it is important that I give students a good foundation on which to continue and succeed throughout their schooling. One important part of this is making sure that they understand rules and consequences, and that the classroom works because we follow them. Aggressiveness and resistance to education, is shown to occur when measures are not taken early in childhood to ensure that a child understands why they must behave in a certain way, at a particular time (Scott, 1998, p.205). I feel confident in my ability to deliver interesting lessons and adjust them for a range of students. In contrast, I am not yet completely comfortable in my understanding of how to approach behaviour management at a young age. Recently early childhood literature has stressed the need for emergent, intentional teaching. However it is challenging to be so explicit when students do not behave and allow you to develop your program around them (Lubawy, 2010, p.5).

When I spoke to my placement teacher, she commented on how kindergarten students were still developing basic social skills that allow human beings to live in harmony together. In consultation with the literature and suggestions from my teacher I intend to trial different forms of behaviour management from Authoritative to Self-Driven, to see what is most effective and to find my own comfortable way of dealing with issues in the class.

**Figure 7.4**: Example 1 of Thomas’ reflective writing

In this excerpt, Thomas demonstrated a small amount of the reporting (Level 1) about a discussion with his mentor teacher as well as sections that highlight his relating (Level 2) of the topic to his teaching. There are also examples of reasoning (Level 3) in the links to the literature and one sentence that looks at future practice or reconstructing (Level 4) his teaching based on his findings. The link to future practice, as shown in the last sentence in Figure 7.4, was a requirement of the assignment with students outlining their Action Plan. As such it is difficult to ascertain the importance of this comment in the context of this entry.

The use of all levels of the framework in this early entry shows that, despite his lack of confidence with reflection, Thomas was able to describe and review situations as well as link them to literature to inform future planning, which are all components of higher levels of reflection. Again, however, it is
important to note that these aspects were scaffolded components of the Plan/Rationale assignment guidelines.

The second entry that was reviewed came from Thomas’ Progress Report submission (Figure 7.5). In this assignment, the students were required to discuss what had happened thus far in their action research projects and begin to reflect on this. The submission was also designed to provide feedback on the action research and the students’ reflections before they embarked on the Final Report.

![Diagram of 4R’s of reflection]

The other classroom had a set behaviour management system that was stuck too. If students kept misbehaving they were placed on the thinking chair for a short period. I felt that this kind of method aligned more with how I feel behaviour should be managed. I believe that it is important that students learn that for many reasons, such as safety, fairness, and a fun classroom for all that they follow certain rules, and that breaking these rules will result in a consistent consequence. Stormont et al. described this as feedback that is immediate and specific so that students are aware of exactly what the teacher felt was wrong (2005, p.135), I have noticed that at this young age students are not yet driven by a moral compass or want to please, as they are still very egocentric. When I stayed for a recess during one of my allotted times I noticed a boy running around with another boy's hat, waving it about and keeping it from him. I walked over and asked, "Should you be stealing other peoples hats?". He looked up at me and very quickly answered, "Yes, because it’s fun!". Without a concrete consequence I feel that Lucas would have no understanding of what he had done, and wouldn't be deterred if he considered repeating this behaviour. ... I need to find a behaviour management middle ground that is multicultural and embraces the meaning of family and respect (Williston, 1998, p.247). The Early Years Learning Framework promotes a pedagogy that is fair, child centred and has the students best interests in heart so that they are being, belonging and becoming (Australian Government Department of Education, Employment and Workplace, 2009). I feel that a clear and consistent behaviour management strategy is incredibly important in insuring that students all feel like they belong in an environment that is supportive and safe.

Figure 7.5: Example 2 of Thomas’ reflective writing

This entry had elements of the three lower levels of the 4R’s of reflection (Ryan, 2011a). There is a mixture of reporting and relating with minor instances of reasoning included. Thomas had integrated two levels of
reflection in discussing his project although there was a description of a specific incident from his teaching here. In recalling this particular occurrence, Thomas provided a brief reporting of the event with some analysis of how this related to his previous experience. From this, there was some further discussion of cultural aspects and a reference to a literature source, although the link from the event to this area of his research was not made clear in this entry. This showed that, although the elements of Level 3 of reflective writing were present in this sample, they were not effectively used in the compilation of the text.

The final entry for review was an excerpt from Thomas’ Final Report. This submission was the culmination of the overall action research project that the students had completed and was an opportunity to showcase the project, and the evidence collected, to show the result of the study. Figure 7.6 is the annotated section of the Reflective Discussion page from the submission and provides an overview of Thomas’ reflective writing.

Figure 7.6: Example 3 of Thomas’ reflective writing
This entry demonstrates reflective writing in several of the levels outlined in the 4R’s of reflection (Ryan, 2011a). The fact that this was the Final Report for the Action Research Project may explain why there was no reconstructing demonstrated. Thomas has provided a summation of what he had done in the project and his views on the completed project. The impact on the future were expected to be in the conclusion section of this report which Thomas constructed from the Prompt 14 - Conclusion Questions and included a section of “future questions posed through research”.

Overall there did not appear to be noteworthy progression in Thomas’ reflective writing across the unit based on his examined samples. The interview responses showed a perceived increase in understanding of the process and that the action based reflections were strongly related to involvement with the action research project. Thomas considered some of the prompts important for his reflective development but there is a contradiction in Thomas’ action versus his perception of his engagement.

For this case study, it appeared that the environment was successful in introducing the platform and providing access to the prompts and ideas. Thomas was, however, interacting with peers through other avenues. There was also no notable change in Thomas’ written reflections. In contrast to this is the second case study, Madison, who was more engaged with the prompts provided in the ePortfolio-based learning environment.

Case Study 6: Madison

Madison was chosen as a case study as she provided some thought provoking viewpoints on reflection and assessment. These views may help to explain some of the issues that arose in the research on engagement with the online teaching environment.

Madison’s action research project was titled Observational Strategies to Engage Disengaged Students, and was implemented in a Year 5 classroom as she was completing a Special Education Minor in her Bachelor of Education Degree. Madison felt:

The reflective component of this cycle is extremely important in all areas of teaching practice, and is a method that I will continue to employ
throughout my teaching practice in the future. (Excerpt from Final Report)

The data Madison provided included usage graphs, as well as taking part in a focus group (FG Int 1), and an individual interview (Ind Int). The work samples for Madison that are included came from her Reflective Journal and an excerpt from her action research project Final Report.

When examining Madison’s pie graph of her usage (Figure 7.7), it showed that she created the reflective blog, which she reported was based on the exemplar prompt, and added 11 Thoughts to it. She also uploaded 9 Files as part of completing the required 3 Webfolios.

![Pie Chart: Asset Type Count]

**Figure 7.7:** Usage log for Madison

Figure 7.8 shows the timeline of when Madison created her assets and showed a fairly even pattern across the time span of the action research project.
There were three assets created in April that showed Madison was engaged with her assignments, with more added in May and the peak in June as the remaining submissions became due. The files were all .pdf files that were used as evidence in her Progress and Final Report submissions. When asked if she felt that these graphs gave a clear indication of her engagement, Madison answered:

No. I don’t think so [because she had done] it in Word documents on the computer and…transferred it. (Ind Int)

Madison found it easier to manipulate and edit Word documents then transfer them via a copy and paste action. This process was different to her usual reflective writing that she typically completed each night as hand written entries in a book while on practicum placements. She also felt that it was not “a great indicator” of engagement because Madison felt reflection was such a varied thing. The most difficult aspect for Madison was transferring her ideas to paper because she was limited by the written forms of language which made it difficult to portray her thinking (Ind Int). This identifies the complexity involved in the process of writing reflections and that it relies on a higher level of understanding to articulate the process (Pavlovich, 2007; Ryan, 2013). Madison considered that conversations with others were a much more successful medium for sharing reflections.

When asked about the overall ePortfolio-based learning environment, Madison would have preferred to have used it from first year and was
concerned about the timing of the unit in terms of the workload leading into the final practicum experience.

I found timing was the biggest issue. I was concerned at the time because we walked into [prac] having had an assignment due that day and consequently we didn’t have all our planning done. I do think that ultimately affected the mark I got for the prac which was a bit unfair. (Ind Int)

Over the study period Madison worked through her initial reservations and found that she:

Didn’t have any problems [because she] followed the instructions and they worked. (FG Int 1)

She reported reading all of the prompts placed in the gateway blog although she did not complete all the activities:

I read it obviously but no I didn’t sort of [use it]...more a time issue than anything...I just didn’t have time to focus on extra work...when there’s a thousand other things happening at the same time. (Ind Int)

In terms of interaction in the environment, Madison was not involved in the Gateway Blog discussion or any other online formats. She commented that:

I find it very antisocial sitting on your own at home alone looking at your computer screen. It’s just not right. It’s not the real world is it? and we are talking about teaching- it is such a social thing. (FG Int 1)

For Madison, learning was a social activity and for that she needed to meet with people and be involved in face-to-face discussions. She found it more productive to meet with people to share reflections and enjoyed being able to ‘bounce’ ideas off one another.

I’ve had to do several units externally and I still haven’t really found myself getting into, I mean I read all the posts but I don’t often have any need to reply. I guess I’m still a face-to-face kind of person. (Ind Int)

Madison was also involved in phone conversations to help people with completing assigned tasks in PebblePad when they were struggling. This showed that sharing and support was occurring among the students but in
most cases, it was not happening in the PebblePad platform. A large number of students involved in the data collection, including Madison, commented that if they had been more familiar with the process of PebblePad, and had used it from much earlier in their degree, this may have been different.

If we’d been able to use PebblePad in [first year unit], you’d have 4 years worth sitting in one place. (FG Int 1)

In terms of the actual activities offered, Madison found Prompt 10 - Outline of 4R Framework the most useful in reinforcing some models that she had been introduced to. She liked:

The way it was laid out and the way it sort of clarified the steps. (Ind Int)

Madison had gone to the DRAW website to follow up the framework and the other information around it, which demonstrated her engagement with this particular prompt. This showed Madison’s engagement with developing her (3) Professional Knowledge Base. When asked further about the components of the Colton and Sparks-Langer (1993) model, Madison felt that the reflective discussions were crucial in the planning of possible solutions - (2) Constructing Knowledge and Meaning and the involvement with the action research cycle was beneficial - (1) Action.

It was when the discussion with Madison turned to action research and reflection that some interesting points were raised. Madison felt that, in her head, she was a strong reflective practitioner but struggled to transfer it to paper properly (FG Int 1). She felt that her writing had:

Probably improved with a framework, which could have [been] introduced in first year. (FG Int1)

The experience throughout the degree had left Madison feeling that reflection at university had to be presented in a particular way that was dictated by the tutors:

If your reflections weren’t about everything you were doing wrong, you weren’t getting marks for it. You need to regurgitate what [the tutors] want to hear. (FG Int 1)
When probed further on this point, Madison responded that even though she acknowledged that they was supposed to be her reflections, they were not *real*:

> Because it was an assignment at the end of the day. It wasn’t necessarily about what [she] was thinking. (Ind Int)

This issue of providing the tutor with ‘what they wanted to hear’ rather than what really happened was raised by Carrington and Selva (2010) and although it had not been considered as part of this investigation, is noteworthy in the context of researching reflection. It relates to the purpose of the reflection and whether the students see the value in what they are doing as part of their own professional and/or personal development. This notion is crucial to engagement in all aspects of the ePortfolio-based learning environment. The students need to see the value of the task and appreciate what they can gain from it to become fully engaged. It is an issue that warrants further investigation in future iterations of the research.

To determine Madison’s level of reflective writing, and whether there was progression after being engaged in the ePortfolio-based learning environment, work samples were examined from her reflective journal that were incorporated into her assignment submissions. The samples came from different stages of the project and were added to the reflective blog from the Word documents, as discussed earlier.

Many of the entries were organised with the headings of Describe, Analyse, Theorise, and Act to differentiate the stages of the action research cycle. Madison has also labeled each piece with an Appendix number to show how it was integrated as evidence for her Final Report. This indicates that there was a specific purpose for the inclusion of each piece and was not the whole journal.

The earliest entry Madison used came from her second visit to the classroom setting and is organised in the four components of the action research cycle, although the ‘Act’ component was outlined first. In this entry (Figure 7.9), Madison outlined what had occurred in the classroom with a particular student and the discussion that had taken place with the mentor teaching surrounding this.
Although Madison used the terminology ‘action research’ here, the level of the reflective writing in these sections was still at the lower end of the 4R’s of reflection (Ryan, 2011a). The description and analysis sentences were from the reporting level, and while there was mention of the previous unit, it was still in terms of relating (Level 2) to previous experience as there is no specific theory outlined. The final section moved briefly into reconstructing (Level 4) in terms of wondering about future action and discussing this with the classroom teacher.

A subsequent classroom visit prompted three entries into the journal that were uploaded to the PebblePad platform over two separate sessions. The whole entry has been included below (Figure 7.10) to allow the comparison of the full entry to the 4R’s of reflection (Ryan, 2011a).
In this example there was reporting of what happened and the relating of this incident to previous experience with a solution offered. There was, however, no meaningful link to theory or the deeper levels of reflective writing.

To identify if Madison was able to complete higher levels of reflective writing, the final work sample for review was taken directly from the Reflective Discussion section of her Final Report (Figure 7.11). This piece was chosen as it was not included by Madison to provide evidence of a particular point she was trying to make in her journal and as such, may have provided a more representative version of her writing.
For example (see Appendix B), one of my early experiences with trying to engage a student during a Mathematics lesson using modeling and encouragement showed my lack of experience in explaining concepts to a student who is not engaged. Although I thought that encouragement would help alongside the explicit teaching of one-on-one work, this proved not to be the case. The student did understand the concepts after working with another student who had mastered this first. It was encouraging to learn that this partnered work could prove effective in some instances, but I still do not know how I would approach a similar situation in future. As far as improving my teaching practice is concerned, I still have to work more effectively on improving the strategies that I employ in these circumstances. The question that I ask myself is "What would I do if this happened again?" and "What strategies can I use to help this student?".

These are very similar issues to the ones that I faced in the initial experience, described in the Rationale of this report, which prompted me to investigate the topic of this action research project. When I looked deeper into this issue at sociocultural theories, I found evidence to suggest, "observing a peer model improves students' self-efficacy for maths problem-solving ability" (Snowman et al., 2009, p. 320). This would lead me to use the strategy of peer modelling with students in a similar situation in future. I will also have to look at improving my own modelling practices, as peer modelling may not always help to improve student engagement and learning outcomes.

**Figure 7.11:** Example 3 of Madison’s reflective writing

This entry demonstrated a higher level of writing and more focus on the reconstructing of practice based on the literature accessed after reviewing the experience. The opportunity to discuss the ongoing nature of the research project in more detail in the final report allowed for this reconstruction. It remains unclear whether entries with detail such as this had been included in Madison’s full journal. This entry demonstrates that she was able to write at a more advanced level and Madison acknowledged that this ability had been assisted by her experience and knowledge across the degree and access to the models of reflection (Ind Int).

In reviewing this case study, Madison was engaged in reading the prompts and used the exemplar ones to complete her assignments. She had a connection to Prompt 10 - *Outline of 4R Framework* that led her to the website to further investigate this framework. In terms of developing reflective abilities, the process of the action research project and the ability to plan and act from reflective entries seemed to have the most effect. The validity of reflections when required for assessment and to meet a specific format was
raised here. Madison saw the value in reflective interactions but preferred the format of verbal discussion and face-to-face interaction to online platforms. Overall, the involvement in the ePortfolio-based learning environment did appear to have a positive effect on the level of Madison’s reflections. Although she felt she was already a reflective thinker, it was the articulation of these ideas on paper that she found to be difficult. The scaffolded approach appeared to help with that.

**Summary**

To answer research sub-question 3:

*What impact does engagement in the ePortfolio environment have on the level of students’ written reflection?*

the data were examined in relation to the activity prompts placed within the ePortfolio-based learning environment and the review of work samples of case studies.

The responses in the online survey demonstrated that the students were engaging with the prompts placed in the blog to differing degrees. The students reported higher use of the exemplar prompts related to assessment than the additional activity prompts included to enhance reflection. This was linked to motivation for completing tasks they considered extra (Cohen, 1983; Watters & Ginns, 2000). The work samples examined across the case studies also showed variation in the level of reflection demonstrated by the students in relation to their engagement with the prompts.

Further examination of the data highlighted three areas of further investigation that included: the reduced engagement with the activity prompts; the focus on the prompts related to reflective writing; and the students perception of whether reflection could be ‘taught.’

The reduced engagement with the activity prompts was disappointing when the tasks had been designed specifically to enhance student reflection. The students reported that they were reading these prompts but not completing the task due to time constraints and confusion surrounding their purpose.
This limited engagement impacted on the success of the overall environment but highlighted to the first design principle for this area of the research.

Design Principle 7: Make the purpose of the prompts clear to the students and introduce them with this purpose clearly articulated within the ePortfolio-based learning environment.

The second design principle comes from the focus on reflective writing. The students’ engagement with this area provided valuable insight into what the students valued and that the scaffolding in this area was crucial to the success of any environment designed to target reflection.

Design Principle 8: Provide multiple opportunities for the students to engage with scaffolded reflective writing tasks.

The final design principle relates to the students’ perception of whether reflection could be taught. The responses to this question highlighted the need for activities aimed at the skills associated with reflection as well as the overall attributes of reflective practitioners. The students also reinforced the need for reflection to be based on practice. This area, in particular, supported the implementation of the ePortfolio-based learning environment with the enculturation teaching model to enhance reflection in pre-service teachers.

Design Principle 9: Incorporate practice wherever possible in the structured scaffolding of reflective thinking and writing.

In relation to the research question, the limited level of engagement within the research makes it difficult to draw strong conclusions. The implementation showed promise for the frameworks developed and provided insight into the type of activities the students valued in the environment. Implementation over a longer timeframe may encourage students to interact more fully with the environment that could demonstrate more direct links to any improvement in practice.

The findings of the three areas of the ePortfolio-based learning environment, as described in Chapters 5, 6 & 7, have all shown a limited degree of implementation success. The analysis of the data highlighted a number of key areas that need to be addressed in further iterations of this or similar ePortfolio environments.
The next chapter provides the conclusion to the research study and reviews the findings in terms of outcomes towards improved implementations of an ePortfolio-based learning environment. These design principles will be further discussed in relation to the frameworks utilised through this doctoral study.
CHAPTER 8

Concluding Comments and Implications for Future Practice

The goal of this research project was to identify what was required for the success of an ePortfolio-based learning environment in the enhancement of reflection in pre-service teachers. In this final chapter, the conclusions will be outlined in terms of answering the overarching research question of:

*In what ways can an ePortfolio platform provide an environment for the scaffolding of the development of reflection in pre-service teachers in a university environment?*

This chapter begins with a summary of the thesis then a review of the findings in relation to the research frameworks that guided the investigation. This discussion then addresses the overall research question and highlights the limitations of the study. This conclusion chapter then outlines the design principles recommended for future iterations of the environment. These design principles emerged from the study as recommendations for ongoing utilisation of ePortfolio-based learning environments. The recommendations are applicable to the general provision of ePortfolio environments as well as those developed specifically to target reflection in higher education settings.

Summary of the thesis

The thesis was introduced by outlining the problems identified in the development of reflection in pre-service teachers. The literature review addressed, in further detail, the fundamental questions of the research study by outlining why the research topic was chosen. This included discussion of why reflection is important in the development of pre-service teachers and reviewed the use of ePortfolio environments.

The outline of the methodology discussed what was implemented within the research project including the theoretical frameworks applied; the details of the participants involved; and the context of the research study. The implementation of the research project outlined specifically how the research was integrated into the ePortfolio environment for the students to use.
The findings chapters were organised to each answer a specific research sub-question. The three sub-questions were reviewed in terms of how each related to an area of the enculturation teaching model within the ePortfolio-based learning environment. These chapters identified what had been successful in the learning environment and also the areas that required further investigation in future iterations of this or similar ePortfolio-based learning environments. The following section outlines these findings in relation to the frameworks of the research study.

**Findings in relation to the theoretical frameworks**

The research study was organised around three key levels as outlined in Figure 2.3 which is repeated here for easier recall.

![Figure 8.1: Model of the research frameworks.](image)

The outer square of this model represents the electronic teaching environment that facilitated the implementation of the research study. The research study aimed to develop design principles for an ePortfolio-based learning environment that targeted the enhancement of reflection in pre-service teachers. This teaching environment was implemented within the PebblePad
platform and reviewed using the cyclic approach of the eLearning Lifecycle (Phillips et al., 2011).

In assessing the suitability of this environmental approach to the research study, the areas of the usability of the platform and the barriers to the students’ engagement with the platform were identified as key factors (Chapter 5). The data examined showed that while the students were able to access the prompts as provided through the Gateway Blog, there were several aspects that reduced their engagement with the platform. These included the timing of the implementation and the preference of the students to use other formats they were more familiar with.

The research found that the students were reluctant to fully engage with the program due to the short time frame of the implementation. They were not able to identify the link between the use of the platform for this experience and their future practice which is a key determinant in the level of acceptance of new technological innovations (Straub, 2009).

For ongoing success of the ePortfolio-based learning environment, it was identified that a more integrated approach is required that facilitates the introduction of the platform at the beginning of the students’ degree programs (DP 1 & 2).

The next level of the research model was the enculturation teaching model represented by the three interlocking circles of Figure 8.1. The enculturation teaching model developed by Tishman, Jay and Perkins, (1993) included the provision of: (1) exemplars of good reflective practice; (2) opportunities for interaction amongst the students; and (3) activities to target the development of reflective skills.

What emerged from the examination of the data in these areas was that the model overall appears to be a useful framework to use within the platform. There were, however, some inconsistencies within the components of the model. For example, the exemplar prompts were the most utilised of the three areas and the interaction component was the most difficult to develop.

The exemplar prompts provided the students with outlines for the assignment tasks and were the most utilised type of prompt within the
platform (Chapter 5 & 7). The students were very focused on the assessable aspects of the action research projects as they felt this was the most relevant to them at that time of the research implementation.

The findings showed that the prompts focused on the interaction component of the model were the most difficult to encourage student engagement. The students acknowledged the importance of reflective interaction, but they preferred other modes of discussion in both face-to-face and alternate online formats (Chapter 6). Changes were needed to the formats of the discussion component of the environment to encourage more interaction to occur within the platform itself (DP 3, 4, 5 & 6).

In relation to the third area of the enculturation teaching model scaffolded through the ePortfolio environment - the activity prompts, the students reported mixed levels of engagement as determined by the results of the data collection (Chapter 7). While many students reported that they had read the activity prompts provided, the motivation to complete the tasks from these guidelines was not as strong as with the exemplar prompts. The students were confused about the purpose of the tasks and were not identifying the value of the activity to their professional development. These factors are required to encourage engagement (Cohen, 1983). The findings from the research highlighted that more explanation was required to demonstrate the value of the prompts to the students for their future teaching careers (DP7).

The one area of prompts that were identified by the students as useful, were those directly relating to reflective writing. The focus on reflective writing as important in the process of enhancing reflection also means that more is required in this area in future iterations of the environment. This is to ensure that students have multiple opportunities to not only be involved in the writing of reflective entries but in the evaluation of their writing towards ongoing improvement (DP 8). The importance of a strong theoretical basis for the activity task was further reinforced when examining the findings in terms of the final level of the research study, the Colton and Sparks-Langer (1993) framework for teacher reflection.

The activities provided within the ePortfolio-based learning environment were developed based on the framework for teacher reflection that Colton
and Sparks-Langer (1993) developed which is represented by the text on the interlocking sections of the circles in Figure 8.1. This model was chosen to ensure that a theoretical approach was implemented toward the enhancement of reflection. The components of the framework for teacher reflection were (1) Action; (2) Constructing Knowledge and Meaning; (3) Professional Knowledge Base and the attributes of reflective practitioners. These were developed based on research in the areas of cognitive psychology, critical theory and motivation and caring (Colton & Sparks-Langer, 1993). The connections of these ideas to the components of the model are represented in the matrix in Appendix II.

In terms of these theoretical areas, the research study found that the action component modeled through the action learning project was valued by the students, and they felt the opportunity to use their reflections in a practical way was beneficial (Chapter 7). There was some overlap with this component and that of the construction of knowledge and meaning. In response to this section, the findings from the research study support the focus on the process of action research and basing reflection on practical experience as well as allowing for reflective discussion for the identification of possible solutions (Chapter 7).

The two components of practice and discussion were developed from the field of cognitive psychology, particularly in relation to the constructivist and experiential theories of learning (Kolb, Boyatzis, & Mainemelis, 2001; Kolb, 1984). The systematic scaffolded approach used in this research, targeted this style of learning by providing the students with tasks to complete in an environment that allowed for interaction and learning through practice. It was, however, not as successful as had been planned due to issues of motivation and engagement that will be further discussed in relation to that theoretical area.

To encourage the students to become more engaged in the environment in the future to allow them to construct these understandings, it is important to explain the purpose behind the prompts and make explicit the links between theory and future practice (Penso et al., 2001)(DP 7).
The third component of the framework for teacher reflection was the professional knowledge base. This area requires students to examine their own personal views and values developed from prior experience as a basis for making decisions in the classroom. The theoretical backdrop for this area of the framework came from a critical theory perspective as well as some cognitive psychology in relation to the viewpoints of novice as opposed to expert teachers (Berliner, 1986; Borko & Livingston, 1989; Carter et al., 1988).

Again the development of students’ levels of self-efficacy and confidence with their classroom practice was a goal of the research that did not reach fruition. The students continued to view the action research project and additional features of the ePortfolio-based learning environment in terms of their current role as pre-service teachers. One case study student (Jaye) had begun to make the connection between the theory and practice as she was spending more time in the classroom (Bandura, 1997), but the remaining students were focused on the tasks for assessment rather than ongoing professional development (Chapter 7).

To improve this in future iterations of the environment, there needs to be a focus on practice and inclusion of reflection on practical experiences as much as possible (DP 9). By incorporating practice, students are able to build their skills in more authentic situations and may therefore make stronger links between theory and practice (Boud, 2006). Focus on practice will also provide the students with more opportunities to interact with classrooms to begin to recognise the role they play in children’s education. This is very important for motivation and the development of the attributes of reflective practitioners.

The final component of the framework was what Colton and Sparks-Langer (1993) describe as the attributes of reflective practitioners. These attributes link directly with critical theory in terms of efficacy and social responsibility but are also embedded with motivation and caring (Noddings, 1984). The students need to connect with their role within the classroom and begin to see themselves as change agents within educational settings. The connection with the model is that practitioners who are able to critically reflect, are able to evaluate practices and theories of practice to make these decisions to achieve the best for students (Van Manen, 1977).
When the components of the theoretical frameworks and the three research sub-questions were considered under the overarching question:

*In what ways can an ePortfolio platform provide an environment for the scaffolding of the development of reflection in pre-service teachers in a university environment?*

the ePortfolio platform as implemented in this research study appeared to have a limited capacity for success in providing an environment to scaffold reflection for the pre-service teacher involved in the university context. There were some positive outcomes from the research, however, several changes are required for future iterations of the ePortfolio-based learning environment.

Specifically, the research study found that strong focus is required on the pedagogy behind the introduction and use of the ePortfolio platform and this needs to be clearly and explicitly communicated to the students involved. An implementation that was initiated at the beginning of the students’ degrees and embedded into all aspects of their learning is required to allow the full scope of development to be achieved. The environment should also incorporate explicit and systematic scaffolding at all stages throughout the pre-service teachers’ professional development to provide a complete picture of reflection and the value of the process in educational settings.

Although the implementation of this research project had some elements of this ‘ideal’ environment, there were a number of limitations in the study. Some were mentioned in the introduction but it is pertinent to review them again at this point in relation to the overall findings and conclusions being drawn from the research.

**Limitations of the research**

Although the research study showed a nominal level of success in the effecting of the ePortfolio-based learning environment, there were a number of limitations that impacted on the implementation. The key limitations relate to: the timing of the implementation; the role of the tutor in the environment; and the sample size of the participants in terms of providing general conclusions.
Firstly, the timing of the research implementation had an impact on the engagement of the students within the environment. The reported use of other platforms for drafting processes and interpersonal interaction reinforced that the students would have preferred to have been exposed to PebblePad earlier in their degree. Research studies into the use of online environments have shown that students struggle with even small deviations from the electronic platforms they prefer to work in (Janosik & Frank, 2013) and that students need to see the long term benefits of platforms to fully engage with them (Edwards, 2013). This highlighted the fact that a single unit implementation in the fourth year of study was not the most opportune time to integrate the environment.

The second limitation identified was the lack of contextualised scaffolding from the tutor within the ePortfolio-based learning environment. Although the researcher had prior experience as a tutor in the action research project unit, it was considered important by the ethics committee that there be reduced involvement of the researcher in the teaching aspect of the environment throughout the research study. The reduced role of tutors in scaffolding the reflective activities appeared to have been a factor in the impact of the environment. The effective use of online discussion is dependant on the role of the tutor or facilitator (Maor, 2003; 2008) and in this case this role was limited. The students were utilising other modes of contact directly with their tutor, which further reduced the level of engagement with the platform. The tutors were also not directly involved in the study in terms of the development of the activity prompts. The tutor input may have been useful in identifying the correct focus for the prompts at the time of need for the students.

A third limitation of the research, as outlined in the data collection described in Chapter 4, was the reduced sample of participants involved in the focus group interviews. Despite the addition of the online survey, the response rate to this level of the data collection was smaller than initially planned. This meant there was a reduced number of students from which to select for individual interviews. Although qualitative studies are designed to provide conclusions based on depth of evidence rather than quantity, the smaller sample impacts on the range of issues identified. Nevertheless, it does
provide trends and tendencies (Ellis et al., 2007) of interest in investigating ePortfolio environments and their ability to be designed to enhance reflection.

Once these limitations are considered, there remain positive findings to be gleaned from the data that highlight the potential effectiveness of the enculturation teaching model (Tishman et al., 1993) enmeshed in the ePortfolio-based learning environment to scaffold the development of reflection in pre-service teachers. The limitations also impact on recommendations for future iterations of the environment that are presented as design principles for further research in this area.

**Design principles for future environments**

The development of design principles for future iterations of this and similar electronic learning environments is the goal of the eLearning Lifecycle that was implemented within this research study (Phillips et al., 2011). Based on the findings from this research, design principles or recommendations for future practice have been developed. These are presented to guide future implementation of an approach using an ePortfolio-based learning environment to enhance the development of reflection in pre-service teachers.

**Design Principle 1**: Introduce an ePortfolio at the beginning of the pre-service teacher program.

**Design Principle 2**: Embed the ePortfolio in as many learning activities as possible.

One of the key barriers to engagement in this research was the timing and mode of the introduction of the platform. By providing an ePortfolio-based learning environment at the beginning of a degree, or incorporating some of these principles into existing systems used within universities to a much more integrated degree, the students may develop study habits within the platforms. By embedding the platform or approach into as many learning areas as possible the use of alternate formats for drafting of work and discussion could be reduced.

This confirms the recommendations of the Australian ePortfolio Project to have a system that is fully integrated within the university (McCowan et al.,
Early in their degrees, students could be provided with guidance that introduces the platform and outlines the purpose behind the ePortfolio implementation (Joyes et al., 2009). This would enable the students to have full access to the evidence collected across their degree to demonstrate progress and personal development (Beishuizen et al., 2006; Hiller et al., 2007). The collection could also be used for multiple purposes including the demonstration of competency against standards or guidelines required for future employment or promotion (Nettleton et al., 2008). The use of the platform from the beginning would also allow study habits to develop in the use of this programme and the students to see the long-term value of their engagement within the learning space (McAllister et al., 2008).

**Design Principle 3**: Utilise a blended approach or video conferencing platforms to allow the students to be involved in face-to-face interactions.

**Design Principle 4**: Add prompts to include written reflection and discussion based on the face-to-face interactions that are occurring.

**Design Principle 5**: Widen the access to the platform to other stakeholders within the students’ action research projects to allow the discussion that occurs to be part of the process.

**Design Principle 6**: Emulate the positive components of the social learning environments within the discussion platform or embed existing social media sites within the ePortfolio-based learning environment.

These design principles all relate to methods to try and encourage the interaction component of the enculturation teaching model (Tishman et al., 1993). The findings in this research study identified that the students understood the value of the discussion process in the development of reflection but it was difficult to engage and measure the impact of these when the bulk of the interaction was happening outside the platform.

By altering the access patterns and formats for these discussions and scaffolding the ‘writing up’ of spoken discussions for ongoing review and improvement, the students may engage more with this component of the model and therefore take steps to developing the attributes required to be reflective practitioners.
Design Principle 7: Make the purpose of the prompts clear to the students and introduce them with this purpose clearly articulated within the ePortfolio-based learning environment.

The lack of motivation by the general students to complete the additional activity prompts was a major drawback of this research project as it limited the opportunities for the students to practice many of the skills associated with reflective practice. There was confusion as to the purpose of the activities but also students were focused on the assessment items and viewed this work as ‘extra’.

To alleviate this, it is important to be explicit about the purpose of the activity task to the students not only in terms of their current studies, but also in relation to the ongoing professional development. Closer monitoring in the blended situation or a stronger role for the tutor in the development of the activities may impact on the students’ willingness to complete the tasks also.

Design Principle 8: Provide multiple opportunities for the students to engage with scaffolded reflective writing tasks.

The pre-service teachers in this research study highlighted the importance of the reflective writing process and the provision of a strong model for this. The introduction of the hierarchical 4R’s of reflection (Ryan, 2011a) model to the students and allowing them to review their own writing is important to the development of reflection (Barton & Ryan, 2013; Ryan, 2011b). By providing students with strong models of reflective practice and allowing them to continually practice these skills against a consistent framework, they will be able to focus on the content of their writing. This will allow for continuous improvements based on regular contextualised feedback.

Design Principle 9: Incorporate practice wherever possible in the structured scaffolding of reflective thinking and writing.

The use of authentic tasks in higher education settings has emerged as an important component in making the required links between theory and practice (Herrington et al., 2014). By allowing the pre-service teachers as much access as possible to real life situations that they are then able to reflect on within a scaffolded environment may assist with these important links.
The focus on theory-to-practice is also important in the development of reflection (Atherton, 2011; Boud, 2006). Students need the opportunity to write about their learning experiences and to act upon these reflections to make positive change. The increased exposure to reflection and reflective writing also assists in the development of the disposition or attributes of reflective practitioners (Colton & Sparks-Langer, 1993).

The adoption of these recommendations would allow for a more effective implementation of the ePortfolio-based learning environment to enhance the overall reflective abilities of students. An environment and integrated implementation such as this would require university and departmental support (Hallam et al., 2010; Lorenzo & Ittelson, 2005; Plaza, Draugalis, Slack, Skrepnek, & Sauer, 2007). It has the potential to positively disrupt existing practices (Joyes et al., 2009) and provide for a deeper approach to learning (Plaza et al., 2007) for a lifetime in both formal and informal learning settings (McAllister et al., 2008).

**Future research directions**

The findings presented here and the limitations that arose from this research have led to the identification of a number of levels of future inquiry. To assist in presenting these, Table 8.1 provides an outline of the theoretical components used throughout this research and the applications they may provide for future research in the areas of eLearning, ePortfolios, reflection, and pre-service teacher development in higher education. The table has been arranged in terms of the research frameworks, the use of the framework in this research, and the possible avenues for future inquiry.
Table 8.1: Future research opportunities of the theoretical frameworks and models

<table>
<thead>
<tr>
<th>Theoretical Framework</th>
<th>Use within this research</th>
<th>Future possibilities of the model</th>
</tr>
</thead>
<tbody>
<tr>
<td>eLearning Lifecycle</td>
<td>This research project utilised sections of this framework to guide the implementation and review of the ePortfolio-based learning environment. The early stages of the model were expedited due to the use of a pre-designed platform and the embedding of the study within an existing unit of study.</td>
<td>The framework was useful and provides a strong model for the implementation and review of all electronic learning environments. The cyclic process is applicable to all areas of higher education and any content of teaching unit.</td>
</tr>
<tr>
<td>(Phillips et al., 2011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enculturation Teaching Model</td>
<td>The use of this model to focus on reflection was appropriate as the dispositions for higher order thinking do require reflective thinking. There was, however, disproportionate engagement across the three areas of the model. The students were engaged with the exemplar prompts but less so with the interaction and activity prompts. The planned changes to the environment may assist with this.</td>
<td>This teaching model is applicable to any area that requires more than the development of a set of skills. It is designed for habits or dispositions and as such is applicable to multiple areas of study.</td>
</tr>
<tr>
<td>(Tishman et al., 1993)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Framework for Teacher Reflection</td>
<td>This model provided a strong framework for the development of the activity prompts although could have had a more primary role in the research in terms of modeling for the students.</td>
<td>This framework continues to provide a strong basis for the development of reflection and could be used to guide future research and the development of methods to assess reflection in higher education settings.</td>
</tr>
<tr>
<td>(Colton &amp; Sparks-Langer, 1993)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4R’s of Reflection</td>
<td>This framework was instrumental in providing the students with a model against which to review their own reflective writing. It was also used in examining the student work samples in the data analysis process.</td>
<td>This model, and the DRAW project it was developed from, can continue to provide an outline for the levels of reflection that the students can incorporate into their writing, and for review and / or assessment of reflective work samples.</td>
</tr>
<tr>
<td>(Ryan, 2011a; DRAW project)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The findings and recommendations from this research demonstrate the ongoing requirement for programs that engage students with the process of reflection. The focus needs to be on innovative ways to scaffold the development of these abilities but not at the expense of strong pedagogy behind the process. The future research opportunities will continue to build upon the current understandings in an area that remains important in the development of lifelong reflective practitioners.
APPENDIX I

Glossary of Terms used in Thesis

This glossary provides the definitions of many of the terms and explanations of the frameworks utilised in the research study.

4R’s of Reflection: Ryan (2011a) and team as part of the Developing Reflective Approaches to Writing (DRAW) Project developed this model. It provided the rubric to scaffold the students’ reflective writing as well as the scale used in reviewing the student work samples in the data analysis process.

Design Principles: the concept of design principles came from the eLearning Lifecycle methodology. The developers of this model used the definition from Nieveen, McKenney and van den Akker (2006) who explained design principles as: “heuristic guidelines to help others select and apply the most appropriate knowledge for a specific design task in another setting” (p. 153). Over time, “design principles can potentially be generalized into theories” (Phillips et al., 2011, p. 92).

eLearning Lifecycle: this was the methodology implemented in the research. It is a cyclic approach of trial and review aimed at the development of design principles (Phillips et al., 2011).

ePortfolio: ePortfolio is the simplified term to describe an electronic portfolio. “A collection of authentic and diverse evidence, drawn from a larger archive representing what a person or organization has learned over time on which the person or organization has reflected, and designed for presentation to one or more audiences for a particular rhetorical purpose” (Barrett, 2005, p. 5).

ePortfolio-based Learning Environment: This term refers to the space within the PebblePad platform that facilitated the scaffolding prompts by providing access to the students and offering the facility for interaction.


**Enculturation Teaching Model:** suggested by Tishman, Jay, and Perkins (1993), this teaching approach combines exemplars of good practice; opportunities for interaction and activities to target required skills. This was originally targeted at dispositions of higher order thinking and directly correlates with reflection and reflective writing.

**Engagement:** At a base level, this means to participate or be involved in. For the purpose of this research study, engagement was determined to be the level of use of the prompts and interactive affordances of the ePortfolio-based learning environment. The students’ reported use of the prompts provided and the posting of comments to the blog platform were used to judge their level of engagement.

**Framework for Teacher Reflection:** developed by Colton and Sparks-Langer (1993). The theoretical basis of this framework provided the platform from which to plan the intervention prompts to be provided in the ePortfolio-based learning environment.

**PebblePad:** The ePortfolio platform chosen to facilitate the learning environment. This is a commercial platform developed by Pebble Learning Ltd that the university has purchased the license for.

**Reflection:** Two key definitions of reflection were used in the research.

1. Reflection is the “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and further conclusions which it tends” (Dewey, 1933, p. 9).
APPENDIX II
Matrix of Theoretical Frameworks

THEORY

Critical Theory

Constructivism

Cognitive Psychology

Novice/Expert Perspectives

Experiential Learning

FRAMEWORK COMPONENT

PROFESSIONAL KNOWLEDGE BASE
Influences and Interpretations

CONSTRUCT KNOWLEDGE AND MEANING
Choose to Attend to Situation
Reflective Discussion
Possible Solution

ACTION
Decisions
Plan
Implement
Evaluate

ATTRIBUTES OF REFLECTIVE PRACTITIONER
Flexibility
Social Responsibility
Efficacy
Consciousness

PRACTICE

Engagement to Connect and Integrate
Scaffolded Approach
Systematic Approach
Collaboration and Discussion

Enculturation Teaching Model
Tishman, Jay and Perkins (1993)

Implemented and Reviewed through eLearning Lifecycle

Motivation & Caring
APPENDIX III

Timeline of Research Implementation and Researcher Role

<table>
<thead>
<tr>
<th>Research phases</th>
<th>Implementation</th>
<th>Completion date or milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle</td>
<td>Purpose</td>
<td>What was done</td>
</tr>
<tr>
<td>0</td>
<td>Analyse the problem</td>
<td>Identified the need for new approach</td>
</tr>
<tr>
<td>1</td>
<td>Design e-learning artefact</td>
<td>PebblePad platform chosen, Existing unit structure reviewed for use</td>
</tr>
<tr>
<td>2</td>
<td>Refine design</td>
<td>Acton research unit integrated to PebblePad</td>
</tr>
<tr>
<td>3</td>
<td>Design e-learning environment which embeds e-learning artefact</td>
<td>Pilot of the environment on a smaller scale – prompts provided to answer student questions through the action research process</td>
</tr>
<tr>
<td>4</td>
<td>Refine design</td>
<td>Based on feedback from pilot, the new environment was implemented</td>
</tr>
<tr>
<td>5</td>
<td>Refine design</td>
<td>Based on the feedback from Cycle 4, changes were again made to the environment for ongoing implementation and review</td>
</tr>
<tr>
<td>6</td>
<td>Refine design</td>
<td>At the completion of the teaching period a full round of data collection was implemented to review the environment</td>
</tr>
</tbody>
</table>
# APPENDIX IV

## Cascading Data Matrix

<table>
<thead>
<tr>
<th>Participant ID</th>
<th>FG Int</th>
<th>Online Survey</th>
<th>Ind Int</th>
<th>Work Sam</th>
<th>Blog Post</th>
<th>LMS Post</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2 3 4 5 6 7 8 9 10 11 12 13 14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chelsea</td>
<td>1</td>
<td>x x x x x x</td>
<td>Y Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thomas</td>
<td>1</td>
<td>x x x x x x x x x x</td>
<td>Y Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alesha</td>
<td></td>
<td></td>
<td>Y Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madison</td>
<td></td>
<td></td>
<td>Y Y Y Y Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zak</td>
<td></td>
<td>x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jaye</td>
<td></td>
<td>x x x x x x x x x x x x x x</td>
<td>Y Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KS</td>
<td>2</td>
<td>x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KR</td>
<td></td>
<td>x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP R</td>
<td></td>
<td>Consent details only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MK R</td>
<td></td>
<td>x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LB R</td>
<td></td>
<td>x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR</td>
<td></td>
<td>x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LP</td>
<td></td>
<td>x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM</td>
<td></td>
<td>x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MV</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RG</td>
<td></td>
<td>x x x x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AR</td>
<td></td>
<td>x x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SH</td>
<td></td>
<td>x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MW</td>
<td>3</td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LS</td>
<td></td>
<td>x x x x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AB</td>
<td></td>
<td>Consent details only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LM</td>
<td></td>
<td>Consent details only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SV</td>
<td></td>
<td>x x x x x X x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td>x x x x x X x x x x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RC</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SH</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NK</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TW</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KS</td>
<td></td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MJ</td>
<td>1</td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Md</td>
<td>2</td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>2</td>
<td>x x x x x x x x x x x x</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>7 25</td>
<td>8 10 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX V

Participant Information Letter

Investigating an ePortfolio environment for developing reflection of pre-service teachers

Investigator (s)
Chief Investigator: Dr Dorit Maor (School of Education, Murdoch University)
Co-investigator: Professor Jan Herrington (School of Education, Murdoch University);
Student Investigator: Pauline Roberts (EdD Candidate, School of Education, Murdoch University).

Contact Person
Dr Dorit Maor
School of Education, Murdoch University,
South Street Campus, WA
Telephone: 08 XXXX XXXX
Email: D.Maor@murdoch.edu.au

You are invited to participate in this study.

Background
Research has shown that reflection is highly valued in the field of education and pre-service teachers are expected to be involved in the process and effectively use reflection as a learning tool. A few studies have been conducted on the development of reflection demonstrating that it is difficult to develop and requires systematic scaffolding. We are interested to learn how we can enhance the development of student reflection so we are inviting you to participate in this research.

This research is being completed as a Doctoral thesis by Pauline Roberts under the supervision of Dr Dorit Maor and Professor Jan Herrington.

Aim of the Study
The aim of the study is to identify a framework for an ePortfolio environment that assists in the development of reflection in pre-service teachers. The research uses the eLearning Lifecycle (Phillips, Kennedy & McNaught, 2011) model and the
enculturation teaching method (Tishman, Jay & Parkins, 1993) aimed at the development of reflective attributes.

Throughout the study, the researcher will provide scaffolding prompts within the PebblePad learning environment designed to assist with the development of reflection. These prompts come from research into reflection and are provided for you to complete if you wish. These additional activities are not assessible and do not count towards your grade. The researcher cannot assist individuals with projects but will provide support for the use of PebblePad and additional prompts that may help with reflection. Participation in these activities is on a voluntary basis.

What Does Your Participation Involve?

You will have access to the technology-based strategies within the ePortfolio environment and have the choice to complete them or not. There are no marks awarded for these activities but they are planned to scaffold the development of the action-learning project. At the completion of the unit:

* You will be asked to provide consent for the collection of blog posts and reflective work samples that can be analysed for interaction patterns and discussion as well as identify levels of reflection.

* You will also be asked to provide the graph of your usage within the PebblePad platform to determine levels of engagement with the range of activities available.

* A group of approximately 25 students will be recruited through a blog post invitation to take part in 45 minute, focus group interviews of 4-5 students to identify key areas within the environment that may have had an impact on reflection. The blog invitation will be placed in the Gateway as:

“As you are aware, the additional activities offered here have been part of a research project. To review the effectiveness of these strategies, the researcher is looking for students to take part in a series of focus group interviews. These interviews will be in groups of 5 and will last approximately 45 minutes. If you would like to be involved in these interviews and provide feedback to this process, please reply to this post with your name, email and mobile phone details. Thanks. Pauline Roberts”

* 10 individual students will be invited to take part in another 45 minute interview, this time individually. This individual interview is designed to provide more detailed responses about your experience in the development of reflection. Selection for these will be based on usage patterns to ensure a cross-section of points of view.

All this information will be assigned pseudonyms for confidentiality and be analysed to determine the effectiveness of the environment in developing reflective practice.

Voluntary Participation and Withdrawal from the Study

It is important that you understand that your involvement in this study is voluntary. While we would be pleased to have you participate, we respect your right to decline. There will be no consequences to you if you decide not to
participate, and this will not affect the way you are treated in the unit. If you decide to discontinue participation at any time, you may do so without providing an explanation. If you withdraw, all information you have provided will be removed from the data collection.

Your privacy

Your privacy is very important to us. Your participation in this study and any information will be treated in a confidential manner. Your name and identifying details will not be used in any publication arising out of the research. Following the study the data will be kept in a de-identified format, electronically on a password protected computer or if hard copy, in a locked cabinet in the office of the Researcher.

Possible Benefits

For all students involved with the ePortfolio environment, it is hoped that the engagement in the strategies will assist in the completion of the action learning project and the development of the ability to reflect more deeply on your experience. The engagement with the technology will also be of benefit when embarking on classroom practice where ICT skills are becoming more sought after.

Possible Risks

There are no specific risks anticipated with participation in this study. However, if you find that you are becoming distressed or concerned in any way you will be advised to receive support from the unit co-ordinator or alternatively, we will arrange for you to see a counselor at no expense to you.

Questions

If you would like to discuss any aspect of this study, please feel free to contact either Pauline Roberts (telephone: 08 XXXX XXXX) or Dr Dorit Maor (telephone: 08 XXXX XXXX). Either of us would be happy to discuss any aspect of the research with you. You are welcome to contact us at that time to discuss any issue relating to the research study. You are also able to contact the Murdoch University Human Research Ethics Committee on XXXX XXXX.

Once we have analysed the information from this study we will post in the blog a summary of our findings. You can expect to receive this feedback in early 2013.

We would like to thank you in advance for your assistance with this research project. We look forward to hearing from you soon.

Dr Dorit Maor

School of Education, Murdoch University,

South Street Campus, WA

Telephone: 08 XXXX XXXX
Email: D.Maor@murdoch.edu.au

Pauline Roberts
EdD Candidate
School of Education, Murdoch University
South Street Campus, WA.
Telephone: XXXX XXXX
Email: P.Roberts@murdoch.edu.au

This study has been approved by the Murdoch University Human Research Ethics Committee (Approval 2012/117). If you have any reservation or complaint about the ethical conduct of this research, and wish to talk with an independent person, you may contact Murdoch University’s Research Ethics Office (Tel. 08 XXXX XXXX (for overseas studies, +61 8 XXXX XXXX) or e-mail ethics@murdoch.edu.au). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
APPENDIX VI

Participant Consent Letter

Investigating an ePortfolio environment for developing reflection of pre-service teachers

The information about this study has been given to me. I have received satisfactory answers to all questions I have asked. I agree to participate in this study. I know that I can choose not to provide any documentation, answer any question, or stop at any time, without being disadvantaged. I understand that all information provided by me is treated as confidential and will not be released by the researcher to a third party unless required to do so by law.

Please tick the box below for each statement to show your consent.

| I agree that data gathered in this study may be used for analysis. |
| I provide permission for the researcher to collect and analyse blog entries completed by me. |
| I provide permission for the researcher to collect and analyse samples of my reflective entries. |
| I provide permission for the researcher to collect and analyse usage patterns graphed within the PebblePad platform. |
| I agree that if I take part in a focus group interview that it will be audio recorded and transcribed. |
| I agree that if I take part in an individual interview that it will be audio recorded and transcribed. |
| I would like to receive a summary of the results from the study. If you tick this box, please provide your contact details below: |

Please contact me at:

Name of participant: ____________________________________________
Student number: ____________________________________________
Signature of participant: ____________________________________________
Date: ___________________________
Signed when received by Chief Investigator: ____________________________
Date: ___________________________
APPENDIX VII

Survey questions from website

These graphics were all taken from the participant view of the online survey. The students were given the information letter at the beginning of the survey and the first question replaced the consent form.

1. By completing this survey, you are providing your consent to be involved in the research. Please identify what data you agree can be accessed as part of the research process.

<table>
<thead>
<tr>
<th>Process</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blog post entries completed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflective entry samples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usage pattern graphs from within Feedback Pad</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Please enter your name here. Confidentiality will be maintained and a pseudonym will be used in the research. This response is to confirm whose information I can access as part of the study.

3. Have you been required to reflect on your teaching at all throughout your degree?
   - Yes
   - No

4. In what contexts, and how were these entries required to be presented?

5. How would you describe your ability to reflect prior to commencing this unit?

6. Do you think your ability to reflect has improved in this unit?
   - Yes
   - No

7. Has your perception of reflection changed through your involvement in this unit?
   - Yes
   - No

8. If you answered yes to either question 6 or 7, please explain in what ways?

9. What do you think the university could do differently to assist with the development of reflective writing?
This group of questions refer to the PebblePad platform.

10. Please identify in the following table whether you utilized any of the prompts provided in the Gateway Blog:

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Did not look at</th>
<th>Read only</th>
<th>Read and used in project</th>
<th>Read and completed activity</th>
<th>Shared writing from activity with others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection on teachers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Something to talk about</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflective Journal as a Blog</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proc/Results Outline</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to refine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adding ethics checklist</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progress report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uploading evidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflective writing review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outline of ALL Framework</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertal 3 step framework</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reflective journal review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conclusion questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final report</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Which did you find the most useful in the completion of your action learning project and why?


12. Were you involved in the blog posts and the ongoing discussion around the unit?
   ○ Yes
   ○ No

13. If you answered yes, in what ways did this help?
    If you answered no, what other avenues (if any) did you use to share your ideas on the unit?


14. Do you think you will continue to use an ePortfolio in the future either in PebblePad or another format?
   ○ Yes
   ○ No

15. Why? why not?


16. Do you have any additional comments to make?


17. Thank you so much for your time to complete this survey.
    If you would like to be involved in individual interviews or would like results from this research, please provide your email details here.

PLEASE CLICK ON THE SUBMIT BUTTON AT THE TOP OF THIS PAGE TO FINISH YOUR SURVEY.
THANKS SO MUCH!
APPENDIX VIII

Peer review of the research project

Throughout the completion of the research, a number of publications and presentations were given in relation to the study. These provided feedback on the ongoing implementation of the project.

<table>
<thead>
<tr>
<th>Type of presentation</th>
<th>Aspect of thesis</th>
</tr>
</thead>
</table>
  www.pebblebash.co.uk/2014/resources/pdf/pb2014rp02.pdf | Specific engagement with the prompts as part of the environment and the barriers to the engagement. |
<table>
<thead>
<tr>
<th>Type of presentation</th>
<th>Aspect of thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abstract reviewed presentations</strong></td>
<td></td>
</tr>
<tr>
<td>ePortfolio Australia Forum, 2012: Australian Catholic University, North Sydney, Australia. <em>Using ePortfolios to facilitate the development of reflective skills in pre-service teachers.</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall research project, feedback specific to Cycle 5 implementation</td>
</tr>
<tr>
<td>Western Australian Institute for Educational Research (WAIER) Research Forum, 2012: Notre Dame University, Fremantle, Western Australia. <em>Using the eLearning lifecycle to plan and review an environment to develop reflection in pre-service teachers.</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Methodology</td>
</tr>
<tr>
<td>Murdoch University Postgraduate Student Association (MUPSA) Conference, 2011: Murdoch University, Perth, Western Australia. <em>Facilitated development of reflective skills in an ePortfolio framework: Do weekly activities help with the process?</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scaffolding framework</td>
</tr>
<tr>
<td>Western Australian Institute for Educational Research (WAIER) Research Forum, 2011: Notre Dame University, Fremantle, Western Australia. <em>Creating design principles to support reflection through an ePortfolio platform.</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Concept of the project</td>
</tr>
</tbody>
</table>
REFERENCES


